

# Caltrain Electrification Project Update

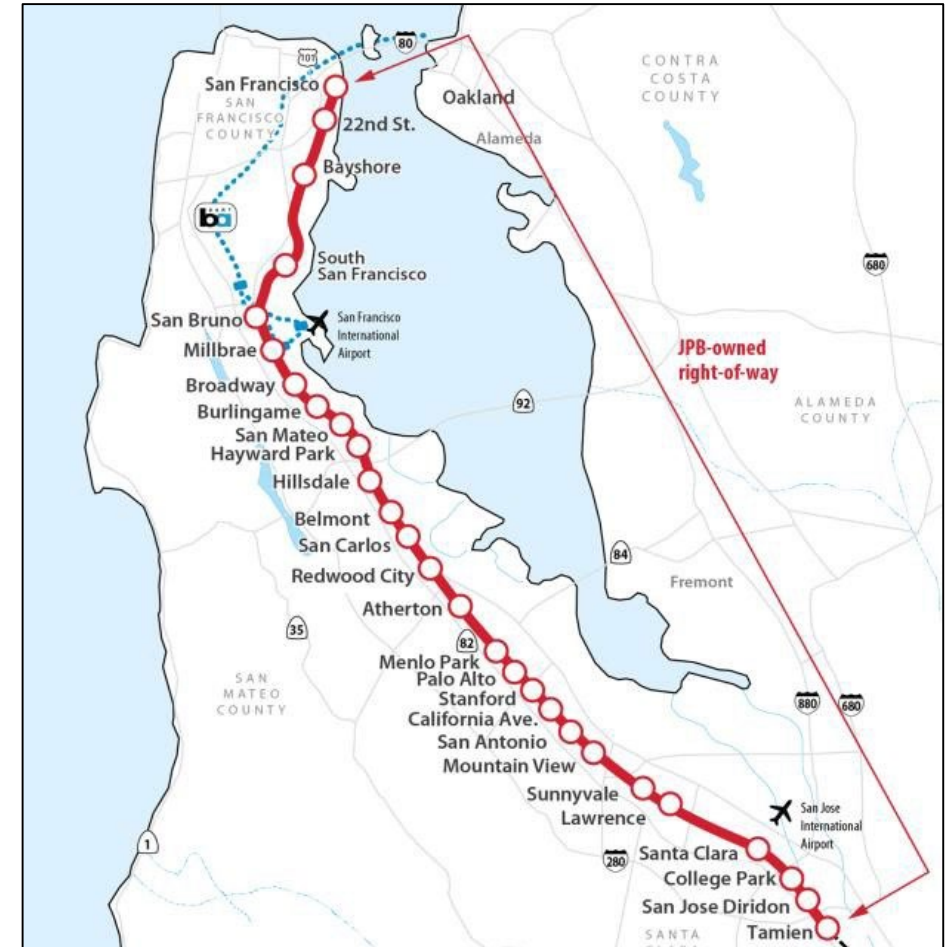
Peninsula Corridor Joint Powers Board  
October 6, 2022  
Agenda Item #13



# Project Overview

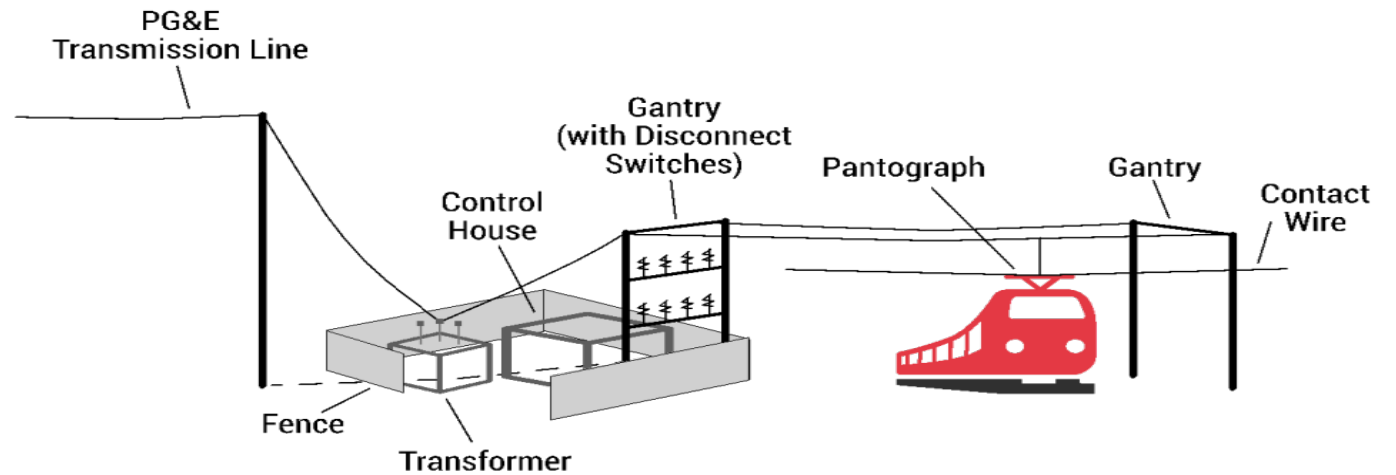
# Project Overview

- San Francisco to San Jose (Tamien Station)
- 51 miles
- Project Cost: \$2.44B
- Revenue Service: fall 2024



# Project Elements

- Electrification
  - Overhead Contact System (OCS)
  - Traction Power Facilities
  - Signal System
- Electric Trains
  - 19 7-car train sets (133 cars)
  - 75% replacement diesel fleet



*(Note: 96 cars funded by project; 37 cars funded by State TIRCP)*

# Project Benefits



Improved Train Performance,  
Increased Service and Greater Capacity

Improved Regional Air Quality and  
Reduced Greenhouse Gas Emissions



Job Creation Locally and  
Across the Country



Reduced Engine Noise  
Emanating from Trains



# Project Highlights

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- Schedule: No change to revenue service date - fall 2024
- Budget: No change to project budget - \$2.44B
  - No draw executed from \$40M project contingency in most recent month (August 2022)
  - \$250K draw executed from \$50M shared risk pool in most recent month (August 2022)
  - ICAP reevaluation / CHSRA review continuing
- Construction
  - Energization of both transmission lines at San Jose Traction Power Facility
  - Arrival of additional equipment to support OCS installation
  - Completion of signal software updates in Segment 2
  - Energization Test on October 22-23 & 29-30
- Electric Trains
  - Electric Train Celebration Event on September 24
  - Qualification and routine testing ongoing

# Safety and Security

Time Period	Reportable Injury Rate
January 1 to August 31, 2022	2.39
Since Project Start (2017)	1.75

*Note: National Average Reportable Injury Rate is 2.50.*

- Two reportable injuries for August 2022
- Development of emergency responder safety presentation for local first responders
- Project Safety Awareness trainings conducted for Training Officers of Santa Clara County Fire Department
- Full-scale emergency exercise scheduled for November 2022



# Construction Update

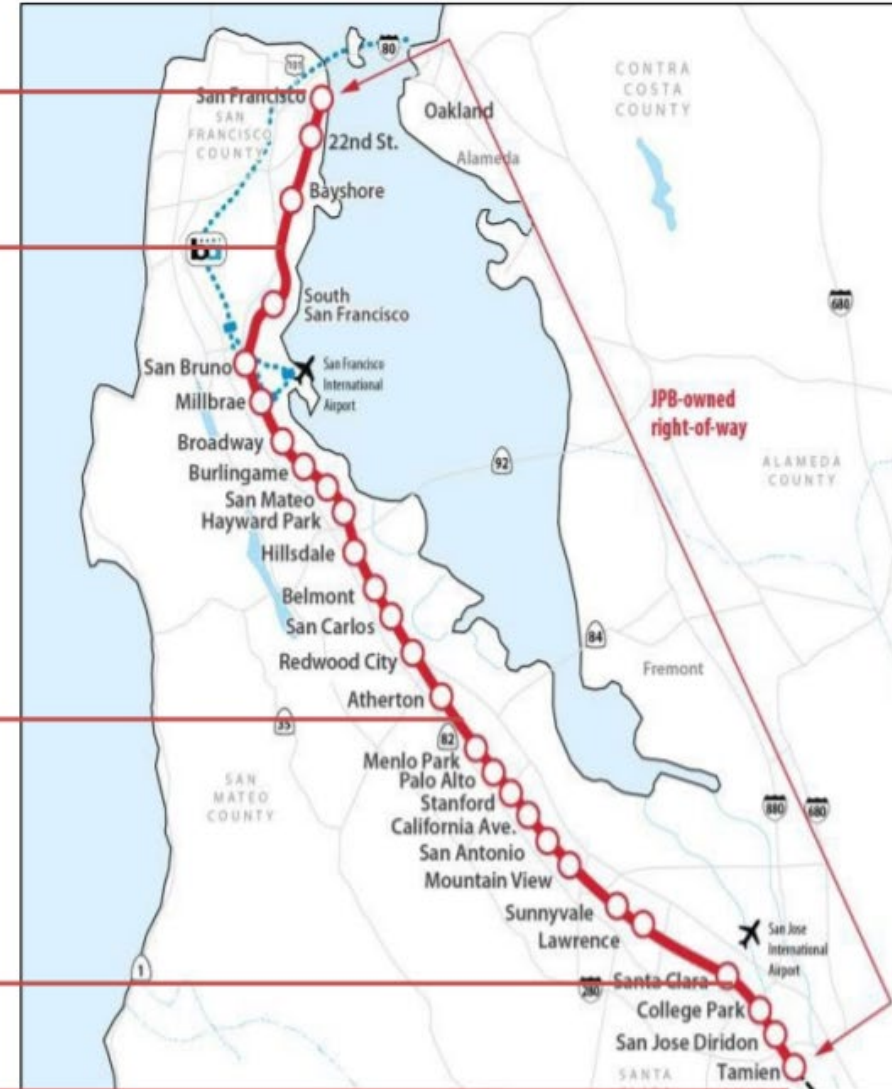
# Construction Segments

**Segment 1**  
San Francisco to Brisbane

**Segment 2**  
South San Francisco to Atherton

**Segment 3**  
Menlo Park to Santa Clara

**Segment 4**  
Santa Clara to Tamien



# Construction Update

Overhead Contact System			
Component	Segment	Installed in August	Remaining
Foundations (3,092 total)	Segments 4, 3, 2, 1	Complete	0
Poles (2,587 total)	Segments 4 / 3	Complete	0
	Segments 2 / 1	52	161
Wire (1.5M linear feet total)	Segments 4 / 3	Complete	0
	Segments 2 / 1	64K Linear Feet	762K Linear Feet

Traction Power Facilities		
Component	Percentage Completed in August	Total Percent Complete
Traction Power Facilities (10 total)	0%	93%



# Energization Testing – Segment 4

Weekends of October 22-23, 29-30

Energization and testing of Overhead Contact System in Santa Clara and San Jose

- Weekends of October 22-23, 29-30
  - First northbound train will start at Lawrence Station
  - First northbound train will not serve Tamien, Diridon and Santa Clara stations (approx. 30 riders/day)
  - Exploring bus bridge options with VTA
- Planned Outreach
  - Mailers
  - Station Signage
  - Take Ones
  - Email blasts
  - Visual Messaging Sign
  - Social Media
  - Conductor Announcements
  - Coordination with Cities & VTA

# Electric Trains

- Electric Train Celebration Event
- Carshells for Trains 17-19 in production
- Trains 6-10 in production at Salt Lake City
- 14<sup>th</sup> trainset anticipated arrival fall 2023
- 19<sup>th</sup> trainset anticipated arrival fall 2024



Electric Train Celebration Event

# Signal System and Communication

## 2 Speed Check (2SC)

- Segment 4
  - Completion of fire alarm testing
- Segment 2
  - Installation of signal facilities, duct bank and cable in preparation for Segment 2 cutovers
  - Completion of software update for Burlingame and San Mateo crossings
  - Final pretesting of Phase 1 cutover between South San Francisco and San Bruno in preparation for cutover planned for October 15-16
- Segments 1 and 3
  - Installation of signal cases and kits

# Signal System and Communication

## (2 Speed Check) – Major Signal Work in December

- Installation of 2 Speed Check hardware and software at 16 grade crossings in Redwood City, Atherton, Menlo Park and Palo Alto
- Weekdays: December 5<sup>th</sup> – 9<sup>th</sup> & December 12<sup>th</sup> – 16<sup>th</sup>
  - Reduced schedule on weekdays
  - Peak service reduced to 2 trains each hour per direction (down from 4)
  - Baby Bullet service suspended
  - Last four trains of evening suspended
- Weekends: Dec. 10<sup>th</sup>-11<sup>th</sup> & 17<sup>th</sup>-18<sup>th</sup>
  - No Caltrain service between Belmont and Mountain View stations
  - SamTrans bus bridge to replace service during two weekend
  - Evening service ends early

# Customer Outreach

- Landing page
- Organic social  
(Twitter, FB, IG, Nextdoor, Tiktok)
- Paid digital and print ads
- Station ambassadors
- Email blasts
- Mobile app alerts
- Visual messaging signage at stations
- Onboard and station announcements
- Press release
- Amplify message via elected officials, cities, counties
- Updates to key stakeholders, business groups
- Outreach to event venues



# Crossing Optimization Project

(outside of PCEP scope)

- Deployment of following first six pilot locations in May 2022:
  - San Jose: Auzerais Avenue and Virginia Street
  - Millbrae: Center Street and Santa Paula Pedestrian Crossing
  - San Francisco: Mission Bay Drive and 16<sup>th</sup> Street
- Temporarily deactivated six pilot wireless crossings due to on-board software error
- Wabtec plans to release updated software for testing/deployment in November 2022
- Affected crossings will utilize 2 Speed Check system until updated software is deployed
- Wabtec developing schedule recovery and mitigation plan

# Signal Work Schedule

City	Number of Crossings	2 Speed Check Installation	Crossing Optimization (Wireless) Installation (outside PCEP scope)
San Jose	2	January 2021	May 2022
Millbrae	1	December 2021	May 2022
Burlingame	6	May 2022	Winter 2022/2023
San Mateo	9	May 2022	Winter 2022/2023
South San Francisco	1	October 2022	Winter 2022/2023
San Bruno	1	October 2022	Winter 2022/2023
Redwood City	6	December 2022	Spring/Summer 2023
Atherton	2	December 2022	Spring 2023
Menlo Park	4	December 2022	Summer 2023
Palo Alto (Alma and Churchill)	2	December 2022	Summer 2023
Palo Alto (Charleston and East Meadow)	2	Spring 2023	Summer 2023
Mountain View	2	Spring 2023	Spring 2023
Sunnyvale	2	Spring 2023	Fall 2023
San Francisco	2	Fall 2023	Spring 2024

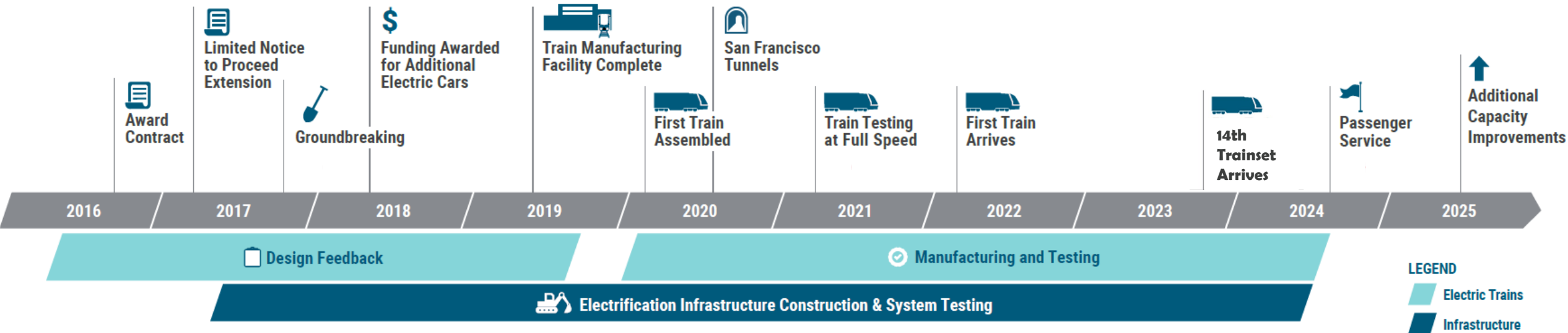
Notes: Dates subject to change; signal work at UPRR owned crossing in Santa Clara to be determined



# Program Management

# Program Master Schedule

## Revenue Service Fall 2024



# Key Milestones

**12 day delay to OCS Construction milestone but no delay to Revenue Service Date.**

Item	Rebaseline Date	Forecasted Date
Completion of Signal System Cutovers in Segment 2	November 2022	December 2022
Completion of Segment 4 Integrated Testing with EMU	May 2022	November 2022
Completion of OCS Construction Work (Critical Path)	September 2023	October 2023
Completion of Signal System Work (Near Critical Path)	September 2023	September 2023
Acceptance of 14 <sup>th</sup> Trainset	January 2024	January 2024
BBII Electrification Substantial Completion	April 2024	April 2024
Revenue Service Date	September 2024	September 2024

# Critical Path Milestones

**12 day delay to OCS Construction milestone but no delay to Revenue Service Date.**

Item	Rebaseline Date	Forecasted Date
<b>Overhead Contact System Construction (Critical Path)</b>		
Completion of OCS Construction in Segment 3	July 2022	Completed July 2022
Completion of OCS Construction in Segment 2	June 2023	June 2023
Completion of OCS Construction in Segment 2	September 2023	October 2023
<b>Rail Signal and Communications (Near Critical Path)</b>		
Completion of Signal System Cutovers in Segment 2	November 2022	December 2022
Completion of Signal System Cutovers in Segment 3	April 2023	April 2023
Completion of Signal System Cutovers in Segment 1	September 2023	September 2023
<b>Pre-Revenue Service Testing</b>	April 2024	May 2024
<b>Revenue Service Date</b>	September 2024	September 2024



# Top Risks

	Risk	Mitigation	Critical Date
	OCS installation delay due to low productivity	<ul style="list-style-type: none"> <li>Additional BBII OCS crew training for regulation and variance in the OCS design/installation due to redesign and accommodations to resolve foundation Differing Site Conditions (DSC) issues.</li> <li>Hiring additional BBII OCS staff members to prevent schedule slippage and help in future installation planning.</li> <li>Held OCS construction scheduling recovery workshop for remaining OCS installation and testing.</li> <li>Increase OCS crews and OCS wiring equipment to increase productivity.</li> </ul>	September 2022
	Sufficient field railway worker in charge (RWIC) for increased work crews	<ul style="list-style-type: none"> <li>Design-builder brought in more watchmen for off-track work.</li> <li>TASI to expedite RWIC hiring and training.</li> <li>Explore third party field resource procurement path.</li> <li>Assess operational impact for expanding work limits with track and time.</li> </ul>	Ongoing
	The contractor may not complete signal and communication design, installation, testing, and cutover for the Two-speed Check (2SC) modifications on time.	<ul style="list-style-type: none"> <li>Streamline design reviews</li> <li>Initiate construction prior to IFC</li> <li>Consolidate locations for cutover, where possible</li> <li>Add an additional cutover team through Balfour/MRS</li> <li>Reduce service and three-week single track during cutover period to maximize access and cutover work windows</li> </ul>	September 2023

**Green** = Mitigations/actions identified and no impact to budget/schedule

**Yellow** = Mitigations/actions identified and potential impact to budget/schedule

**Red** = Impact to budget/schedule

# Top Risks, cont'd

	Risk	Mitigation	Critical Date
	Funding of \$410 million program gap	<ul style="list-style-type: none"><li>• Special task force is in place to identify federal and state grant opportunities to pursue.</li><li>• Targeted advocacy is ongoing.</li><li>• Prepare earmarks grant scope and application.</li></ul>	April 2023

**Green** = Mitigations/actions identified and no impact to budget/schedule

**Yellow** = Mitigations/actions identified and potential impact to budget/schedule

**Red** = Impact to budget/schedule



# Program Budget

Description of Work	Re-Baseline Budget	Cost This Month	Cost To Date	Estimate To Complete	Estimate At Completion
Electrification	\$1,097,149,881	\$16,630,743	\$834,064,434	\$263,085,447	\$1,097,149,881
EMU Procurement	\$556,072,601	\$9,574,507	\$394,991,868	\$161,213,098	\$556,204,966
Minor Construction Contracts (SSF, 25th Grade, Tunnel, CEMOF, SCADA, Non-BBI OCS)	\$67,055,072	-\$20,912	\$64,410,692	\$3,680,502	\$68,091,194
Real Estate Acquisition & Support	\$34,914,177	\$13,245	\$23,794,189	\$11,119,988	\$34,914,177
PG&E, Utilities	\$132,088,995	\$995,960	\$200,316,271	-\$68,227,277	\$132,088,995
Management Oversight & Support	\$312,699,697	\$2,278,514	\$246,374,900	\$66,324,796	\$312,699,697
TASI Support	\$114,488,767	\$1,468,675	\$84,277,472	\$30,211,295	\$114,488,767
Finance Charges	\$9,898,638	\$113,382	\$8,975,136	\$923,502	\$9,898,638
Insurance	\$6,581,851	\$315,598	\$4,897,449	\$1,684,402	\$6,581,851
Other Required Projects & Services	\$9,084,176	\$50,548	\$2,899,228	\$6,184,948	\$9,084,176
Environmental Mitigation	\$14,438,866	\$1,696	\$1,207,099	\$13,231,767	\$14,438,866
Caltrain Capital Overhead (ICAP)	\$48,217,887	-\$1,675,633	\$19,881,392	\$28,336,495	\$48,217,887
Contingency	\$40,000,089	\$0	\$0	\$38,831,602	\$38,831,602
<b>Total</b>	<b>\$2,442,690,697</b>	<b>\$29,746,321</b>	<b>\$1,886,090,130</b>	<b>\$556,600,566</b>	<b>\$2,442,690,697</b>

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

"Cost This Month" represents cost of work performed August 2022;

"Cost To Date" includes actuals (amount paid) and accruals (amount of work performed) as of August 2022.

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

As of August 31, 2022



# Program Budget

## (Management Oversight and Support)

- PCEP Management Oversight and Support Service approved budget \$312.7 million
- Projected remaining costs to completion (August 2022 – December 2024) \$68.6 million

Vendor	Current Contract Authority	Additional Contract Authority Dates	Additional Contract Authority
JACOBS	\$35,500,000	Approved December 2021	Increased by \$18,500,000
AECOM	\$36,361,332	Approved in August 2022	Increased by \$11,943,960
B&G	\$5,060,000	Approved in August 2022	Increased by \$4,432,182
Gannett Fleming	\$67,743,400	Anticipated in December 2022	\$8.3M (Estimated)
LTK	\$36,845,000	Anticipated in October 2023	\$0.8M (Estimated)
<b>Totals</b>	<b>\$181,509,732</b>		<b>\$43,976,142</b>

Note: Above amounts identified in budget scrub conducted in December 2021 and included in the \$2.44 program budget.



# Major Contract Progress

Contract	Contract Value	Cost Incurred to Date	Contract Percent Complete	Weighted Percent	Total Percent of Project Complete
<b>Balfour Beatty</b> Infrastructure	\$1,097,149,881	\$834,064,434	76.0%	59.69%	45.4%
<b>Stadler</b> EMU Procurement	\$555,841,582	\$394,991,868	71.1%	30.24%	21.5%
<b>ARINC*</b> SCADA	\$4,400,346	\$3,618,830	82.2%	0.24%	0.2%
<b>PG&amp;E**</b>	\$124,106,400	\$111,554,925	89.9%	6.75%	6.1%
<b>ProVen</b> Tunnels	\$47,059,353	\$47,059,353	100.0%	2.56%	2.6%
<b>ProVen</b> CEMOF	\$9,476,816	\$9,474,676	100.0%	0.52%	0.5%
<b>Total</b>	<b>\$1,838,034,378</b>	<b>\$1,400,764,086</b>		<b>100.00%</b>	<b>76.21%</b>

Notes: Includes only major direct contracts; does not include Management Oversight, TASI, Finance Charges, Insurance, ICAP, Contingency

\*Does not include T&M portion of CCO-005

\*\*Represents the PCEP portion with cost sharing allocation of PCEP 40% / PG&E 60%



# \$40 Million Program Contingency

Status	Amount
Program Contingency	\$40.0M
Amount Drawn	(\$1.17M)
Remaining	\$38.83M
CMB September 2022 Approved	(\$0.00M)
<b>Forecasted Remaining Contingency</b>	<b>\$38.83M</b>

*Note: 'Change Management Board Approved' includes approved changes not yet drawn from contingency.*

# \$50 Million Shared Risk Contingency

Status	Amounts
BBII Shared Risk Contingency	\$50.00M
Amount Drawn	(\$2.81M)
Remaining	\$47.19M
CMB September 2022 Approved	(\$0.00M)
<b>Forecasted Remaining Shared Risk Contingency</b>	<b>\$47.19M</b>

*Note: 'Change Management Board Approved' includes approved changes not yet drawn from contingency.*

# Funding Update (Federal)

- Supplemental FTA Capital Investment Grants Full Funding Grant Agreement (FFGA) funding
  - House THUD Appropriations Bill (estimate \$51M could go towards project)
- “Community Project” funding
  - \$10M included Senate Appropriations Bill by Senator Feinstein and Padilla
- FRA Federal State Partnership for Intercity Rail grant program (partnership with HSR)
  - Advocating for beneficial NOFO criteria; Applications likely October 2022
  - Coordination with MTC, Diridon, Downtown Extension, HSR stakeholders

# Funding Update (State)

- FY 23 State Budget signed into law
  - \$10.9B transportation package over 4 years
  - \$900 - \$1.2B available for existing projects outside of Southern California that meet certain criteria - Caltrain Electrification eligible – Announcement of awards expected January 2023

# Upcoming Board Actions

- Contract Authority for Consultant Services
  - Hatch LTK
  - Gannett Fleming



FOR MORE INFORMATION

[WWW.CALTRAIN.COM](http://WWW.CALTRAIN.COM)

