Choosing a Long Range Vision

Caltrain Business Plan

JPB
August 1, 2019

Caltrain

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**

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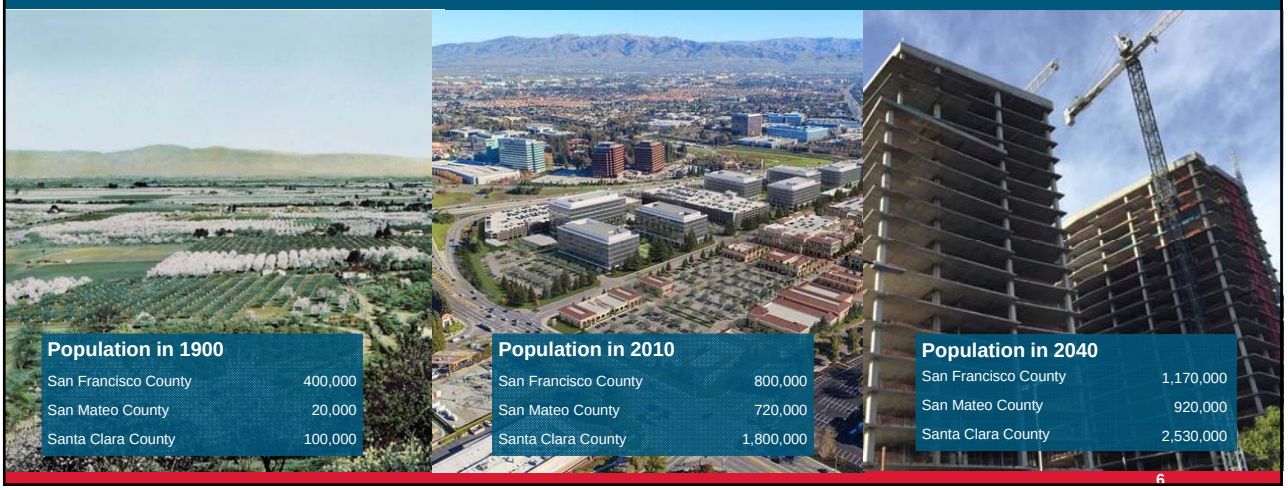
Executive Director Remarks

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

Urban growth is a global phenomenon.


London, England


Buenos Aires, Argentina


Toronto, Canada

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Rail investments remain an essential tool to shape and manage growth.

London, England

Buenos Aires, Argentina

Toronto, Canada

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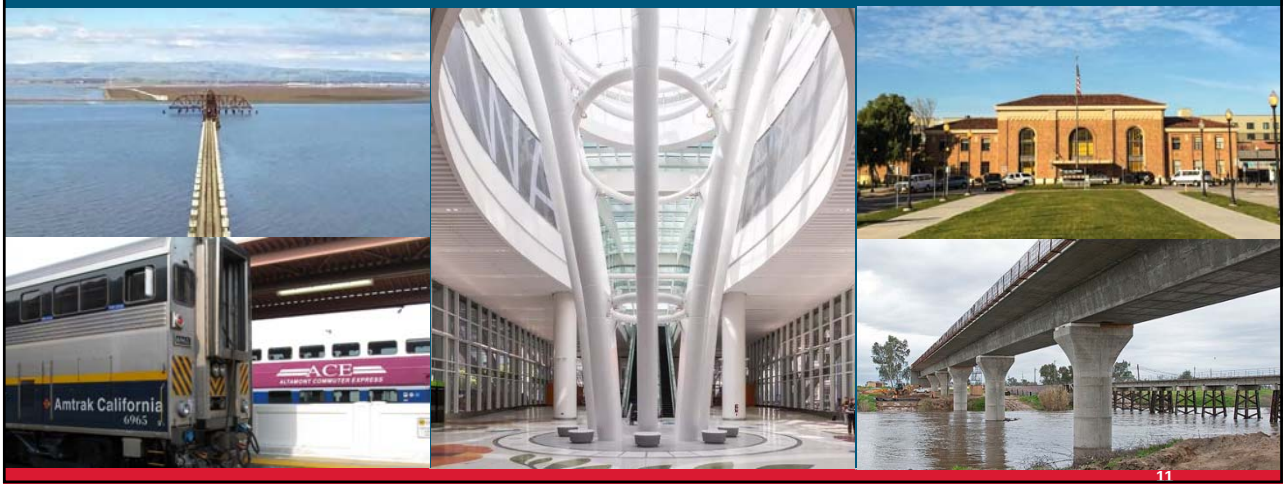
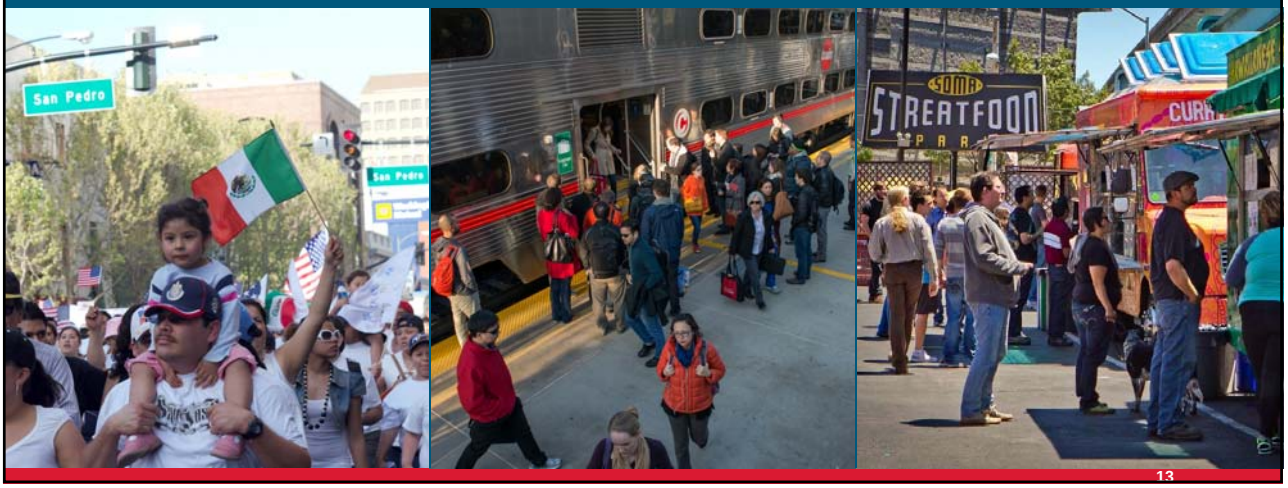
The future of rail in the Bay Area is still coming together, with many different plans and projects underway.



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.



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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

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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

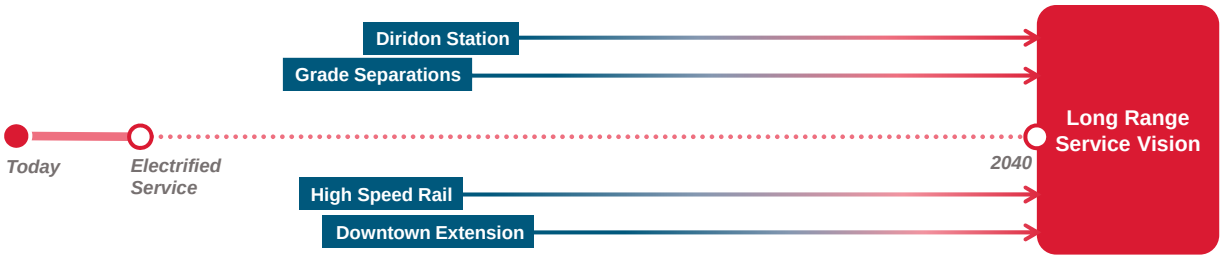
Baselining the Vision

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

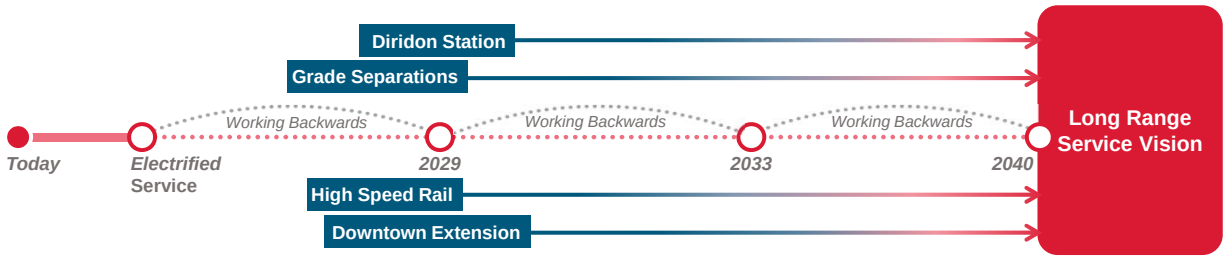
What kind of service has been contemplated previously?

How do they fit together and what do they cost?

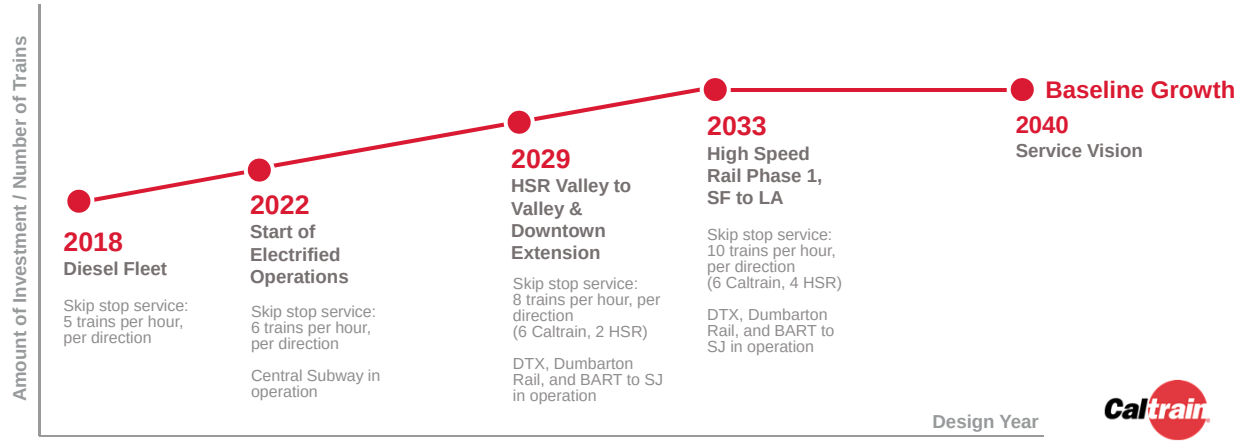
The vision must account for and integrate a complex set of plans and projects across many timeframes.



Once we've chosen the "big" vision, we can work back to define the best path to get there.

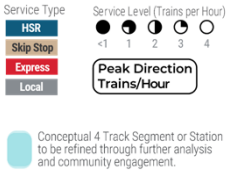


Getting to a Baseline



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

$2.3B

$16.2B
Investments Planned and Proposed by Caltrain Partners

$3.3B	$3.4B	$2.6B	$6.9B
Downtown Extension to Salesforce Transit Center	Diridon Station and Surrounding Rail Infrastructure*	High Speed Rail Investments	City-led Grade Separations

$3.6B
New Caltrain Investments to Support Baseline Growth Scenario

$3.6B

** Placeholder cost pending detailed cost estimate to be developed through Diridon Integrated Station Concept Plan*

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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

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Baseline Investments by Investment Type

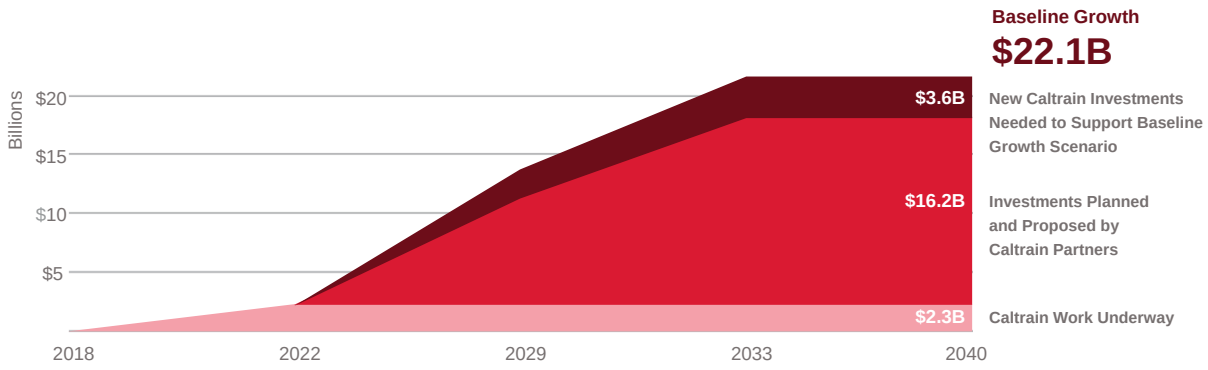
Grade Crossings & Separations
- Grade separation investments including all City-led plans and projects

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



What does it mean for Caltrain to Choose a Long Range Vision?

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

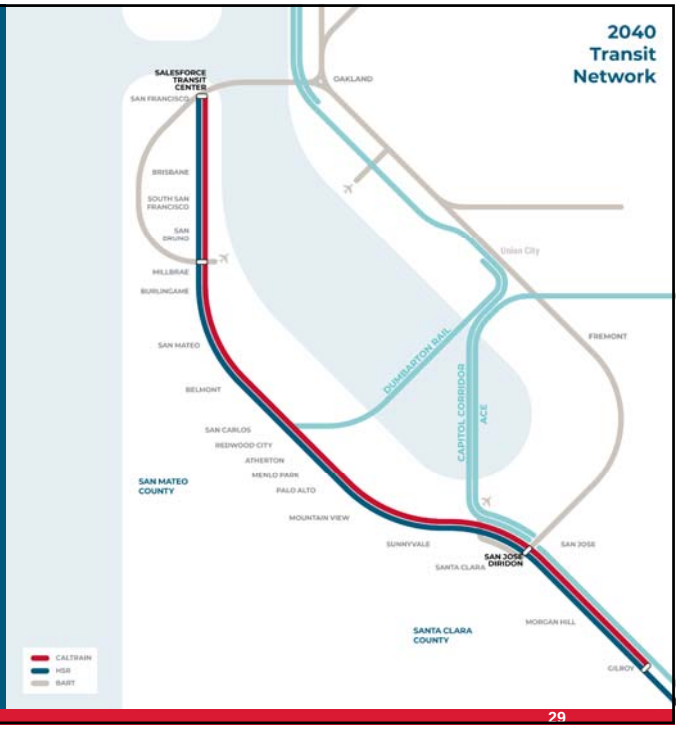
Today, Caltrain serves bidirectional and polycentric ridership demand

- ~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

[1]Based on Plan Bay Area forecasts and approved projects by individual cities



Service Planning Process

2018 2019

Stakeholder Engagement

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

Outreach Activities to Date

July 2018 – August 2019 Timeline

	2018						2019							
	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Local Policy Maker Group	●	●	●		●	●		●	●	●		●	●	●
City/County Staff Coordinating Group	●	●	●		●	●		●	●	●		●	●	●
Project Partner Committee	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stakeholder Advisory Group				●		●					●			●
Partner General Manager				●			●				●		●	
Targeted Online Engagement Website Launch, Data Visualization Challenge, Reddit/YouTube Live, Online Open House					●			●			●		●	●
Community Meetings SPUR, Friends of Caltrain, Station Outreach					●		●	●	●		●	●		●
Sister Agency Presentations SFCTA, SF Capital Planning, TJPA, SamTrans, SMCTA, CCAG, VTA, MTC, Diridon Station JPAB					●	●	●	●	●	●	●	●	●	●

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Outreach Activities to Date

As of July 20, 2019 - by the Numbers

Stakeholders Engaged

21
Jurisdictions

26
Public Agencies

93
Organizations in Stakeholder Advisory Group

156
Stakeholder Meetings

Public Outreach

51
Public Meetings and Presentations

1,000+
Survey Responses

14,300+
Website Views

258,200+
Social Media Engagements

32

Public Engagement

Community Meetings

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

Online Open House

Online Open House:
www.caltrain2040.org/openhouse

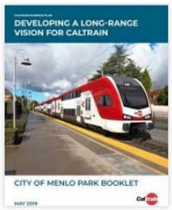
Variety of Engagement Tools

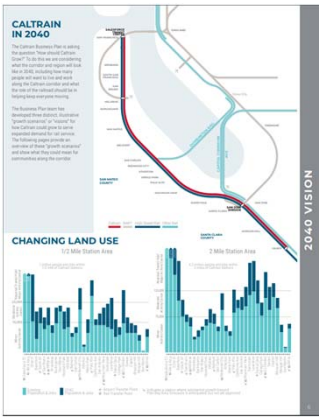
reddit

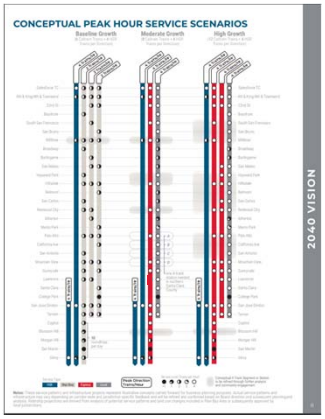
YouTube

Individual Jurisdiction Outreach

City Booklets







View the booklets at: www.caltrain2040.org

Individual Jurisdiction Outreach

July 2018 – August 2019 Timeline

	Atherton	Belmont	Brisbane	Burlingame	Gilroy	Menlo Park	Millbrae	Morgan Hill	Mountain View	Palo Alto	Redwood City	San Bruno	San Carlos	San Francisco	San Jose	San Mateo	Santa Clara	South San Francisco	Sunnyvale
Round 1: Fall 2018 Railroad-Community Interface Meeting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Round 2: Spring 2019 Railroad-Community Interface Meeting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
City Council Meeting Scheduled or Completed		✓	✓	✓		✓	✓		✓	✓	✓		✓	✓* *SFCTA	✓	✓		✓	

View individual jurisdiction booklets at: www.caltrain2040.org/community-interface

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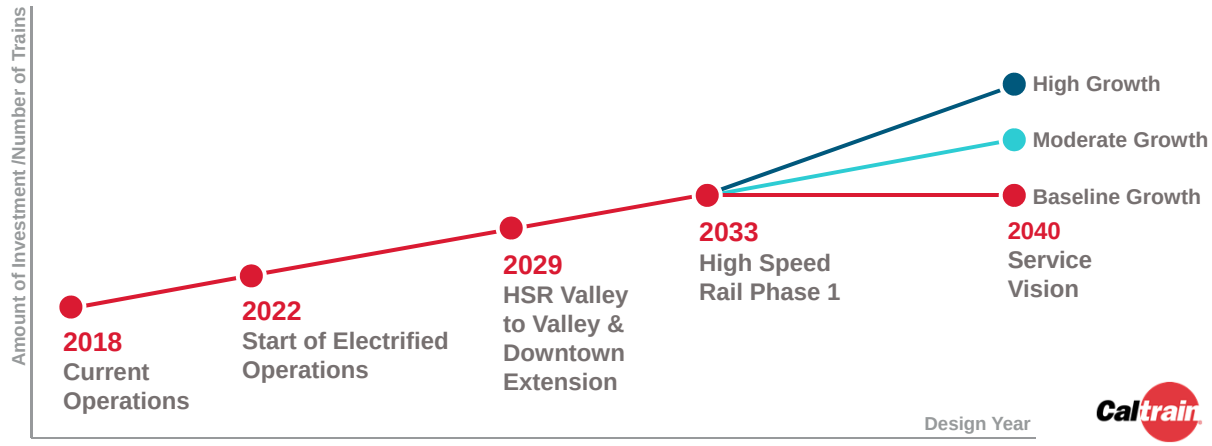
How Much Service Should Caltrain Provide?



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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

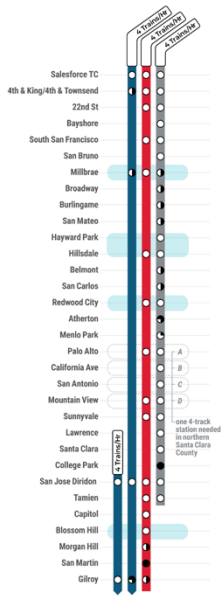
Service Type: HSR, Skip Stop, Express, Local

Service Level (Trains per Hour): <1, 1, 2, 3, 4

Peak Direction Trains/Hour

Conceptual 4 Track Segment or Station to be refined through further analysis and community engagement.

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

Service Type: HSR, Skip Stop, Express, Local

Service Level (Trains per Hour): <1, 1, 2, 3, 4

Peak Direction Trains/Hour

Conceptual 4 Track Segment or Station to be refined through further analysis and community engagement.

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

What is a Business Case?

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

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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
- Financial Analysis
- Caltrain Economic Analysis
- Regional Analysis
- Flexibility and Uncertainty

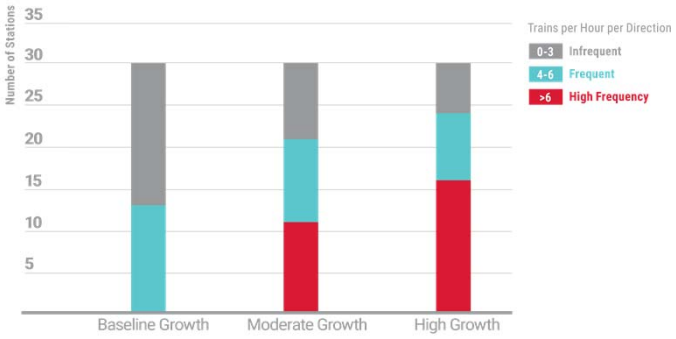
Service Comparison

The following slides present a direct comparison of service-based performance metrics between the different 2040 Growth Scenarios.

Service Comparison

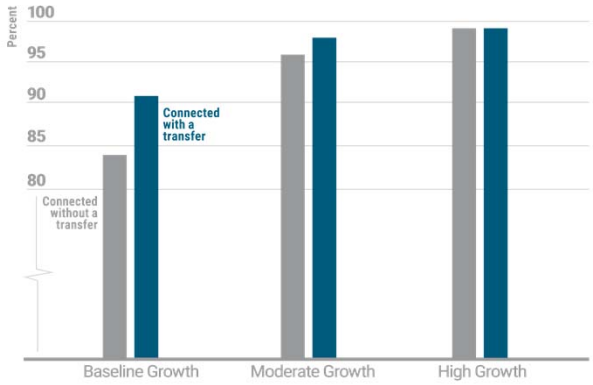
Peak Period Frequency

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.



	Metric	Baseline Growth	Moderate Growth	High Growth
Frequency	Number of Stations Served by Frequent Service (>4 TPHPD)	13 Stations	21 Stations	24 Stations
	Longest wait times at major stations served by all trains	22 minutes	12 minutes	8 minutes

Coverage and Internal Connectivity



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.

	Metric	Baseline Growth	Moderate Growth	High Growth
Connectivity	Percentage of Station Pairs Connected Without / (With) a Transfer	84% (91%)	96% (98%)	99% (99%)
	Number of Station Pairs Not Connected at All*	95	17	2

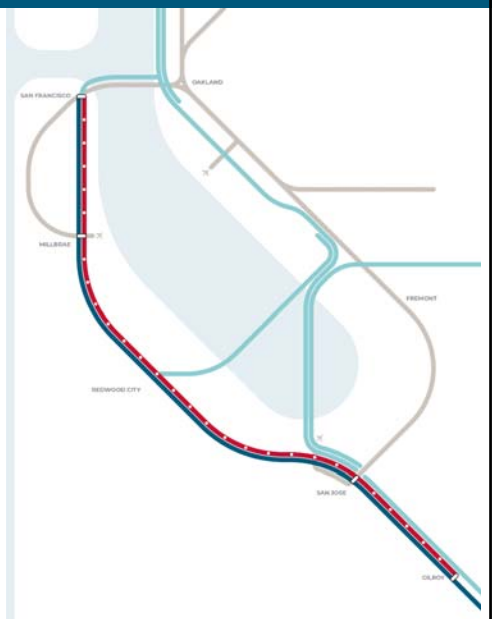
**Defined as trips requiring out-of-direction travel or transfers in excess of 15 minutes*

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.

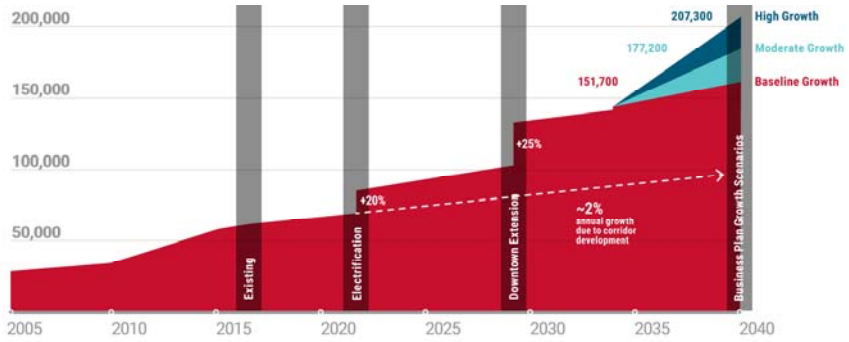


	Metric	Baseline Growth	Moderate Growth	High Growth
Network Integration	Timed Connections at Regular Intervals	No	Yes	Yes

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.



	Metric	Baseline Growth	Moderate Growth	High Growth
Ridership	Daily Ridership*	151,700 Riders	177,200 Riders	207,300 Riders
	Comfortable Peak Hour Train Loads?*	No	Crowding on some trains	Yes

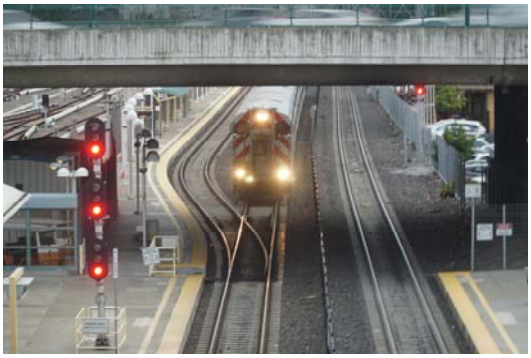
**Crowd Constrained Ridership (135%)*

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.



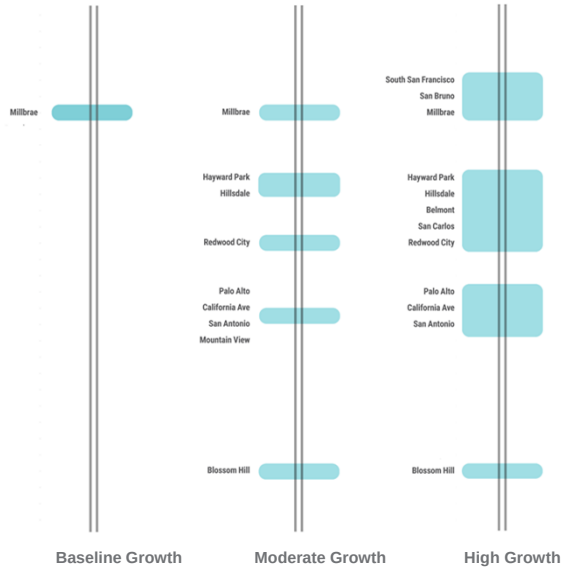
	Metric	Baseline Growth	Moderate Growth	High Growth
Travel Time	Travel Time, San Francisco (STC) to San Jose (Diridon)	69-73 Minutes	61 Minutes	60 Minutes
	Average Travel Time per Rider, All Origin-Destination Pairs	33 Minutes	32 Minutes	31 Minutes

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

Conceptual 4 Track Segment or Station to be refined through further analysis and community engagement.

	Metric	Baseline Growth	Moderate Growth	High Growth
Infrastructure	Passing Tracks Needed	<1 Mile	<5 Miles	15-20 Miles



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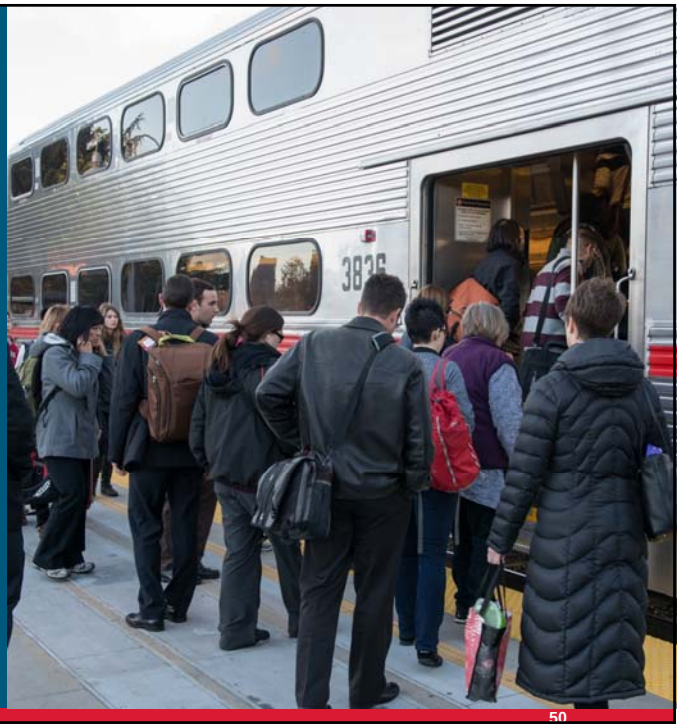
Financial Analysis

The following slides analyze how Caltrain's financial performance would differ in each of the 2040 growth scenarios.



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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

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Capital Investments

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.

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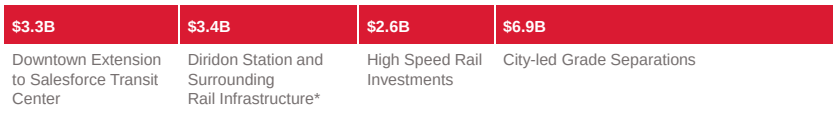
The Baseline Costs $22.1 Billion

$2.3B
Caltrain Work Underway

$16.2B
Investments Planned and Proposed by Caltrain Partners



Downtown Extension to Salesforce Transit Center

Diridon Station and Surrounding Rail Infrastructure*

High Speed Rail Investments

City-led Grade Separations

$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*

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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

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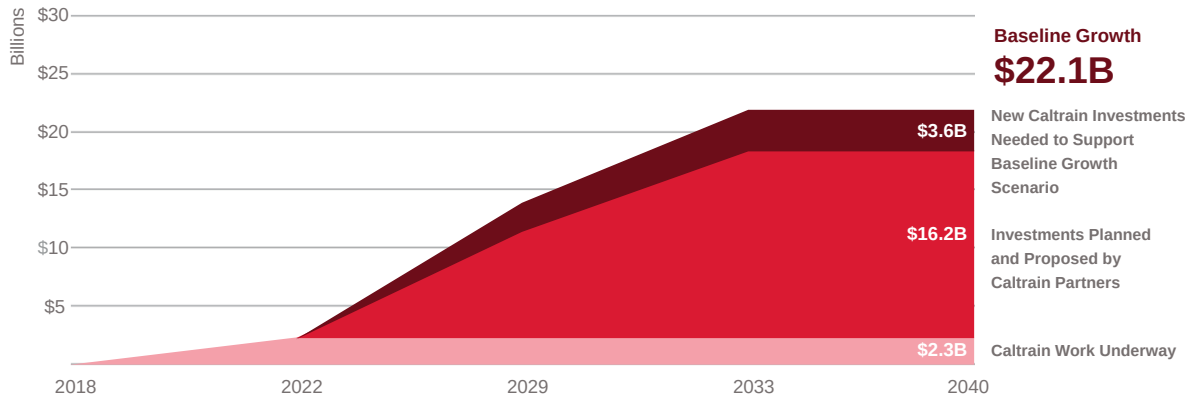
Investing for Growth

Total Corridor Investment Over Time by Growth Scenario



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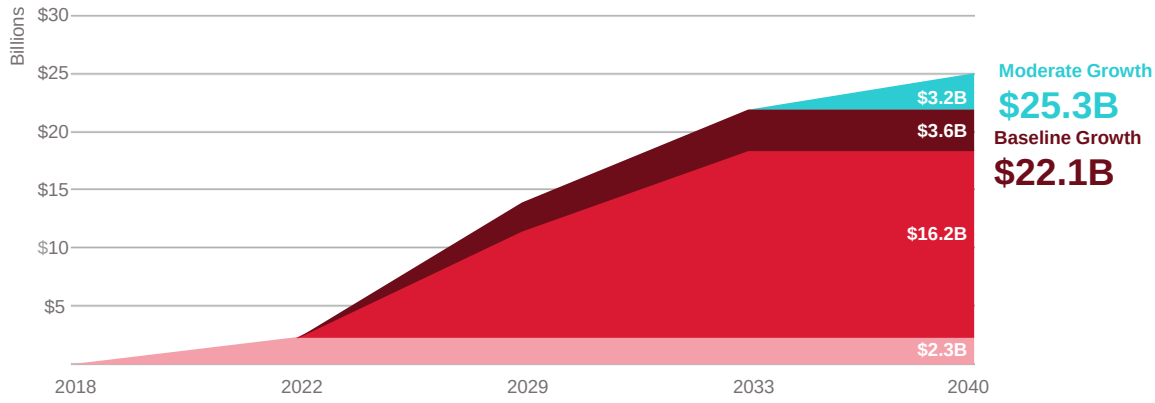
Investing for Growth

Total Corridor Investment Over Time by Growth Scenario



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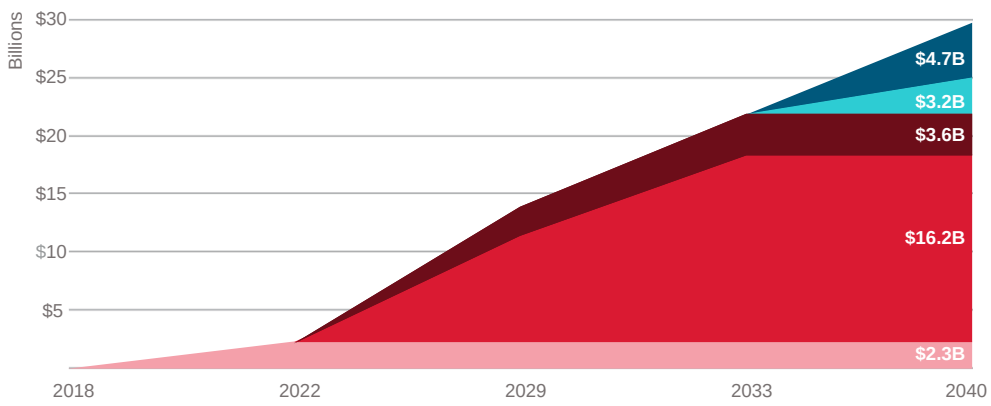
Investing for Growth

Total Corridor Investment Over Time by Growth Scenario



High Growth
$30.0B
Moderate Growth
$25.3B
Baseline Growth
$22.1B

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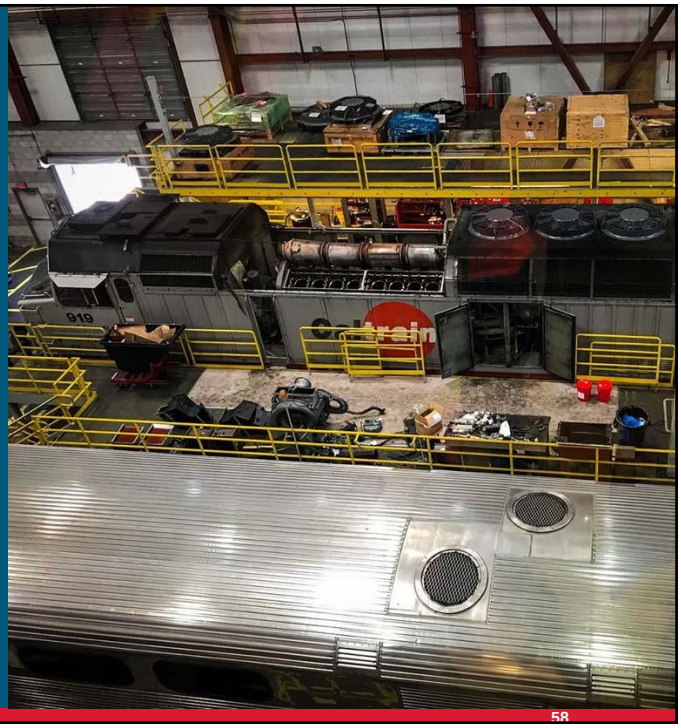
Operating & Maintenance Costs

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.



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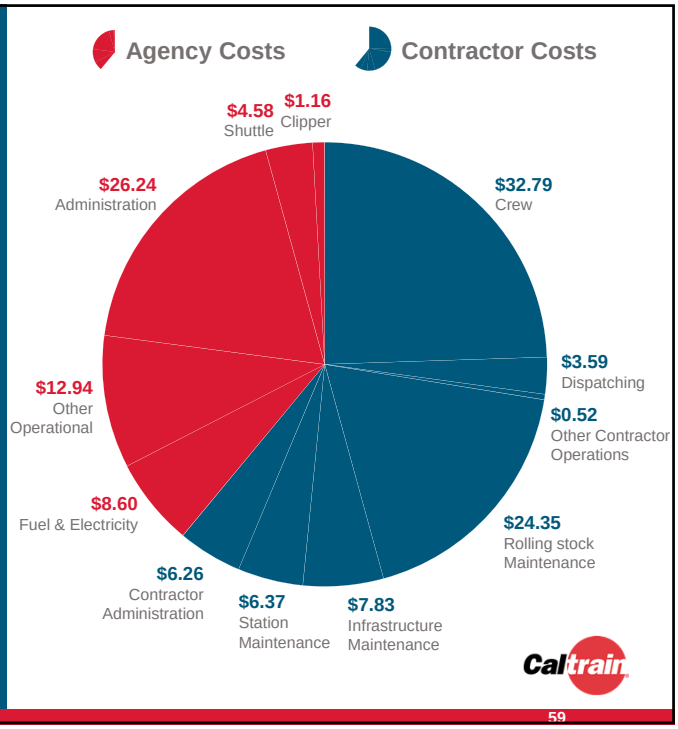
Current Operating Costs

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

Total 2018 Operating Cost: $135.3 million



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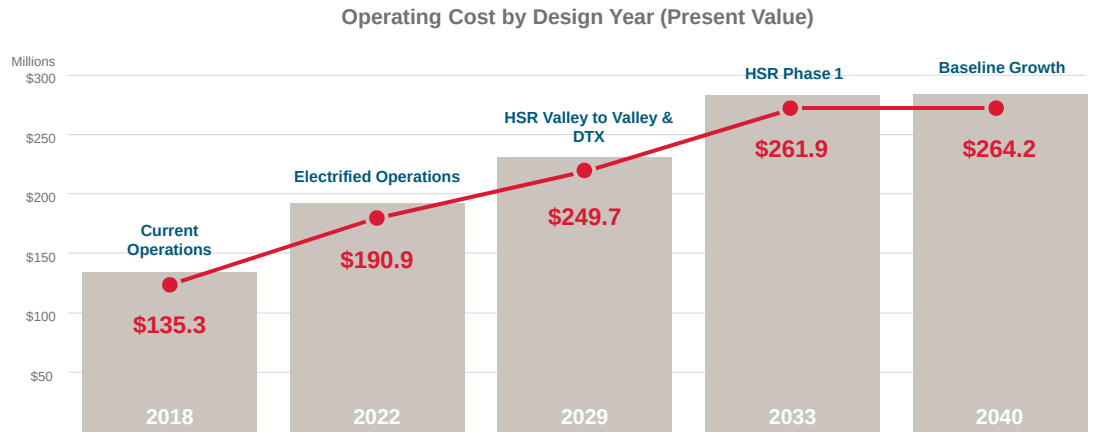
A Changing System to Baseline Growth

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.



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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

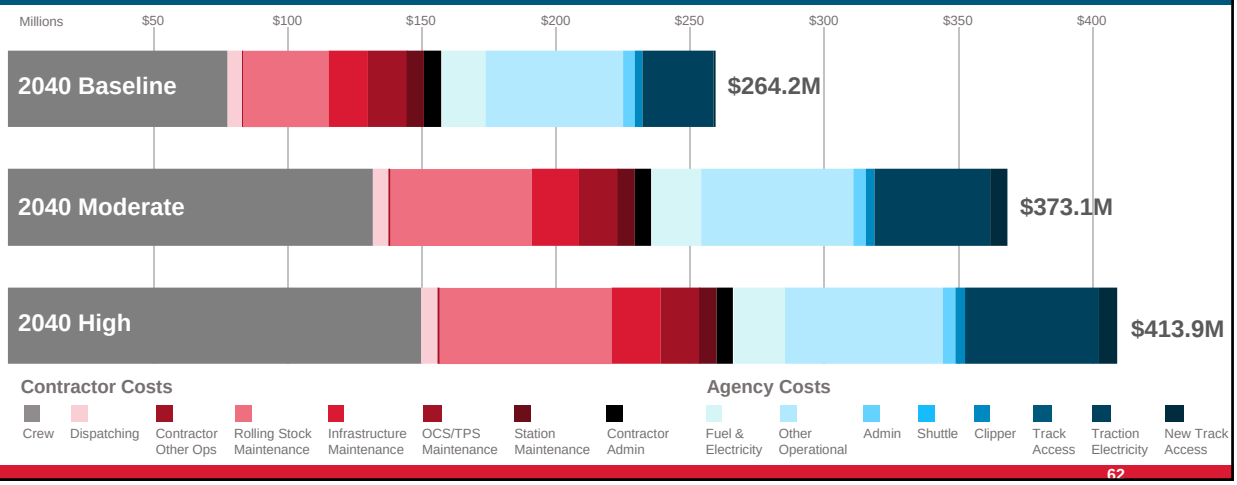
2022 to 2029

- 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

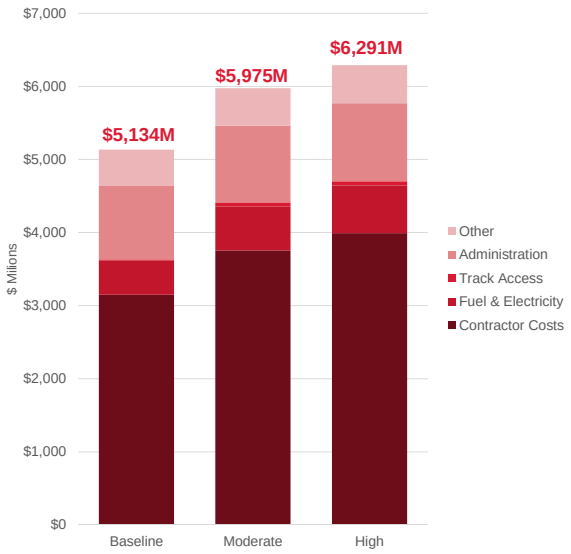
- Administrative staff continues to grow with the size of the operation
- Increased service levels require traction energy costs (electricity) and infrastructure and fleet maintenance costs

Year 2040 Operating Costs



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

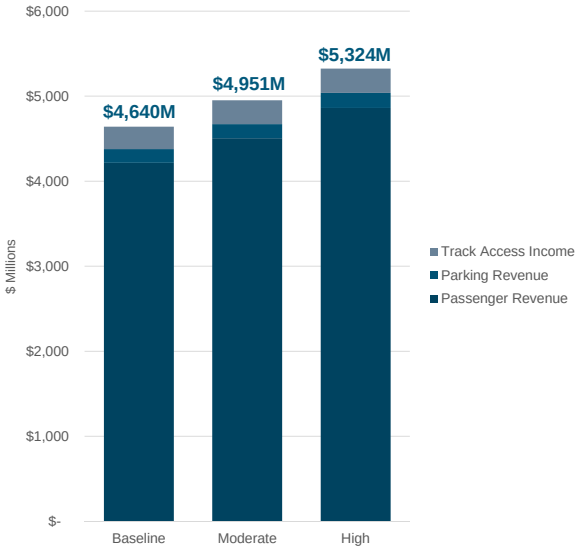
Definition: Fare revenue from Caltrain riders

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.

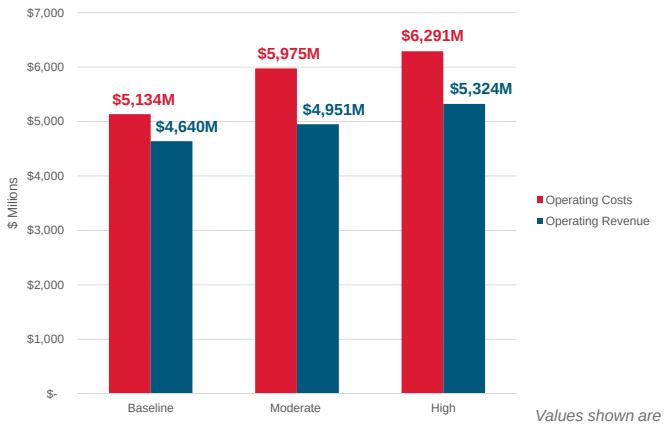
These and other potential revenue sources will be analyzed in detail after the Board adopts a long range service vision.



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%

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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

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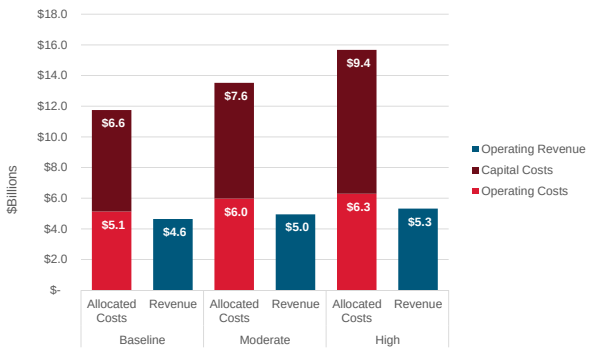
Financial Analysis

Total Caltrain Allocated Costs and Revenue 2018 to 2070



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

Net Investment
2018-2070 Present Value

($7.1B) Baseline Growth

($8.6B) Moderate Growth

($10.3B) High Growth

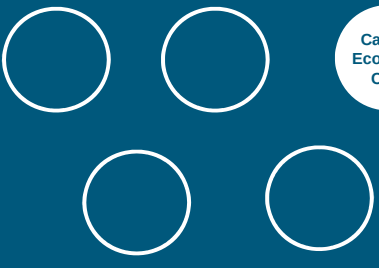
Incremental Investment over Baseline
2018-2070 Present Value

($1.5B) Moderate Growth

($3.2B) High Growth

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

		Moderate Growth		High Growth	
Benefit	**Unit**	**Total***	**Per Year Average**	**Total***	**Per Year Average**
Existing Transit User Travel Time Savings	*hours*	12.9M	0.43M	20.9M	0.70M
New Transit User Travel Time Savings	*hours*	27.7M	0.92M	40.4M	1.35M
Avoided Auto Trips (VMT Savings from New Transit Users)	*vehicle miles*	9,000M	300M	16,100M	540M
Roadway Network Safety Improvements	*reduced fatal/injury accidents*	7,300	240	13,000	430
Public Health Benefits (from Active Transportation Mode Access)	*lives saved*	70	2	150	5
	reduced absent days at work	30,000	1,000	67,000	2,200

**Values rounded for presentation purposes*

Caltrain User Benefits and Costs

Present Value of Benefits and Incremental Costs from 2018-2070

	Moderate Growth	High Growth
Existing Transit User Travel Time Savings	$0.65B	$0.97B
New Transit User Travel Time Savings	$0.18B	$0.30B
VMT/Auto Operating Cost Savings	$0.94B	$1.68B
Roadway Network Safety Improvements	$0.39B	$0.70B
Public Health Benefits	$0.19B	$0.42B
Total Benefits	**$2.36B**	**$4.07B**
Incremental Capital Cost	($0.94B)	($2.76B)
Incremental O&M Cost	($0.84B)	($1.16B)
Total Costs	**($1.78B)**	**($3.92B)**
Benefit-Cost Ratio	**1.33**	**1.04**
Net Present Value	**$0.58B**	**$0.15B**

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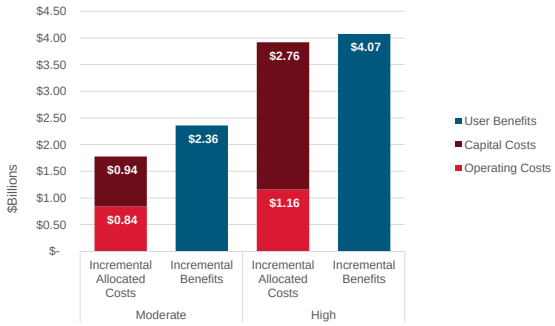
Caltrain Economic Case by Scenario

Incremental Benefits and Costs 2018-2070



Net Present Value 2018-2070 PV

$0.58B

$0.15B

Benefit Cost Ratio 2018-2070

1.33 Moderate Growth

1.04 High Growth

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

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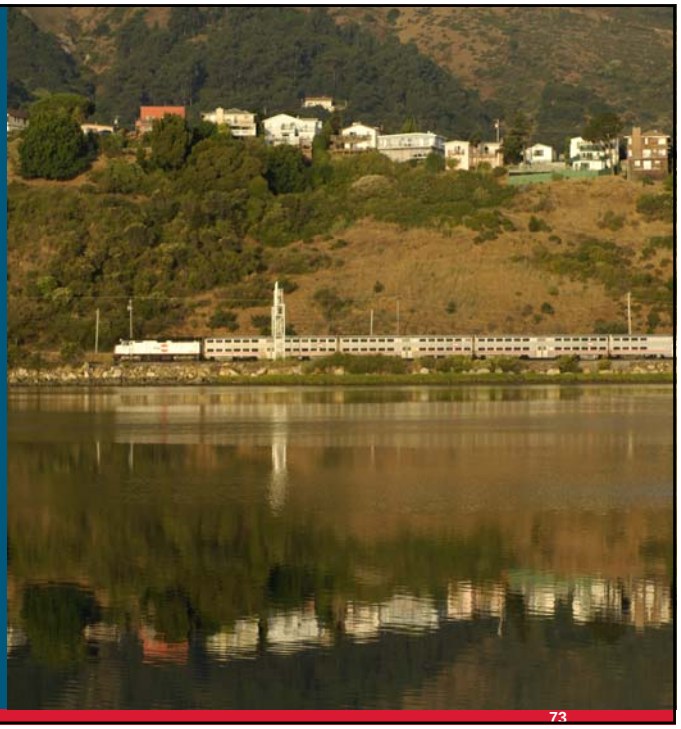
Regional Analysis

The following slides present analysis related to how the different growth scenarios could benefit the larger region.



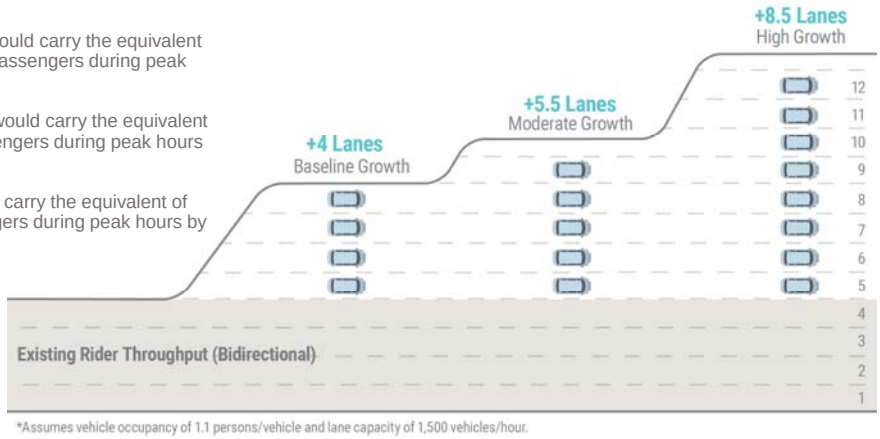
Freeway Throughput

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

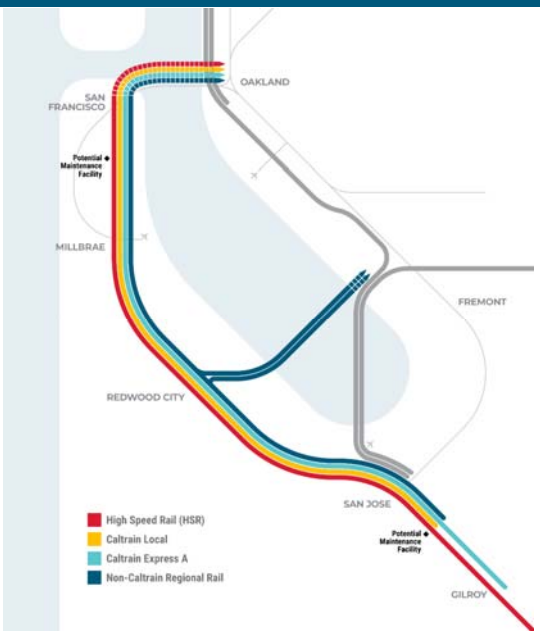
All service scenarios are compatible with regional rail needs.

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



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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.

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

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.

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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.

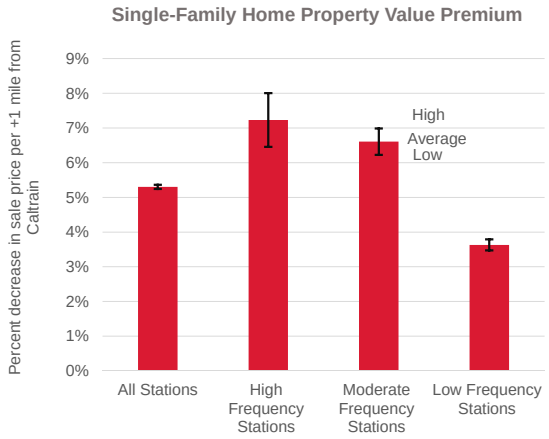
Residential Property Value Premiums

3%-7% Single-Family Home

2%-6% Condominium

Office Property Value Premiums

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



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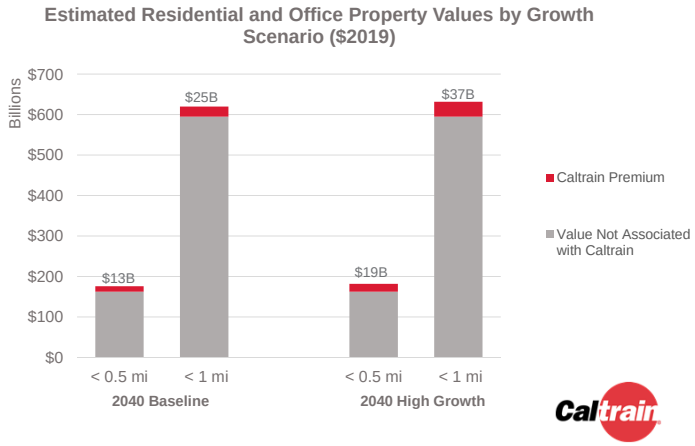
Land Value Benefits from Caltrain Service

2040 Growth Scenario Benefits

Total Estimated Property Value Benefits of Caltrain Service

2040 Baseline	2040 High Growth	
$13B	**$19B**	Within ½ mile
$25B	**$37B**	Within 1 mile



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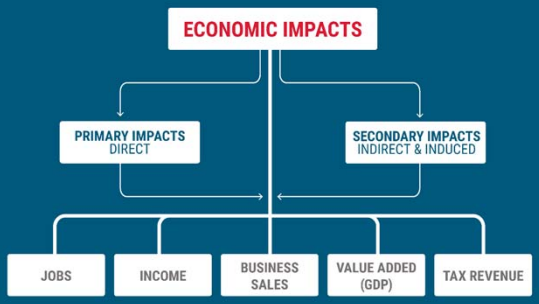
Regional Economic Impact Analysis



Economic Impact Analysis (EIA) looks at the total economic impact of each growth scenario, including:

- Direct effects of initial capital cots
- 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)

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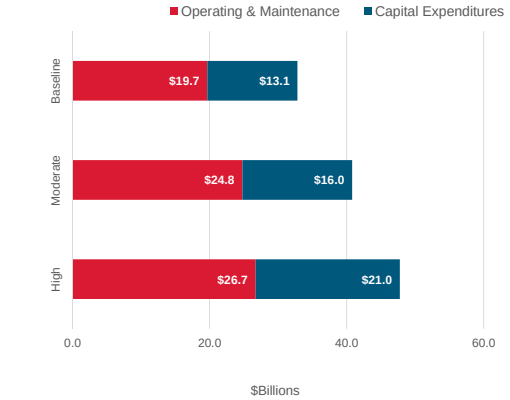
Regional Economic Impact

Total Output 2018 to 2070



Total Economic Output 2018-2070

$32.8B	Baseline Growth
$40.8B	Moderate Growth
$47.7B	High Growth

Jobs* from Capital Spending 2018-2070

44K job-years	Baseline Growth
51K job-years	Moderate Growth
69K job-years	High Growth

Incremental Output over Baseline

$8.0B	Moderate Growth
$14.9B	High Growth

Incremental Jobs over Baseline

7K job-years	Moderate Growth
24K job-years	High Growth

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

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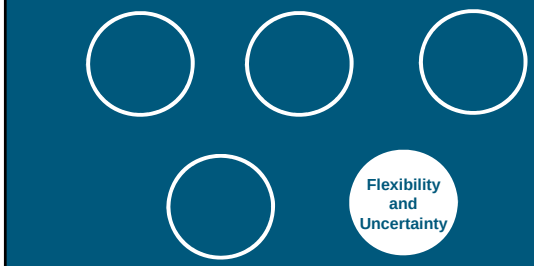
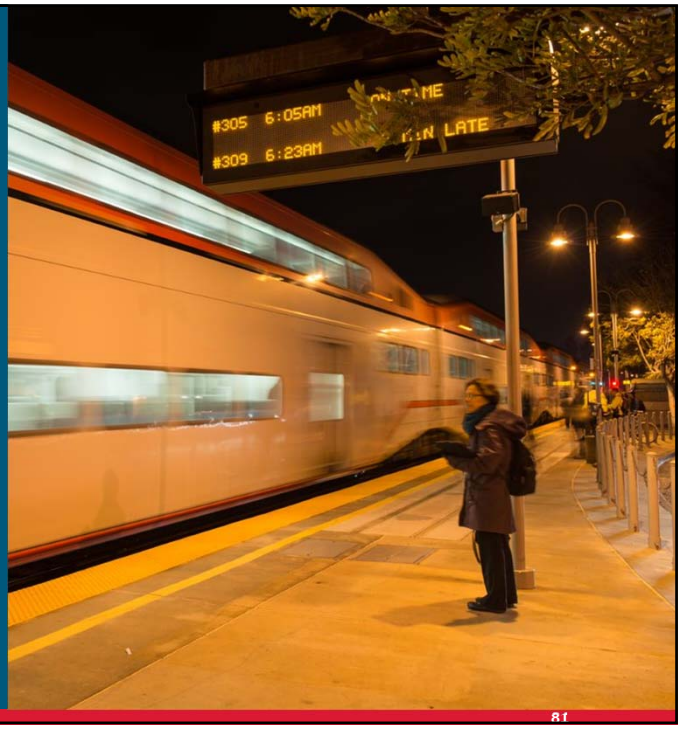
Flexibility and Uncertainty

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

Project	Development Status
ACE Forward and Altamont Vision service expansion of ACE	Conceptual Planning and Environmental
Capital Corridor Vision	Conceptual Planning
City-led grade separations	Various (conceptual planning thru detail design)
Diridon Station and Surrounding Rail Infrastructure	Conceptual Planning (pre-Environmental)
Downtown Extension to Salesforce Transit Center	Environmental and Design
Dumbarton Rail Crossing	Planning and pre-Environmental
HSR Investments	Environmental and Design
Second Transbay Crossing	Conceptual Planning

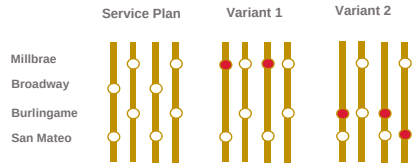
Flexibility to Refine Illustrative Service Planning

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:

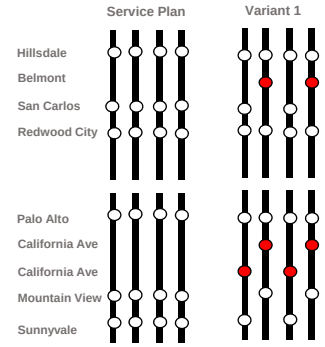
- Exact service levels and station stopping patterns
- Opportunities to close or add stations (such as the proposed Oakdale Station)
- Specific infrastructure locations and designs to support service needs

Example Service Plan Variants

Moderate Growth, Mid-Peninsula, Local Service



High Growth, Peninsula, Express B Service



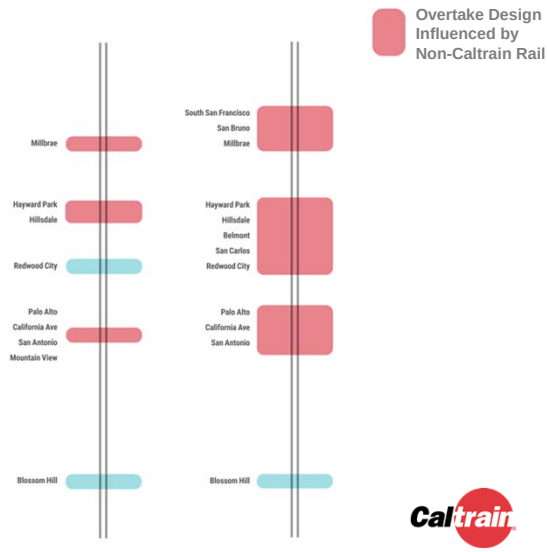
Implications of Uncertainty to Growth Scenarios

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



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.

Range of Results Across All Sensitivity Tests

Key Metric	Original Value	Low	High
Farebox Recovery Ratio			
Moderate Growth	**75%**	72%	79%
High Growth	**77%**	74%	81%
Percent Change in Net Investment			
Moderate Growth	-	26%	-18%
High Growth	-	29%	-19%
Benefit Cost Ratio			
Moderate Growth	**1.33**	1.13	1.55
High Growth	**1.04**	0.83	1.30

Summary

Service

	Metric	Baseline Growth	Moderate Growth	High Growth
Frequency	Number of Stations Served by Frequent Service (>4 TPHPD)	13 Stations	21 Stations	24 Stations
	Longest Wait Times At Major Stations Served by All Trains	22 minutes	12 minutes	8 minutes
Connectivity	Percentage of Station Pairs Connected Without/(With) a Transfer	84% (91%)	96% (98%)	99% (99%)
	Number of Station Pairs Not Connected at All	95	17	2
Network Integration	Timed Connections at Regular Intervals	No	Yes	Yes
Ridership	Daily Ridership (capacity constrained)	151,700 Riders	177,200 Riders	207,300 Riders
	Comfortable Peak Hour Train Loads?	No	Some Crowding	Yes
Travel Time	Travel Time, San Francisco (STC) to San Jose (Diridon)	69-73 Minutes	61 Minutes	60 Minutes
	Average Travel Time per Rider, All Origin-Destination Pairs	33 Minutes	32 Minutes	31 Minutes
Infrastructure	Passing Tracks Needed	<1 Mile	<5 Miles	15-20 Miles

Summary

Financial Analysis | Caltrain Economic Case

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

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.

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Summary

Regional Analysis

	Metric	Baseline Growth	Moderate Growth	High Growth
Freeway Throughput	Additional Freeway Lanes	+4 lanes	+5.5 lanes	+8.5 lanes
Regional Rail Integration	Accommodation of Large-Scale Corridor-Sharing Beyond HSR	could be scaled to accommodate	could be scaled to accommodate	can accommodate
Environmental Benefits	GHG (MTCO2e)	1,108,045	1,898,330	3,006,028
Land Value Benefits	Property Value Premiums Generated by 2040 Service Growth within 1 Mile of a Station	$10B	$10 - $22B	$22B
Economic Productivity	Economic Output	$32.8B	$40.8B	$47.7B
	Full and Part-time Jobs	44K job-years	51K job-years	69K job-years

88

Summary

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 Long Range Service Vision: Staff Recommendation

(1) 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

Caltrain Long Range Service Vision: Staff Recommendation

(1) Continued

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.

Caltrain Long Range Service Vision: Staff Recommendation

(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

Caltrain Long Range Service Vision: Staff Recommendation

(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.

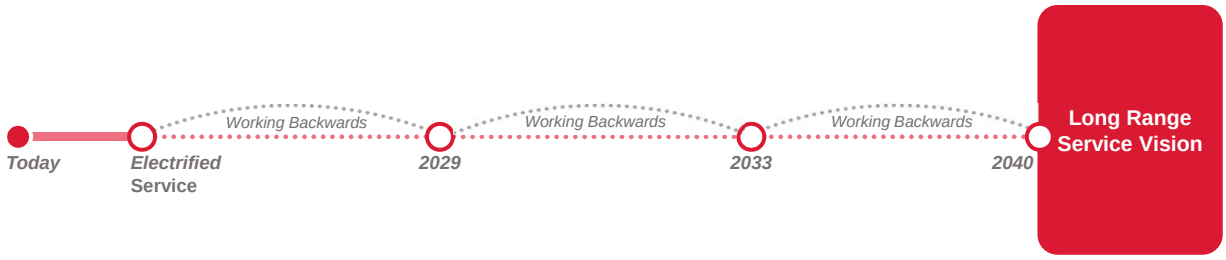
The Board will receive a summary of outreach undertaken and feedback received prior to any request to take action on the long range service vision.

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** 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

Overview

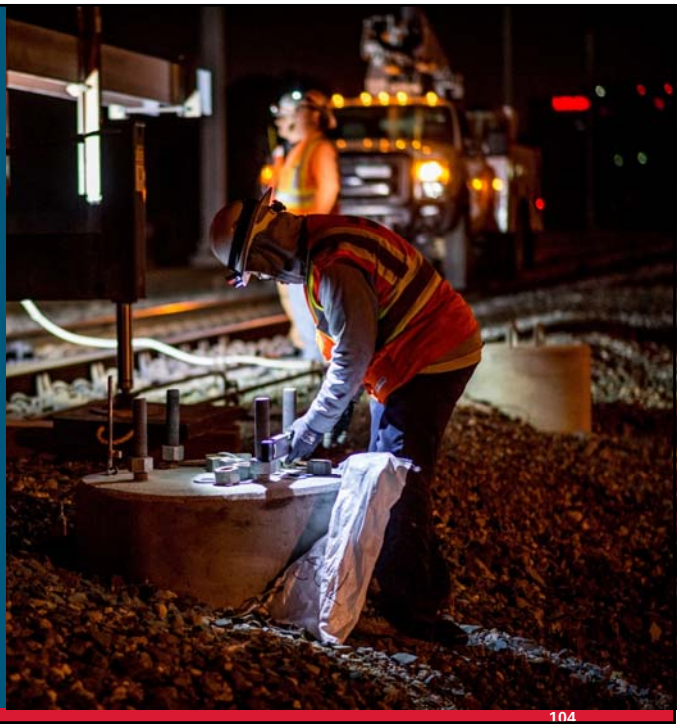
Overview | Service Delivery | Internal Organization | Governance

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	Internal Organization	Governance
What is it?	How Caltrain operates and delivers its services	How Caltrain organizes itself	How Caltrain is overseen by a governing body
What is the Focus?	Focus on train service delivery and contracting mechanism	Focus on resources, functionality, shared services	Focus on options for self-directed change, regional integration, and certain parallel considerations

Key Questions for Each Area

	Timing	Recommendations And Focus Areas	Implementation
Questions	Is this the right time to be having this discussion? What are the implications if no decisions are reached?	What are the recommendations or key focus areas?	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

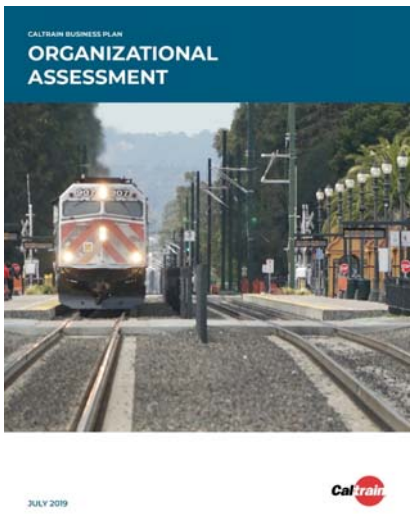
Recommendations

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

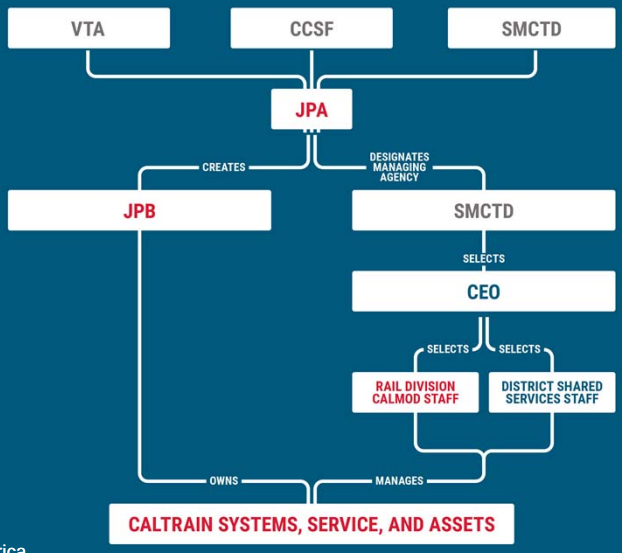
- Caltrain is a Joint Powers Authority, formed through a Joint Powers Agreement (JPA) between three member agencies
- The system is governed by the Peninsula Corridor Joint Powers Board (JPB), a 9-member board appointed under the terms of the JPA

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

DETAILED FUNCTIONALITY

The matrix below provides similar information for the detailed functionality.

	Caltrain Management		Caltrain Contractor		Non-Caltrain		Notes
	Rail Division + CalMod	SamTrans Shared Services	TASI	Other 3rd Party Contractors	Outside Entities (Public partners and cities)	Outside Entities (Private)	
CEO	X	X					1
Operations							
Transportation	X		X				2
Maintenance of Way	X		X				3
Maintenance of Equipment	X		X				4
Maintenance of Stations	X		X		X		5
Customer Service		X	X				6
Ticket Selling and Tariff Enforcement	X	X	X		X		7
Safety and Security							
Safety	X	X	X	X			8
Police				X			9
Security		X		X			10
Finance							
Budget	X	X	X				11
Accounting		X					12
Treasury and Payroll		X					12
Insurance and Claims Management		X					12
Real Estate and Commercial Activities							
Managing leases and railroad-owned property		X					13
Obtaining land, easements, and permits for construction projections		X					13
Reaching commercial agreements with third parties		X					13

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

Service Delivery

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

Overview — Service Delivery — **Internal Organization** — Governance

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

COMPARISON OF CALTRAIN TO LARGE US COMMUTER RAIL PROPERTIES

Agency Name	Total Employees	Car Miles	Car Miles Per Employee	Passenger Miles	Passenger Miles Per Employee	Footnote
NJ Transit	4,850	61,500,000	12,700	2,077,100,000	428,300	1
Long Island Rail Road	7,331	67,100,000	9,200	2,996,900,000	408,800	4
Metro-North Railroad	6,461	68,600,000	10,700	2,271,000,000	351,500	
Metra	4,797	43,700,000	9,200	1,577,400,000	328,900	3
MBTA	2,394	25,000,000	10,500	697,700,000	291,500	5
SEPTA	1,921	19,500,000	10,200	426,200,000	221,900	2
Average	4,626	47,600,000	10,400	1,674,400,000	338,500	6
Caltrain	580	7,400,000	12,700	406,100,000	700,000	7
Caltrain Performance vs. Average			+22%		+107%	

Sources:
Metrics and Service Data Tables, National Transit Database, 2017, Federal Transit Administration.
Employees Data Tables, National Transit Database, 2017, Federal Transit Administration.
MBTA Commuter Rail Fact Sheet.

Notes:
1. Staffing excludes Northeast Corridor and Penn Station Infrastructure Maintenance.
2. Staffing excludes Northeast Corridor, 30th Street Station, and Harrisburg Line Infrastructure Maintenance.
3. Staffing excludes services not directly operated by Metra (BNSF and UP).
4. Staffing excludes Penn Station Infrastructure Maintenance.
5. Staffing excludes Northeast Corridor and South Street Station Infrastructure Maintenance.
6. Average excludes Caltrain.
7. Caltrain includes both TASI employees and Caltrain employees working on the railroad.

Details of Caltrain's internal organization are discussed in Chapter 4 of the Organizational Assessment Report

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 — Service Delivery — Internal Organization — **Governance**

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;

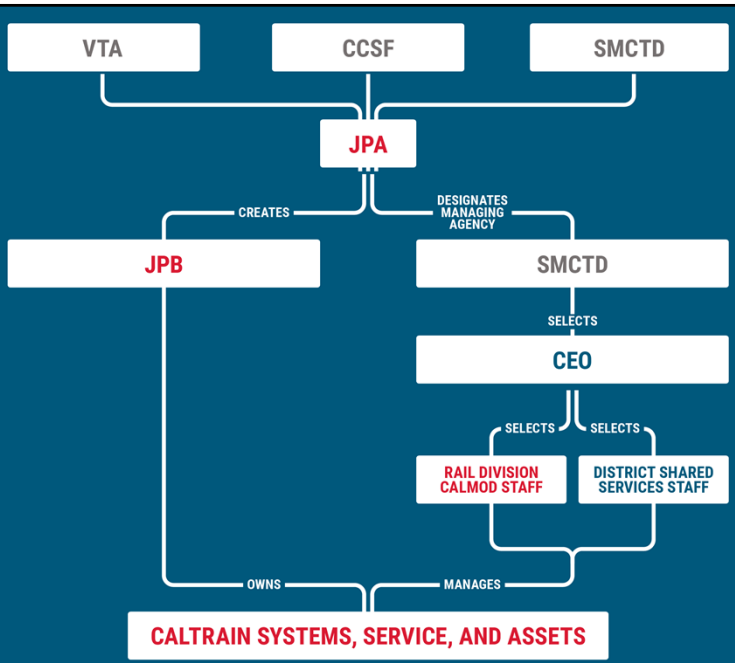
1) Self-directed options
2) Regional (Non-self directed) options
3) Parallel considerations

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

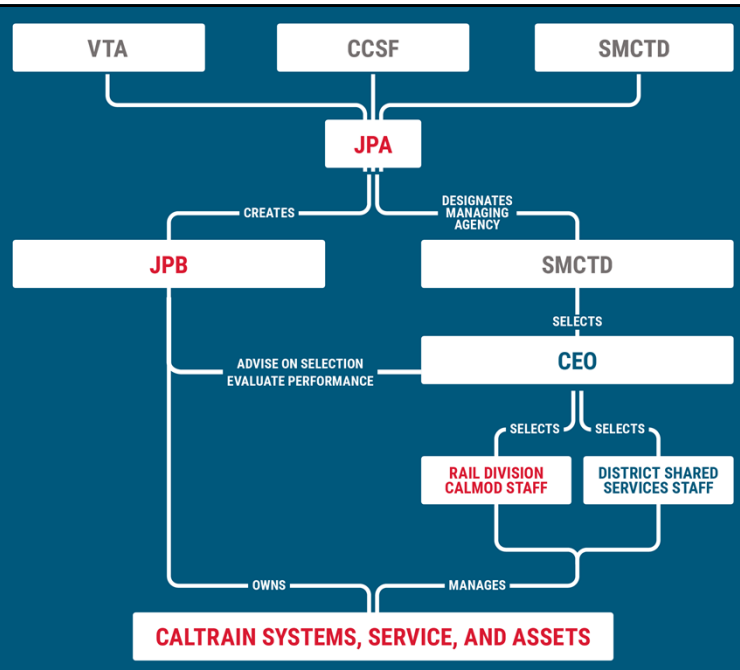
Governance

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

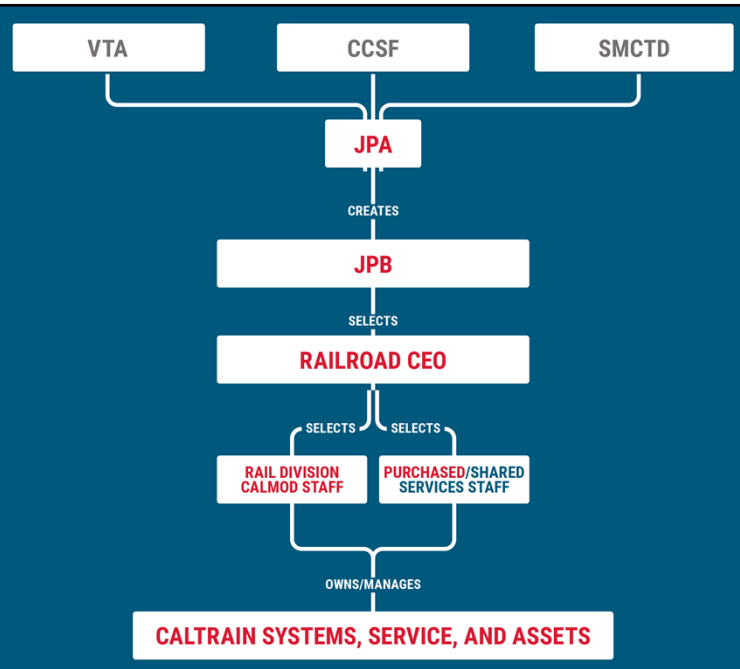


Governance
Self-Directed Option B: JPB as Currently Structured Coupled with Modifications

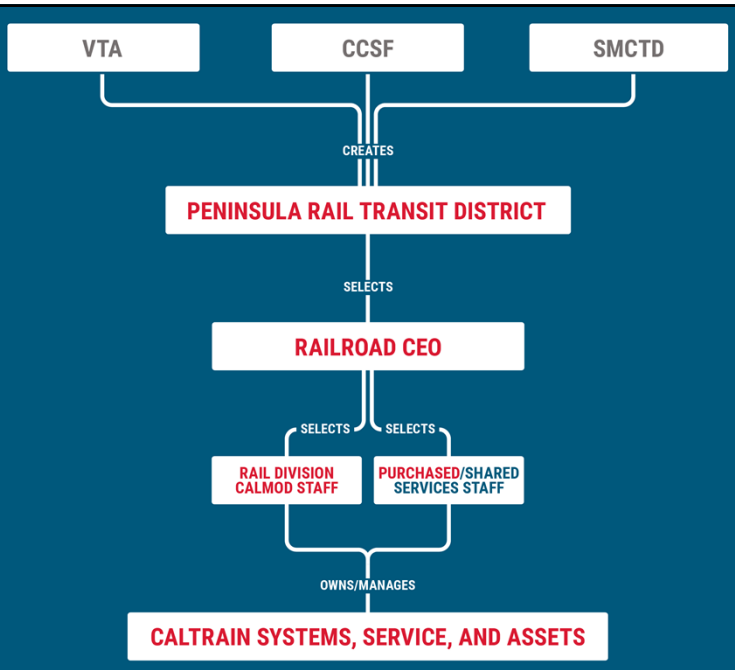


Governance
Self-Directed Option C:
Retention of the JPA as currently structured but reorganized as a railroad authority that directly hires its management and administrative employees

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

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

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

Governance

Recommendations: Self-directed Options

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

Governance

Recommendations: Non Self-directed Options & Parallel Considerations

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

FOR MORE INFORMATION

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