Choosing a Long Range Vision
Caltrain Business Plan

JPB
August 1, 2019
Agenda for Today

Executive Director Remarks

A Long Range Vision for Caltrain Service
- Why Do We Need a Vision and What Are We Deciding?
- Developing Scenarios
- Weighing Caltrain’s Choices
- Staff Recommendation

From Vision to Business Plan - Next Steps

Organizational Assessment
Executive Director Remarks
A Long Range Vision For Caltrain Service
Why Does Caltrain Need a Vision?
Caltrain is part of a dynamic corridor

Population in 1900
- San Francisco County: 400,000
- San Mateo County: 20,000
- Santa Clara County: 100,000

Population in 2010
- San Francisco County: 800,000
- San Mateo County: 720,000
- Santa Clara County: 1,800,000

Population in 2040
- San Francisco County: 1,170,000
- San Mateo County: 920,000
- Santa Clara County: 2,530,000
Connecting many different communities
Within a growing and challenged region

Only 18% of Bay Area households could afford a median-priced home

Map: Here's how much time, money you lose commuting in the Bay Area
Depending on your income, it could be enough for a down payment on a house within five years.

California releases air quality guidelines for schools dealing with wildfire smoke
Recommendations available "just in time for fire season," coming school year.
Urban growth is a global phenomenon.
Rail investments remain an essential tool to shape and manage growth.

London, England
Buenos Aires, Argentina
Toronto, Canada
The future of rail in the Bay Area is still coming together, with many different plans and projects underway.
Caltrain will be the first, modern electrified railroad in California. The Vision we choose will shape the future of rail in the region and the state.
And our success will mean that we make every day life easier for the people who live and work in our communities.
What is a Long Range Service Vision?

A Long Range Service Vision describes an achievable “End State” for the Corridor in 2040

**Train Service**
- Frequencies
- Stopping patterns
- Service types
- Number of trains

**Infrastructure Needs**
- Fleet
- Systems
- Infrastructure
- Support facilities

**Costs**
- Operating
- Maintenance
- Capital

**Outcomes**
- Ridership
- Mobility benefits
- Revenues
Choosing a Long Range Service Vision is a key step in developing the Business Plan.

The Long Range Service Vision sets a target for the future that we and our partners can grow towards incrementally.

A successful Long Range Service Vision:

• Is rooted in thorough and credible analysis
• Respects, integrates, and supports the existing plans and commitments that Caltrain and its partners have made
• Is detailed enough to provide actionable guidance to the agency as it develops its own plans and engages with local, regional, and state partners
• Is sufficiently flexible to remain relevant even as the details, timing, and costs of individual projects change or evolve
Board Guidance and Timeline

July 2018 – July 2019
Development and Evaluation of Growth Scenarios

August 2019
Staff Recommendation for Long Range Service Vision

October 2019
Refinement and Proposed Adoption of Long Range Service Vision

Early 2020
Completion of Business Plan
Baselining the Vision

What state, regional, and local projects have already been built or planned in the Caltrain Corridor for 2040?

What kind of service has been contemplated previously?

How do they fit together and what do they cost?
The vision must account for and integrate a complex set of plans and projects across many timeframes.
Once we’ve chosen the “big” vision, we can work back to define the best path to get there.
Getting to a Baseline

2018
Diesel Fleet
Skip stop service: 5 trains per hour, per direction

2022
Start of Electrified Operations
Skip stop service: 6 trains per hour, per direction
Central Subway in operation

2029
HSR Valley to Valley & Downtown Extension
Skip stop service: 8 trains per hour, per direction
(6 Caltrain, 2 HSR)
DTX, Dumbarton Rail, and BART to SJ in operation

2033
High Speed Rail Phase 1, SF to LA
Skip stop service: 10 trains per hour, per direction
(6 Caltrain, 4 HSR)
DTX, Dumbarton Rail, and BART to SJ in operation

2040
Service Vision
Baseline Growth

Design Year
2040 Baseline Growth: Service Details

**Today**

- Caltrain runs a maximum of **5 trains per peak hour per direction** with limited service outside of peak, weekday commute hours.

**2022-2033**

- With the completion of electrification in 2022, Caltrain will run **6 trains per peak hour per direction** and will improve its off-peak service.
- Previously, long range planning has not looked at increasing Caltrain’s maximum service beyond 6 trains per hour per direction.
- Instead, Caltrain’s long range plans have focused on the “blended system” – sharing the corridor with up to 4 HSR trains by 2033.

**2040 Baseline**

- Skip stop service with **6 trains per peak hour per direction** and 4 HSR trains.
- New passing tracks at Millbrae.
- Bunched service results in irregular Caltrain headways; each pattern arrives over span of 10 minutes, then a 20-minute gap between trains.
- Three half-hourly skip stop patterns each with similar travel times.
- South of Tamien, peak-direction skip stop service with 10 round trips per day.
- This “baseline” service is consistent with HSR’s ongoing environmental process.
Baseline Investments

While the “Baseline” for the 2040 Service Vision contemplates only modest increases in Caltrain service beyond electrification, there are many other investments planned for the Caltrain corridor before 2040.

Some of these projects are directly required to enable the baseline level of service while others reflect the goals and commitments of Caltrain’s local, regional and state partners.

**Baseline investments include:**

1. Caltrain projects already underway
2. Local, Regional & State partner projects that directly influence Caltrain
3. Additional Caltrain investments needed to fill out the baseline and support blended operations
# The Baseline Costs $22.1 Billion

## $2.3B
Caltrain Work Underway

## $16.2B
Investments Planned and Proposed by Caltrain Partners

<table>
<thead>
<tr>
<th>$3.3B</th>
<th>$3.4B</th>
<th>$2.6B</th>
<th>$6.9B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downtown Extension to Salesforce Transit Center</td>
<td>Diridon Station and Surrounding Rail Infrastructure*</td>
<td>High Speed Rail Investments</td>
<td>City-led Grade Separations</td>
</tr>
</tbody>
</table>

## $3.6B
New Caltrain Investments to Support Baseline Growth Scenario

* Placeholder cost pending detailed cost estimate to be developed through Diridon Integrated Station Concept Plan
Baseline Investments by Investment Type

Track & Rail
- Curve straightening & track upgrades to achieve 110mph
- 4-tracking for Millbrae Station
- SJ to Gilroy corridor rebuild to three tracks

Systems
- New signal systems (Caltrain and HSR)
- Additional communication systems
- SJ to Gilroy OCS/TPS system

Stations and Platforms
- Station access improvements
- Platform extensions for 8-car trains
- Level boarding
- 22nd Street station improvements
- HSR station at Gilroy
- SJ to Gilroy rebuild of all Caltrain stations
Baseline Investments by Investment Type

Grade Crossings & Separations
- Grade separation investments including all City-led plans and projects

Terminals & Yards
- Completion of DTX
- Diridon Station project
- North LMF and CEMOF relocation

Fleet
- PCEP fleet costs
- Fleet upgrades for Baseline service
Building the Baseline
Total Corridor Investment Over Time to Achieve the Baseline

Baseline Growth
$22.1B

- New Caltrain Investments Needed to Support Baseline Growth Scenario: $3.6B
- Investments Planned and Proposed by Caltrain Partners: $16.2B
- Caltrain Work Underway: $2.3B
Caltrain’s 2040 Service Vision needs to be a “Big Tent”

• The Caltrain corridor is a key regional transportation asset and many of our partner cities and agencies have major commitments or planned investments (Projects) in the corridor. The vast majority of these are substantially unfunded.

• The “Baseline Vision” incorporates these investments, as well as the basic improvements that Caltrain will need by 2040 to operate a fully modernized blended system at “baseline” levels of frequency.

• Building from this “baseline,” Caltrain has assessed options for incremental expansion of service

Caltrain’s core question as it considers a Long Range Service Vision:

How Much Service Should We Provide?
Developing Scenarios
Market Demand

Today, Caltrain serves bidirectional and polycentric ridership demand
• ~60,000 daily boardings
• Highly concentrated around stations with fastest & most frequent service
• One-third of trips occur in reverse-peak direction
• Half of trips occur outside of San Francisco

By 2040, Caltrain has the potential to serve a market of over 200,000 daily riders
• Corridor expected to add 1.2 million people and jobs within 2 miles of Caltrain (+40%)¹
• Significant freeway congestion
• Major infrastructure projects further increase Caltrain demand
  • BART to Santa Clara County
  • Downtown Extension/Pennsylvania Avenue Tunnel
  • Dumbarton Rail

¹Based on Plan Bay Area forecasts and approved projects by individual cities
Service Planning Process

2018

- Developed Service Planning Parameters & Goals
- Identified Initial Service Approaches
- Developed Detailed SF-SJ Peak Hour Concepts

2019

- Screened and Evaluated Detailed Service Concepts and Expanded to include Southern San Jose and Gilroy
- Considered Off-peak and Weekend Service to Develop Complete Service Plans
- Service Explorations and Operations Simulation; considered terminal planning

Stakeholder Engagement
## Outreach Activities to Date

### July 2018 – August 2019 Timeline

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jul</td>
<td>Aug</td>
</tr>
<tr>
<td>Local Policy Maker Group</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>City/County Staff Coordinating Group</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Project Partner Committee</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Stakeholder Advisory Group</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Partner General Manager</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Targeted Online Engagement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Website Launch, Data Visualization Challenge, Reddit/YouTube Live, Online Open House</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Community Meetings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPUR, Friends of Caltrain, Station Outreach</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Sister Agency Presentations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SFCTA, SF Capital Planning, TJPA, SamTrans, SMCTA, CCAG, VTA, MTC, Diridon Station JPAB</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

31
# Outreach Activities to Date

**As of July 20, 2019 - by the Numbers**

## Stakeholders Engaged

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurisdictions</td>
<td>21</td>
</tr>
<tr>
<td>Public Agencies</td>
<td>26</td>
</tr>
<tr>
<td>Organizations in Stakeholder</td>
<td>93</td>
</tr>
<tr>
<td>Advisory Group</td>
<td></td>
</tr>
<tr>
<td>Stakeholder Meetings</td>
<td>156</td>
</tr>
</tbody>
</table>

## Public Outreach

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Meetings and Presentations</td>
<td>51</td>
</tr>
<tr>
<td>Survey Responses</td>
<td>1,000+</td>
</tr>
<tr>
<td>Website Views</td>
<td>14,300+</td>
</tr>
<tr>
<td>Social Media Engagements</td>
<td>258,200+</td>
</tr>
</tbody>
</table>
Public Engagement

Community Meetings

Online Open House

Variety of Engagement Tools

50+ public meetings, more scheduled here: www.caltrain2040.org/get-involved

Online Open House Live on August 1st: www.caltrain2040.org/openhouse
Individual Jurisdiction Outreach

City Booklets

View the booklets at: www.caltrain2040.org
## Individual Jurisdiction Outreach
### July 2018 – August 2019 Timeline

<table>
<thead>
<tr>
<th></th>
<th>Atherton</th>
<th>Belmont</th>
<th>Brisbane</th>
<th>Burlingame</th>
<th>Gilroy</th>
<th>Menlo Park</th>
<th>Millbrae</th>
<th>Morgan Hill</th>
<th>Mountain View</th>
<th>Palo Alto</th>
<th>Redwood City</th>
<th>San Bruno</th>
<th>San Carlos</th>
<th>San Francisco</th>
<th>San Jose</th>
<th>San Mateo</th>
<th>Santa Clara</th>
<th>South San Francisco</th>
<th>Sunnyvale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Round 1: Fall 2018</strong> Railroad-Community Interface Meeting</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Round 2: Spring 2019</strong> Railroad-Community Interface Meeting</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>City Council Meeting</strong> Scheduled or Completed</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

*SFCTA

View individual jurisdiction booklets at: [www.caltrain2040.org/community-interface](http://www.caltrain2040.org/community-interface)
How Much Service Should Caltrain Provide?

- **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:
- High Growth
- Moderate Growth
- Baseline Growth
2040 Baseline Growth Scenario

**Trains per Hour, per Direction**

- Peak: 6 Caltrain + 4 HSR
- Off-Peak: 3 Caltrain + 3 HSR

**Stopping Pattern**

- Skip stop

**Travel Time, STC-Diridon**

- 69-73 Min

**New Passing Tracks**

- Millbrae

**Service Plan Description**

- Bunched service results in irregular Caltrain headways; each pattern arrives over span of 10 minutes, then a 20-minute gap between trains
- Three half-hourly skip stop patterns each with similar travel times
- South of Tamien, peak-direction skip stop service with 10 round trips per day
2040 Moderate Growth Scenario

Trains per Hour, per Direction
- Peak: 8 Caltrain + 4 HSR
- Off-Peak: 6 Caltrain + 3 HSR

Stopping Pattern
- Local / Express with timed transfer at Redwood City

Travel Time, STC-Diridon
- 61 Min (Express)
- 85 Min (Local)

New Passing Tracks
- Millbrae, Hayward Park-Hillsdale, Redwood City, Northern Santa Clara County, Blossom Hill

Service Plan Description
- Local and Express trains each operating at 15-minute frequencies with timed cross-platform transfer at Redwood City
- Skip stop pattern for some mid-Peninsula stations; some origin-destination pairs not served at all
- Trains serve Capitol and Blossom Hill every 15 minutes and Morgan Hill and Gilroy every 30 minutes
2040 High Growth Scenario

Trains per Hour, per Direction
- Peak: 12 Caltrain + 4 HSR
- Off-Peak: 6 Caltrain + 3 HSR

Stopping Pattern
- Local / Express A / Express B with timed transfer at Redwood City

Travel Time, STC-Diridon
- 61 Min (Express A)
- 82 Min (Local)

New Passing Tracks
- South San Francisco-Millbrae, Hayward Park-Redwood City, northern Santa Clara County, Blossom Hill

Service Plan Description
- Local and Express A trains each operating at 15-minute frequencies with timed cross-platform transfer at Redwood City
- Express B trains operate every 15 minutes between 4th & King and Tamien
- Local trains make nearly all stops
- Trains serve Capitol and Blossom Hill every 15 minutes and Morgan Hill and Gilroy every 30 mins
Weighing Caltrain’s Choices
A **Business Case** is a decision-making framework used by transportation agencies around the world. They are intended to objectively assess whether an investment makes sense and provides long term value to the public. They can include different components that variously focus on the strategic, financial, economic, and deliverability elements of different projects or programs.

**MetroLinx GO**
Toronto, Canada

**Brighton Main Line**
Route Strategy
London, England

**TransPennine Express**
Rail Franchise
Northern England

**High Speed 2**
England
Components of the Business Case Analysis

We have adapted a traditional Business Case Analysis to the specific, and complicated circumstances of the Caltrain corridor. Collectively, this analysis helps provide guidance as to whether we should remain on the “baseline” course or if there is value in choosing a Long Range Service Vision for Caltrain that aims higher.

The following slides present and weigh analyses in each of the following areas.
Service Comparison

The following slides present a direct comparison of service-based performance metrics between the different 2040 Growth Scenarios.
The **number of stations** receiving frequent or high frequency service increases substantially in the Moderate and High Growth Scenarios due to higher train volumes in the peak period.

### Peak Period Frequency

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Stations Served by Frequent Service (&gt;4 TPHPD)</strong></td>
<td>13 Stations</td>
<td>21 Stations</td>
<td>24 Stations</td>
</tr>
<tr>
<td>Longest wait times at major stations served by all trains</td>
<td>22 minutes</td>
<td>12 minutes</td>
<td>8 minutes</td>
</tr>
</tbody>
</table>
The Moderate and High Growth Scenarios serve nearly all origin-destination pairs, while the Baseline offers less connectivity.

The Baseline Growth scenario operates three skip stop patterns. Sixteen percent of station pairs are not connected without a transfer, and nine percent of all station OD pairs (95 total) are not connected at all.

The Moderate Growth scenario operates a partially skip stop local pattern and an express pattern. Four percent of station pairs are not connected without a transfer, and two percent of station OD pairs (17 total) are not connected at all.

The High Growth scenario operates a local pattern and an express pattern that connects nearly all stations (99%) directly.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of Station Pairs Connected Without / (With) a Transfer</td>
<td>84% (91%)</td>
<td>96% (98%)</td>
<td>99% (99%)</td>
</tr>
<tr>
<td>Number of Station Pairs Not Connected at All*</td>
<td>95</td>
<td>17</td>
<td>2</td>
</tr>
</tbody>
</table>

*Defined as trips requiring out-of-direction travel or transfers in excess of 15 minutes
Network Connectivity

The Moderate and High Growth Scenarios enable timed connections to the regional transit network.

The Baseline Growth Scenario’s irregular wait times inhibit timed connections with other transit services.

The Moderate Growth and High Growth scenarios are highly structured, repeating patterns “pulsed” out of major terminals. These service patterns provide excellent opportunities for seamless, coordinated connections with other transit services.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timed Connections at Regular Intervals</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Ridership

On its current **Baseline** path, Caltrain would experience a **demand** of 161,000 daily riders by 2040.

The **Moderate and High Growth** scenarios would increase **demand** to 185,000 and 207,000 riders, respectively, leading to ridership and VMT saving increases.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Ridership*</td>
<td>151,700 Riders</td>
<td>177,200 Riders</td>
<td>207,300 Riders</td>
</tr>
<tr>
<td>Comfortable Peak Hour Train Loads?*</td>
<td>No</td>
<td>Crowding on some trains</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Crowd Constrained Ridership (135%)*
Travel Time

The **Moderate and High Growth** service plans provide the fastest travel times for major origin-destination pairs with express service, while the **Baseline** provides faster travel times for minor origin-destination pairs with skip stop service.

In-vehicle travel times are influenced by a range of factors, such as stopping patterns, signaling systems, locations of passing tracks, and rolling stock.

While maximum speeds on the corridor would increase from 79 MPH to 110 MPH by 2040 in all scenarios, travel time reductions are somewhat limited by increased levels of train traffic along a mostly two track corridor and increased density of stops served.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel Time, San Francisco (STC) to San Jose (Diridon)</td>
<td>69-73 Minutes</td>
<td>61 Minutes</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Average Travel Time per Rider, All Origin-Destination Pairs</td>
<td>33 Minutes</td>
<td>32 Minutes</td>
<td>31 Minutes</td>
</tr>
</tbody>
</table>
New 4 Track Infrastructure Required

The **Moderate and High Growth** service plans require passing track infrastructure to support blended service with HSR, so that faster trains can pass slower trains at multiple points in the corridor.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passing Tracks Needed</td>
<td>&lt;1 Mile</td>
<td>&lt;5 Miles</td>
<td>15-20 Miles</td>
</tr>
</tbody>
</table>

Conceptual 4 Track Segment or Station to be refined through further analysis and community engagement.
The following slides analyze how Caltrain’s financial performance would differ in each of the 2040 growth scenarios.
Structuring the Investment Program

The Business Plan identifies a program of individual corridor investments that collectively support expanded rail service.

This program is categorized **functionally** by investment type:

- Track and Rail
- Systems
- Stations and Platforms
- Grade Crossings and Separations
- Terminals and Yards
- Fleet

And **temporally** structured by the assumed dates that key service changes and events are planned for the corridor:

- 2022 - Start of electrified service
- 2029 - Opening of DTX and initial HSR service
- 2033 - Full Phase 1 HSR service
- 2040 - Service Vision Build Out
The following slides present projections of the total cost of investments required to support the different 2040 Growth Scenarios.

Many of these investments - particularly those included in the baseline - are not exclusively “Caltrain” projects. They are needed for a variety of reasons and serve multiple purposes and beneficiaries.
## The Baseline Costs $22.1 Billion

### $2.3B
Caltrain Work Underway

### $16.2B
Investments Planned and Proposed by Caltrain Partners

<table>
<thead>
<tr>
<th></th>
<th>$3.3B</th>
<th>$3.4B</th>
<th>$2.6B</th>
<th>$6.9B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downtown Extension to Salesforce Transit Center</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diridon Station and Surrounding Rail Infrastructure*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Speed Rail Investments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City-led Grade Separations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### $3.6B
New Caltrain Investments to Support Baseline Growth Scenario

* Placeholder cost pending detailed cost estimate to be developed through Diridon Integrated Station Concept Plan
Moderate & High Growth Investments

The following additional investments are incremental to the “Baseline” Scenario and enable service levels and ridership levels contemplated in the “Moderate” and “High” Scenarios.

**Additional Station Enhancements**
- Moderate: +$100M
- High: +$300M

**Additional grade crossing investments**
- Moderate: +$500M
- High: +$2.1B

**Additional Fleet**
- Moderate: +$700M
- High: +$1.3B

**Expanded storage and maintenance yards**
- Moderate: +$300M
- High: +$400M

**Moderate: Station overtakes: +$900M**
4 short overtakes needed to support express and HSR overtakes of local trains

**High: Station and running overtakes: +$3.2B**
Up to 15 miles of passing tracks and station overtakes as needed to support express and HSR passing of local trains
Investing for Growth
Total Corridor Investment Over Time by Growth Scenario

Baseline Growth
$22.1B

New Caltrain Investments Needed to Support Baseline Growth Scenario
$3.6B

Investments Planned and Proposed by Caltrain Partners
$16.2B

Caltrain Work Underway
$2.3B
Investing for Growth
Total Corridor Investment Over Time by Growth Scenario

- Baseline Growth: $22.1B
- Moderate Growth: $25.3B
Investing for Growth
Total Corridor Investment Over Time by Growth Scenario

- **Baseline Growth**
  - $2.3B
  - $22.1B

- **Moderate Growth**
  - $3.6B
  - $25.3B

- **High Growth**
  - $4.7B
  - $30.0B
Operating & Maintenance Costs

The following slides present projections of Caltrain’s future operating and maintenance costs.

These projections have been developed through detailed modeling of Caltrain’s existing operations and a projection of how costs will change over time with new investments and changes to service on the corridor.
Current Operating Costs

Existing (2018) contractor and agency operating costs (in $millions)

Total 2018 Operating Cost: $135.3 million
A Changing System to Baseline Growth

The Caltrain service and corridor are changing. As the system grows and as the corridor serves more trains and riders, overall operating costs will increase.

Operating Cost by Design Year (Present Value)

- **Current Operations**
  - 2018: $135.3
  - 2022: $190.9

- **Electrified Operations**
  - 2029: $249.7

- **Baseline Growth**
  - 2033: $261.9
  - 2040: $264.2

- **HSR Valley to Valley & DTX**
  - 2033: $261.9

- **HSR Phase 1**
  - 2040: $264.2
Key Drivers of Change

Operating & Maintenance Costs

2017 to 2022

- Increased service levels require additional crew costs and traction energy costs (electricity/fuel)
- A ramp-up in administrative staff is required to manage the expanded operation and new capital commitments
- New OCS/TPS equipment requires maintenance

2022 to 2029

- Increased service levels require additional crew costs and traction energy costs (electricity)
- A further ramp-up in administrative staff is required to manage the expanded, blended operation
- Increase in service levels, fleet size and train lengths causes increase in fleet maintenance costs and infrastructure maintenance costs

2029 to 2033

- Administrative staff continues to grow with the size of the operation
- Increased service levels require traction energy costs (electricity) and infrastructure and fleet maintenance costs
Year 2040 Operating Costs

2040 Baseline
2040 Moderate
2040 High

Contractor Costs
Agency Costs

Crew Dispatching Contractor Other Ops Rolling Stock Maintenance Infrastructure Maintenance OCS/TPS Maintenance Station Maintenance Contractor Admin Fuel & Electricity Other Operational Admin Shuttle Clipper Track Access Traction Electricity New Track Access

Millions
$50 $100 $150 $200 $250 $300 $350 $400

$264.2M $373.1M $413.9M

Traction Electricity New Track Access
Operating Costs Summary

Total Costs 2018 to 2070

Values shown are present (Year 2018) value using a discount rate of 4.0%
Operating Revenue Summary
Total Revenue 2018 to 2070

Track Access Income
Definition: Income from railroads using JPB infrastructure
Assumption: HSR share of track maintenance + current small amounts

Parking Revenue
Definition: Income from Caltrain drivers who pay to park
Assumption: changes in supply by growth scenario; existing occupancy and existing revenue per space remains constant

Passenger Revenue
Definition: Fare revenue from Caltrain riders
Assumption: Average fares remain constant in real terms

Revenues Not analyzed at this Stage
Shuttle Revenue and other incomes including real estate and advertising were not modeled at this stage of the Business Plan. Existing revenues were held constant and projected forward.

These and other potential revenue sources will be analyzed in detail after the Board adopts a long range service vision.

Values shown are present (Year 2018) value using a discount rate of 4.0%
Total Operating Costs and Revenue
Total 2018 to 2070

Operating Deficit
2018-2070 PV
($494M)
($1,024M)
($966M)

Farebox Recovery
Average (2018-2070)
82% Baseline Growth
75% Moderate Growth
77% High Growth

Values shown are present (Year 2018) value using a discount rate of 4.0%
Cost Allocation

Balancing Costs and Benefits

Overall corridor investment costs have been subcategorized and allocated so that we can more fairly and directly weigh the "costs" of expanded Caltrain service against the "benefits".

This process **does not reflect project delivery or funding responsibility** – it is simply a way to "disentangle" the costs of complex, multi-use investments so that we can assess the direct benefits of expanded Caltrain service relative to costs.

**Allocation By Category:**

- **Track** – Overtakes allocated per prime user, maintenance of tracks shared on a usage basis
- **Terminals and Stations** – costs allocated to Caltrain based on platform usage
- **Grade Separations** – costs allocated to Caltrain based on legal requirements
- **Systems and Equipment** – capital costs allocation varies based on timing and system; maintenance generally shared
- **Maintenance Facilities** – Caltrain's own facility costs
- **Fleet** – Caltrain's own fleet costs
Financial Analysis
Total Caltrain Allocated Costs and Revenue 2018 to 2070

Net Investment
2018-2070 Present Value

- Baseline Growth: ($7.1B)
- Moderate Growth: ($8.6B)
- High Growth: ($10.3B)

Incremental Investment over Baseline
2018-2070 Present Value

- Moderate Growth: ($1.5B)
- High Growth: ($3.2B)

Values shown are present (Year 2018) value using a discount rate of 4.0%
Caltrain Economic Case

The following slides analyze the economic benefits of the different 2040 growth scenarios as they apply to existing and future Caltrain riders. These benefits are expressed relative to the baseline.
Caltrain User Benefits:

The following user benefits were analyzed, quantified, and monetized as part of the Caltrain Economic Case.

These benefits are analyzed on an incremental basis.

Existing Transit User Time Savings
- **Definition**: improvements to travel times due to increased service levels and faster trains
- **Assumption**: Number of existing transit trips; net travel time between station pairings; value of time

New Transit User Time Savings
- **Definition**: improvements in travel times for drivers that switch to Caltrain
- **Assumption**: Number of new transit trips; net travel time between station pairings; value of time

Auto Operating Cost Savings
- **Definition**: reductions to auto operating and out-of-pocket costs for drivers who switch from driving to Caltrain due to improved service
- **Assumption**: Fuel cost (excluding taxes); Non-fuel costs (maintenance, repairs, and tires; vehicle depreciation)

Roadway Network Safety
- **Definition**: reductions in collisions from fewer drivers on parallel roadways
- **Assumption**: Reduced number of vehicles; accident rate by severity; accident costs by severity

Public Health Benefits
- **Definition**: Improvements to public health from new riders using active transportation modes (bicycles and walking) to access Caltrain stations
- **Assumption**: Access mode share by station (bike/walk); avg absence per employee; percent of sick days reduced when active at least 30 min per day; avg. distance to access station by mode; value of reduced absenteeism; percent reduction in mortality per annual (bike/walk) miles; mortality rate (bike/walk); mortality reduction cost

Note: Revenue is not included as a benefit for the Caltrain Economic Case
## Caltrain User Benefits over Baseline

Total Benefits 2018 to 2070, Average Annual Benefits 2040 to 2070

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Benefit Unit</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total*</td>
<td>Per Year Average</td>
</tr>
<tr>
<td>Existing Transit User Travel Time Savings</td>
<td>hours</td>
<td>12.9M</td>
<td>0.43M</td>
</tr>
<tr>
<td>New Transit User Travel Time Savings</td>
<td>hours</td>
<td>27.7M</td>
<td>0.92M</td>
</tr>
<tr>
<td>Avoided Auto Trips (VMT Savings from New Transit Users)</td>
<td>vehicle miles</td>
<td>9,000M</td>
<td>300M</td>
</tr>
<tr>
<td>Roadway Network Safety Improvements</td>
<td>reduced fatal/injury accidents</td>
<td>7,300</td>
<td>240</td>
</tr>
<tr>
<td>Public Health Benefits (from Active Transportation Mode Access)</td>
<td>lives saved</td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>reduced absent days at work</td>
<td>30,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

*Values rounded for presentation purposes
## Caltrain User Benefits and Costs

### Present Value of Benefits and Incremental Costs from 2018-2070

<table>
<thead>
<tr>
<th></th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing Transit User Travel Time Savings</strong></td>
<td>$0.65B</td>
<td>$0.97B</td>
</tr>
<tr>
<td><strong>New Transit User Travel Time Savings</strong></td>
<td>$0.18B</td>
<td>$0.30B</td>
</tr>
<tr>
<td><strong>VMT/Auto Operating Cost Savings</strong></td>
<td>$0.94B</td>
<td>$1.68B</td>
</tr>
<tr>
<td><strong>Roadway Network Safety Improvements</strong></td>
<td>$0.39B</td>
<td>$0.70B</td>
</tr>
<tr>
<td><strong>Public Health Benefits</strong></td>
<td>$0.19B</td>
<td>$0.42B</td>
</tr>
<tr>
<td><strong>Total Benefits</strong></td>
<td>$2.36B</td>
<td>$4.07B</td>
</tr>
<tr>
<td><strong>Incremental Capital Cost</strong></td>
<td>($0.94B)</td>
<td>($2.76B)</td>
</tr>
<tr>
<td><strong>Incremental O&amp;M Cost</strong></td>
<td>($0.84B)</td>
<td>($1.16B)</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td>($1.78B)</td>
<td>($3.92B)</td>
</tr>
<tr>
<td><strong>Benefit-Cost Ratio</strong></td>
<td>1.33</td>
<td>1.04</td>
</tr>
<tr>
<td><strong>Net Present Value</strong></td>
<td>$0.58B</td>
<td>$0.15B</td>
</tr>
</tbody>
</table>
Caltrain Economic Case by Scenario
Incremental Benefits and Costs 2018-2070

Values shown are present (Year 2018) value using a discount rate of 4.0%

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Net Present Value</th>
<th>Benefit Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018-2070 PV</td>
<td></td>
</tr>
<tr>
<td>Moderate Growth</td>
<td>$0.58B</td>
<td>1.33 Moderate Growth</td>
</tr>
<tr>
<td>High Growth</td>
<td>$0.15B</td>
<td>1.04 High Growth</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incremental Allocated Costs</th>
<th>Incremental Benefits</th>
<th>Incremental Allocated Costs</th>
<th>Incremental Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>$0.84</td>
<td>$2.36</td>
<td>$1.16</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td>$2.76</td>
<td>$4.07</td>
</tr>
</tbody>
</table>
Regional Analysis

The following slides present analysis related to how the different growth scenarios could benefit the larger region.
Today, Caltrain carries 4 freeway lanes worth of people during peak hours. By 2040, the proposed growth scenarios will carry an additional 4 to 8.5 freeway lanes worth of passengers.

The **Baseline Growth** scenario would carry the equivalent of 4 new freeway lanes worth of passengers during peak hours by 2040.

The **Moderate Growth** scenario would carry the equivalent of 5.5 new freeway lanes of passengers during peak hours by 2040.

The **High Growth** scenario would carry the equivalent of 8.5 new freeway lanes of passengers during peak hours by 2040.

*Assumes vehicle occupancy of 1.1 persons/vehicle and lane capacity of 1,500 vehicles/hour.
Regional Rail Integration

All service scenarios are compatible with regional rail needs.

**High Growth** anticipates large-scale corridor sharing, or “interlining” through investments in 4-track segments.

**Baseline & Moderate Growth** preserve the ability to scale up to large-scale corridor sharing but hold off on proactive investments until regional needs are better defined.

Examples of active studies and plans ongoing in the region that could advance the potential need for significant interlining onto Caltrain’s corridor include:

- A standard gauge transbay crossing connecting San Francisco and the East Bay
- The reactivation of the Dumbarton rail bridge
- The development of expanded, “visionary” levels of service by ACE or Capital Corridor into San Jose
Environmental Benefits
Emissions Reductions 2022 to 2070

All scenarios deliver significant environmental benefits - both through the elimination of remaining diesel train service and the diversion of a substantial number of auto trips.

<table>
<thead>
<tr>
<th></th>
<th>GHG Savings (MTCO2e)</th>
<th>ROG Emissions Reductions (lbs)</th>
<th>NOx Emissions Reductions (lbs)</th>
<th>PM2.5 Emissions Reductions (lbs)</th>
<th>Diesel PM Emissions Reductions (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>1,108,045</td>
<td>426,970</td>
<td>7,065,695</td>
<td>247,750</td>
<td>264,588</td>
</tr>
<tr>
<td>Moderate</td>
<td>1,898,330</td>
<td>450,131</td>
<td>7,199,666</td>
<td>251,535</td>
<td>269,889</td>
</tr>
<tr>
<td>High Growth</td>
<td>3,006,028</td>
<td>482,662</td>
<td>7,387,824</td>
<td>256,854</td>
<td>277,336</td>
</tr>
</tbody>
</table>

Assumes conversion to 100% renewable power starting in 2029, consistent with CHSRA goals. Analysis conducted using the California Air Resources Board Quantification Methodology for transit and intercity rail capital program investments.
Land Value Benefits from Caltrain Service
Existing Residential and Office Benefits

Statistical and comparative analyses were performed to estimate the impact of existing Caltrain service on property values in the vicinity of stations. These relationships were used to forecast impacts of the Growth Scenarios on property values.

Residential Property Value Premiums
- 3%-7% Single-Family Home
- 2%-6% Condominium

Office Property Value Premiums
Office rents **20% higher** within a half-mile of Caltrain

![Single-Family Home Property Value Premium](chart.png)
Land Value Benefits from Caltrain Service

2040 Growth Scenario Benefits

Total Estimated Property Value Benefits of Caltrain Service

<table>
<thead>
<tr>
<th></th>
<th>2040 Baseline</th>
<th>2040 High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.5 mi</td>
<td>$13B</td>
<td>$19B</td>
</tr>
<tr>
<td>&lt; 1 mi</td>
<td>$25B</td>
<td>$37B</td>
</tr>
</tbody>
</table>

Estimated Residential and Office Property Values by Growth Scenario ($2019)

- **Caltrain Premium**
- **Value Not Associated with Caltrain**
Economic Impact Analysis (EIA) looks at the total economic impact of each growth scenario, including:

- Direct effects of initial capital costs
- Long-term operating cost spending
- Multiplier effects generated by these direct expenditures

The following economic effects are estimated:

- Direct effect (capital and operating costs)
- Indirect effect (supply-chain spending)
- Induced effect (employee spending)
- Total effect (Direct + Indirect + Induced)
Regional Economic Impact
Total Output 2018 to 2070

Total Economic Output 2018-2070
- Baseline: $32.8B
- Moderate: $40.8B
- High: $47.7B

Jobs* from Capital Spending 2018-2070
- Baseline Growth: 44K job-years
- Moderate Growth: 51K job-years
- High Growth: 69K job-years

Incremental Output over Baseline
- Moderate Growth: $8.0B
- High Growth: $14.9B

Incremental Jobs over Baseline
- Moderate Growth: 7K job-years
- High Growth: 24K job-years

Values shown are present (Year 2018) value using a discount rate of 4.0%, Jobs are considered full- and part-time jobs in San Francisco, San Mateo and Santa Clara Counties.
Flexibility and Uncertainty

The “2040 Service Vision” will set a generalized framework for growth. There are still many unknowns regarding exactly how both the Caltrain corridor and the regional rail network may evolve. This section helps frame some of those unknowns and opportunities.
## Status of Regional and State Projects

### Status of Major Projects Impacting the Caltrain Corridor

<table>
<thead>
<tr>
<th>Project</th>
<th>Development Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE Forward and Altamont Vision service expansion of ACE</td>
<td>Conceptual Planning and Environmental</td>
</tr>
<tr>
<td>Capital Corridor Vision</td>
<td>Conceptual Planning</td>
</tr>
<tr>
<td>City-led grade separations</td>
<td>Various (conceptual planning thru detail design)</td>
</tr>
<tr>
<td>Diridon Station and Surrounding Rail Infrastructure</td>
<td>Conceptual Planning (pre-Environmental)</td>
</tr>
<tr>
<td>Downtown Extension to Salesforce Transit Center</td>
<td>Environmental and Design</td>
</tr>
<tr>
<td>Dumbarton Rail Crossing</td>
<td>Planning and pre-Environmental</td>
</tr>
<tr>
<td>HSR Investments</td>
<td>Environmental and Design</td>
</tr>
<tr>
<td>Second Transbay Crossing</td>
<td>Conceptual Planning</td>
</tr>
</tbody>
</table>
Flexibility to Refine Illustrative Service Planning

Service planning work to date has been focused on the development of detailed, illustrative growth scenarios for the Caltrain corridor. Future work will be needed to determine:

• Exact service levels and station stopping patterns
• Opportunities to close or add stations (such as the proposed Oakdale Station)
• Specific infrastructure locations and designs to support service needs

**Example Service Plan Variants**

**Moderate Growth, Mid-Peninsula, Local Service**

- Millbrae
- Broadway
- Burlingame
- San Mateo

**High Growth, Peninsula, Express B Service**

- Hillsdale
- Belmont
- San Carlos
- Redwood City
- Palo Alto
- California Ave
- Mountain View
- Sunnyvale
Implications of Uncertainty to Growth Scenarios

The **High Growth Scenario** most directly accommodates large-scale corridor sharing and expanded service, but the details of this scenario - including potential stopping patterns and location and extent of required infrastructure - are also highly influenced by state and regional projects.

The **Moderate Growth Scenario** does not directly accommodate the same level of growth but has infrastructure that can be more discretely planned. It has the potential to scale up as regional projects are further confirmed, defined, and funded.

---

4-Track Infrastructure Uncertainty
Segments Dependent on Design Input/Timing of Regional and State Projects

[Diagram showing infrastructure segments dependent on design input/timing of regional and state projects.]

---

Overtake Design Influenced by Non-Caltrain Rail
**Initial Financial and Economic Sensitivity Testing**

Four high level sensitivity tests were performed to determine the durability of key business metrics if assumptions change. Tests were performed individually (one at a time):

- Discount Rate        +/- 2 points
- Value of Time Saved to Riders +/- 10%
- Capital Costs         +/- 10%
- Operating and Maintenance Costs +/- 5%

The range of impacts on key metrics from initial tests results are summarized in the table.

<table>
<thead>
<tr>
<th>Key Metric</th>
<th>Original Value</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Farebox Recovery Ratio</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate Growth</td>
<td>75%</td>
<td>72%</td>
<td>79%</td>
</tr>
<tr>
<td>High Growth</td>
<td>77%</td>
<td>74%</td>
<td>81%</td>
</tr>
<tr>
<td><strong>Percent Change in Net Investment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate Growth</td>
<td>-</td>
<td>26%</td>
<td>-18%</td>
</tr>
<tr>
<td>High Growth</td>
<td>-</td>
<td>29%</td>
<td>-19%</td>
</tr>
<tr>
<td><strong>Benefit Cost Ratio</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate Growth</td>
<td>1.33</td>
<td>1.13</td>
<td>1.55</td>
</tr>
<tr>
<td>High Growth</td>
<td>1.04</td>
<td>0.83</td>
<td>1.30</td>
</tr>
<tr>
<td>Metric</td>
<td>Baseline Growth</td>
<td>Moderate Growth</td>
<td>High Growth</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-----------------</td>
<td>-----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Number of Stations Served by Frequent Service (&gt;4 TPHPD)</td>
<td>13 Stations</td>
<td>21 Stations</td>
<td>24 Stations</td>
</tr>
<tr>
<td>Longest Wait Times At Major Stations Served by All Trains</td>
<td>22 minutes</td>
<td>12 minutes</td>
<td>8 minutes</td>
</tr>
<tr>
<td>Percentage of Station Pairs Connected Without/(With) a Transfer</td>
<td>84% (91%)</td>
<td>96% (98%)</td>
<td>99% (99%)</td>
</tr>
<tr>
<td>Number of Station Pairs Not Connected at All</td>
<td>95</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Timed Connections at Regular Intervals</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Daily Ridership (capacity constrained)</td>
<td>151,700 Riders</td>
<td>177,200 Riders</td>
<td>207,300 Riders</td>
</tr>
<tr>
<td>Comfortable Peak Hour Train Loads?</td>
<td>No</td>
<td>Some Crowding</td>
<td>Yes</td>
</tr>
<tr>
<td>Travel Time, San Francisco (STC) to San Jose (Diridon)</td>
<td>69-73 Minutes</td>
<td>61 Minutes</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Average Travel Time per Rider, All Origin-Destination Pairs</td>
<td>33 Minutes</td>
<td>32 Minutes</td>
<td>31 Minutes</td>
</tr>
<tr>
<td>Passing Tracks Needed</td>
<td>&lt;1 Mile</td>
<td>&lt;5 Miles</td>
<td>15-20 Miles</td>
</tr>
</tbody>
</table>

**Summary:**
- **Service Metrics**:
  - Frequency: 13 Stations, 21 Stations, 24 Stations
  - Connectivity: 84% (91%), 96% (98%), 99% (99%)
  - Network Integration: No, Yes, Yes
  - Ridership: 151,700 Riders, 177,200 Riders, 207,300 Riders
  - Comfortable Peak Hour Train Loads?: No, Some Crowding, Yes
  - Travel Time: 69-73 Minutes, 61 Minutes, 60 Minutes
  - Average Travel Time per Rider: 33 Minutes, 32 Minutes, 31 Minutes
  - Passing Tracks Needed: <1 Mile, <5 Miles, 15-20 Miles

- **Passing Tracks Needed**:<1 Mile, <5 Miles, 15-20 Miles
### Summary

**Financial Analysis**

**Caltrain Economic Case**

---

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Capital Costs</td>
<td>($22.1B)</td>
<td>($25.3B)</td>
<td>($30.0B)</td>
</tr>
<tr>
<td>Caltrain Allocated Capital Costs</td>
<td>($6.6B)</td>
<td>($7.6B)</td>
<td>($9.4B)</td>
</tr>
<tr>
<td>Total Operating Costs</td>
<td>($5.1B)</td>
<td>($6.0B)</td>
<td>($6.3B)</td>
</tr>
<tr>
<td>Year 2040 Operating Costs</td>
<td>($0.26B)</td>
<td>($0.37B)</td>
<td>($0.41B)</td>
</tr>
<tr>
<td>Farebox Recovery Ratio</td>
<td>82%</td>
<td>75%</td>
<td>77%</td>
</tr>
<tr>
<td>Net Investment</td>
<td>($7.1B)</td>
<td>($8.6B)</td>
<td>($10.3B)</td>
</tr>
<tr>
<td>Net Present Value</td>
<td>-</td>
<td>$0.58B</td>
<td>$0.15B</td>
</tr>
<tr>
<td>Benefit Cost Ratio</td>
<td>-</td>
<td>1.33</td>
<td>1.04</td>
</tr>
</tbody>
</table>

Except for Total Capital Costs, values are shown as a present (Year 2018) value using a discount rate of 4.0% and cover the period from 2018-2070.
<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline Growth</th>
<th>Moderate Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Freeway Throughput</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional Freeway Lanes</td>
<td>+4 lanes</td>
<td>+5.5 lanes</td>
<td>+8.5 lanes</td>
</tr>
<tr>
<td><strong>Regional Rail Integration</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accommodation of Large-Scale Corridor-Sharing Beyond HSR</td>
<td>could be scaled to accommodate</td>
<td>could be scaled to accommodate</td>
<td>can accommodate</td>
</tr>
<tr>
<td><strong>Environmental Benefits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GHG (MTCO2e)</td>
<td>1,108,045</td>
<td>1,898,330</td>
<td>3,006,028</td>
</tr>
<tr>
<td><strong>Land Value Benefits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property Value Premiums Generated by 2040 Service Growth within 1 Mile of a Station</td>
<td>$10B</td>
<td>$10 - $22B</td>
<td>$22B</td>
</tr>
<tr>
<td><strong>Economic Productivity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Output</td>
<td>$32.8B</td>
<td>$40.8B</td>
<td>$47.7B</td>
</tr>
<tr>
<td>Full and Part-time Jobs</td>
<td>44K job-years</td>
<td>51K job-years</td>
<td>69K job-years</td>
</tr>
</tbody>
</table>
Uncertainties to consider in selecting a Service Vision for Caltrain include:

- Ultimate design and timing of key regional projects impacting the corridor is still in flux and may change
- All scenarios have a degree of flexibility; detailed service and infrastructure planning will be an ongoing process
- Scale and location of passing tracks needed are sensitive to state and regional rail plans, particularly in the high growth scenario
- Key business metrics may shift as fundamental assumptions change

The Moderate Growth Scenario:
- Does not directly accommodate large-scale corridor sharing but has the potential to scale up
- Has a high level of confidence that the Benefit-Cost Ratio to Caltrain is over 1.0 even if key assumptions change

The High Growth Scenario:
- Most directly accommodates large-scale corridor sharing and interlining but infrastructure is sensitive to changes in regional and state assumptions
- Has less certainty that Benefit-Cost Ratio to Caltrain is solidly over 1.0 should key assumptions change
Staff Recommendation
Caltrain’s Long Range Service Vision directs the railroad to plan for a substantially expanded rail service that will address the local and regional mobility needs of the corridor while supporting local economic development activities. When fully realized, this service will provide:

A. A mixture of express and local Caltrain services operated in an evenly spaced, bi-directional pattern.

B. Minimum peak hour frequencies of;
   i. 8 trains per hour per direction on the JPB-owned corridor between Tamien Station in San Jose and San Francisco extended to Salesforce Transit Center at such time as the Downtown Extension is completed.
   ii. 4 trains per hour per direction between Blossom Hill and Tamien Stations, subject to the securing of necessary operating rights.
   iii. 2 trains per hour per direction between and Gilroy and Blossom Hill Stations, subject to the securing of necessary operating rights.
Caltrain Long Range Service Vision: Staff Recommendation

(1) Continued

C. Off-peak and weekend frequencies of between 2 and 6 trains per hour per direction north of Blossom Hill and hourly between Gilroy and Blossom Hill, with future refinements to be based on realized demand.

D. Accommodation of California High Speed Rail trains, in accordance with the terms of existing and future blended system agreements between the JPB and the California High Speed Rail Authority.

E. Delivery of these services will occur through the incremental development of corridor projects and infrastructure to be further defined through individual planning process, feasibility studies, and community engagement. At this time, such infrastructure is conceptually understood to include:

i. Investments in rail systems including a new, high performance signal system.

ii. Station modifications including platform lengthening, level boarding, and investments in station access facilities and amenities to support growing ridership and improve customer experience.

iii. New and modified maintenance and storage facilities in the vicinity of both terminals as well as the expansion of the electrified Caltrain fleet.
E. Delivery of these services will occur through the incremental development of corridor projects and infrastructure to be further defined through individual planning process, feasibility studies, and community engagement. At this time, such infrastructure is conceptually understood to include:

iv. A series of short, 4-track stations and overtakes at various points throughout the corridor

v. Completion of key regional and state partner projects including

a. The Downtown Extension to the Salesforce Transit Center
b. The reconstruction of Diridon Station and surrounding rail infrastructure
c. The reconstruction and electrification of the rail corridor south of Control Point Lick to the Gilroy Station
d. Additional improvements to allow for the operation of High Speed Rail service between Gilroy and San Francisco
e. The substantial grade separation of the corridor as well as safety upgrades to any remaining at-grade crossings, undertaken in a coordinated strategic manner driven by the desires of individual local jurisdictions as well as legal requirements associated with any proposed 4-track segments.
(2) Caltrain’s Long Range Service Vision further directs the railroad to continue its consideration of a potential “higher” growth level of service in the context of major regional and state rail planning. Specifically, the Long Range Service Vision directs the railroad to;

A. Work with regional and state partners to study and evaluate both the feasibility and desirability of higher levels of service in the context of major regional and state rail initiatives including planning related to the Dumbarton Rail Corridor, the 2nd Transbay Crossing, the potential for expanded ACE and Capitol Corridor services, and ongoing planning for the California High Speed Rail system.

B. To take certain actions to consider and, where feasible, not preclude such higher levels of service as they specifically relate to;
   i. The planning of rail terminals and related facilities
   ii. The sale or permanent encumbrance of JPB land
   iii. The design of grade separations in areas where 4-track segments may be required
   iv. The sizing of future maintenance facilities and storage yards

C. To return to the board with a recommendation regarding any formal expansion of the Long Range Service Vision at such a time as clear regional and state policy and funding commitments are in place and the feasibility of such an option on the corridor has been confirmed.
(3) Finally, Caltrain’s Long Range Service Vision directs the railroad to periodically reaffirm the Vision to ensure that it continues to provide relevant and useful guidance to the railroad. Such reaffirmations should occur;

A. At a regular intervals of no less than 5 years
B. In response to significant changes to JPB or partner projects that materially influence the substance of the Long Range Service Vision
Caltrain Long Range Service Vision: Staff Recommendation

The features of the Service Vision include:

- **Fast and frequent all day (every day) service**: user friendly, show up and go
  - Faster, all day baby bullet service with express service every 15 minutes
  - Significantly increased off-peak and weekend service levels
  - Comprehensive local service providing coverage to every community

- **Increased Capacity**
  - Tripling today’s ridership, serving nearly 180,000 people a day
  - Adding the equivalent capacity of more than 5 freeway lanes worth of regional capacity

- **Regional Connectivity**
  - End to end service - connecting Gilroy to downtown San Francisco (all day, both ways)
  - Regular service making transfers and connections easier and more predictable
Caltrain Long Range Service Vision: Staff Recommendation

- The Service Vision maximizes the benefits of local, regional and state sponsored projects including
  - Local investments in grade separations
  - Improved terminal infrastructure (Diridon and San Francisco).
  - High Speed Rail
- The Service Vision establishes Caltrain as a leader in implementing a regional rail network providing the service and infrastructure that can respond and grow to meet regional needs.
- Work is already underway on implementing the Vision. It starts with the electrification of the service in 2022. From that point a series of incremental improvements will deliver increasingly improved service over time - we don't have to wait until 2040.
From Vision to Plan – Next Steps
Planned and Completed Outreach

The Caltrain Business Plan team will expand outreach activities during the months of July, August, and September as the Board considers a draft recommendation for a long range service vision.

The Board will receive a summary of outreach undertaken and feedback received prior to any request to take action on the long range service vision.

For updated public presentation information visit: https://www.caltrain2040.org/get-involved/

July, August, September
List as of today

- July 12 Partner General Managers / Executives
- July 22 Online Public Meeting
- July 24 Caltrain Planning Subcommittee Meeting
- July 24 Caltrain Access and Accessibility Committee
- July/August Federal and State Delegation Briefings
- August 1 Launch of the "Online Open House"
- August 8 Stakeholder Advisory Group
- August 12 General Public Meeting San Jose
- August 14 Caltrain City/County Staff Group
- August 14 General Public Meeting San Francisco
- August 16 SB 797 Agency Group
- August 21 Caltrain Citizen Advisory Committee
- August 22 Caltrain Local Policy Maker Group
- August 29 General Public Meeting San Carlos
- August 1 – September 24 Sister Agency Boards
  - VTA (August 1)
  - MTC (September 4)
  - SamTrans (September 4)
  - SMCTA (September 5)
  - SFCTA (September 24)
- August/September Rider Outreach
- August/September City Councils, as requested
- September Santa Clara County Board of Supervisors
- September 17 San Mateo County Boards of Supervisors
- September 19 Caltrain Bicycle Advisory Committee
Once We’ve Chosen the “Big” Vision, We Can Work Back to Define the Best Path to Get There
Completing the Business Plan

Completion of the Business Plan is targeted for early 2020.

When staff returns to the Board in October, a detailed roadmap for the completion of the Plan will be provided for discussion.

Key Focus Areas to Complete the Plan:

Service Analysis
- “Walk back” of incremental phasing and steps to implement the vision
- Focus on post-electrification generation of investments

First and Last Mile
- Long term needs and phasing
- Analysis of strategies and outcomes

Funding and Revenues
- Existing and new funding sources
- Commercial strategies and revenue opportunities
- Efficiencies

Additional Organizational Assessment and Community Interface Work
Organizational Assessment
Change is Coming

Today, Caltrain operates a successful and efficient commuter rail service.

Looking forward, both the railroad and the region have made transformative decisions and commitments that compel organizational change.

Finally, realization of the long range service vision specified through the Business Plan will require additional organizational transformation.
Three Critical Organizational Areas

**Service Delivery**
- What is it? How Caltrain operates and delivers its services
- What is the Focus? Focus on train service delivery and contracting mechanism

**Internal Organization**
- What is it? How Caltrain organizes itself
- What is the Focus? Focus on resources, functionality, shared services

**Governance**
- What is it? How Caltrain is overseen by a governing body
- What is the Focus? Focus on options for self-directed change, regional integration, and certain parallel considerations
Key Questions for Each Area

**Questions**

**Timing**
- Is this the right time to be having this discussion?
- What are the implications if no decisions are reached?

**Recommendations And Focus Areas**
- What are the recommendations or key focus areas?

**Implementation**
- What additional work is needed?
Organizational Assessment Process

Initial Assessment
Conducted over 50 interviews and reviewed documents and reports
Documented key observations and areas requiring organizational focus

Defining Railroad Functions & Mapping the Current Caltrain Organization
Outlined basic functions necessary to plan, operate, and maintain a major regional railroad
Analyzed how Caltrain currently completes the work

Comparison to Other US and International Railroads
Reviewed how other agencies are governed, organized and deliver service

Detailed Organizational Analysis
Detailed analysis to identify options and focus areas related to service delivery, internal organization and governance

Recommendations
Identified specific recommendations and implementation steps
Organizational Assessment Report

The Organizational Assessment was developed by Howard Permut of Permut Consulting LLC and former President of Metro-North.

Key areas of Howard’s work have been supported by the Stanford Global Projects Center and a team of outside experts.

Read the full report at www.caltrain2040.org
What is the Current Caltrain Organization?

**Governance**
- Caltrain is a Joint Powers Authority, formed through a Joint Powers Agreement (JPA) between three member agencies
  - The system is governed by the Peninsula Corridor Joint Powers Board (JPB), a 9-member board appointed under the terms of the JPA

**Internal Organization**
- The JPA designates the San Mateo County Transit District (SMCTD) as Caltrain’s “managing agency”
  - SMCTD employees manage and administer the Caltrain system, either as part of a Caltrain-dedicated department or through a shared services arrangement with other SMCTD business lines

**Service Delivery**
- The JPB contracts with a private company, Transit America Services Inc (TASI) for the direct operation of the Caltrain service and maintenance of the railroad’s assets. The operating contract is managed by SMCTD
Roles and Responsibilities at Caltrain are Complex

Caltrain fulfills all of the functions of a major railroad but does so within a complicated framework that creates bifurcated responsibilities for many key activities. This is because the railroad;

• Is managed within a multi-modal, shared services agency
• Delivers service through a 3rd party contract
• Traverses 21 local jurisdictions

Details of Caltrain’s organization and functionality are discussed in Chapter 2 of the Organizational Assessment Report
Comparison to Other US Systems

We compared Caltrain with a spectrum of US peer passenger railroads, focusing on how they approach the issues of service delivery, internal organization and governance.

US Peer Railroads

- Capitol Corridor (CCJPA)
- Southern California Regional Rail Authority (Metrolink)
- San Joaquin Regional Rail Commission (ACE)
- Sonoma-Marin Area Rail Transit (SMART)
- Massachusetts Bay Transportation Authority (MBTA)
- Southeastern Pennsylvania Transportation Authority (SEPTA)
Comparison to Other International Systems

We also reviewed three international railways to understand how their organizational structures enable their success in specific areas such as monetizing real estate assets, sharing corridors with multiple carriers and incentivizing the private sector to deliver services efficiently.

International Peer Railroads

- Bern-Lötschberg-Simplon (BLS) Railway (Switzerland)
- Kintetsu Rail Company (Japan)
- Chiltern Railways (UK)
Comparison to Other Systems - Lessons Learned

The detailed comparison with other systems can be found in Chapter 3 of the Organizational Assessment Report

Service Delivery
• There is no standard or “correct” model for service delivery; the choice reflects the specific circumstances the railroads face at a given point in time
• Third party service contracting, similar to Caltrain, is the most common delivery method in the US. In-house service delivery is generally used in older US railroads but SMART is a recent counter example
• There is no clear correlation between the model used and financial or service performance
• International railways utilize the private sector to a much greater degree than US railroads with greater risk transfer
• The agency retains ultimate responsibility regardless of the method selected

Internal Organization
• Shared services are used at select other railroads, however the structure of arrangements varies
• There are major differences between organizations that are expanding rapidly or delivering major capital projects versus those that are operating existing stable systems

Governance
• Board composition, committee structure vary greatly across agencies.
• Member agency involvement in budget development process is related to both board structure and to funding sources.
• Most boards have a more direct and exclusive (not shared) relationship to its railroad executives than Caltrain.
Service Delivery

Overview | Service Delivery | Internal Organization | Governance
Caltrain’s existing operating contract expires in 2022 and includes a one year option to extend. There is an opportunity to negotiate a five year extension pending FTA approval. The agency must choose what to do.

**Considerations**
- Many potential options to choose from and model can evolve over time
- Railroad is transitioning from a stable operation to a period of dynamic change

**Key Factors Informing Choices**
- Ability of chosen model to achieve Caltrain’s corporate objectives and support planned services and projects
- Balancing of reputational and financial risk, control and cost;
- Anticipated market response and associated costs
- Implications for labor agreements and federal labor protection provisions
- Timing of transition and associated risks
- Maintaining adequate negotiating leverage
- Organizational bandwidth
Service Delivery

Caltrain has three distinct options to choose from for service delivery.

Service Delivery Options

1. Extension of TASI contract with modifications

2. Solicitation of a service provider through the standard procurement process
   • Bundled or unbundled contract
   • Gross cost or net cost models

3. Provision of services with in-house forces
Service Delivery

Recommendations

Timing
• Immediately initiate development of a comprehensive strategy for future service delivery including prioritization of new contract elements
• Caltrain should discuss extension with FTA
• Starting work now maximizes Caltrain’s flexibility and provides the widest range of options

Recommendation
• Recommended that Caltrain should pursue extension of the TASI contract with a set deadline to complete the negotiation.
• Deadline would be set so that Caltrain would have sufficient time to procure another operator if negotiations are not successful.

Implementation
• Form an inter-disciplinary task force of senior staff
• Develop a work plan and schedule reflecting the above
Internal Organization
Internal Organization

Staff Resourcing

- Caltrain is the most efficient major passenger railroad in the country as measured by basic outputs per employee (car miles and passenger miles per employee)
- Caltrain is significantly under resourced for today’s work outputs let alone to successfully implement the recommended service vision
Internal Organization

Shared Services
As the railroad grows in scope and complexity a key issue is which services can effectively be shared with other organizations, and which ones will require dedicated focus and rail specialization.

Shared Services Considerations
Changes to specific service sharing arrangements should reflect consideration of:

• The degree to which specialized railroad skills are necessary
• The financial savings (or costs) generated through sharing arrangements.
• The need for clear lines of responsibility and authority within the organization
• The selected service delivery model
• The selected governance model
Internal Organization

Functions & Processes
As it enters into a period of major transformation, Caltrain will require a different type and level of output from key functional areas. It will also need to intensify its focus on critical process interfaces.

Attracting and Retaining Talent and Skills
Another common theme has been the need to attract and retain talent. This is challenging in a high cost area.

Key Functions and Functional Areas that Require Focus
- Planning Department (underway)
- Contracts and agreements with external parties
- Rail Activation Plan
- IT
- Procurement and Human Resources
- Performance Management
- First Mile/Last Mile at stations
- Capital Project Implementation

Key Issues Related to Talent and Skill Retention
- Addressing high vacancy rates
- Large number of “seconded” consultant staff
- Need to attract skill-based workforce to deliver the service vision
Internal Organization

Recommendations

Timing
• Now is time to take actions that address current deficiencies and prepare the organization for the next five years
• Maintaining the status quo will not allow Caltrain to provide high quality expanded rail service, participate constructively on major regional projects, and implement its Business Plan

Recommendation
• Address vacancies immediately
• Undertake a complete organizational study and identify specific modifications to be implemented in FY20/21 Budget and for the upcoming five years
• Develop financial resourcing strategy

Implementation
• Form an inter-disciplinary task force led by a senior staff member to address vacancies
• Develop a work plan and conduct study over next 3 to 6 months
Governance

Overview
A critical assumption is a dedicated source of revenues will become available - any modification of the existing Caltrain governance structure will not alone solve the financial challenges faced by the organization.

Structure
Governance options and considerations are discussed within three groups:
1) Self-directed options
2) Regional (Non-self directed) options
3) Parallel considerations

Many of the options described within these groups are not mutually exclusive.
Governance

Self-Directed Options
The following governance models are described as “self directed” because their implementation could be initiated by agreement of Caltrain’s member agencies.
Governance
Self-Directed Option A: Retention of the Status Quo
Governance
Self-Directed Option B: JPB as Currently Structured Coupled with Modifications
Governance

Self-Directed Option C:
Retention of the JPA as currently structured but reorganized as a railroad authority that directly hires its management and administrative employees.

Self-Directed Option D:
Same as Option C except that staffing is supplemented on an as needed basis with expertise from JPA member agencies.
Self-Directed Option E: Creation of a Special District to Govern and Administer Caltrain - Peninsula Rail Transit District (PRTD)
Governance

Non Self-Directed Options
The non-self-directed options described here include options for either the full or partial regional, or mega-regional integration of multiple railroads and agencies.

The process to implement these options would be significantly more complex. At the same time, such options may be intrinsically tied to the funding and implementation of key portions of the Business Plan and initiatives being undertaken by other agencies.

Very careful and comprehensive analysis needs to be done to understand the pros and cons as well as the implications with regard to transferring authority and decision-making, funding, cost and service delivery to another organization.
Non-Self Directed Options
Current Operations

Separate Railroad A

Separate Railroad B
Non-Self Directed Options
Option F: Regional Cooperation

Separate Railroad A

Coordinated Activities by Agreement

Separate Railroad B
Non-Self Directed Options
Option G: Regional Integration of Key Functions

Separate Railroad A

Regional Entity

Separate Railroad B
Non-Self Directed Options
Option H: Consolidated Regional Rail Authority with Subsidiary Railroads

Regional “Umbrella” Authority

Subsidiary Railroad A  Shared Functions  Subsidiary Railroad B
Non-Self Directed Options
Option I: Fully Consolidated Regional Railroad

Consolidated Regional Railroad
Governance

Parallel Governance Considerations and Structures

There are a number of “governance-level” issues that Caltrain must consider regardless of its ultimate core governance model.

In some instances these may be addressed through parallel or separate governance structures or agreements.

Megaproject Delivery

• Major organizational issue
• May be addressed through separate Construction Authority or grade separation district

Integration with other Railroads

• Coordination with HSR around use of shared infrastructure
• Potential to look at interlining of other operators and/or geographic expansion of Caltrain services

Increased Role of Private Sector

• Commercialization or privatization of all or parts of railroad’s business
Timing
• Timing is right to engage in discussion and review of self-directed options given magnitude of transformation faced by Caltrain

Recommendation
• Organizational assessment provides a menu of viable self-directed governance options
• Most options require amendment to JPA- which falls under the purview and responsibility of Caltrain’s member agencies
• Recommendation that member agencies should reach consensus on preferred option

Implementation
• General Managers of the member agencies should form a task force of themselves or a senior empowered representative of their agency to review options and make recommendation to their boards within a specified time period
Timing

• It is in Caltrain’s interest to constructively and actively engage in discussions related to regional governance and key parallel considerations

Recommendations

• Caltrain should be involved in all aspects of regional rail discussions (options F through I) even if discussions are in early stages

• Caltrain should develop a position on the potential for a regional construction authority

• Caltrain should continue to work with the State and High Speed Rail Authority to define needed future agreements in conjunction with the evolution of the Authority’s plans

• Caltrain should work, through the remainder of the Business Plan, to identify areas where private sector partnerships may be most beneficial to its mission