Agenda

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

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

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

Average Daily Ridership

1998
2018
At Capacity Today

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

### Table 1.2: Caltrain Fleet Inventory

<table>
<thead>
<tr>
<th>SERIES</th>
<th>QUANTITY</th>
<th>NUMBER OF 3CATS</th>
<th>YEAR OF MANUFACTURE</th>
<th>MAKE</th>
<th>RETIRE DATE</th>
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</thead>
<tbody>
<tr>
<td><strong>Locomotives</strong></td>
<td></td>
<td></td>
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<tr>
<td>F40 PH-2</td>
<td>5</td>
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<td>1985</td>
<td>GM - EMD</td>
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<td>F40 PH-2C</td>
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<td>MP36PH-3C</td>
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<td>2003</td>
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<td><strong>Passenger Cars</strong></td>
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<tr>
<td>Gallery Trailer</td>
<td>14</td>
<td>120</td>
<td>1999-2000</td>
<td>Nippon Sharyo</td>
<td>2030</td>
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<td>Gallery Cab (Bike)</td>
<td>10</td>
<td>108</td>
<td>1985-1987</td>
<td>Nippon Sharyo</td>
<td>2015-2017</td>
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<td>Gallery Cab (Bike)</td>
<td>6</td>
<td>78</td>
<td>1999-2000</td>
<td>Nippon Sharyo</td>
<td>2030</td>
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<tr>
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<td>97</td>
<td>1985</td>
<td>Nippon Sharyo</td>
<td>2015</td>
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<tr>
<td>Bi-Level Trailer*</td>
<td>16</td>
<td>149</td>
<td>1997</td>
<td>Bombardier</td>
<td>2027</td>
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<tr>
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<td>144</td>
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<td>Bombardier</td>
<td>2032</td>
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<tr>
<td>Bi-level Trailer (Bike)</td>
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<td>114</td>
<td>2002</td>
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<td>2032</td>
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<td>Bombardier</td>
<td>2031-2032</td>
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<tr>
<td>Bi-level Trailer (Bike)</td>
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<td>2008</td>
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<td>2038</td>
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<td>Bombardier</td>
<td>2032</td>
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<tr>
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<td>140</td>
<td>2008</td>
<td>Bombardier</td>
<td>2038</td>
</tr>
</tbody>
</table>

*Trailers recently acquired from Metrolink with refurbishment ongoing.

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

<table>
<thead>
<tr>
<th>Area</th>
<th>Project</th>
<th>Service</th>
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<tbody>
<tr>
<td>51 miles</td>
<td>Electrification:</td>
<td>Up to 79 mph</td>
</tr>
<tr>
<td></td>
<td>• Overhead Contact System (OCS)</td>
<td>Service Increase</td>
</tr>
<tr>
<td></td>
<td>• Traction Power Facilities</td>
<td>• 6 trains / hour / direction</td>
</tr>
<tr>
<td></td>
<td>Electric Trains (EMUs)</td>
<td>• More station stops / reduced travel time</td>
</tr>
<tr>
<td></td>
<td>• 75 percent of fleet</td>
<td>• Restore Atherton &amp; Broadway service</td>
</tr>
<tr>
<td>San Francisco to San Jose</td>
<td></td>
<td>Mixed-fleet service (interim period)</td>
</tr>
<tr>
<td>(Tamien Station)</td>
<td></td>
<td>Continue tenant service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ACE, Capital Corridor, Amtrak, Freight</td>
</tr>
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</table>
## Service Benefits

<table>
<thead>
<tr>
<th>Metric</th>
<th>Today</th>
<th>PCEP</th>
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<tbody>
<tr>
<td>Example Baby Bullet Train</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retain 5-6 stops</td>
<td>60 min</td>
<td>45 min</td>
</tr>
<tr>
<td>Retain SF to SJ 60 minutes</td>
<td>6 stops</td>
<td>13 stops</td>
</tr>
<tr>
<td>Example Redwood City Station</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Train stops / peak hour</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

Note: Prototypical Train and Schedule
Key Regional Benefits (2040)

- **Greenhouse Gases Annual**: 176,000 metric tons of CO²
- **Daily Traffic Congestion**: 619,000 vehicle miles
- **Engine Noise**: Reduced

**Up to 97%**

- **Clean Air Daily**
- **Ridership Daily**
- **Improved Frequency / Quicker Trips**

111,000 More Service

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 | • Utility Survey  
|                               | • Geotechnical Investigations  
|                               | • Disposal of Soil from Geotechnical Investigations  
|                               | • Soil Resistivity Testing  
|                               | • Site Surveys  
|                               | • Signal Cable Inspections  

| Work In Progress | • Foundation Potholing  

| Future Work | • Tree Pruning and Removal  
|            | • Foundation Installation  
|            | • Pole Installation  
|            | • Wire Installation  
|            | • Paralleling Station  

## Construction Activities Schedule

### Palo Alto

<table>
<thead>
<tr>
<th>Date</th>
<th>Work Activity</th>
<th>Expected Duration*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer/Fall 2018</td>
<td>Potholing</td>
<td>2-3 months</td>
</tr>
<tr>
<td>Fall 2018</td>
<td>Tree Pruning/Removal</td>
<td>2-3 months</td>
</tr>
<tr>
<td>Spring/Summer 2019</td>
<td>Foundation Installation</td>
<td>1-2 months</td>
</tr>
<tr>
<td>Summer 2019</td>
<td>Paralleling Station Construction</td>
<td>4-6 months</td>
</tr>
<tr>
<td>Summer / Fall 2019</td>
<td>Pole/Wire Installation</td>
<td>4-5 months</td>
</tr>
</tbody>
</table>

*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

Vegetation Clearance Zone:
- No vegetation overhang beyond trim lines or within 10 feet of electrical components.

Note: This figure depicts worst case scenario vegetation clearance with side poles.

Overhead Contact System/ New Electrification Infrastructure

Vegetation Trim Line

Limb cuts

Cross Section View

NOT TO SCALE
## City of Palo Alto: Tree Pruning and Replacement Plan

<table>
<thead>
<tr>
<th></th>
<th>Caltrain Right of Way</th>
<th>Public Property</th>
<th>Private Property</th>
</tr>
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<tbody>
<tr>
<td>Trees Removed</td>
<td>52</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Trees Pruned &gt;25%</td>
<td>60</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Trees Pruned &lt;25%</td>
<td>236</td>
<td>91</td>
<td>38</td>
</tr>
</tbody>
</table>

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

Palo Alto Border - Embarcadero Rd.
- Trees Trimmed: 146
- Trees Removed: 15

Embarcadero Rd. - Oregon Expressway
- Trees Trimmed: 175
- Trees Removed: 39

Oregon Expressway - Meadow Dr.
- Trees Trimmed: 47
- Trees Removed: 2

Meadow Dr. - San Antonio Rd.
- Trees Trimmed: 59
- Trees Removed: 1
Foundation Construction

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

Example of Poles Currently Planned for Use in Palo Alto

Center

Portal
<table>
<thead>
<tr>
<th>Location</th>
<th>Municipality</th>
<th>Mile Post</th>
<th>Existing Pole Color</th>
<th>Existing Furniture Color</th>
<th>Existing Color</th>
<th>Shelter</th>
<th>Option 1 Color for Poles</th>
<th>Option 2 Color for Poles</th>
<th>Option 3 Color for Poles</th>
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</thead>
<tbody>
<tr>
<td>Palo Alto</td>
<td>Palo Alto</td>
<td>30.00-30.2</td>
<td>grey</td>
<td>brown</td>
<td>n/a</td>
<td></td>
<td>color FS 23522</td>
<td>color FS 36495</td>
<td>color FS 30032</td>
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<tr>
<td>California</td>
<td>Palo Alto</td>
<td>31.80</td>
<td>black</td>
<td>black/brown</td>
<td>black</td>
<td></td>
<td>color FS 27040</td>
<td>color FS 30032</td>
<td>color FS 14052</td>
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<tr>
<td>Stanford Stadium</td>
<td>Palo Alto</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>color FS 14052</td>
<td>color FS 14052</td>
<td>color FS 14052</td>
</tr>
</tbody>
</table>
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
CALMOD CONTACT INFORMATION

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