



Memorandum

AGENDA ITEM 8

DATE: February 21, 2024
TO: Transportation Authority Board
FROM: Carl Holmes - Deputy Director for Capital Projects
SUBJECT: 2/27/2024 Board: Major Capital Project Update: Caltrain Modernization Program

<p>RECOMMENDATION <input checked="" type="checkbox"/> Information <input type="checkbox"/> Action</p> <p>None. This is an information item.</p> <p>SUMMARY</p> <p>The Caltrain Modernization (CalMod) program is a \$2.72 billion suite of projects, which includes Positive Train Control (PTC) and the Peninsula Corridor Electrification Project (PCEP). PTC was completed in December 2020. PCEP is comprised of electrification of the Caltrain line between San Jose and San Francisco, upgrade of the signal system, and the procurement of electric multiple-unit vehicles (EMUs). As of December 31, 2023, PCEP has expended 91.3% of its current budget. Installation of the Overhead Contact System (OCS) elements has been completed, and Regulation review, where the OCS is checked to confirm proper alignment, height, stagger, and clearances, is almost complete. Traction power facilities are also nearing completion. Six trains are now on-site and undergoing dynamic testing and burn-in. The current PCEP Baseline Budget is \$2.44 billion, and the project is fully funded. The planned revenue service date is September 2024. Caltrain staff will attend the February 27 Board meeting to provide a brief project update.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Fund Allocation <input type="checkbox"/> Fund Programming <input type="checkbox"/> Policy/Legislation <input type="checkbox"/> Plan/Study <input checked="" type="checkbox"/> Capital Project Oversight/Delivery <input type="checkbox"/> Budget/Finance <input type="checkbox"/> Contract/Agreement <input type="checkbox"/> Other: _____
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BACKGROUND

CalMod is a \$2.72 billion suite of sustainable projects that will electrify and upgrade the performance, operating efficiency, capacity, safety, and reliability of Caltrain commuter rail service, while improving air quality and reducing greenhouse gas emissions. CalMod includes the PTC Project, which was completed on December 17, 2020, and the PCEP, which has two components: electrification of the Caltrain line between San Jose and San Francisco; and the purchase of EMUs to operate on the electrified railroad. Revenue service is scheduled for September 2024.



The CalMod Program will improve system performance with faster, more reliable service while minimizing equipment and operating costs. The CalMod Program is critical to the long-term financial sustainability of Caltrain. The improvements will extend for 52 miles from San Francisco to San Jose and will also prepare Caltrain for future extension to the Salesforce Transit Center through The Portal project, led by the Transbay Joint Powers Authority. CalMod will also prepare the corridor for the future High-Speed Rail blended system. The Federal Transit Administration (FTA) approved the Full Funding Grant Agreement for the project in 2017.

Like any large capital project, the CalMod funding plan relies on contributions from multiple funding partners including the three Peninsula Corridor Joint Powers Board (PCJPB) member counties (San Francisco, San Mateo, and Santa Clara), the Transportation Authority, the Metropolitan Transportation Commission, and the California High-Speed Rail Authority (CHSRA), in addition to the FTA. CalMod funding partners codified their financial contributions in a series of memorandums of agreement, of which the latest included an oversight protocol. The three PCJPB counties have provided a local contribution of \$80 million each to the CalMod program. The Transportation Authority provided about \$41 million, primarily from the Prop K sales tax and One Bay Area Grant programs. The San Francisco Municipal Transportation Agency provided the remaining \$39 million of San Francisco's local contribution from the Prop AA General Obligation Bond.

The Funding Partners oversight protocol for CalMod requires the Executive Director of Caltrain to attend a Board of Supervisors meeting twice a year to provide an update on the CalMod Program. With the concurrence of the President of the Board of Supervisors, the updates since 2019 have taken place at Transportation Authority Board meetings.

DISCUSSION

The paragraphs below provide a brief status update on the CalMod program.

Positive Train Control (PTC) [COMPLETED]. This \$329.3 million project is complete. PTC is an advanced signal system that equipped the corridor with federally mandated safety technology. Caltrain received conditional approval of the PTC Safety Plan from the Federal Railroad Administration (FRA) in December 2020. PTC is currently in Revenue Service and is fully interoperable with all tenants. Caltrain's Interoperable Electronic Train Management System is now certified by the FRA as a mixed PTC system. Caltrain has established a follow-on maintenance agreement with Wabtec Corporation, the project's contractor.

Peninsula Corridor Electrification Project (PCEP). As of December 31, 2023, expenditures on the PCEP reached \$2.23 billion, \$91.3% of the \$2.44 billion current budget. Work is progressing on both the Electrification and the Vehicles components of the project, as well as on rail activation preparedness.



Electrification design-build contract. In August 2016, Caltrain awarded the Design-Build Electrification contract to Balfour Beatty Infrastructure in the amount of \$697 million.

Overhead Contact System (OCS) foundations, poles, arms, and wire installation have been completed. Regulation review, where the OCS is checked to confirm proper alignment, height, stagger, and clearances, is complete with the exception of Main Track 2 in the Guadalupe Bridge area. Grounding and bonding are complete in Segments 3 and 4, and work continues in Segments 1 (8 connections remaining), and 2 (24 connections remaining).

Work is nearing completion on the Traction Power Facilities. Power substations in San Jose and South San Francisco are 100% complete. Traction Power substations 1 and 2 interconnections are also complete. All the other facilities are 98% complete with only punchlist and testing remaining.

Short Circuit testing is anticipated to complete in February 2024. Signals and Communication Systems construction is complete. All Signals cutovers have been completed for the whole alignment and only punch-list items remain.

Training for first responders continues.

Tunnels. [COMPLETED] Final Acceptance for the work on modifications to the 100-year-old San Francisco tunnels was reached in December 2020.

Vehicles. On September 6, 2016, Caltrain gave a limited Notice to Proceed to Stadler Rail for the \$551 million EMU contract to design and fabricate 96 electric vehicles. After receipt of the Full Funding Grant Agreement, Caltrain issued the full Notice to Proceed on June 1, 2017. Subsequently, Caltrain executed an option for an additional 37 cars, bringing the total to 133 cars. In accordance with the Buy America provisions of the FTA funding, the vehicles are being manufactured by Stadler US at its new facility in Salt Lake City, Utah.

Six trainsets are now on-site. Trains 1 and 11 are complete and ready to ship in Salt Lake City. Trains 7 and 8, together with trains 12 through 19, are in various stages of production. The 14th completed trainset is anticipated to arrive at CMOF in July 2024, a delay from March 2024 resulting from the execution of the Change Order for the installation of Broadband equipment. The 19th trainset's new anticipated arrival is in the fall of 2024. Trains 15 through 19 represent additional trainsets purchased with funding outside of the PCEP budget.

Train burn-in is underway, with three trains reaching the 1,000-mile requirement that must be met prior to commencing revenue service.

Maintenance training continues. The Vehicle Storage Plan has been finalized, together with the Interim Maintenance Plan, and Legacy Fleet Retirement Strategy. The Permanent Maintenance Plan has also been completed. Operator training continues.



Preparation of a train storage area at 4th and Townsend railyard has started.

Central Equipment and Maintenance Facility. (CMOF) [COMPLETED] Located in San Jose since 2007, this facility accommodates inspections, maintenance, repair, train washing, and storage for the rail fleet. As part of the PCEP, the facility just went through an overhaul to accommodate the new electric vehicles. All work at the facility was completed in July 2022.

Cost and Schedule. The current Baseline Budget for the PCEP, adopted by the PCJPB in December 2021, is \$2.44 billion. As of December 31, 2023, \$2.23 billion, or 91.3%, has been expended.

The current budget includes a total of \$90 million in contingency: \$50 million in a shared risk pool and \$40 million in allocated and unallocated contingency. As of December 31, 2023, \$42.49 million in contingency remained, including \$34.45 million in the risk pool. The Revenue Service date remains unchanged for September 2024, three months before the FFGA Revenue Service date of December 2024.

Rail Activation. The Rail Activation Plan, which details the activities that will allow Caltrain to be ready to receive the project and start revenue service, has been completed. The team has completed a risk workshop and is in the process of developing risk grading and mitigations. The Team has completed and published the Updated Timetable, Operating Rules, and System Special Instructions and FTA is reviewing the Railroad Operating Documents.

Funding. The project is fully funded. On January 31, 2023, Caltrain received \$367 million from the state's Transit and Intercity Rail Capital Program (TIRCP) which, together with the previously awarded \$43 million from the federal Omnibus Appropriations Bill, fully covers the \$410 million funding shortfall resulting from the December 2021 Baseline Budget adjustment. Achieving full funding had the added benefit of pushing off Caltrain's projected operating deficit for approximately two years by freeing up Measure RR funds that would have otherwise been needed to help close the funding gap.

Progress Reports. Detailed CalMod monthly reports are provided to the Caltrain Board and are publicly available. Peninsula Corridor Electrification Project reports are located at:

<https://www.caltrain.com/electrification-document-library>

Challenges and Opportunities. There are some challenges that could impact Caltrain's ability to complete CalMod on schedule. The Risk Management Team meets on a monthly basis to evaluate risks and make any needed adjustments. The results of the most recent quarterly quantitative risk analysis, conducted in December 2023, forecasted an overall project risk of \$29.89 million, an increase over the previous quarter's \$24.2 million. The increase is not considered significant because it reflects the ebb and flow of the project and the fact that the project is nearing completion. There is sufficient contingency remaining to cover the cost, should the risks materialize. The top five risks that we are monitoring include:

- Theft of Impedance Bonds Cables
- Contractor Overhead Contact System Productivity



- Traction power equipment is showing signs of rust and corrosion
- Successful completion of Traction Power Energization and Short Circuit Testing
- Improper installation and commissioning of breakers in control buildings may result in SF₆ gas (an inert, harmless gas used for insulation in electrical systems) leaks at some traction power facilities

The Transportation Authority's PMO continues to oversee the project in accordance with the Funding Partners Oversight Protocol.

FINANCIAL IMPACT

None. This is an information item.

CAC POSITION

None. This is an information item. The Community Advisory Committee will consider this item at its February 28, 2024, meeting.

SUPPLEMENTAL MATERIALS

- Attachment 1 - Caltrain Electrification Presentation

Caltrain Electrification Update

San Francisco County
Transportation Authority
Board Meeting

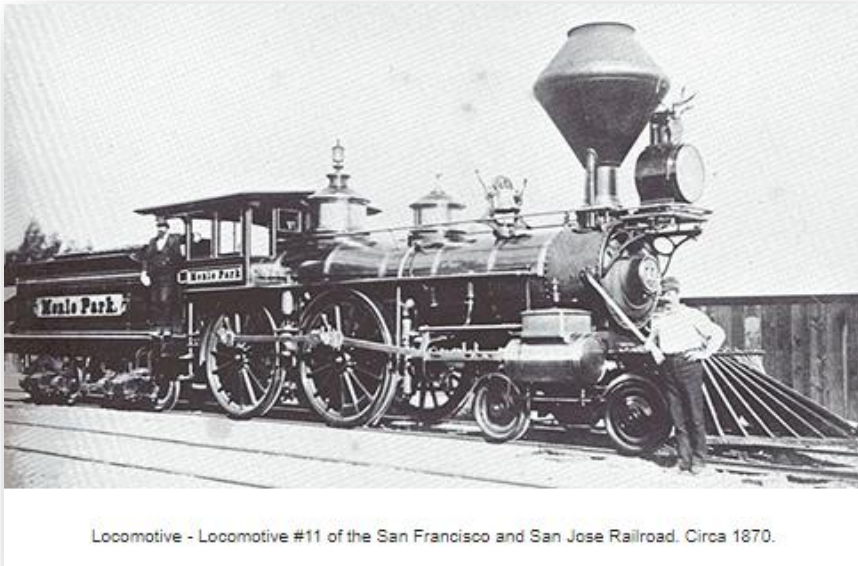
February 27, 2024
Agenda Item 11



Transformational Moment

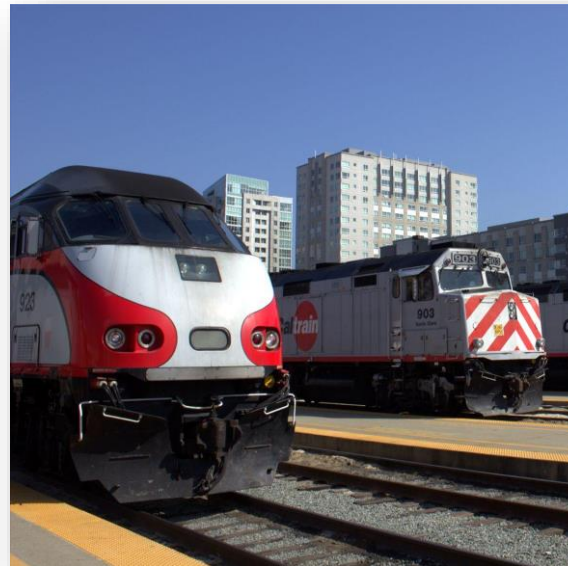
First Time in 30 years any US system fully converted from diesel to electric system

160-Year-Old History of Caltrain's Passenger Rail



Locomotive - Locomotive #11 of the San Francisco and San Jose Railroad. Circa 1870.

Steam 1860s



Diesel 1950s to present



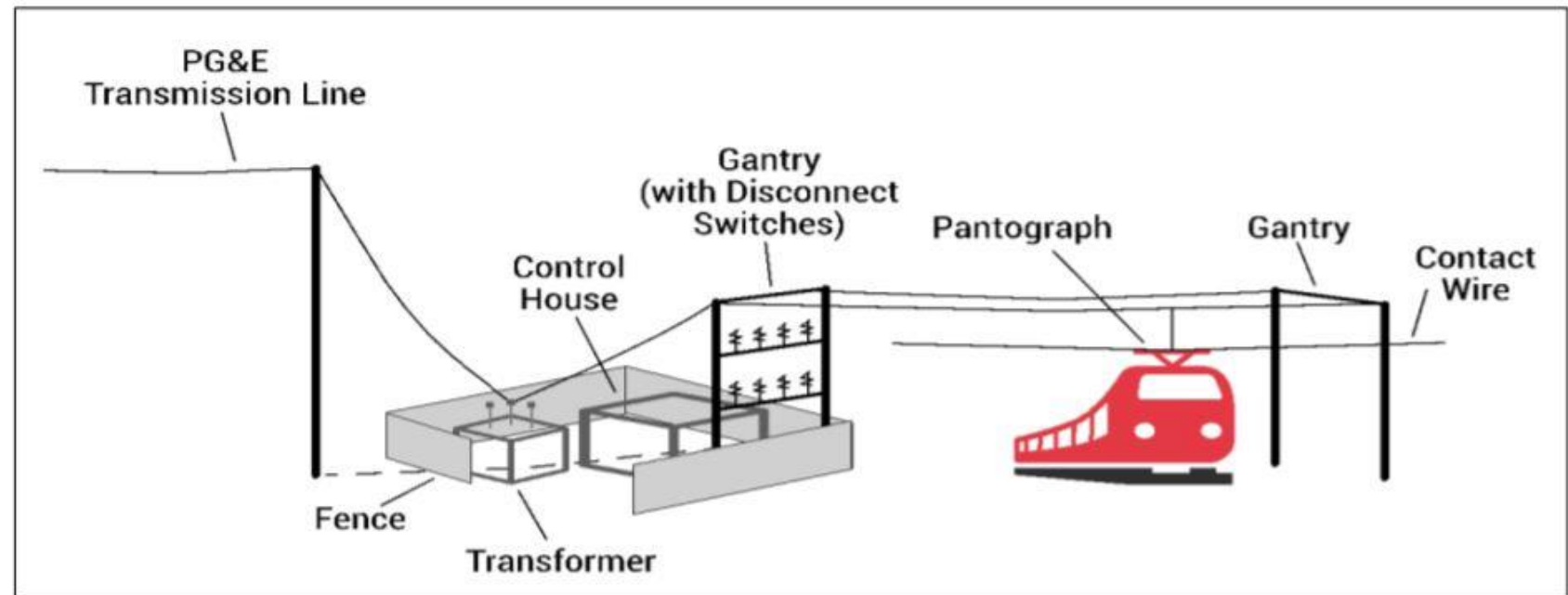
Electric 2024



Transition from Diesel to Electric

First Electric Commuter Railroad in CA

- 25KV Overhead Contact System (used by high-speed rail system)
- 23 Electric Trainsets
- Two-Speed Check signal system (approved by Federal Railroad Administration, Union Pacific and CA High Speed Rail)



Key Milestones

Complete:

- Foundations (3,000+)
- Poles (2,500+)
- Traction Power Facilities (10)
- Overhead Wire (2.5 million feet)
- Upgraded the Signal System San Francisco to San Jose (31 at grade crossings)
- Energized: Mountain View to San Jose (15 miles)
- 8 trainsets on Caltrain property (1,000 mile passed by 4 trains)
- Over 1,000 First Responders Trained



Upcoming:

- Repairs of Winter Storm Damage
- Full Corridor Energized (Spring 2024)
- Additional trainsets on property and testing (Spring - Fall 2024)
- Soft Launch (Summer 2024)
- **Passenger Service: September 2024**



Top Risks

- Contractor Quality Control and Quality Assurance
- Theft of Impedance Bonds Cables
- Contractor Overhead Contact System Productivity
- Traction Power Energization and Short Circuit Testing (TPS-1)
- Timely Completion of Integrated Testing and Live Runs

Project Budget

	(A)	(B)	(C)	(D)	(E)	(F) = (D) + (E)
Description of Work	Re-Baseline Budget	Current Budget	Cost This Month	Cost To Date	Estimate To Complete	Estimate At Completion
Electrification	\$1,097,149,881	\$1,094,958,881	\$5,228,468	\$1,024,348,284	\$68,980,596	\$1,093,328,881
EMU Procurement	\$556,072,601	\$564,986,271	\$4,620,386	\$462,211,880	\$102,774,391	\$564,986,271
Minor Construction Contracts (SSF, 25th Grade, Tunnel, CEMOF, SCADA, Non-BBI OCS)	\$67,055,072	\$68,091,194	\$0	\$64,972,201	\$2,353,867	\$67,326,067
Real Estate Acquisition & Support	\$34,914,177	\$34,914,177	\$292,003	\$24,883,289	\$10,030,889	\$34,914,177
PG&E, Utilities	\$132,088,994	\$132,088,994	\$6,388	\$207,547,623	-\$74,621,629	\$132,925,994
Management Oversight & Support	\$312,699,697	\$315,007,767	\$2,983,304	\$293,127,153	\$21,880,614	\$315,007,767
TASI Support	\$114,488,767	\$136,528,469	\$2,698,913	\$115,864,211	\$25,013,112	\$140,877,323
Finance Charges	\$9,898,638	\$9,898,638	\$373,315	\$11,009,861	\$458,669	\$11,468,530
Insurance	\$6,581,851	\$6,581,851	\$0	\$6,291,001	\$290,850	\$6,581,851
Other Required Projects & Services	\$9,084,176	\$10,484,176	\$21,341	\$6,014,442	\$4,669,734	\$10,684,176
Environmental Mitigation	\$14,438,866	\$13,038,866	\$2,882	\$1,307,851	\$9,961,123	\$11,268,974
Caltrain Capital Overhead (ICAP)	\$48,217,887	\$48,217,887	\$594,356	\$29,976,839	\$18,241,049	\$48,217,887
Contingency	\$40,000,089	\$7,893,525	\$0	\$0	\$5,102,797	\$5,102,797
Total	\$2,442,690,697	\$2,442,690,697	\$16,821,354	\$2,247,554,636	\$195,136,061	\$2,442,690,697

Notes: "Re-Baseline Budget" includes executed change orders and awarded contracts;

"Cost This Month" represents cost of work performed December 2023;

"Cost To Date" includes actuals (amount paid) and accruals (amount of work performed) as of December 2023;

"Contingency" budget is drawn down and transferred to other elements after CMB approvals as reflected in the Estimate at Completion.



Project Contingency and Shared Risk Pool

Item	Amount	Drawn in December 2023	Drawn To Date	Amount Remaining
BBII Shared Risk Pool	\$50.00M	\$0.35M	\$15.40M	\$34.60M
Project Contingency	\$40.00M	\$0.00M	\$32.11M	\$7.89M
Total	\$90.00M	\$0.35M	\$47.51M	\$42.49M

Electrified Service Plan Benefits

Improved service for all riders



Get There Faster

Express from SF to SJ in under an hour

Quicker local service, 75 minutes instead of 100

Save nearly 30 minutes on trips from Southern Santa Clara County to SF



Ride More, Wait Less

Half-hourly service during weekends and off-peak, more service during peak

20% more train service

26% more train service at equity priority stations



First Class for Everyone

Free Wi-Fi

Smoother, quieter experience

Outlets at every seat

Digital trip information onboard

Spacious, accessible bathrooms



Clean and Green

GHG emissions reduced by 250K MTCO2 annually – equivalent to taking 55,000 cars off the road each year

Improves local air quality

Quieter trains, both onboard and off

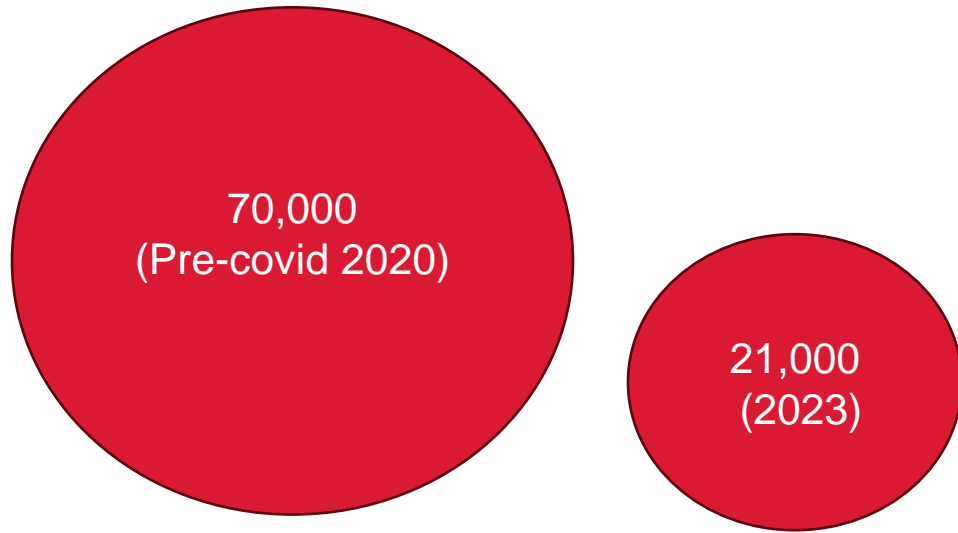
Electric Train Public Tours

San Francisco – September 2023 (Photos Below)
San Mateo County - Spring 2024



Caltrain Fiscal Cliff Update

Caltrain Ridership / Fiscal Challenges

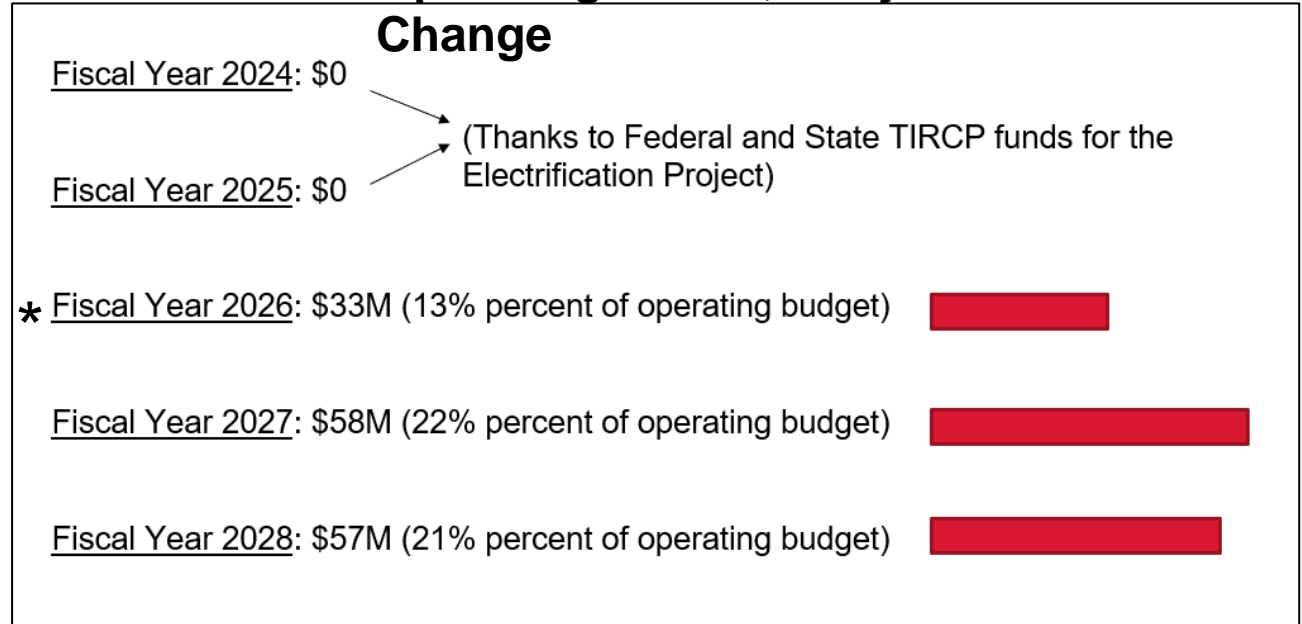


Average Daily Riders

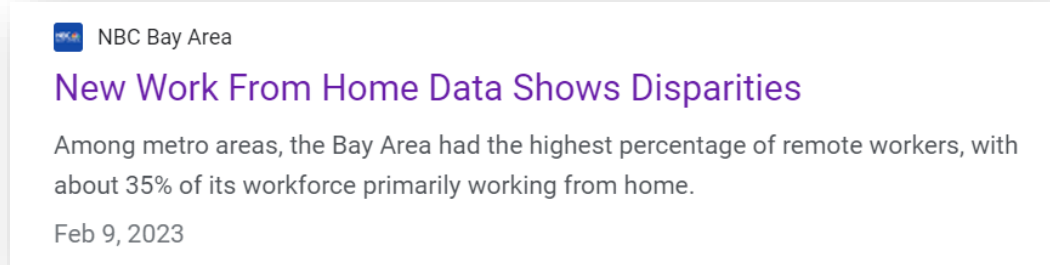
Notes:

- Farebox Recovery 74% (2020); 30% (2023)
- 20+ closures in 2023 for electrification construction
- Average weekday ridership increased by 14% compared to the same month in prior year

Operating Deficit, Subject to Change



* Current MTC recommendation \$25M, reduce deficit to \$8M in FY26



FOR MORE INFORMATION

WWW.CALTRAIN.COM



Caltrain Corridor Overview

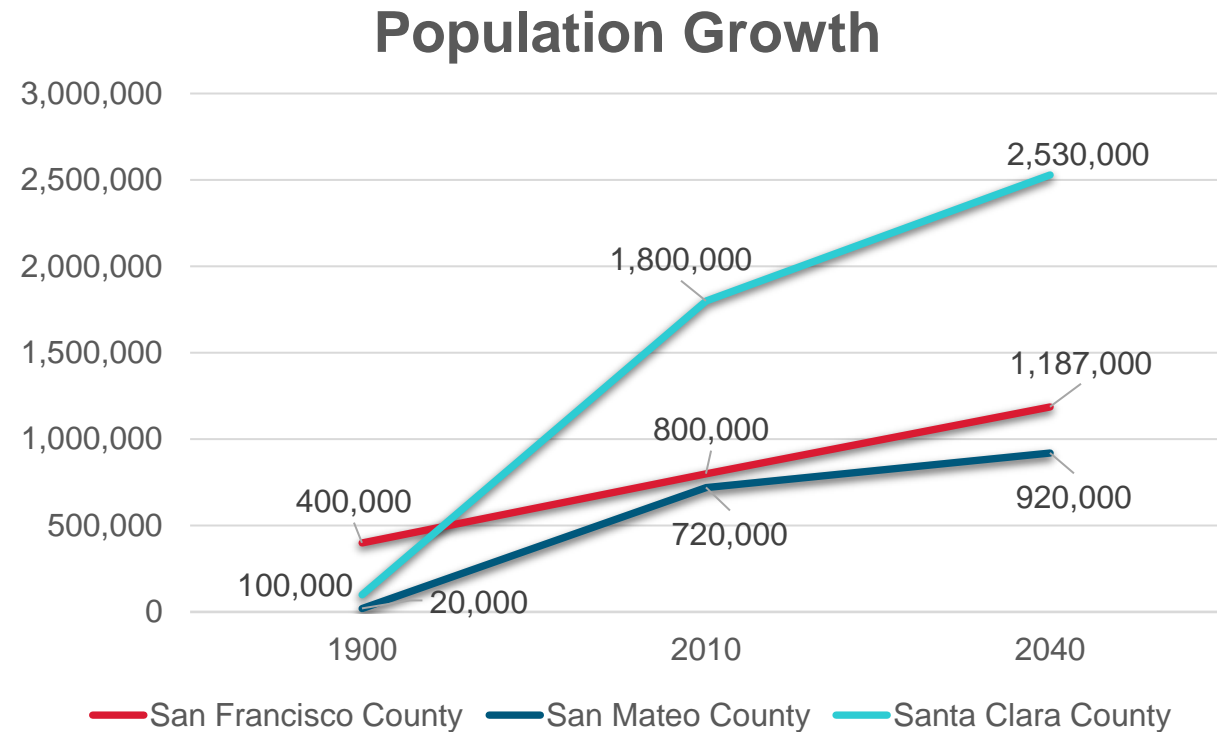
Caltrain Corridor

- 77 miles of track from end to end
- 31 stations
- Bi-directional commute
- 41 at-grade crossings
- Pre-pandemic:
 - 7th largest commuter rail in the country
 - 70% farebox recovery
 - Over 18 million Unlinked Passenger Trips (UPT) in 2019
 - Frequently overcrowded trains, standing room only



Corridor Growth 40% Increase

By 2040, an additional 1.2 million people will work and live within 2 miles of the Caltrain corridor.



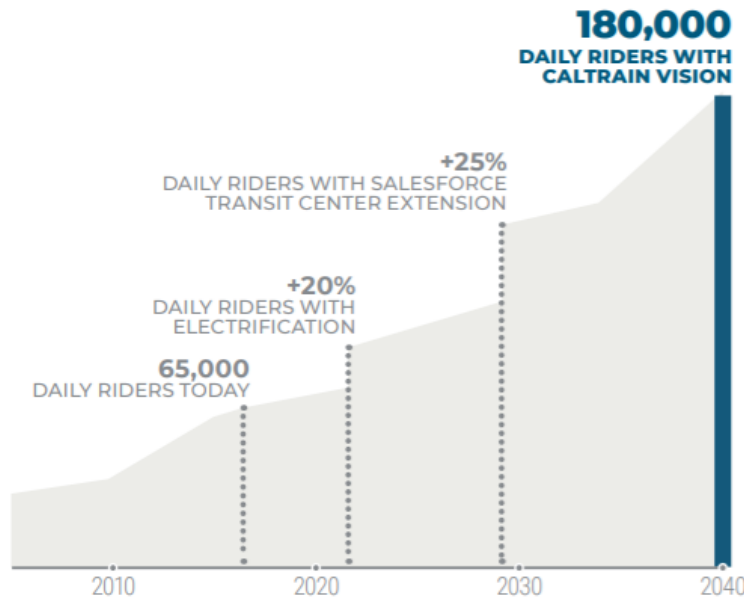
2040 Vision

Zero Emission Future

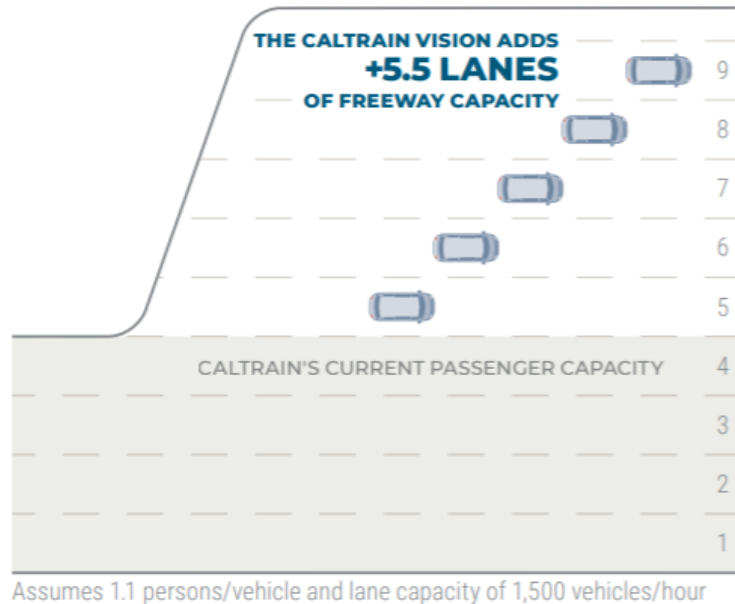
MORE TRANSPORTATION CAPACITY



CARRYING MORE PEOPLE



TRAINS VS LANES

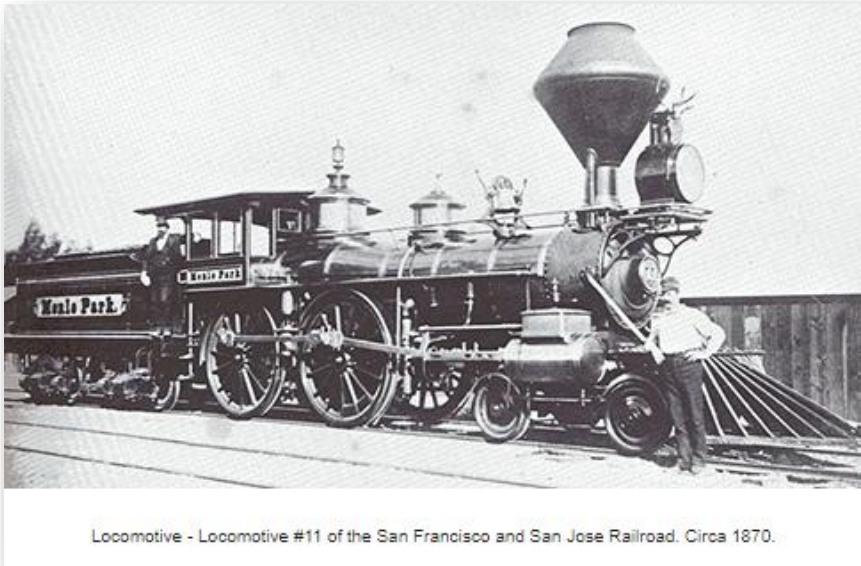


Caltrain's 2040 future service vision supports regional growth, arrival of high-speed rail, and more equitable, sustainable service.



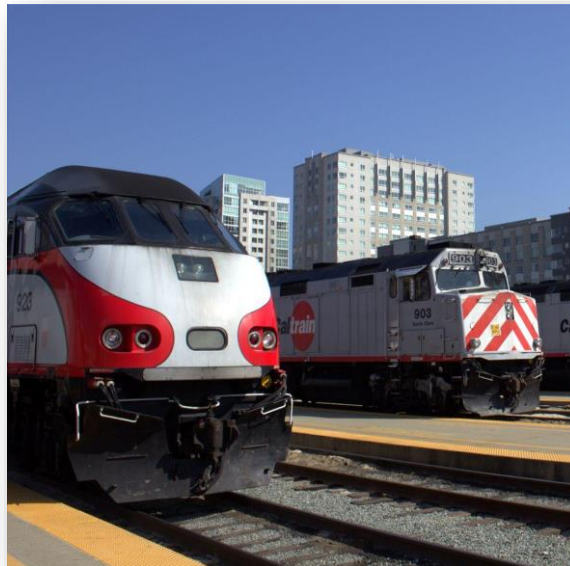
Transformational Moment

Electrification will help Caltrain become a cleaner, more efficient component of the transportation network.



Locomotive - Locomotive #11 of the San Francisco and San Jose Railroad. Circa 1870.

Steam 1860s



Diesel 1950s to present



Electric 2024



A Connected Future

- Electrified Caltrain corridor will enable additional investments expanding the Bay Area intercity rail network.
- Existing and future tenants
 - Capital Corridor (Amtrak)
 - Altamont Corridor Express
 - California High Speed Rail
- Expansion projects
 - San Francisco Downtown Extension
 - San Jose Diridon Station Rebuild
 - Grade Separations



California High-Speed Rail, Draft Business Plan, Pg. 23

Electrification Project Benefits

Safety

- Crash energy management technology (meets FRA Alternate Compliance requirements for mixed traffic).
- Crash absorption system protecting train driver and passengers (meets FRA crashworthiness standard).
- Latest generation of vehicle control systems including detailed diagnostic features.
- Improved braking performance.



Sustainability

- Eliminates 2.09 million tons of carbon emissions.
- Future Caltrain will carry equivalent of 5½ lanes of freeway traffic.



SUSTAINABILITY

Replacing old diesel trains with new electric trains will reduce GHG emissions and improve air quality



Energy Independence

- Reduce dependence on foreign energy sources; Rely on cleaner, renewable domestic energy sources.
- California committed to renewable and zero-carbon energy resources supplying 100% electric retail sales to customers by 2045.
- EMU trains include regenerative braking for additional energy savings



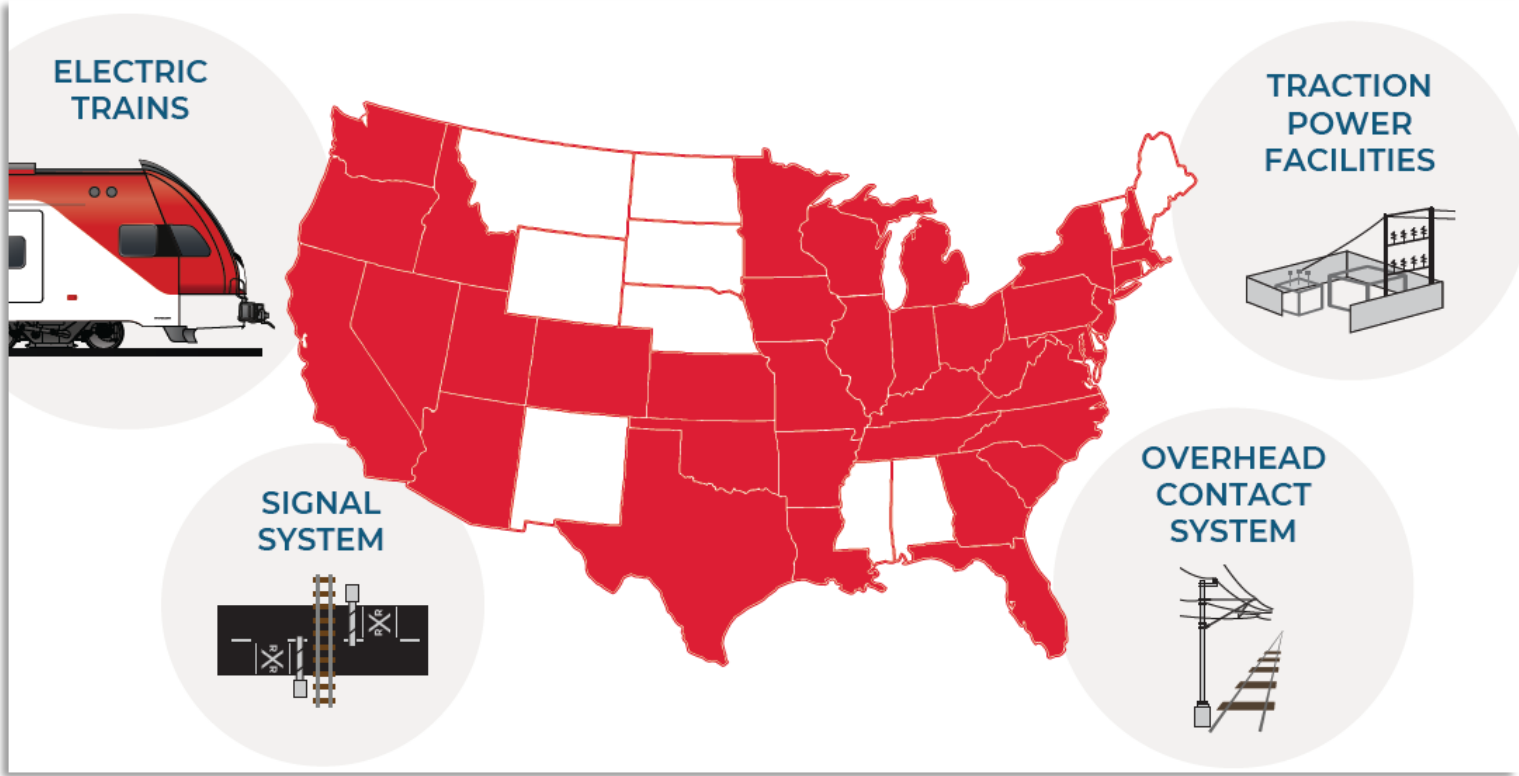
Equity

- Decreases emissions and noise pollution in communities of concern
- Benefits disadvantaged communities:
 - San Francisco (Bayview)
 - Santa Clara
 - Redwood City
 - San Bruno
 - South San Francisco
- Improves mid-day and off-peak service for essential workers



Economic Growth and Job Creation

33,000 Jobs Created in 36 States



Buy America Compliant

- Stadler (Switzerland based company) opened first facility in the US with guarantee of Caltrain Electrification Project contract
- Stadler Salt Lake City Facility:
 - 400+ employees
 - Local apprenticeship program
- Additional foreign suppliers opening US locations in order to be Buy America compliant

