Peninsula Corridor
Electrification Update Meeting
Sequoia High School
November 01, 2017

Agenda

• Caltrain System Overview
• Project Overview
• Electric Multiple Unit (EMU) Design
• Redwood City and North Fair Oaks Construction Activities
• Questions
Caltrain System

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

Ridership

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Daily Ridership</th>
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<tbody>
<tr>
<td>1997</td>
<td>23,000</td>
</tr>
<tr>
<td>2000</td>
<td>25,000</td>
</tr>
<tr>
<td>2003</td>
<td>30,000</td>
</tr>
<tr>
<td>2005</td>
<td>35,000</td>
</tr>
<tr>
<td>2009</td>
<td>40,000</td>
</tr>
<tr>
<td>2012</td>
<td>45,000</td>
</tr>
<tr>
<td>2015</td>
<td>50,000</td>
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</table>
At Capacity Today

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

Aging Fleet

<table>
<thead>
<tr>
<th>SERIES</th>
<th>QUANTITY</th>
<th>NUMBER OF SEATS</th>
<th>YEAR OF MANUFACTURE</th>
<th>MAKE</th>
<th>RETIRE DATE</th>
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<tbody>
<tr>
<td>Locomotives</td>
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<td>GM - EMD</td>
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<td>2003</td>
<td>Motive Power</td>
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<td>Passenger Cars</td>
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<tr>
<td>Gallery Trailer</td>
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<td>120</td>
<td>1999-2000</td>
<td>Nippon Sharyo</td>
<td>2030</td>
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<tr>
<td>Gallery Cab (Bike)</td>
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<td>1985-1987</td>
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<td>2015-2017</td>
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<tr>
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<td>78</td>
<td>1999-2000</td>
<td>Nippon Sharyo</td>
<td>2030</td>
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<tr>
<td>Gallery Cab (Bike)</td>
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<td>97</td>
<td>1985</td>
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<td>Bi-Level Trailer*</td>
<td>18</td>
<td>149</td>
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<td>2027</td>
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<td>Bombardier</td>
<td>2032</td>
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<tr>
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<td>2002</td>
<td>Bombardier</td>
<td>2032</td>
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<td>2001-2002</td>
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<td>2031-2033</td>
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<tr>
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<td>2038</td>
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<tr>
<td>Bi-Level Trailer</td>
<td>6</td>
<td>140</td>
<td>2008</td>
<td>Bombardier</td>
<td>2038</td>
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</tbody>
</table>

*Trains recently acquired from Metrolink with refurbishment ongoing.
## Project Description

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

## Key Regional Benefits (2040)

- **Greenhouse Gasses Annual**
  - 176,000 metric tons of CO₂

- **Daily Traffic Congestion**
  - 619,000 vehicle miles

- **Engine Noise Reduced**

- **Up to 97% Clean Air Daily**

- **111,000 Ridership Daily**

- **Improved Frequency / Quicker Trips**

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

MILESTONES

- Caltrain strategic plan makes electrification a priority
- Environmental Clearance
- Award Contract
- Groundbreaking
- First Electric Train Arrives
- Passenger Service with Electric Trains
- Additional Capacity Improvements

*Please keep in mind that testing and construction will overlap as each segment will be tested individually, prior to final system testing.

Note: Schedule Subject to Change

Electric Train Design & Public Input
Peninsula Corridor Electrification Project
Electric Train Outreach: Phased

- 2016 Capacity Board Decision (bike to seat ratio, onboard bathrooms, upper doors)
- 2017 Design Progressing: Additional Public Input
- 2018 Virtual Reality 360 Tour

Electric Train Exterior Design Public Poll

<table>
<thead>
<tr>
<th>EXTERIOR DESIGN POLL RESULTS</th>
<th>6331 TOTAL VOTES</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>2665</td>
</tr>
<tr>
<td>2</td>
<td>814</td>
</tr>
<tr>
<td>3</td>
<td>1580</td>
</tr>
<tr>
<td>4</td>
<td>1272</td>
</tr>
</tbody>
</table>

1. 42.1%
2. 12.9%
3. 25%
4. 20.1%
Electric Train Exterior Design

WINNING DESIGN: OPTION 1

Electric Train Seat Design

WINNING DESIGN: OPTION B

SEAT POLL RESULTS

A 39.7%
B 60.3%
Electric Train Onboard Bike Storage Outreach

Station Outreach with Samples: August 8 to September 1

FEEDBACK COLLECTION PROCESS

+ BICYCLE ADVISORY COMMITTEE (BAC)
+ BIKE COALITION INPUT
+ ONLINE BIKE POLL
+ STATION OUTREACH
+ RIDER COMMENTS
Electric Train
Onboard Bike Storage Design

• Maximizes capacity
• Accommodates variety of bike types
• Recommended by:
  • Bicycle Advisory Committee
  • Bike Coalitions (SF and Silicon Valley)

Construction
Work Segment 2, Area 1
- Redwood City
- North Fair Oaks
## Field Work Status

<table>
<thead>
<tr>
<th>Work Completed to Date</th>
<th>Work In Progress and Upcoming</th>
<th>Future Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Utility Survey</td>
<td>• OCS Foundation Potholing</td>
<td>• OCS Pole Installation</td>
</tr>
<tr>
<td>• Geotechnical Investigations</td>
<td>• Signal Cable Potholing</td>
<td>• OCS Wire Installation</td>
</tr>
<tr>
<td>• Disposal of Soil from Geotechnical Investigations</td>
<td>• Tree Pruning and Removal</td>
<td></td>
</tr>
<tr>
<td>• Soil Resistivity Testing</td>
<td>• OCS Foundation Construction</td>
<td></td>
</tr>
<tr>
<td>• Site Surveys</td>
<td></td>
<td></td>
</tr>
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<td>• Signal Cable Inspections</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Potholing

- Images of workers performing potholing operations.
Future Construction Activities

Redwood City and North Fair Oaks

<table>
<thead>
<tr>
<th>Date</th>
<th>Work Activity</th>
<th>Expected Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late 2017/Early 2018</td>
<td>Tree Pruning/Removal</td>
<td>1-2 months</td>
</tr>
<tr>
<td>Summer 2018</td>
<td>Foundation Construction</td>
<td>3-4 months</td>
</tr>
<tr>
<td>Late 2018</td>
<td>Overhead Wiring Pole and Wire Installation</td>
<td>3-4 months</td>
</tr>
</tbody>
</table>

Tree Pruning and Replacement

- Vegetation cleared for Electrical Safety Zone

Note: This figure depicts worst case scenario vegetation clearance with all poles.
## Redwood City: Tree Pruning and Replacement Plan

<table>
<thead>
<tr>
<th></th>
<th>Caltrain Right of Way</th>
<th>Private Property</th>
<th>Public Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees Removed</td>
<td>16</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Trees Pruned &gt;25%</td>
<td>4</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Trees Pruned &lt;25%</td>
<td>28</td>
<td>7</td>
<td>37</td>
</tr>
</tbody>
</table>

*Note: Information may change as the design progresses.*

## North Fair Oaks: Tree Pruning and Replacement Plan

<table>
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<tr>
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<td>17</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Trees Pruned &gt;25%</td>
<td>1</td>
<td>29</td>
<td>3</td>
</tr>
<tr>
<td>Trees Pruned &lt;25%</td>
<td>55</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>

*Note: Information may change as the design progresses.*
Foundation Work

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

Foundation Specifics

- Approx. 130 poles installed in Redwood City
- Approx. 80 poles in North Fair Oaks
- Foundation size varies from 30” to 42”
- Foundation spacing approx. 180’ apart
Pole Foundation Work

Will take place on and off track

DrillTech on track foundation train

DrillTech off-track OCS Drill Rig

Pole Installation

On/off-track crane for installation

Wide flange & square poles
Overhead Contact System (OCS)
Will take place on-track

Construction Impacts

- Daytime work and night work from 8 p.m. - 6 a.m.
- Some 24 hour weekend work
- Crews will utilize acoustic barrier blankets and position lights away from homes
- Dedicated hotline for construction complaints
Public Outreach

• Subscribe to Weekly Updates
  – Visit caltrain.com/pcepconstruction

• Additional Community Meetings
  – Pole and Wire Installation

• Construction Outreach Office

Public Outreach

• Physical Notices
Construction Contact Information

Email: calmod@caltrain.com
Phone: 650.399.9659
Toll Free: 800.660.4287

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San Mateo, CA 94403
9 a.m. - 6 p.m. Monday-Friday

www.caltrain.com/pcepconstruction