Local Policy Maker Group (LPMG) Meeting

Thursday, April 25, 2019
5:30 p.m. – 7:30 p.m.
SamTrans Offices – Bacciocco Auditorium 2nd Floor
1250 San Carlos Ave., San Carlos

Members of the public are welcome to attend the teleconference location at
1970 Santa Cruz Ave, Menlo Park, CA

Agenda

1. Call to Order
2. Staff Report
3. Caltrain Business Plan
4. Caltrain Electrification Project
5. HSR Update (Presented by California High-Speed Rail Authority Staff)
6. Public Comments
7. LPMG Member Comments/Requests
   a. Grade Separation Toolkit
8. Next Meeting
   a. Thursday May 23, 2019 at 5:30pm
9. Adjourn

All items on this agenda are subject to action
Memorandum

Date: April 25, 2019
To: CalMod Local Policy Maker Group (LPMG)
From: Sebastian Petty, Senior Advisor
Re: Caltrain Business Plan

Project update
The following is one in a series of monthly project updates for the Caltrain Business Plan. These updates provide a high level summary of project activities and progress and are paired, when applicable, with a presentation that reflects project materials and messaging shared with stakeholder groups during the subject month. The following “April” update covers work completed in late March of 2019 and April of 2019.

ONGOING TECHNICAL WORK
• Through spring of 2019 the Caltrain Business Plan team continued intensive technical work on the plan. The following technical work products are documented in the attached presentation that was provided to the Project Partner Committee as well as the CSCG and LPMG;
• Analysis of grade crossing improvements and potential investments along the Caltrain corridor

The following additional technical analysis is ongoing and will be presented in the coming months;

• Continued service planning work including
  o Initiation of dynamic simulation of all service concepts
  o Exploration of additional service concepts and variations
• Specification and quantification of capital investments needed to support service scenarios including track and system upgrades, station modifications, fleet and support facilities and grade crossing improvements and separations (discussed in the attached presentation)
• Finalization of key inputs and assumptions into the integrated business model including the calculation of key operating and maintenance costs
• Ongoing organizational assessment work specifying key railroad functionalities, mapping of Caltrain organization and analysis of national and international
comparison railroads as well as development of preliminary organizational recommendations

- Ongoing community interface documentation and development of comparison corridor case studies

MEETINGS AND OUTREACH
Stakeholder outreach and engagement activities continued in April with a number of events that covered material related to service planning. The following major meetings occurred in April:

- Transbay Joint Powers Authority Citizen Advisory Committee (April 9)
- Mountain View City Council (April 9)
- Transbay Joint Powers Authority Board of Directors (April 9)
- Caltrain Business Plan Ad Hoc Committee (April 15)
- City County Staff Group (April 17)
- Belmont City Council (April 23)
- Local Policy Maker Group (April 25)

In addition to public meetings, the Business Plan team also began the second round of individual meetings with staff from each of the 21 local jurisdictions along the Caltrain corridor. These meetings are still ongoing but were substantially completed during the month of April.

The Project Partner Committee (PPC) held its regular, full meeting on April 23.

NEXT STEPS
The first part of the Business Plan is focused on the development of a long-range service vision for the railroad accompanied by an assessment of the community-corridor interface and the Caltrain organization. The remainder of the project will be focused on the creation of the implementation plan, including a detailed business plan and funding approach. The Business Plan team will continue to provide monthly updates throughout the Business Plan. Over the next several months the team will provide significant updates on further service planning details, ridership projections, and capital and operating costs associated with each scenario.
Continuing to Build a Business Case
What is the Caltrain Business Plan?

**What**
Addresses the future potential of the railroad over the next 20-30 years. It will assess the benefits, impacts, and costs of different service visions, building the case for investment and a plan for implementation.

**Why**
Allows the community and stakeholders to engage in developing a more certain, achievable, financially feasible future for the railroad based on local, regional, and statewide needs.

What Will the Business Plan Cover?

**Technical Tracks**

- **Service**
  - Number of trains
  - Frequency of service
  - Number of people riding the trains
  - Infrastructure needs to support different service levels

- **Business Case**
  - Value from investments (past, present, and future)
  - Infrastructure and operating costs
  - Potential sources of revenue

- **Community Interface**
  - Benefits and impacts to surrounding communities
  - Corridor management strategies and consensus building
  - Equity considerations

- **Organization**
  - Organizational structure of Caltrain including governance and delivery approaches
  - Funding mechanisms to support future service
Where Are We in the Process?

2018
- Board Adoption of Scope
- Initial Scoping and Stakeholder Outreach

2019
- Stanford Partnership and Technical Team Contracting
- Technical Approach Refinement, Partnering, and Contracting
- Part 1: Service Vision Development

2020
- Board Adoption of 2040 Service Vision
- Part 2: Business Plan Completion
- Board Adoption of Final Business Plan
- Implementation

We Are Here

2040 Service Scenarios: Different Ways to Grow

2018
- Current Operations

2022
- Start of Electrified Operations

2029
- HSR Valley to Valley & Downtown Extension

2033
- High Speed Rail Phase 1

2040
- Service Vision

Design Year

Amount of Investment / Number of Trains

High Growth
Moderate Growth
Baseline Growth

Different Ways to Grow
2040 Baseline Growth Scenario (6 Caltrain + 4 HSR)

Features
- Blended service with up to 10 TPH north of Tamien (6 Caltrain + 4 HSR) and up to 10 TPH south of Tamien (2 Caltrain + 8 HSR)
- Three skip stop patterns with 2 TPH – most stations are served by 2 or 4 TPH, with a few receiving 6 TPH
- Some origin-destination pairs are not served at all

Passing Track Needs
- Less than 1 mile of new passing tracks at Millbrae associated with HSR station plus use of existing passing tracks at Bayshore and Lawrence

Options & Considerations
- Service approach is consistent with PCEP and HSR EIRs
- Opportunity to consider alternative service approaches later in Business Plan process

Moderate Growth Scenario (8 Caltrain + 4 HSR)

Features
- A majority of stations served by 4 TPH local stop line, but Mid-Peninsula stations are serviced with 2 TPH skip stop pattern
- Express line serving major markets – some stations receive 8 TPH
- Timed local/express transfer at Redwood City

Passing Track Needs
- Up to 4 miles of new 4-track segments and stations: Hayward Park to Hillsdale, at Redwood City, and a 4-track station in northern Santa Clara county (Palo Alto, California Ave, San Antonio or Mountain View. California Ave Shown)

Options & Considerations
- To minimize passing track requirements, each local pattern can only stop twice between San Bruno and Hillsdale - in particular, San Mateo is underserved and lacks direct connection to Millbrae
- Each local pattern can only stop once between Hillsdale and Redwood City
- Atherton, College Park, and San Martin served on an hourly or exception basis
High Growth Scenarios (12 Caltrain + 4 HSR)

Features
- Nearly complete local stop service – almost all stations receiving at least 4 TPH
- Two express lines serving major markets – many stations receive 8 or 12 TPH

Passing Track Needs
- Requires up to 15 miles of new 4 track segments: South San Francisco to Millbrae, Hayward Park to Redwood City, and northern Santa Clara County between Palo Alto and Mountain View (shown: California Avenue to north of Mountain View)

Options & Considerations
- SSF-Millbrae passing track enables second express line; this line cannot stop north of Burlingame
- Tradeoff between infrastructure and service along Mid-Peninsula - some flexibility in length of passing tracks versus number and location of stops
- Flexible 5 mile passing track segment somewhere between Palo Alto and Mountain View
- Atherton, College Park, and San Martin served on an hourly or exception basis

Ridership Projections

On its current, baseline path, Caltrain would experience demand of up to 161,000 daily riders by 2040. The Moderate and High Growth scenarios would increase demand to 185,000 and 207,000 riders, respectively.

Crowding may impact Caltrain’s ability to fully capture future demand. When constrained for crowding, all-day ridership in the baseline scenarios could be 6% lower and 4% lower in the moderate growth scenario. There is sufficient capacity in the high growth scenario to serve all projected demand.
Caltrain’s peak load point occurs around the mid-Peninsula. Today, Caltrain serves about 3,900 riders per direction during its busiest hour at this peak load point. This is equivalent to 2.5 lanes of freeway traffic.

The Baseline Growth Scenario increases peak hour ridership to about 6,400 riders at the peak load point – equivalent to widening US-101 by 2 lanes. Peak hour demand exceeds capacity by about 40%.

The Moderate Growth Scenario increases peak hour ridership to about 7,500 riders at the peak load point – equivalent to widening US-101 by 2.5 lanes. Peak hour demand exceeds effective capacity by about 35% due to higher demand for express trains.

The High Growth Scenario increases peak hour ridership to over 11,000 at the peak load point – equivalent to widening US-101 by 5.5 lanes. All ridership demand is served.

Assumes 135% max occupancy load
Purpose

• Provide a corridor wide background and perspective on at-grade crossings and grade separations
• Discuss ongoing city-led grade separation plans and projects
• Quantify the range of investment in grade crossings to be incorporated into the 2040 “Service Vision”
• Discuss next steps

Context

At-Grade Crossing by County in Caltrain Territory
• San Francisco: 2 at-grade crossings
• San Mateo: 30 at-grade crossings
• Santa Clara: 10 at-grade crossings (with 28 additional crossings on the UP-owned corridor)

Most of the data shown in this presentation pertains to the Caltrain-owned corridor north of Tamien Station
Today, 71 of 113 crossings along the Caltrain corridor have already been separated (63%) and 12 of 30 crossings along the UP corridor have been separated (29%).

The grade separations have been constructed (and reconstructed) at various points during the corridor’s 150-year history.

Planning for, funding, and constructing grade separations has been a decades-long challenge for the Caltrain corridor.

Background

History

Grade Separations Have Been an Enduring Challenge

"In 1929, Palo Alto City Mayor, C.H. Christen, and Stanford University Engineering Professor Emeritus, W.F. Durand, organized political leaders from San Francisco, San Mateo, and Santa Clara counties to form the Peninsula Grade Crossing Conference, also referred to as the Peninsula Grade Crossing Association. Professor Durand and the association, with help from the San Francisco City Engineer, Southern Pacific Railroad, and the California Railroad Commission, studied the grade crossing situation on the San Francisco Peninsula throughout 1930 and sought ways to eliminate grade crossings.

In 1931, the association’s engineering subcommittee released a detailed, $9 million two-phase proposal to eliminate grade crossings on the peninsula. The “Primary Program” of the plan called for construction of grade separations at the 15 most traveled and hazardous grade crossings and closure of the 17 least important grade crossings. The “Secondary Program” would have completed the elimination of all major grade crossings in San Francisco, San Mateo, and Santa Clara counties. The conference’s aim was to permit travelers to cross railroad tracks only via grade separations. At an average cost of $270,000 per grade separation, the Peninsula Grade Crossing Conference proposed legislation to fund these projects through a portion of the state’s gasoline tax.”

* Historic Context Statement, Roadway Bridges of California 1936-1959. Published by Caltrans in 2003
Background

History

The following grade separation projects have been completed since the JPB assumed ownership of the Caltrain Service in 1992:

- Millbrae: Millbrae Ave (1990s)
- North Fair Oaks: 5th Ave (1990s)
- Redwood City: Jefferson Ave (1990s)
- Belmont: Ralston, Harbor (1990s)
- San Carlos: Holly, Britain Howard (1990s)

There is one grade separation project under construction:
- San Mateo: 25th Avenue (estimated 2021 completion)

Funding for Grade Separation provided through San Mateo County’s “Measure A” sales tax (1988, 2004) has been instrumental in completing these projects, while dedicated funding has previously not been available in San Francisco or Santa Clara Counties.

Background

Safety

Over 80 collisions occurred at Caltrain’s grade crossings in the 10 years from 2009-2018. More than 30 of these collisions involved a fatality:

- 11 crossings had 0 collisions
- 8 crossings had 4 or more collisions
- 21 crossings had 1 or more fatalities

Data presented for Caltrain-owned corridor only. Collision data from FRA reports.
**Background Usage**

Today, during a typical weekday, Caltrain’s at-grade crossings are traversed by approximately 400,000 cars. This is equivalent to the combined traffic volumes on the Bay Bridge and San Mateo Bridge.

The 10 busiest at-grade crossings account for half of all traffic volumes.

**Background Regulation**

Caltrain understands that the requirement for grade separation set by the current regulatory framework may be out of pace with the ongoing plans and desires of many communities on the corridor.

The 2040 “Vision” will consider substantially expanded investment in grade crossing improvements and separations.

**When is Grade Separation or Closure of a Crossing Required?**

Grade crossings are regulated by the Federal Railroad Administration (FRA) and, in California, by the California Public Utilities Commission.

Under current regulations, the separation or closure of an at-grade crossing is required in the following circumstances:

- When maximum train speeds exceed 125 mph (FRA regulation)
- When the crossing spans 4 or more tracks (CPUC guidance interpreted into Caltrain Standards)
Existing Gate Downtimes

Today, Caltrain’s crossing gates are down for an average of about 11 minutes during the peak weekday commute hour. Gate down times range from 6 minutes up to nearly 17 minutes.

Note: Gate downtimes shown reflect the average time crossing gates are down only. Depending on individual crossing and roadway configuration traffic signals may stay red for longer and auto users may experience longer delays.

Data presented for Caltrain-owned corridor only.

2040 Gate Downtimes

In 2040, projected crossing gate down times vary by scenario. This evaluation does not take into consideration planned or potential grade separations.

<table>
<thead>
<tr>
<th>Gate Down Time by Scenario</th>
<th>Shortest</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>11</td>
<td>17</td>
<td>28</td>
</tr>
<tr>
<td>Moderate</td>
<td>14</td>
<td>20</td>
<td>31</td>
</tr>
<tr>
<td>High</td>
<td>18</td>
<td>25</td>
<td>39</td>
</tr>
</tbody>
</table>

Minutes per Peak Hour

Note: Gate downtimes shown reflect the average time crossing gates are down only. Depending on individual crossing and roadway configuration traffic signals may stay red for longer and auto users may experience longer delays.

Data presented for Caltrain-owned corridor only.
The purpose of this analysis is to generate a defensible estimate of the overall financial investment in grade separations that might be needed to support different levels of future train service in the corridor.

Understanding the total financial need is an essential part of developing a “business case” for increased Caltrain service – it is required to fairly represent and align the potential costs of new service with the benefits claimed.

This work is not an attempt to redefine standards for grade separation nor is it intended to prescribe individual treatments or outcomes at specific crossings.

Weighing the Cost of Grade Crossing Improvements

**Purpose**

- Ensure that the overall capital costs developed for each service scenario include a reasonable level of total, corridor wide investment in grade separations and grade-crossing improvements.

**Overall Methodology**

- Review and utilize and City-led plans for each grade separations or closures.
- Develop generic investment types and costs for crossings where no plans are currently contemplated.
- Develop ranges of potential investment costs varied by:
  - Service Scenario
  - Intensity of investment (low, medium, high)
City Studies, Plans and Projects

- Many cities along the corridor are actively planning or considering grade separations
- Each of these represents a major community effort to plan a significant and impactful project
- These projects, including their estimated and potential costs (as available), have been incorporated into the Business Plan

Types of Investments Considered

Today, many crossings on the corridor are not actively being studied for grade separation but may require investment or intervention in the future. A range of generic costs were developed to help estimate the aggregate potential costs of these investments

City-Generated Cost
Project type and cost already specified or estimated by city
Cost varies

Grade Separation
Full grade separation of an existing crossing, or a new crossing
$255 - 355 M unit cost

Mitigated Closure
Road closure with separated bike/ped access or equivalent investment
$35M unit cost

Crossing Improvement
Quad gates and/or other safety improvements and treatments
$1M unit cost
### City-led Grade Separation and Closure Plans

Caltrain has incorporated or accounted for grade separation concepts, plans and cost estimates from the following city-led studies into the Business Plan:

<table>
<thead>
<tr>
<th>City</th>
<th>Crossings Under Study</th>
<th>Status of Plan or Study</th>
<th>City Generated Cost Estimate or Range</th>
<th>Included in Business Plan?</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco</td>
<td>Pennsylvania Ave Tunnel (includes both Mission Bay Dr and 16th St Crossings)</td>
<td>Feasibility / 1% Design</td>
<td>$1.4B*</td>
<td>✓</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>Linden Ave</td>
<td>PSR</td>
<td>TBD</td>
<td>✓</td>
</tr>
<tr>
<td>San Bruno</td>
<td>Scott St</td>
<td>PSR</td>
<td>TBD</td>
<td>✓</td>
</tr>
<tr>
<td>Burlingame</td>
<td>Broadway</td>
<td>EIR</td>
<td>$274M</td>
<td>✓</td>
</tr>
<tr>
<td>San Mateo</td>
<td>25th Ave</td>
<td>Construction</td>
<td>$180M</td>
<td>✓</td>
</tr>
<tr>
<td>Redwood City</td>
<td>Whipple Ave, Brewster Ave, Broadway (Maple, Main and Chestnut under potential consideration)</td>
<td>PSR</td>
<td>$350 - 500M (Whipple, Brewster and Broadway)</td>
<td>✓</td>
</tr>
</tbody>
</table>

In many cases cities have not yet selected a single preferred option or have not approved specific cost estimates. In these instances standardized unit costs may be used for Business Planning purposes. These can costs can be updated at a later point in the planning process based on City decisions and input.

*Cost shown is highly preliminary and subject to change*
City-led Grade Separation and Closure Plans

Caltrain has incorporated or accounted for grade separation concepts, plans and cost estimates from the following city-led studies into the Business Plan:

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<th>Crossings Under Study</th>
<th>Status of Plan or Study</th>
<th>City Generated Cost Estimate or Range</th>
<th>Included in Business Plan?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunnyvale</td>
<td>Mary Ave</td>
<td>Feasibility Study with 15% Design</td>
<td>$100 - 200M</td>
<td>✓</td>
</tr>
<tr>
<td>Sunnyvale</td>
<td>Sunnyvale Ave</td>
<td>Feasibility Study with 15% Design</td>
<td>$40 - 250M</td>
<td>✓</td>
</tr>
<tr>
<td>San Jose</td>
<td>Azurais Ave, Virginia Ave</td>
<td>Under study through Diridon Integrated Station Concept Plan</td>
<td>TBD</td>
<td>✓</td>
</tr>
<tr>
<td>San Jose</td>
<td>Skyway Dr, Branham Ln, Chynoweth Ave</td>
<td>Feasibility Study</td>
<td>$366M – $1,054M</td>
<td>✓</td>
</tr>
</tbody>
</table>

*Crossings are part of UP-Owned Corridor*

In many cases cities have not yet selected a single preferred option or have not approved specific cost estimates. In these instances standardized unit costs may be used for Business Planning purposes. These can costs can be updated at a later point in the planning process based on City decisions and input.

Key Variables between Scenarios

Estimated Number of Crossings in 4-Track Segments*

- **Baseline**: 0
- **Moderate**: 2
- **High**: 12

Estimated Gate Downtime Ranges

- **Baseline**: 11 – 28 Minutes per Peak Hour
- **Moderate**: 14 – 31
- **High**: 18 – 39

*Variation by Service Scenario*

The potential need and desire for grade separations and grade crossing improvements is significant across all scenarios.

The details of potential investments will vary between scenarios based on the location and extent of 4-track segments as well as the amount of gate downtime projected.

*A range of options are discussed for potential 4-track segments within the Moderate and High Growth service scenarios. Number of crossings impacted by 4-track segments are indicative estimates only and subject to variation based on more detailed design and feasibility studies.*
Potential Planning Level Grade Crossing Cost Estimates

<table>
<thead>
<tr>
<th>Legal Minimum Investments</th>
<th>Type</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Auto</td>
<td>$221M</td>
<td>$926M</td>
<td>$4.1B</td>
</tr>
<tr>
<td></td>
<td>Corridor Wide Cost Estimate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bike / Ped</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>$221M</td>
<td>$926M</td>
<td>$4.1B</td>
</tr>
<tr>
<td></td>
<td>Auto Crossing Treatments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quad Gates &amp; Safety Improvements</td>
<td>41</td>
<td>39</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Mitigated Closure</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Grade Separation</td>
<td>1</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>

The legal minimum investments in grade separation and at-grade crossings would include grade separation at all crossings in 4-track segments and installation of quad gates at all remaining crossings. City-generated projects are not included in this estimate except for the 25th Avenue Grade Separation (which is already under construction).

Union Pacific Corridor (Tamien to Gilroy)

Caltrain does not own the Union Pacific Corridor. Plans for expanded service on this corridor are relatively new and the details of potential future train volumes are highly dependent on HSR’s future plans and service levels. For Business Planning purposes, Caltrain has proposed carrying a single general allocation cost to capture the need for grade crossing improvements on this corridor. This allocation assumes estimated costs for City-planned separations in San Jose as well as potential additional investments throughout the UP corridor.

Legal Minimum
- Quad gates at all crossings
- Total costs = approx. $28M

Recommended Approach for Business Planning
- City planned separations at Skyway Dr, Branham Ln, and Chynoweth Ave
- Two additional separations
- 3 mitigated closures
- Quad gates at remaining crossings
- Total cost = approx. $1.4B
Building Ranges of Investment

Variation by Level of Investment

Caltrain understands that local plans and interest in grade separation go significantly beyond current regulatory requirements. The Business Plan team has developed three different “levels” of corridor wide investments that represent different approaches to grade separation— all significantly exceeding minimum legal requirements.

These ranges are simply intended to convey different approaches to investment— they do not define new standards nor do they prescribe specific plans at individual crossings.

Investment Included

Lower Intensity Investment
- All city-planned projects
- Recommended UP corridor investments
- Separation and/or mitigated closure of remaining crossings with highest ADT and gate downtimes
- Quad gates at remaining crossings

Medium Intensity Investment
- All city-planned projects
- Recommended UP corridor investments
- Separation and/or mitigated closure of many remaining crossings with higher ADT and gate downtimes
- Quad gates at remaining crossings

Higher Intensity Investment
- All city-planned projects
- Recommended UP corridor investments
- Separation and/or mitigated closure of most or all remaining crossings
- Quad gates at remaining crossings (if any)

Potential Planning Level Grade Crossing Cost Estimates: Low

<table>
<thead>
<tr>
<th>Type</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Corridor Wide Cost Estimate for Crossings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto</td>
<td>$8.4B</td>
<td>$8.6B</td>
<td>$9.6B</td>
</tr>
<tr>
<td>Bike / Ped</td>
<td>$140M</td>
<td>$140M</td>
<td>$140M</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$8.5B</strong></td>
<td><strong>$8.7B</strong></td>
<td><strong>$9.7B</strong></td>
</tr>
</tbody>
</table>

| Investments on JPB-owned Corridor   |                 |                 |            |
| Quad Gates & Safety Improvements    | 14              | 14              | 10         |
| Mitigated Closure                   | 3               | 3               | 6          |
| Grade Separation                    | 24              | 24              | 25         |

| Investments on UP-owned Corridor    |                 |                 |            |
| Quad Gates & Safety Improvements    | 20              | 20              | 20         |
| Mitigated Closure                   | 3               | 3               | 3          |
| Grade Separation                    | 5               | 5               | 5          |

Builds on and accounts for costs associated with all City-led separation and closure plans.
# Potential Planning Level Grade Crossing Cost Estimates: Medium

<table>
<thead>
<tr>
<th></th>
<th>Type</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Corridor Wide Cost Estimate for Crossings</td>
<td>Auto</td>
<td>$8.7B</td>
<td>$8.9B</td>
<td>$10.1B</td>
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<tr>
<td></td>
<td>Bike / Ped</td>
<td>$140M</td>
<td>$140M</td>
<td>$140M</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>$8.8</td>
<td>$9.0B</td>
<td>$10.2B</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Investments on JPB-owned Corridor</th>
<th>Quad Gates &amp; Safety Improvements</th>
<th>12</th>
<th>11</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mitigated Closure</td>
<td>4</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Grade Separation</td>
<td>25</td>
<td>25</td>
<td>27</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Investments on UP-owned Corridor</th>
<th>Quad Gates &amp; Safety Improvements</th>
<th>20</th>
<th>20</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mitigated Closure</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Grade Separation</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

*Builds on and accounts for costs associated with all City-led separation and closure plans*

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# Potential Planning Level Grade Crossing Cost Estimates: High

<table>
<thead>
<tr>
<th></th>
<th>Type</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Corridor Wide Cost Estimate for Crossings</td>
<td>Auto</td>
<td>$8.9B</td>
<td>$9.8B</td>
<td>$11.0B</td>
</tr>
<tr>
<td></td>
<td>Bike / Ped</td>
<td>$140M</td>
<td>$140M</td>
<td>$140M</td>
</tr>
<tr>
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<td>Total</td>
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<tr>
<td></td>
<td>Grade Separation</td>
<td>5</td>
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*Builds on and accounts for costs associated with all City-led separation and closure plans*
Next Steps

Within the Business Plan
- Incorporate grade crossing investment estimates into overall corridor costing and business case analysis
- Continue peer review of corridor wide grade separation case studies and examples

Beyond the Business Plan
- Develop corridor wide grade separation strategy, potentially addressing:
  - Construction standards and methods
  - Project coordination and sequencing
  - Community resourcing and organizing
  - Funding analysis and strategy

For individual City projects
- Continue working with cities and county partners to support advancement of individual grade separation plans and projects

There is a significant body of work remaining to address the issue of at grade crossings in the Caltrain corridor.

Caltrain plans to continue advancing a corridor wide conversation regarding the construction, funding and design of grade separations while continuing to support the advancement of individual city-led projects.
Memorandum

Date: April 25, 2019
To: CalMod Local Policy Maker Group (LPMG)
From: John Funghi, CalMod Chief Officer; Casey Fromson, Gov. Affairs Director
Re: Caltrain Electrification Project E-Update

CALMOD CELEBRATES EARTH DAY

April is Earth Month, so Caltrain is sharing some facts about how the Caltrain Modernization program is contributing to a healthier planet and a happier local community. The electrification of the fleet will result in a 97% reduction in emissions and will remove 176,000 metric tons of greenhouse gases annually, which are the main contributor to climate change. Switching from diesel to electric-powered trains also means reductions in noise pollution along the corridor. Together these environmental benefits mean a healthier habitat for people, plants, and animals alike. Over 65,000 people ride Caltrain every day. That’s a lot of cars off the road, and electrification will allow even more people to choose a form of transportation that’s only getting greener.

Visit CalMod.org/project-benefits to learn more
ELECTRIFICATION INFRASTRUCTURE UPDATE

This month, crews continued installation of foundations as well as conduit along the corridor from South San Francisco to San Jose. Work was also performed on paralleling stations in Sunnyvale and San Mateo, and three traction power facilities along the corridor. Check out our video to see a timelapse of crews working to install a transformer, which is an important element of a substation that helps to ensure electricity is consistently distributed throughout the Caltrain system.

To sign up for weekly construction updates or for more construction information, visit CalMod.org/Construction.
ELECTRIC VEHICLE UPDATE

In April, the front-end mask of the first cab car (pictured above) began production in Los Angeles. Trainset #1 also ushered in a new era at the Salt Lake City manufacturing facility, with cars moving into the new production hall.

View more pictures at www.CalMod.org/Gallery.

PUBLIC MEETINGS

San Jose Community Meeting – April 22, 2019 at 6:30 p.m.
San Francisco Community Meeting – May 1, 2019 at 6:00 p.m.

For more details, and a full list of upcoming meetings, please visit CalMod.org/events.

DETAILED PROGRESS REPORT

- February 2019 Monthly Progress Report presented to Caltrain Board on April 4, 2019
Date: April 25, 2019  
To: Local Policy Maker Group (LPMG)  
From: Boris Lipkin, Northern California Regional Director  
Re: California High-Speed Rail Program Update  

STATEWIDE UPDATE  

Construction Update  
Construction continues in the Central Valley with significant progress in Kings County, where work has begun on an abutment construction for an overcrossing at Excelsior Avenue. North of Fresno, workers are busy installing metal decking and reinforcing steel to serve as the floor of the San Joaquin River Viaduct. These activities, along with other ongoing work in Construction Packages 1-4, translates into a total of 2,680 construction jobs since the groundbreaking in 2015.

Follow all construction updates at https://buildhsr.com/construction_update/

NORTHERN CALIFORNIA UPDATE  

Spring 2019 Community Working Group Meetings and Other Outreach  
On April 22, 2019, the Authority began the next round of Community Working Group (CWG) meetings in both the San Francisco to San Jose and San Jose to Merced Project Sections.

Discussion topics at these meetings include a presentation on the safety and security characteristics of high-speed rail and an update on the Preferred Alternative (PA) process and how the community working groups will be engaged. The PA update in this round of meetings will be introducing the process for soliciting CWG feedback on the Staff Recommended PA at the next round of CWG meetings (Summer 2019).

The summer CWG meetings will take place on the way to the identification of the Northern California preferred alternatives at the September Board meeting. During the summer CWG meetings, the Authority will share the staff recommendation for the preferred alternative in each project section and solicit feedback from the group so that it can be shared with the Board of Directors. As part of that, the Authority will provide the PA evaluation tables focused on the differentiating factors between the alternatives that summarize the analysis that’s been done. A sample of the tables that will include the information from the analysis for each alternative are enclosed.
Spring CWG Meetings have been scheduled as follows:

<table>
<thead>
<tr>
<th>Date and Time</th>
<th>Meeting</th>
<th>Location</th>
<th>Meeting Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 22 at 6 – 8:00 p.m.</td>
<td>Morgan Hill – Gilroy CWG</td>
<td>250 Old Gilroy St, Gilroy, CA 95020</td>
<td>Link</td>
</tr>
<tr>
<td>May 2 at 6 – 8:00 p.m.</td>
<td>San Jose CWG</td>
<td>Edenvale Branch Library, 101 Branham Ln E, San Jose, CA 95111</td>
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</tr>
<tr>
<td>May 7 at 6 – 8:00 p.m.</td>
<td>South Peninsula CWG</td>
<td>Santa Clara Central Park Library, Margie Edinger Room, 2635 Homestead Road, Santa Clara, CA 95051</td>
<td></td>
</tr>
<tr>
<td>May 20 at 6 – 8:00 p.m.</td>
<td>San Mateo County CWG</td>
<td>San Mateo Senior Center, 2645 Alameda de las Pulgas, San Mateo, CA 94403</td>
<td>Link</td>
</tr>
<tr>
<td>May 28 at 6 – 8:00 p.m.</td>
<td>San Francisco CWG</td>
<td>Bay Area Metro Center, Yerba Buena Room, 375 Beale Street, San Francisco, CA 94105</td>
<td></td>
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</table>

Beyond the information shared at the CWG meetings, the Authority will also provide the LPMG a presentation on how environmental justice is addressed in the environmental process. This is an important component of the environmental process and will be included in the Draft EIR/EIS but the focus now is to share the methodology and approach and answer any questions the LPMG may have on the subject.

**RECENT AND UPCOMING OUTREACH ACTIVITIES**

- March 28: LifeMoves Homeless Walk (Redwood City)
- March 29: Gilroy Mobility Partnership
- April 4: LifeMoves Homeless Walk (South San Francisco)
- April 9: Visitacion Valley Neighbor Up Tabling Event
- April 11: West San Jose Kiwanis Club
- April 20: South San Francisco Tree Planting
- April 22: Morgan Hill-Gilroy CWG
- April 25: North Fair Oaks Community Meeting
- May 2: San Jose CWG
- May 7: South Peninsula CWG
- May 18: Sunnydale Family Day
- May 20: San Mateo County CWG
- May 28: San Francisco CWG
### Table 1 System Performance, Operations and Cost

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>Alt. A</th>
<th>Alt. B</th>
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<tbody>
<tr>
<td>Alignment Length <em>(miles)</em></td>
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<tr>
<td>Maximum Authorized Speed <em>(mph)</em></td>
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<tr>
<td>Proximity to Transit Corridors <em>(miles)</em></td>
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<tr>
<td>Operational Service Travel Time <em>(minutes)</em></td>
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<td>Estimated Capital Costs <em>(${ billion})</em></td>
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<tr>
<td>Estimated Annual Operations and Maintenance Costs <em>(${ million})</em></td>
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### Table 2A Community Factors

<table>
<thead>
<tr>
<th>EFFECTS</th>
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<tbody>
<tr>
<td><strong>Displacements</strong></td>
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<tr>
<td>Residential displacements <em>(# of units)</em></td>
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<tr>
<td>Commercial and industrial displacements <em>(# of units)</em></td>
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<tr>
<td>Community and public facilities displacement <em>(# of units)</em></td>
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<td>Total displacements</td>
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### Table 2B Environmental Factors

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<tbody>
<tr>
<td><strong>Biological Resources</strong></td>
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<tr>
<td>Permanent impacts on wetlands <em>(acres)</em></td>
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<tr>
<td>Permanent impacts on other waters of the U.S. <em>(acres)</em></td>
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<tr>
<td><strong>Transportation</strong></td>
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<tr>
<td>Temporary impacts on major roadways and intersections from construction vehicles</td>
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<td>Continuous permanent impacts on passenger rail and bus access</td>
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Table 2B Environmental Factors, continued

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<td>Temporary impacts on emergency access and response times from construction vehicles</td>
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<td><strong>Station Planning Land Use and Development</strong></td>
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<tr>
<td>Permanent Impacts of the Brisbane Light Maintenance Facility to Land Uses Designated as Mixed-Use <em>(acres)</em></td>
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<td><strong>Aesthetics and Visual Quality</strong></td>
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<tr>
<td>Permanent degradation of visual quality within the San Mateo to Redwood City Landscape Unit</td>
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<td><strong>Environmental Justice</strong></td>
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<tr>
<td>Impacts on minority and low-income communities</td>
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<tr>
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<td>Permanent impacts on habitat for listed plant species habitat (non-overlapping)</td>
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<tr>
<td>Permanent impacts on habitat for listed wildlife species with the most impacts overall (California tiger salamander, acres)</td>
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<td>Wildlife corridor impacts</td>
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<tr>
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<td><strong>Section 4(f)/6(f) Resources</strong></td>
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<td>Permanent use of 4(f)/6(f) park resources (acres)</td>
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<td>Permanent use of NRHP-listed/eligible historic resources per Section 4(f) and acreage</td>
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<td><strong>Build Environment Historic Resources</strong></td>
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<td>Number of SU impacts on NRHP-listed/eligible resources</td>
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<td>Number of SU impacts on CEQA only historic resources</td>
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<td>Severe noise impacts after noise barrier mitigation (# of sensitive receptors)</td>
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<tr>
<td>Severe noise impacts with noise barrier mitigation and if local municipalities implement quiet zones (# of sensitive receptors)</td>
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<td><strong>Transportation</strong></td>
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<td>Permanent SU impacts on intersections after mitigation</td>
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<td>2040 peak travel time delay in Monterey Corridor (NB - AM/PM, SB – AM/PM, minutes)</td>
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<td>Permanent road closures</td>
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<td>Permanent SU impacts to freeway segments</td>
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<td>Consistency with City of Gilroy HSR Station Transit-Oriented Development Plan</td>
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<td><strong>Agricultural Farmland</strong></td>
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<td>Permanent conversion of Important Farmland (acres)</td>
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<td><strong>Aesthetics and Visual Quality</strong></td>
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<tr>
<td>Number of Visual Landscape Units with Significant Unavoidable Impacts</td>
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<tr>
<td><strong>Environmental Justice</strong></td>
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</tbody>
</table>
# NORTHERN CALIFORNIA REGION

Local Policy Maker Group

April 25, 2019

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## MEETING AGENDA

<table>
<thead>
<tr>
<th>Introduction from the Regional Director</th>
<th>Environmental Justice Analysis</th>
<th>Safety &amp; Security Characteristics of High-Speed Rail</th>
<th>Preferred Alternative Engagement Update</th>
</tr>
</thead>
</table>

Introductions | Environmental Justice | HSR Characteristics | PA Engagement |
ENVIRONMENTAL JUSTICE

Rich Walter, ICF

PREFERRED ALTERNATIVE PROCESS

STEP ONE
Range of Alternatives

STEP TWO
Evaluation of Alternatives

Authority collects stakeholder input on Preferred Alternative

STEP THREE
Board Identification of the Preferred Alternative
ENVIRONMENTAL JUSTICE ANALYSIS

Regulatory Considerations

- **Federal**
  - Title VI of the Civil Rights Act (42 U.S.C. § 2000(d) et seq.)
  - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (USEO 12898)
  - Presidential Memorandum Accompanying USEO 12898
  - Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (USDOT Order 5610.2(a))
  - Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. § 61)

- **State**
  - California Gov. Code Section 11135(a), 11136
  - California Gov. Code 65040.12(e)

ENVIRONMENTAL JUSTICE EXISTING CONDITIONS

- Identify Resource Study Area (RSA).
- Identify Reference Community
ENVIRONMENTAL JUSTICE
EXISTING CONDITIONS

- Identify Resource Study Area (RSA)
- Identify Reference Community

Introductions

ENVIRONMENTAL JUSTICE
EXISTING CONDITIONS

- Identify low-income populations within resource study area = persons with household incomes at or below 200 percent of the poverty guidelines.

Introductions

PA Engagement
ENVIRONMENTAL JUSTICE

EXISTING CONDITIONS

- Identify minority populations within resource study area = American Indian and Alaskan Native, Asian, Black or African American, Hispanic or Latino, and Native Hawaiian and other Pacific Islander

ENVIRONMENTAL JUSTICE

METHODOLOGY

Method

- Targeted outreach to low-income and minority populations
ENVIRONMENTAL JUSTICE

METHODOLOGY

Method
- Targeted outreach to low-income and minority populations

- Use impact analysis methodologies
- Identify specific impacts to low-income and minority populations through overlay of impacts on identified locations

EJ Populations + Impacts
EJ Populations
Adverse & Beneficial Impacts
IMPACT AVOIDANCE, MINIMIZATION & MITIGATION

Measures Applied from other Analyses:

- **Traffic**
  - Construction Management Plan
  - Intersection improvements
  - Emergency vehicle detection, etc.

- **Noise/Vibration**
  - Construction measures
  - Noise barriers
  - Building sound insulation

CASE STUDY: ROSELEDA VILLAGE, WASCO

- 17 acres
- >200 units
- $10 million HSR allocation in lieu of in-place mitigation
**DISPROPORTIONATE IMPACTS**

**Determination**
- Identify impacts to reference population
- Compare to impacts to low-income and minority populations
- Determine if impacts are disproportionately high and adverse in EJ populations as compared to impacts to reference population
  - If $3A/2A > 3B/2B$ → disproportionate
  - If $3A/2A < 3B/2B$ → not disproportionate

---

**ENVIRONMENTAL JUSTICE ANALYSIS**

**Where will I find the information and analysis?**

- **Technical Reports**
  - Environmental Justice Engagement Summary

- **EIR/EIS**
  - Chapter 5: Environmental Justice
SAFETY & SECURITY
CHARACTERISTICS OF
HIGH-SPEED RAIL

Simon Whitehorn, Deputy Director, Operations & Maintenance
Right-of-way systems –
• Broken Rail Management
• Train Detection
• Earthquake Monitoring
• Rock Fall Monitoring
• Trespass Detection
• Large Animal Detection
• High Wind monitoring
• Flood Detection

Incursion wall (where applicable)
Security fencing

Wildlife crossing

‘crumple zone’ on front and rear of train

‘Emergency windows’ in each car

Enhanced car couplings
Grade crossing features

- Quad road barriers
- Channelization
- 8ft high right-of-way fence

Train Control System (ATC)

- Train Safe Movement Authority
- Track Circuits
- Acoustic Monitoring
- Rail Management
- Broken Rail Detection
- Road / Rail Vehicle Incursion
- CCTV analytics
  - Incursion protection monitoring
- CCTV analytics
  - Engineer Reports
- Seismometers
- Dispatcher Traffic Management
- Route Conflict Detection
- Trip Wires
  - Vibration Sensors
- Anemometers
- Water Flow Sensors
- Rain Level monitoring
- Weather Sensors

Other features:
- Anemometers
- Water Flow Sensors
- Rain Level monitoring
- Rockfall Sensors
- Trespass
- Road / Rail Vehicle Incursion
- CCTV analytics
  - Incursion protection monitoring
- Track Circuits
  - Acoustic Monitoring
  - Rail Management
- Broken Rail Detection
- Train Safe Movement Authority
- Train Control System (ATC)
Road / Rail Vehicle Incursion

Train Control System (ATC)

Train Safe Movement Authority

Trespass

Earthquake

Route Conflict Detection

Rockfall Sensors

Weather Sensors

Broken Rail Detection

Train mounted Train Control System

Propulsion and Braking System

Radio System

Communications System

STOP
FEATURES OF A MODERN RAILROAD SYSTEM
Designed so Safety and Security are built in to every element provided:

- Foundation
- Train
- Operation

PREFERRED ALTERNATIVE ENGAGEMENT UPDATE

Boris Lipkin, Northern California Regional Director
Yosef Yip, Northern California Outreach Representative
NORTHERN CALIFORNIA OUTREACH

Environmental Milestones
- 2019: September 17, December 2019
- 2020: March 2020
- 2021: November 2020, March 2021

Open Houses and Public Hearing
- 2019: Open Houses in Summer
- 2020: Open Houses in Winter, Draft EIR/S in Spring
- 2021: Final EIR/S, Open Houses in Winter, Public Comment in Spring

Community Working Group Meetings
- 2019: Winter, Spring, Summer
- 2020: Fall, Winter

Ongoing Outreach

EIR/S = Environmental Impact Report/Statement

PREFERRED ALTERNATIVE CRITERIA

System Performance, Operations, & Costs
- Alignment Length
- Maximum Authorized Speed
- Proximity to Transit Corridors
- Travel Time
- Capital Costs
- O&M Costs

Environmental Factors
- Analysis will determine which factors are differentiators
- Wetlands and Waters
- Parks and Recreation Areas
- Historical Sites
- Environmental Justice

Community Factors
- Residential Units
- Commercial Properties
- Community/Public Facilities
- Acres Affected
- Additional factors identified by communities
### SYSTEM PERFORMANCE, OPERATIONS & COSTS

#### SAN FRANCISCO-SAN JOSE ALTERNATIVES

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#### SAN JOSE-MERCED ALTERNATIVES

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UPCOMING WORKING GROUP MEETINGS

SPRING 2019

Morgan Hill-Gilroy CWG
April 22, 6:00 – 8:00 pm
Portuguese Hall
Gilroy, CA

San Jose CWG
May 2, 6:00 – 8:00 pm
Edenvale Branch Library
San Jose, CA

South Peninsula CWG
May 7, 6:00 – 8:00 pm
Santa Clara Library
Santa Clara, CA

San Mateo County CWG
May 20, 6:00 – 8:00 pm
San Mateo Senior Center
San Mateo, CA

San Francisco, CWG
May 28, 6:00 – 8:00 pm
Bay Area Metro Center
San Francisco, CA

Introductions
Environmental Justice
HSR Characteristics
PA Engagement

PACHECO PASS VISUALIZATION