



WELCOME!

PUBLIC MEETING MAY 29, 2018

Rail Alignment and Benefits Study

The **Rail Alignment and Benefits (RAB) Study** is analyzing the best ways to bring Caltrain and High Speed Rail to the Salesforce Transit Center (SFTC) while connecting San Francisco's fastest-growing neighborhoods.

Today's meeting will summarize the findings from the Study, including a preliminary preferred rail alignment for Caltrain and High Speed Rail: **the Pennsylvania Avenue (DTX + Extended Tunnel)**. Community members are invited to provide input on the alignment, the other four study components and next steps.

The RAB Study includes 5 components:

- **1. Rail Alignment into the Salesforce Transit Center (SFTC)**
This component seeks to answer the most time sensitive question of the RAB: how to bring both Caltrain and High Speed Rail from the county line into the Salesforce Transit Center.
- **2. Railyard Reconfiguration/Relocation**
This component considers reknitting the fabric of the City by modifying or relocating some or all of the activities at the 4th/King Railyard.
- **3. Urban Form and Land Use Considerations**
This component explores possible opportunities to re-connect streets, improve bike/pedestrian connections, create affordable housing, and add public amenities if the railyard is reconfigured or relocated.
- **4. Transit Center (SFTC) Extension/Loop**
This component explores future scenarios to improve station capacity through potential extensions to the East Bay or through loops returning to the South.
- **5. Boulevard I-280**
This component analyzes the interaction between proposed rail alternatives and the I-280 structure.

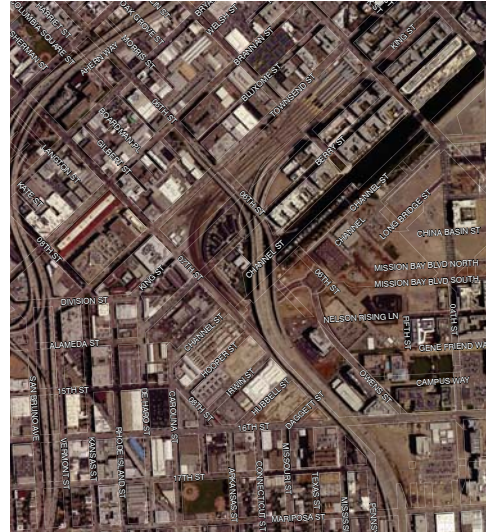




After decades of low density industrial activity, the southeast quadrant of San Francisco will see tremendous growth in population, jobs and public amenities. An anticipated 20,000 new households and 35,000 jobs are anticipated just in the Southern Bayfront area between Mission Creek and the county line.



At the same time, state and regional transportation systems are changing. The Central Subway is expected to be in operation by 2019, Caltrain electrification by 2022, and High Speed Rail into San Francisco in 2029 (with early operations in 2027).



In 2014, the City and County of San Francisco recognized that additional impacts on our neighborhoods and employment centers needed to be addressed before these combined projects became reality. There was a particular need to integrate the Downtown Rail Extension (DTX) with San Francisco's goals for land use, pedestrian safety, and neighborhood connectivity.

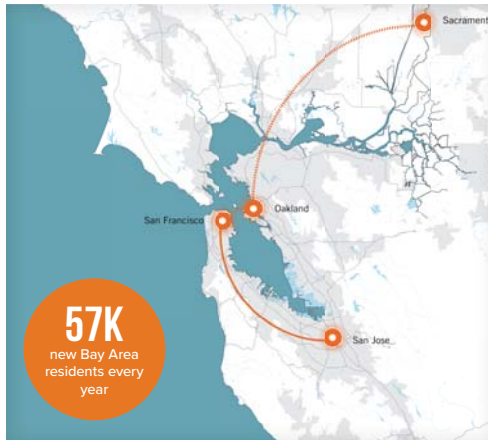
With a comprehensive lens across jurisdictions, the RAB study was the first step in identifying solutions to these impacts. This approach is now pointing to concrete solutions that underground trains, remove transportation conflicts, and create more livable neighborhoods.



CALIFORNIA IS GROWING IN POPULATION & JOBS

California	2015	2065	Growth
Population	39 M	52 M	+ 33%
Employees	16 M	28 M	+ 77%

To create the equivalent capacity of high speed rail, 4,300 lane miles and 115 airport gates would be needed throughout the State



THE BAY AREA IS EXPECTED TO GROW OVER 40% BY 2065

Bay Area	2015	2065	Growth
Population	7.6 M	10.7 M	+ 41%
Employees	4 M	5.8 M	+ 44%

San Jose to San Francisco would take 30 minutes via high-speed rail



SF POPULATION IS PROJECTED TO DOUBLE

San Francisco	2015	2065	Growth
Population	860,000	1,430,000	+ 66%
Employees	700,000	995,000	+ 44%

Maximizing rail access can help lower demand for streets and freeways



THE SOUTHEAST QUADRANT ACCOUNTS FOR 75% OF SF GROWTH

	2015	2065	Growth
Population	87,000	257,000	+ 194%
Employees	304,000	554,000	+ 82%

Undergrounding rail could re-connect 6 east-west roads across Caltrain tracks in Potrero Hill, Showplace Square and Mission Bay

What is the challenge of the DTX?

Under the direction of the Transbay Joint Powers Authority (TJPA), the Downtown Rail Extension (DTX) is a rail connection from the vicinity of 7th/Townsend to Salesforce Transit Center (SFTC) for use by both Caltrain and CHSRA.

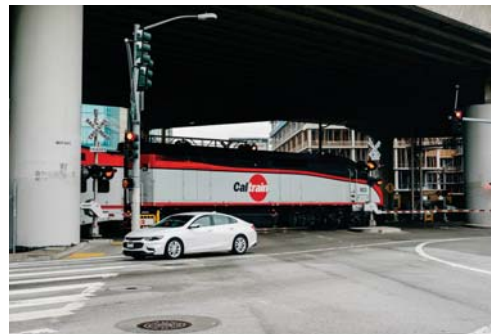
The DTX as shown to the right was selected in 2004, prior to the addition of thousands of new homes and jobs in this area of the city. For a mile along the current Caltrain route, Mission Bay Drive/7th and 16th Street/7th are the only two east-west connections to/from Mission Bay.

The impacts to these intersections were beyond the scope of the DTX's environmental review. If the DTX is built as currently environmentally cleared, future high speed and Caltrain service would close 16th Street and Mission Bay Drive intersections for at least 20 minutes every peak hour.

With increased vehicle traffic, a future bus rapid transit route, and emergency services to UCSF on 16th Street, the current DTX plan would increase congestion, emergency response times, and neighborhood impacts.



At-grade rail crossing at Mission Bay Drive & 7th St.

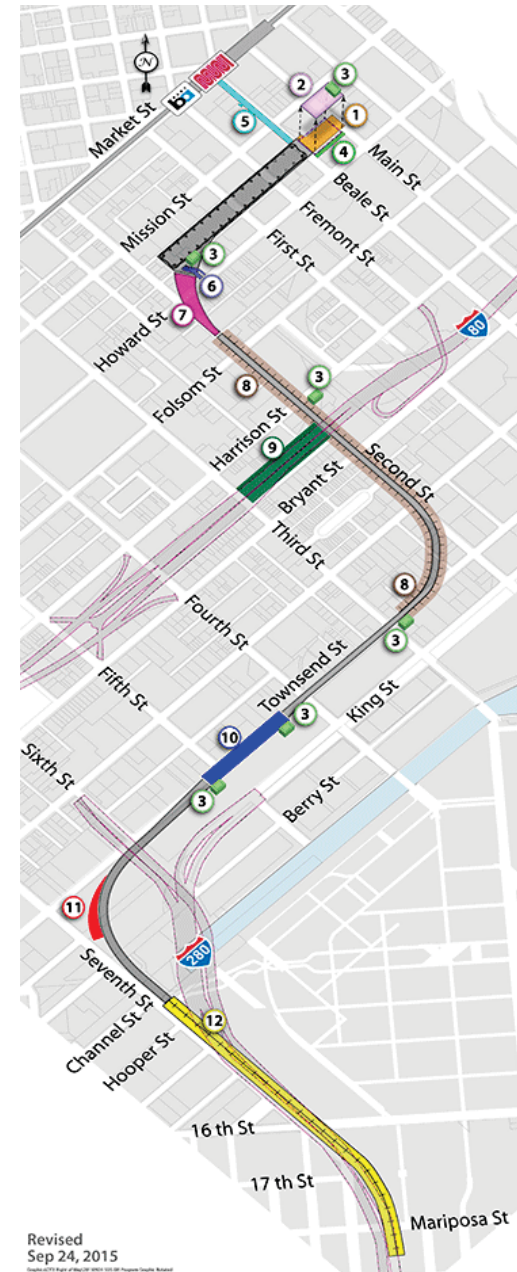


At-grade rail crossing at 16th and 7th Streets



Visualization of high speed rail, Caltrain, BRT, emergency services, & pedestrians crossing 16th St (and 7th) at-grade.

DTX as Planned and Environmentally Cleared



1. **Train Box Extension:** The underground train box could be extended east one block to Main Street.
2. **Intercity Bus Facility:** A new bus facility above the extended train box between Beale and Main streets to serve operators such as Amtrak and Greyhound.
3. **Ventilation and Emergency Egress Structures**
4. **Taxi Staging Areas**
5. **BART/Muni Underground Pedestrian Connector** linking the Embarcadero BART/ Muni Metro Station to the Transit Center.
6. **Bicycle/Controlled Vehicle Ramp:** A bicycle ramp to below-grade bicycle facilities and parallel ramp for emergency and maintenance vehicles.
7. **Widened Throat Structure:** The proposed widened throat structure provides the connection between the underground tracks and the train box below the Transit Center.
8. **Rock Dowels.** 15-foot-long rods that would be installed along the mined tunnel segment.
9. **Parking at AC Transit Bus Storage Facility**
10. **4th and Townsend Underground Station.** The station would parallel Townsend Street.
11. **Tunnel Stub Box:** A new below-grade train box at the west end of the Caltrain railyard near Townsend and Seventh streets would be constructed to accommodate future grade separations and expedite future arrival of below-grade Caltrain and high-speed trains.
12. **Additional Trackwork:** A turnback track and maintenance of way storage track would be constructed within the existing Caltrain right-of-way between Hooper Street and Mariposa Street, immediately east of Seventh Street.

Introduction

Fast, frequent, and reliable Caltrain and High Speed Rail service to and within the City are essential to the Bay Area and California. However, the current design to bring trains to the Salesforce Transit Center would result in more than 20 minutes of street closures in any peak hour at 16th Street/7th Street and Mission Bay Drive/7th Street. The RAB Study seeks to bring trains to SFTC in a way that benefits City neighbors and stakeholders.



OVERVIEW: COMPONENT 1

Component #1 of the study sought to answer the most time sensitive question of the RAB: how to bring both Caltrain and High-Speed Rail from the county line into the Salesforce Transit Center (SFTC).

The three rail alignment options are shown in the map to the left, with more details on each alignment shown on separate boards.

Component #1 illustrates how undergrounding rail is essential to getting trains downtown and connecting rapidly-growing, eastern neighborhoods to the rest of San Francisco.

The Preliminary Preferred Alignment is Option 2: Pennsylvania Avenue.

The design and phased construction (of "DTX + Extended Tunnel") solves the challenges of the at-grade intersections without slowing down the construction of the DTX between 7th/Townsend and SFTC.

Additionally, undergrounding the rail alignment near 22nd Street creates opportunities to reknit over 1 mile of the city, reuse the 4th/King railyard, re-design 22nd Street station and ensure that all trains can utilize SFTC.



OVERVIEW:

RAIL ALIGNMENT OPTION 1

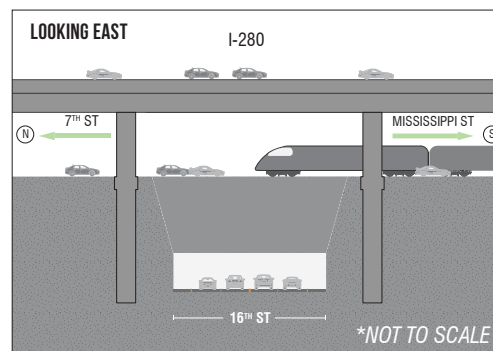
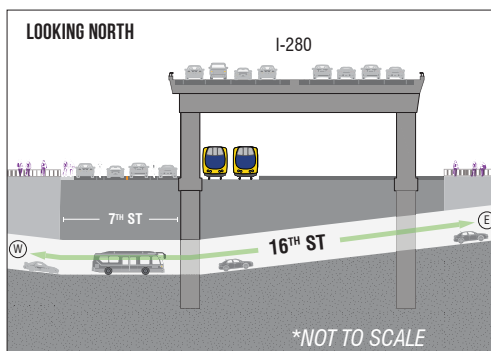
- » Downtown Rail Extension (DTX) is built as proposed, from 7th/Townsend to SFTC
- » 4th/Townsend underground station is built
- » Railyard above ground at 4th/King remains
- » Surface tracks south of 4th/King remain
- » 16th St & Mission Bay Dr become trenched underpasses, 35-50 feet deep, 0.6 miles in length
- » Year of estimated completion: 2026
- » Cost: \$5.1 billion
- » Blocks impacted by alignment construction: 53+
- » Environmental review approved for DTX, further required for grade separations



16th & 7th Street - looking east, pedestrian perspective



16th & 7th Streets - looking east (from 1010 Potrero)



CROSS SECTIONS

16th & 7th Street intersection with 16th Street moved underground, below the rail operations.

This produces a trench of 0.6 Miles in length.

PROS +

- » Provides access for emergency services to UCSF hospital by trenching 16th street
- » DTX portion of rail has an approved environmental clearance
- » Allows rail providers to proceed on their construction schedules
- » Could allow a phased construction schedule with trenching streets to follow shortly after
- » Requires the least amount of reassessment by the partner agencies and jurisdictions
- » Is the least expensive option

CONS -

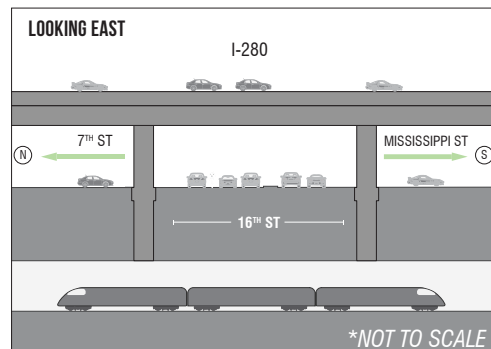
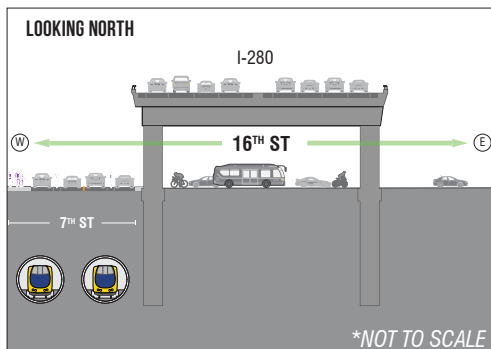
- » Based on old, more industrial land uses
- » Limits east/west crossings to 16th and Mission Bay Dr.
- » Requires trenches 4-5 stories deep to avoid street closures when trains present (20+ min. per peak hour)
- » Trenches:
 - Would be double the depth of Cesar Chavez or Geary
 - Create barriers to eastern neighborhoods
 - Disrupts ped, bike, vehicle connections
 - Create more uncertain conditions with sea level rise
- » Creates two rail facilities (4th/King and 4th/Townsend)
- » Current Railyard uses likely remain
- » Does not require all trains to terminate at SFTC
- » Environmental clearance of trenching streets is required

**OVERVIEW:****RAIL ALIGNMENT OPTION 2**

- » Downtown Rail Extension (DTX) is built as proposed, from 7th/Townsend to SFTC
- » 4th/Townsend underground station is built
- » DTX operates while Pennsylvania Ave underground extension is constructed
- » Assumes removal of 4th/King yard and construction of a new southern rail yard
- » Rail moved underground near 22nd Street Caltrain station
- » Year of estimated completion: 2027
- » Cost: \$6.0 billion
- » Blocks impacted by alignment construction: 12+
- » Environmental review required for additional tunnel length



16th & 7th Streets - looking east (from 1010 Potrero)

**CROSS SECTIONS**

16th & 7th street intersection with trains moved underground, below the streets.

PROS

- » Avoids a long, deep trenching of 16th Street and 7th/Mission Bay Dr., by moving trains underground
- » Does not slow down DTX design and construction
- » Improves safety at two at-grade intersections by eliminating train crossings
- » Creates opportunities for new pedestrian, bike & vehicle connections around 4th/King
- » Creates opportunities for housing, land use and public amenities at 4th/King Rail yard
- » Reconnects 1+ mile currently divided by train tracks
- » Creates opportunities to improve 22nd Street Caltrain Station
- » Allows for potential additional storage underground
- » Requires all trains to utilize SFTC

CONS

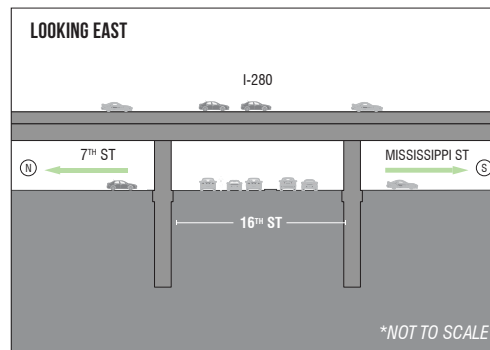
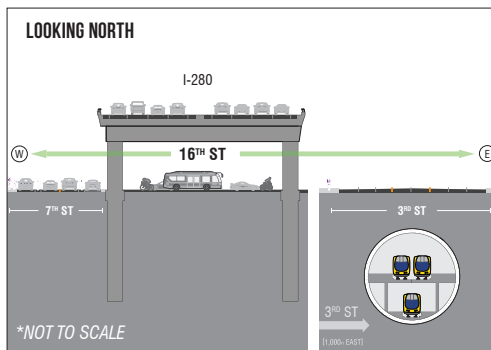
- » Increases project costs compared to Option 1
- » Requires additional environmental review for tunnel south of 7th/Townsend
- » Requires relocation of train storage & maintenance to a southern location
- » Likely requires the relocation of underground utilities



OVERVIEW: RAIL ALIGNMENT OPTION 3

- » Downtown Rail Extension (DTX) is not built as proposed
- » Creates a new alignment west and under the proposed DTX alignment
- » Builds a new underground 3rd St. Station to serve the Mission Bay community
- » Removes 4th/King Rail yard
- » Assumes maintenance and storage at new southern railyard.
- » Moves rail alignment underground near 22nd Street and then veers east under 3rd Street
- » Year of estimated completion: 2031
- » Cost: \$9.3 billion
- » Blocks impacted by alignment construction: 0¹
- » Environmental review required for entire length

¹ Pending a location for tunnel boring machine to enter



CROSS SECTIONS

16th & 7th Street intersection with trains moved underground, below 3rd Street.

PROS +

- » Avoids long, deep trenching at 16th St and 7th/ Mission Bay Dr by moving trains underground
- » Improves safety at two at-grade intersections by eliminating train crossings
- » Reconnects 1+ mile of the city currently divided by train tracks
- » Creates opportunities for new pedestrian, bike, vehicle connections around 4th/King
- » Creates opportunities to improve 22nd Street Caltrain Station
- » Creates opportunities for housing, land use and public amenities at 4th/King Rail yard
- » Provides a direct connection to Caltrain and HSR for Mission Bay
- » Requires all trains to utilize SFTC

CONS -

- » Highest project costs of the three alignments
- » Longest schedule for completion
- » Requires additional environmental review on the entire new segment
- » Requires relocation of train storage & maintenance to a southern location
- » Constrains space for underground storage tracks at Mission Bay station
- » Requires large tunnel boring machine
- » Increases uncertainty due to interactions with the 3rd Street Bridge and AT&T Park
- » Eliminates the potential for phased construction. Trains would continue to run to/ from 4th/King until the new tunnel to SFTC is completed

INTRODUCTION

NOTE: The 4th & King railyard is currently owned by a private entity with an operations easement to Caltrain. Any change in its use must first assess impacts to the viability, efficiency and effectiveness of Caltrain service. San Francisco will continue to coordinate with Caltrain, as the transit agency creates a new business plan and plan for blended service with high-speed rail.

The 4th/King Railyard provides multiple services that are essential to Caltrain:

- » Station: final destination or point of departure for more than 15,000 residents and workers in San Francisco every day
- » Staging: allowing multiple trains to quickly begin service after a big event such as a baseball game
- » Storage and Maintenance: for Caltrain trains not currently in service

PROS +

- » Improves neighborhood connectivity and safety by re-connecting 5th, 6th, King, Townsend and other parallel streets
- » Undergrounding rail in either the Pennsylvania Avenue or Mission Bay alignment options creates an opportunity to re-knit over 1-mile of the city
- » Creates opportunities for public amenities like affordable housing, open space and other land uses
- » Builds new state of the art railyard and facilities
- » Eliminates industrial externalities such as rail hazards and noise

For future evaluation:

- » Potential efficiencies gained using a new storage/maintenance location to the south

OVERVIEW: COMPONENT 2

In both the "Future with Surface Rail" and "Pennsylvania Avenue" alignment options, there is the possibility to expand the underground 4th/Townsend Station to allow for some additional storage or staging functions.

If a new location is approved for storage and maintenance, space could be available at the railyard for potential reuse and reconnecting neighborhood streets.

After preliminary analysis of 5 potential locations for railyard functions, two potential locations remain for further study.

Full analysis of the Peninsula Corridor Service Vision (or "Blended Service") and of Caltrain's Business Plan are required before discussions related to the railyard can be furthered. Both documents are expected in 2018.

CONS -

- » Requires additional environmental clearance
- » Requires a change in Caltrain operations with the storage and maintenance at a new location
- » Potentially adds operating costs for Caltrain
- » May result in longer waits for event-specific trains currently staged at 4th/King Railyard

For future evaluation:

- » Full analysis of the Blended Service Plan and Caltrain Business Plan are required to understand impacts of the 4th/King Railyard reconfiguration/relocation (draft plans anticipated 2018)
- » Caltrain operating cost analysis



OVERVIEW: COMPONENT 3

Reconfiguring/Relocating the 4th/King railyard could reconnect and improve nearby neighborhoods

In addition, if the railyard isn't needed for trains, approximately twenty (20) acres of land could be repurposed.

The Railyard site could accommodate 2.4 million square feet of commercial and 1.5 million square feet of residential space based on zoning consistent with Central SoMa.

Preliminary analysis shows this could create an estimated \$481M in City bonding potential.



INTRODUCTION

The Salesforce Transit Center (SFTC) will be the final stop for both Caltrain and High Speed Rail (HSR) trains coming to San Francisco.

Cleaning, stocking, and security checks will increase the time trains occupy the platforms and therefore limit the number of trains that can be served.

In the future, demand will likely exceed the capacity available at SFTC and more capacity will be needed.

The only way to expand capacity is to extend out the east side of the trainbox via (1) a transbay extension to Alameda or Oakland or (2) a "loop," which returns south.

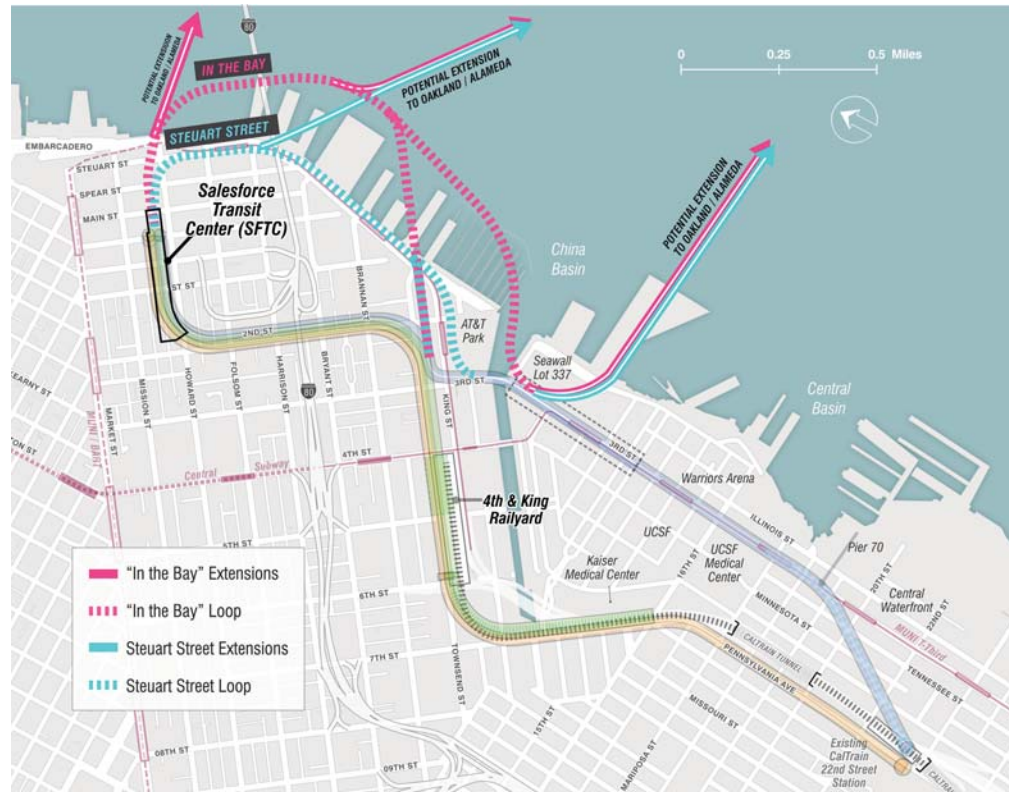
Providing for more capacity at SFTC could provide a seamless train connection to Oakland and Sacramento rather than requiring multiple transit modes and transfers like today.

OVERVIEW: COMPONENT 4

This component sought to determine whether extensions or loops could help increase train capacity at SFTC or support future connections to the East Bay.

Four conceptual extension/loop alignments were considered (for operational benefits only, not costs or engineering). The study determined that:

- » An extension/loop is not necessary at this time, but can be viewed as a long-term project
- » Only 5 of 6 SFTC tracks can be extended
- » Two of the extension/loop alignments were infeasible due to turning radii requirements. The two feasible alignments are "Steuart Street" and "In the Bay"
- » The two feasible alignments serve both Caltrain and HSR trains
- » Extensions to the East Bay would result in new ridership pools, but loops would not.



PROS ⊕

- » Provides for additional capacity along the Caltrain corridor essential for future additional rail service
- » Potentially provides rail access to/ from Alameda/Oakland
- » Provides enough time to plan, engineer, and environmentally clear the project

CONS ⊖

- » Requires additional planning, engineering, and environmental clearance
- » Costs are not known
- » Funding could likely be secured only after Caltrain operates a fully electrified fleet (TBD) and HSR is in operation in the City in 2029 with potential early service in 2027

For future evaluation:

- » Caltrain will operate additional trains and their Business Plan will help identify when an expansion to SFTC will be needed
- » BART is initiating a study of a potential second transbay tube
- » While these alignments are feasible, additional study would be necessary to determine 1) final alignment, 2) construction timeline, and 3) cost estimates
- » Future Seawall work should identify a punch-out panel for a future extension



INTRODUCTION

Interstate 280 runs along the eastern side of the City. It was initially designed to connect to I-80, the Embarcadero Freeway, and the Bay Bridge, ultimately creating a ring road around the City.

After the freeway revolt and the Loma Prieta earthquake, I-280 never completed these connections. It terminates in off-ramps at the 4th/King and 6th/Brannan intersections.

While there has been a recurring discussion about changing the freeway north of Potrero Hill, specific changes to I-280 are not the focus of this study. The I-280 is a usable freeway and is expected to remain viable for the foreseeable future. However, the RAB Study did explore potential impacts of I-280 changes on the rail alignments in Component #1 and vice versa.

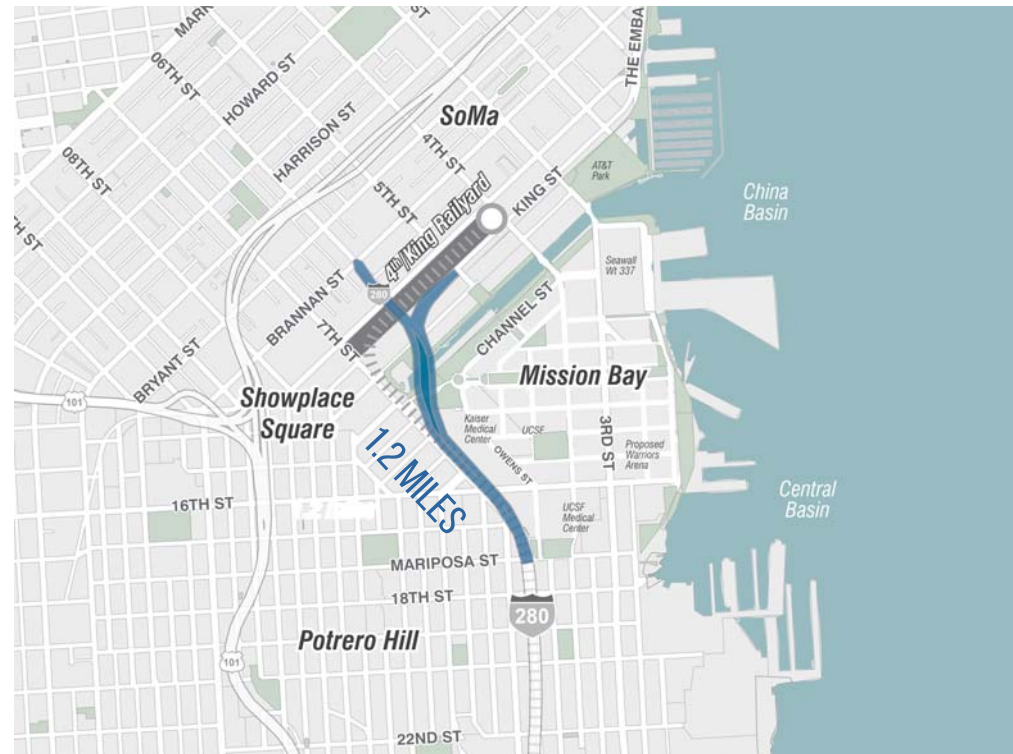
Additional study related to the feasibility of removing a portion of I-280 is possible in the future.

OVERVIEW: COMPONENT 5

Component #5 studied the interaction between three rail alignments and the I-280 structure to ensure that rail does not preclude the possibility of future changes to I-280 north of Mariposa.

The study determined that:

- » Removing I-280 does not create new opportunities for rail, in any of the three alignments
- » Changes to I-280 do not impact any of the other Study components
- » Removing I-280 requires much longer conversation with Caltrans
- » There is not sufficient right-of-way for Caltrain to remain at surface (i.e. in the Future with Surface Rail Alignment) and to bring the freeway to ground level. But changing I-280 is a matter for future consideration with Caltrans
- » The RAB findings did not further pursue the potential to remove I-280 once it was determined that the freeway segment has considerable useful life remaining. However, the potential for removal should be included in the City's future analysis.



The RAB Study determined that changing I-280 north of Mariposa St does not impact the rail alignments in Study Component #1 and, vice versa, the rail alignments do not require or preclude future changes to I-280.

PROS TO CHANGING I-280 ⊕

- » May provide for better overall traffic flow in the area but with some roads experiencing higher flows than current. Specifically, improvement may be seen at the intersections around 6th/Brannan and 4th/King
- » Removing an elevated freeway could achieve aesthetic improvements and help connect neighborhoods

CONS TO CHANGING I-280 ⊖

- » Only a very preliminary study has been completed to date. Costs are not known and funding is not, and would not be, secured until much more analysis and preliminary assessment and consideration by Caltrans is completed
- » I-280 remains a usable freeway segment
- » Some roads would experience higher traffic volumes under the boulevard option
- » Removal of the I-280 segment would require significant additional planning, engineering, and environmental clearance



I-280 overpass at Mission Bay Drive & 7th Street



I-280 overpass at 16th Street & 7th Street

