

CalMod



Caltrain Electrification Update

Palo Alto Architectural Review Board

November 15, 2018



Agenda

- Caltrain System Overview
- Project Overview
- Electric Train Design
- Palo Alto Construction Activities
- Questions



Caltrain System

JPB owns right-of-way from SF to San Jose

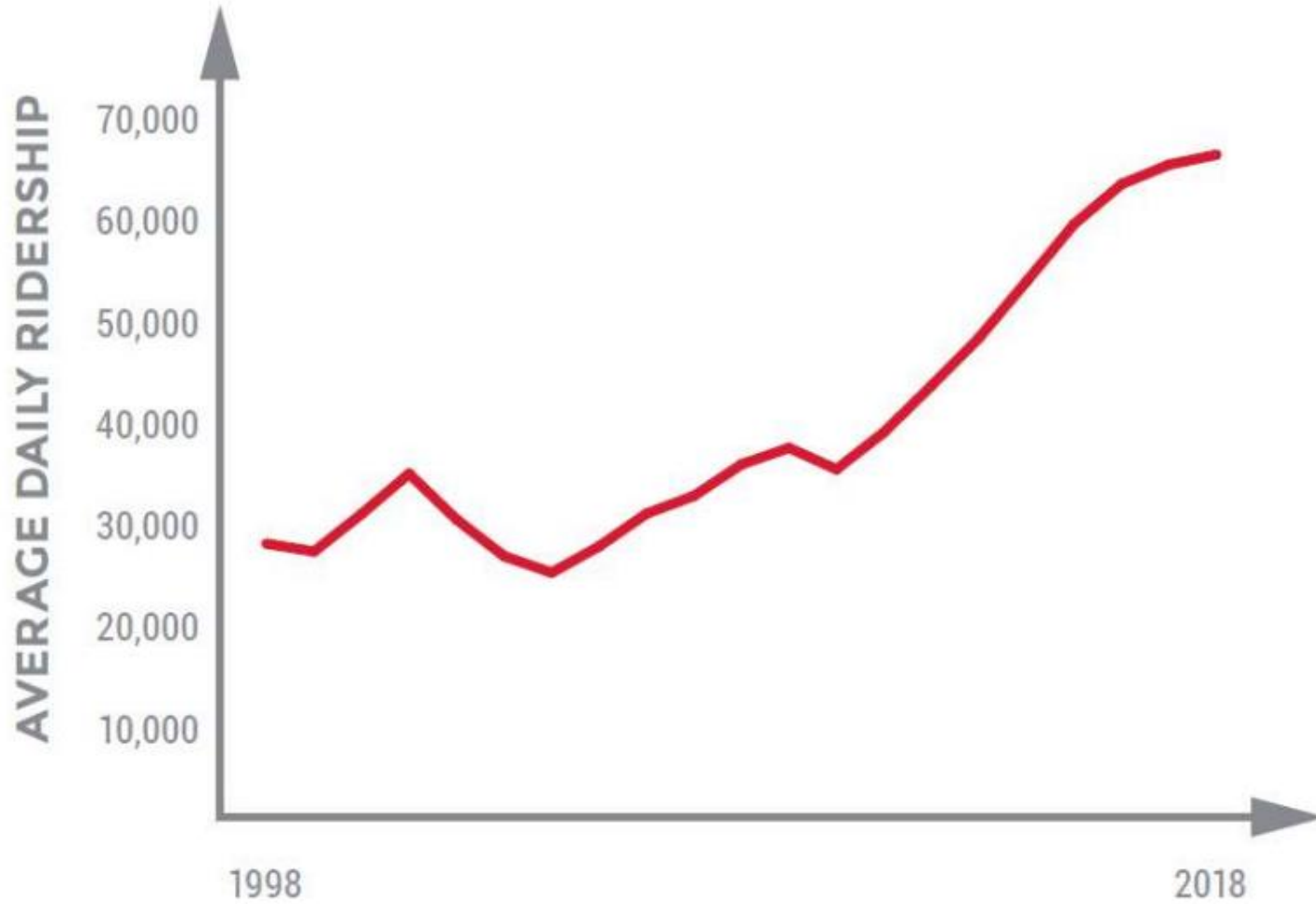


- 32 Stations Gilroy to San Francisco
- 92 Weekday Trains
- At-Grade Crossings, viaducts, and bridges
- Intermodal Connections
- Bike Commuters

Union Pacific owns



Ridership



At Capacity Today



Bi-directional commute with riders standing on trains going southbound and northbound

Aging Fleet

Table 1.2: Caltrain Fleet Inventory

SERIES	QUANTITY	NUMBER OF SEATS	YEAR OF MANUFACTURE	MAKE	RETIRE DATE
Locomotives					
F40 PH-2	5	na	1985	GM - EMD	2015
F40PH-2-CAT	15	na	1985-1987	GM - EMD	2015-2017
F40 PH-2C	3	na	1998	Boise Locomotive	2028
MP36PH-3C	6	na	2003	Motive Power	2033
Passenger Cars					
Gallery Trailer	26	142	1985-1987	Nippon Sharyo	2015-2017
Gallery Trailer	16	148	1985-1987	Nippon Sharyo	2015-2017
Gallery Trailer	14	120	1999-2000	Nippon Sharyo	2030
Gallery Cab (Bike)	10	108	1985-1987	Nippon Sharyo	2015-2017
Gallery Cab (Bike)	6	78	1999-2000	Nippon Sharyo	2030
Gallery Cab (Bike)	21	97	1985	Nippon Sharyo	2015
Bi-Level Trailer*	16	149	1997	Bombardier	2027
Bi-Level Trailer	9	144	2002	Bombardier	2032
Bi-level Trailer (Bike)	2	114	2002	Bombardier	2032
Bi-level Trailer (Bike)	5	114	2001-2002	Bombardier	2031-2032
Bi-level Trailer (Bike)	2	114	2008	Bombardier	2038
Bi-level Trailer (Bike)	1	127	2002	Bombardier	2032
Bi-Level Trailer	6	140	2008	Bombardier	2038

*Trailers recently acquired from Metrolink with refurbishment ongoing.



At Retirement Age: 20/29 loco; 73/134 cars

Project Description

Area	Project	Service
51 miles San Francisco to San Jose (Tamien Station)	Electrification: <ul style="list-style-type: none">• Overhead Contact System (OCS)• Traction Power Facilities Electric Trains (EMUs) <ul style="list-style-type: none">• 75 percent of fleet	Up to 79 mph Service Increase <ul style="list-style-type: none">• 6 trains / hour / direction• More station stops / reduced travel time• Restore Atherton & Broadway service Mixed-fleet service (interim period) Continue tenant service <ul style="list-style-type: none">• ACE, Capital Corridor, Amtrak, Freight



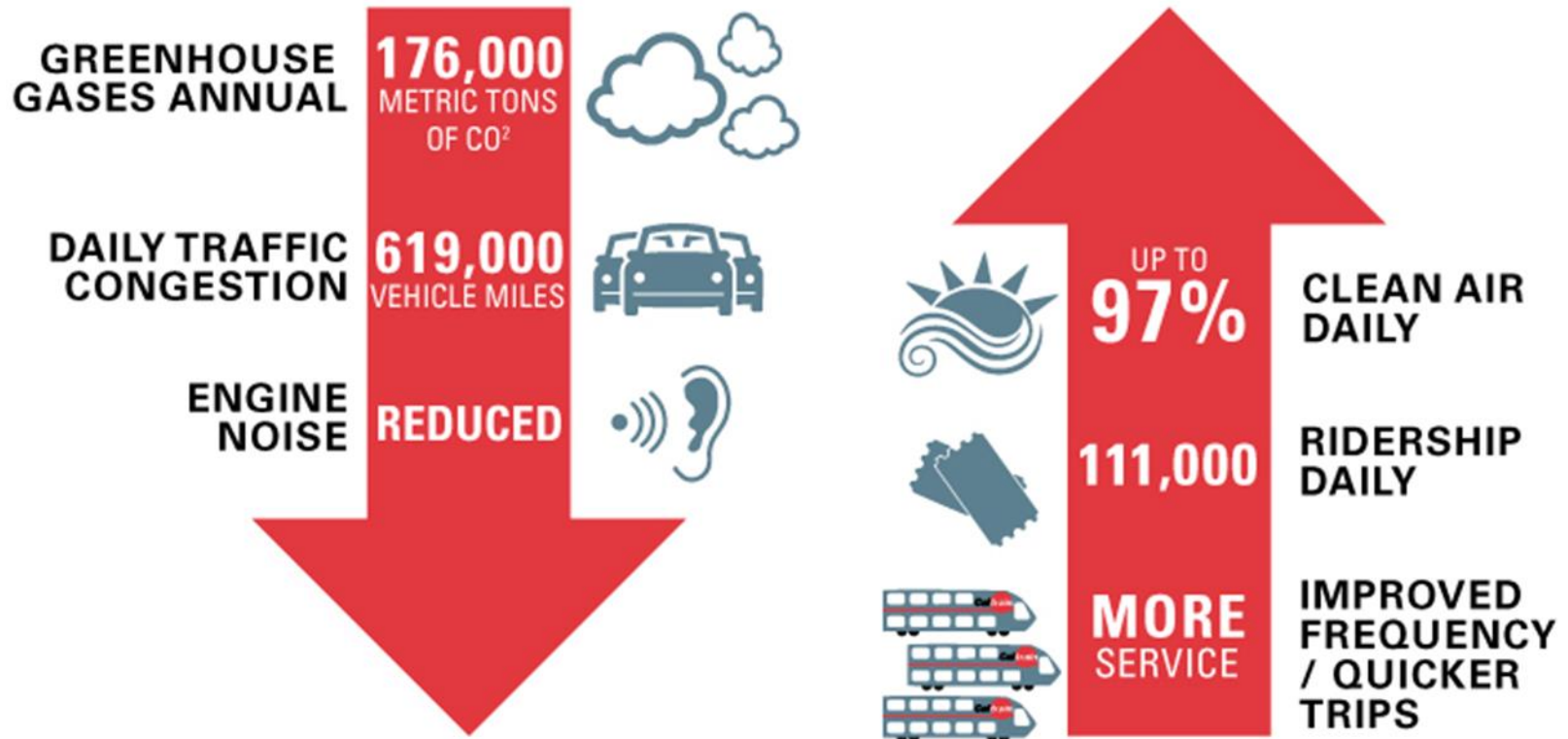
Service Benefits

Metric	Today	PCEP
Example Baby Bullet Train		
Retain 5-6 stops	60 minutes	45 minutes
Retain SF to SJ 60 minutes	6 stops	13 stops
Example Redwood City Station		
Train stops / peak hour	3	5



Note: Prototypical Train and Schedule

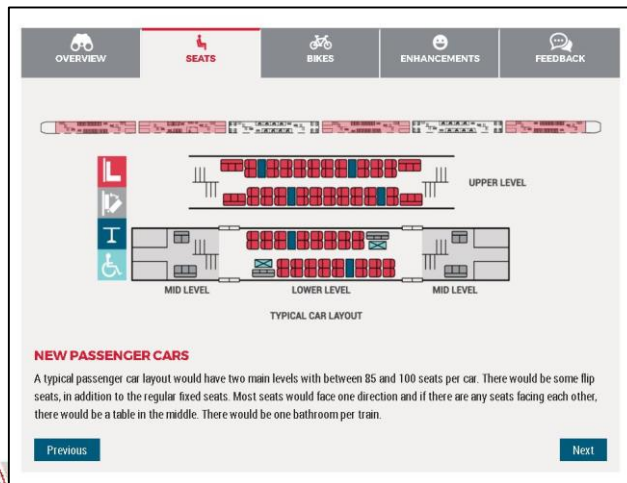
Key Regional Benefits (2040)



Note: 2013 BAC Report, generates \$2.5B economic activity and 9,600 jobs

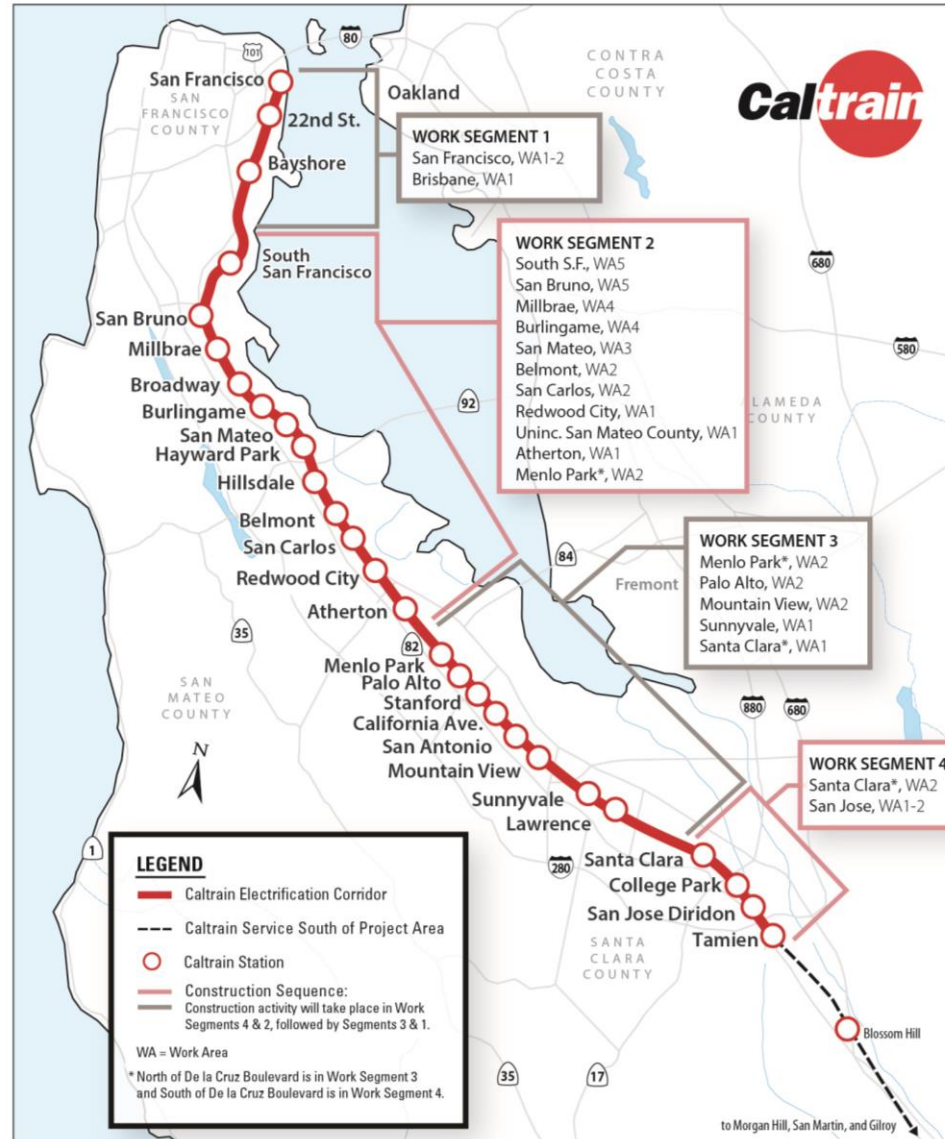
Electric Train

- 2016 Capacity Board Decision (bike to seat ratio, onboard bathrooms, upper doors ‘not precluded’)
- 2017 Design Progressing w/ Additional Public Input
 - Completed: Exterior design, Seat colors, Bike Storage, ADA restroom
- 2019 Virtual Reality 360 Tour

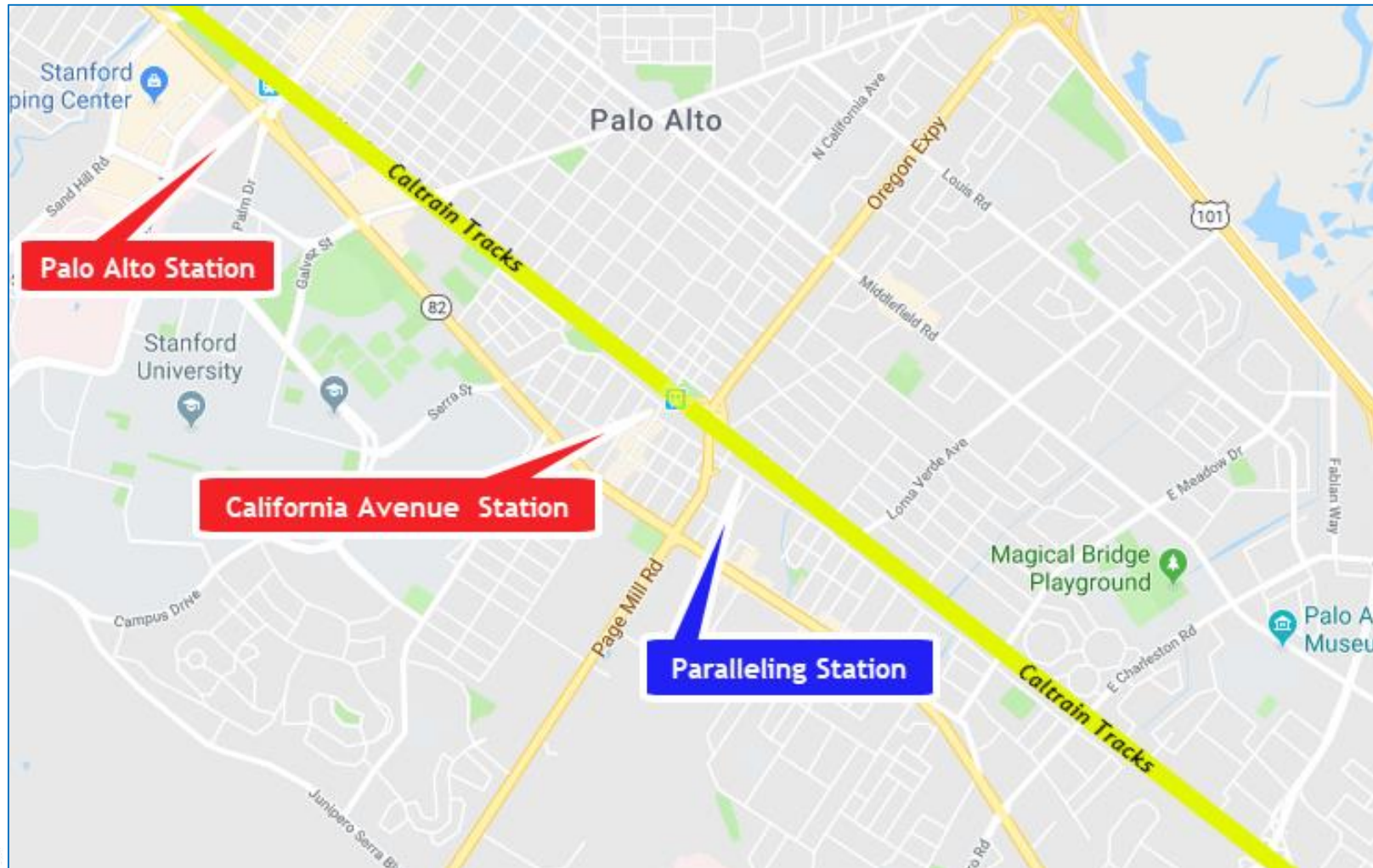


CalMod Construction Phasing

- 51 Miles Corridor
- 4 Work Segments
- 3,000 Poles
- 10 Traction Power Facilities



Palo Alto – Work Segment 3



Palo Alto Work Area 3.8 miles

Field Work Status

Pre-Construction Work Completed	<ul style="list-style-type: none">• Utility Survey• Geotechnical Investigations• Disposal of Soil from Geotechnical Investigations• Soil Resistivity Testing• Site Surveys• Signal Cable Inspections
Work In Progress	<ul style="list-style-type: none">• Foundation Potholing
Future Work	<ul style="list-style-type: none">• Tree Pruning and Removal• Foundation Installation• Pole Installation• Wire Installation• Paralleling Station





Construction Activities Schedule

Palo Alto

Date	Work Activity	Expected Duration*
Summer/Fall 2018	Potholing	2-3 months
Fall 2018	Tree Pruning/Removal	2-3 months
Spring/Summer 2019	Foundation Installation	1-2 months
Summer 2019	Paralleling Station Construction	4-6 months
Summer / Fall 2019	Pole/Wire Installation	4-5 months



*Expected duration indicates first and last day of activity. Number of actual work days will be fewer.

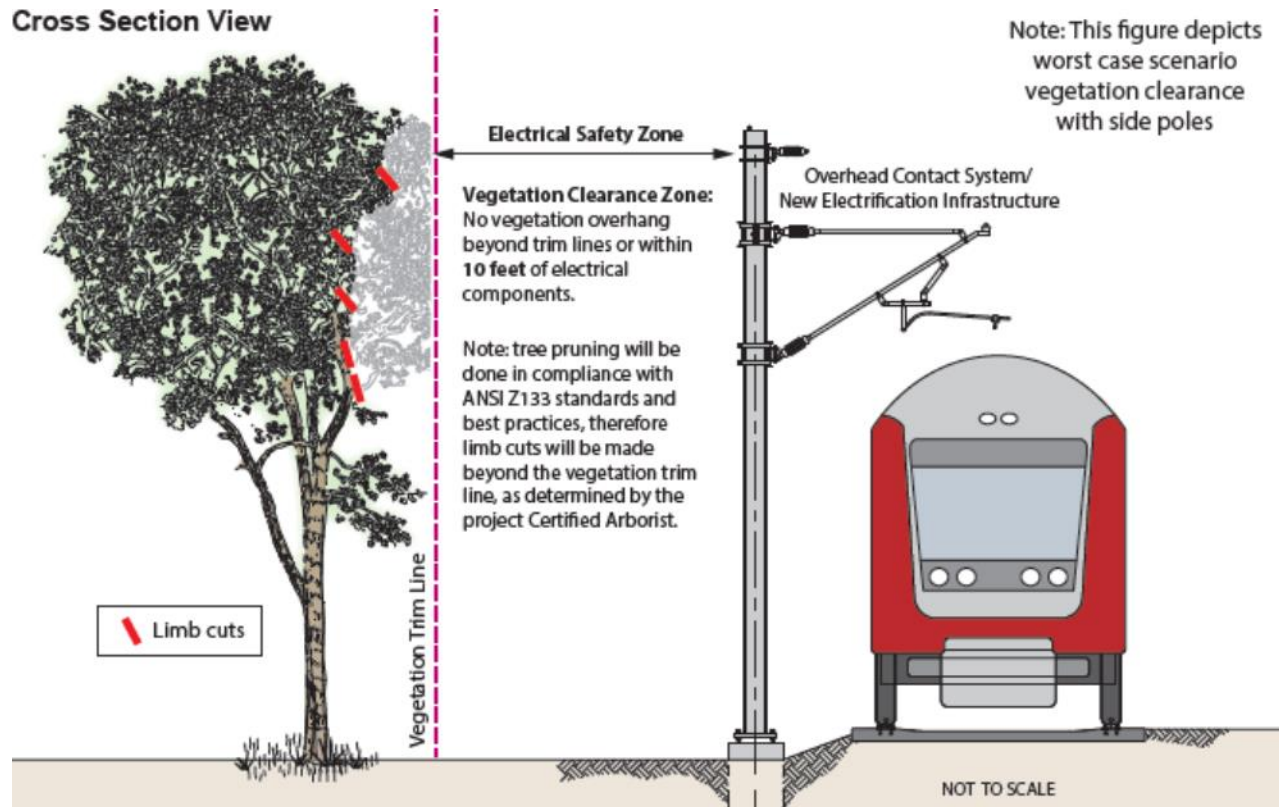


Potholing



Approx. 263 Potholes in Palo Alto

Tree Pruning and Replacement



Vegetation cleared for Electrical Safety Zone

City of Palo Alto: Tree Pruning and Replacement Plan

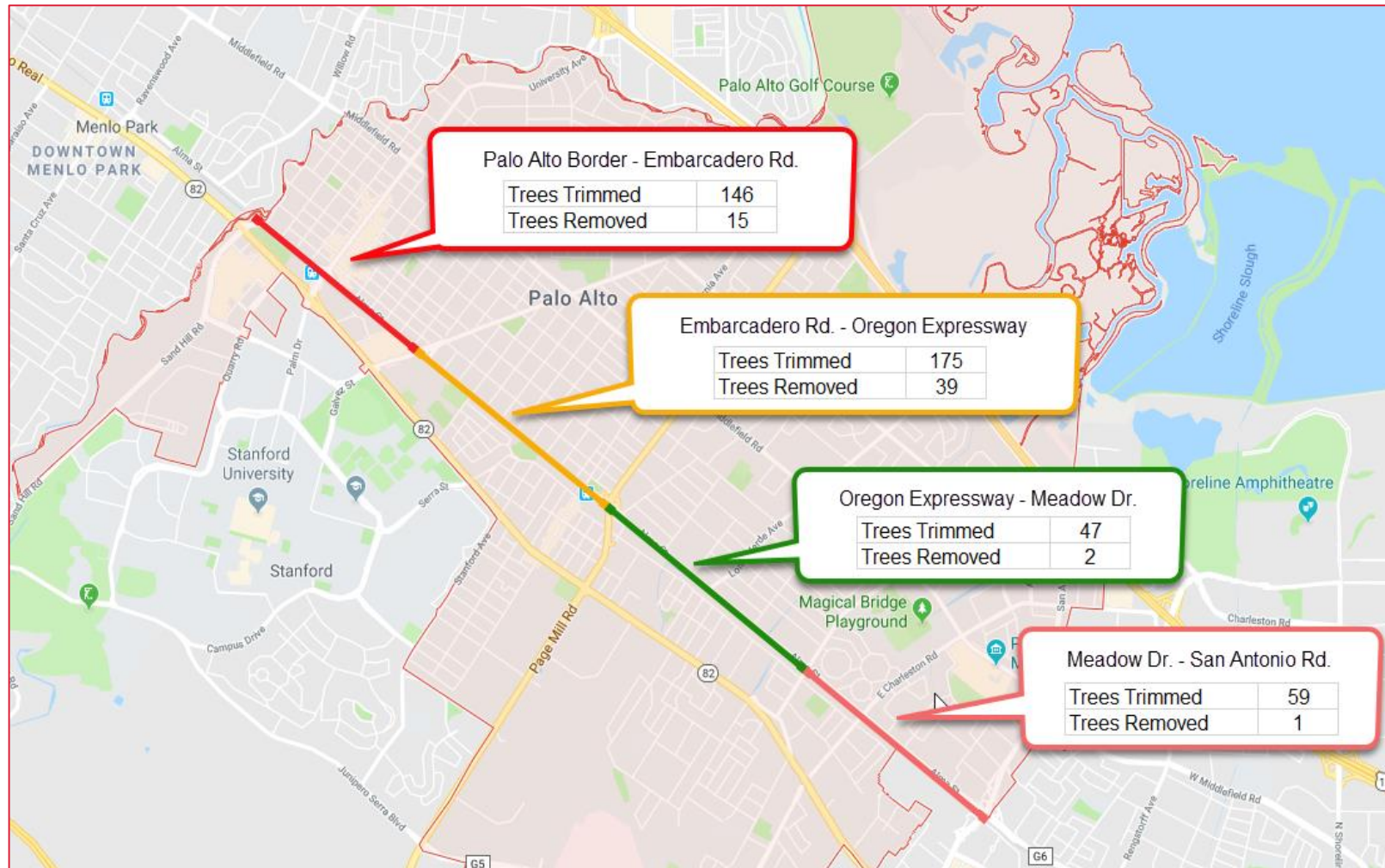
City of Palo Alto			
	Caltrain Right of Way	Public Property	Private Property
Trees Removed	52	5	0
Trees Pruned >25%	60	10	0
Trees Pruned <25%	236	91	38

120 Trees will be replaced per the Palo Alto Tree Replacement Plan



Note: Information may change as the design progresses

Summary Map of Tree Work



Foundation Construction

- Excavation
- Rebar and Anchor Installation
- Electrical Grounding
- Concrete Fill



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Foundation Installation



On Track Equipment



Pole Installation

- 3,000 Installed throughout Corridor
 - Approx. 196 poles in Palo Alto
- Pole Height: 30-45.5'
- Pole Spacing: ~180' apart



Pole Types



Single Track Cantilever



Two Track Cantilever

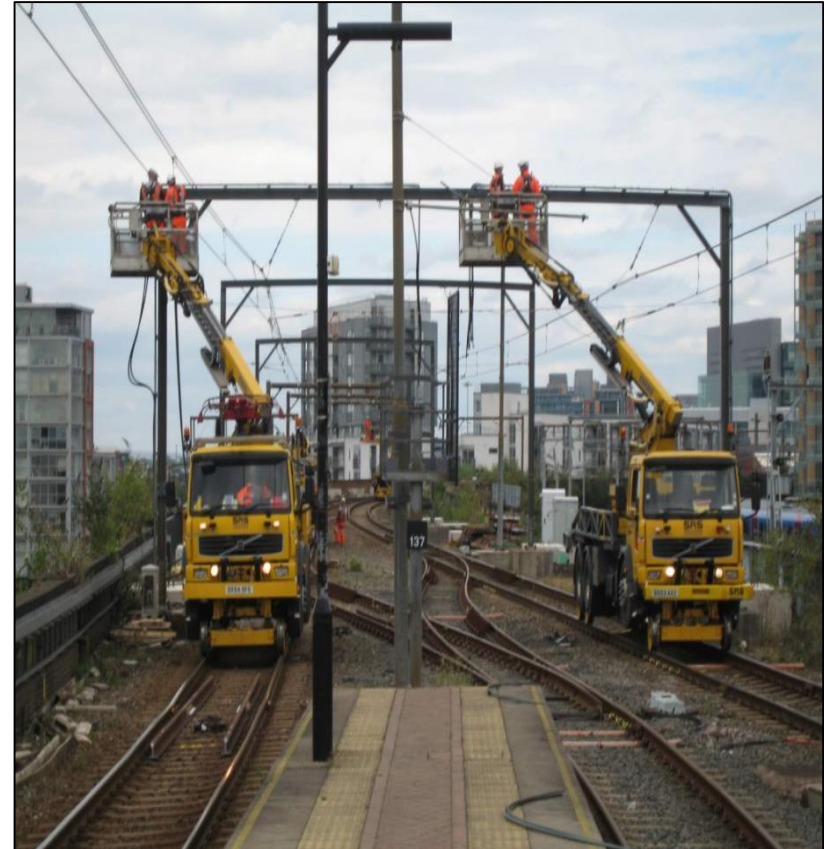


Example of Poles Currently Planned for Use in Palo Alto

Pole Types



Center



Portal



Example of Poles Currently Planned for Use in Palo Alto

Station Pole Color Options

location	municipality	Mile Post	existing pole color	existing furniture color	existing color shelter	Option 1 color for Poles	Option 2 color for poles	Option 3 color for poles
Palo Alto	Palo Alto	30.00-30.2	grey	brown	n/a	color FS 23522	color FS 36495	color FS 30032
California	Palo Alto	31.80	black	black/brown	black	color FS 27040	color FS 30032	color FS 14052
Stanford Stadium	Palo Alto					color FS 14052	color FS 14052	color FS 14052



Pole Installation



Current Pole Installation

Stringing Wire



Shunt wires to be installed where overhead utilities cross tracks

Traction Power Facilities

- 10 Traction Power Facilities Installed throughout Corridor
- Facility Components
 - Transformer
 - Gantries (up to 50')
 - Control House
- Provides electrical power to trains through the Overhead Contact System
- Unmanned, secure, lighted facility



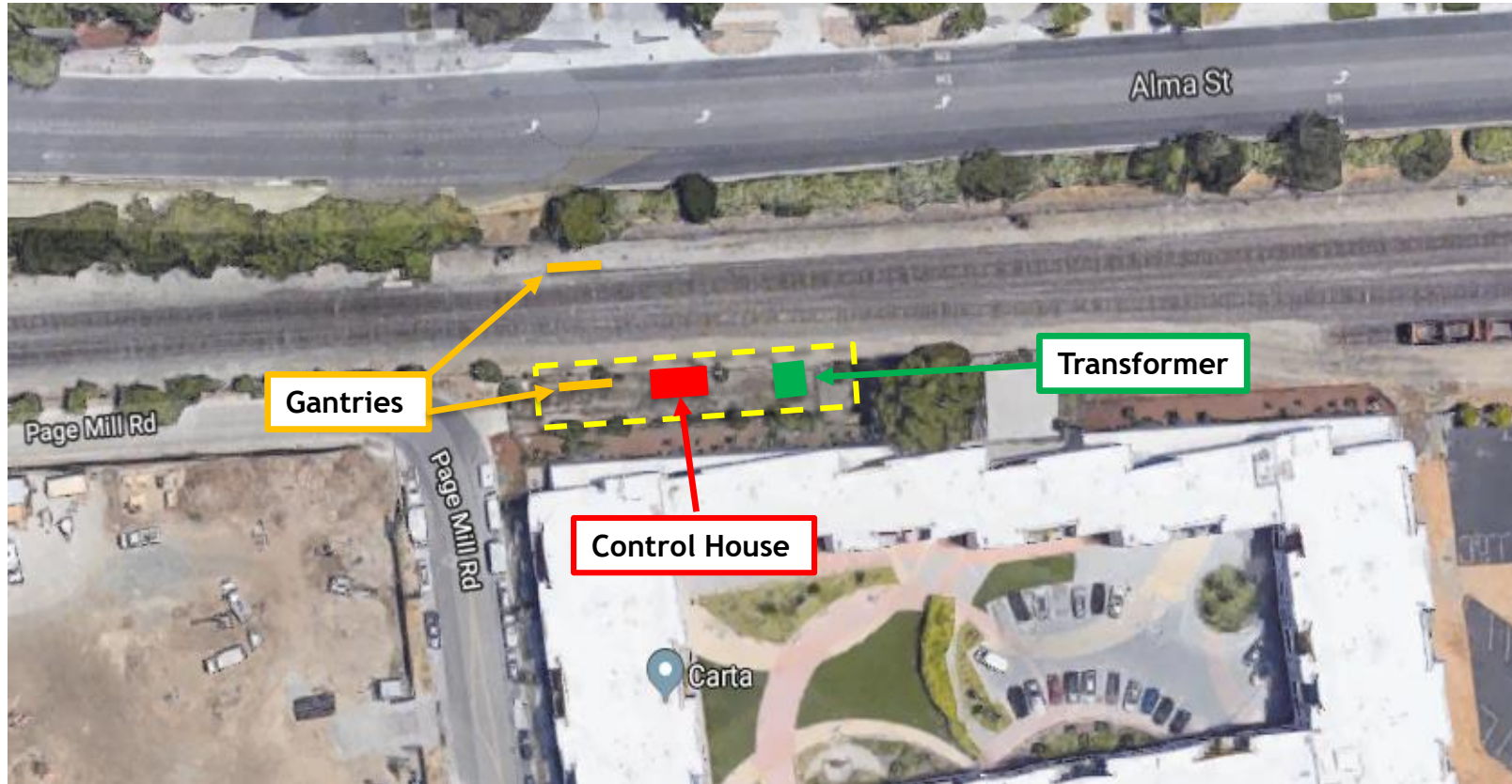
Paralleling Station 5

- Located south of Page Mill Road on Caltrain Property
 - Coordination with City on location during EIR
- Vegetation Screening will be implemented with review and input from City Staff
- Control House Color to be selected by City





Paralleling Station 5 Location



Based on 35% Drawings. Subject to Change.

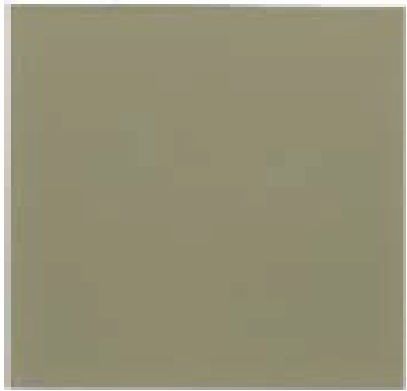


Example Paralleling Station



Example from Amtrak Northeast Corridor

Control House Color Options



Carlsbad Canyon



Juniper Green



Beetle



Construction Impacts

- Work will occur during day and night
- Some 24 hour weekend work
- Crews will utilize acoustical barrier blankets and position lights away from homes
- Dedicated hotline for construction complaints



Caltrain Service During Tunnel Work

- Weekends - Oct 6, 2018 to March 17, 2019
 - Caltrain service north of the Bayshore Station will be suspended on the weekends
 - Bus service will be provided from Bayshore to 4th and King and 22nd Street stations
- Weekday service will remain unchanged
- Caltrain service south of Bayshore will remain unchanged
- Bus schedule available at Caltrain.com



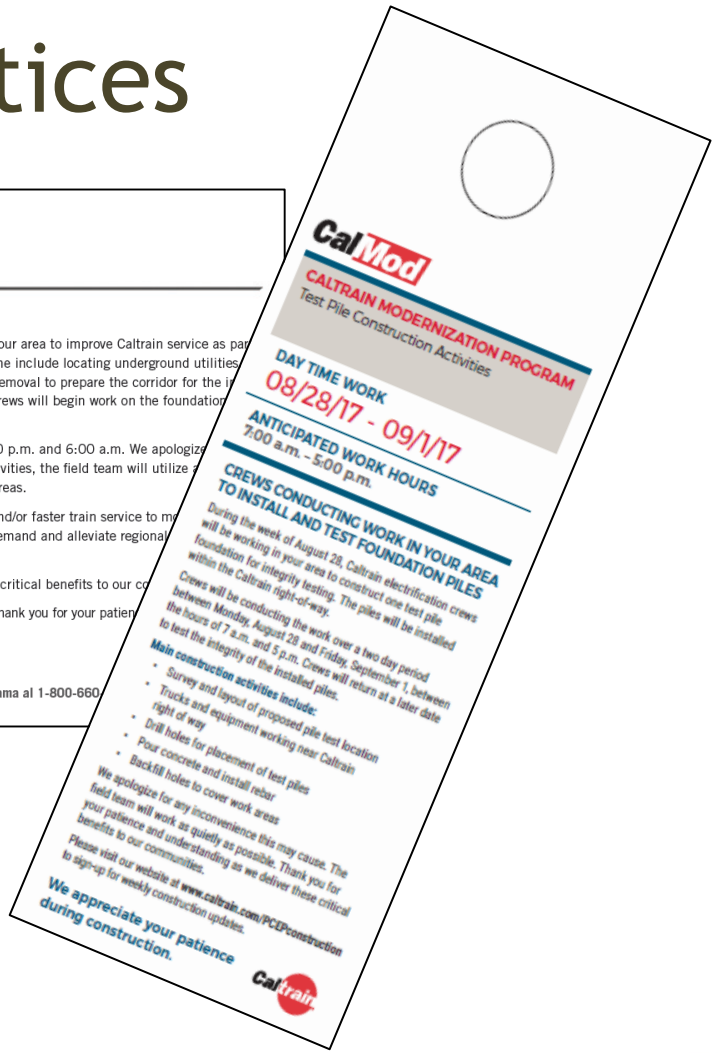
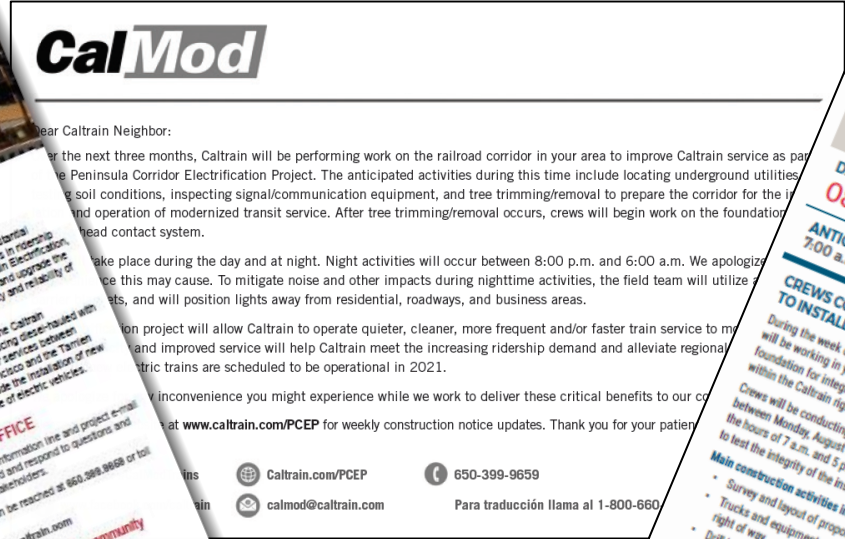
Public Outreach

- Subscribe to Weekly Updates
 - Visit www.calmod.org
- Additional Community Meetings
 - Pole and Wire Installation
 - Paralleling Station Construction
- Social Media
- Construction Outreach Office



Public Outreach

Physical Notices







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