Advanced Signal System (CBOSS PTC)

Updated Installation Work Plan

LPMG Meeting
September 25, 2014

Context
Caltrain Modernization Program

• Projects
  – Advanced Signal System (2015)
  – Corridor Electrification and Electric Multiple Units (2019)

Project Description

• Communications Based Overlay Signal System (CBOSS) Positive Train Control (PTC)
• Fiber Optic Network
• Project Requirements
  – Includes federal mandate (PTC)
  – Improves Caltrain performance
• Project Partners
  – FRA, UP, CHSRA, JPB
• Needed for Blended System
CBOSS PTC Requirements

- **PTC**
  - Prevent train to train collisions
  - Prevent over speed derailments
  - Prevent incursions into established work zones
  - Prevent movement through a misaligned switch
  - Interoperability

- **CBOSS**
  - Enhanced crossing safety / performance
  - Improved headways and operational flexibility
  - Enforcement of scheduled station stops
  - Schedule management
  - Employee In Charge

### Project Total Cost and Milestones

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (in millions)</th>
<th>Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Planning and Procurement</td>
<td>$5</td>
<td>2010 - 2011</td>
</tr>
<tr>
<td>Phase 1 - Critical Design</td>
<td>$25</td>
<td>2012 – 2013</td>
</tr>
<tr>
<td>Phase 2 - Final Design, Data Communications Subsystem &amp; Fiber Backbone Installation</td>
<td>$51</td>
<td>2013 – 2014</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$231</strong></td>
<td></td>
</tr>
</tbody>
</table>
# Installation Work Update

## Progression: South to North

### PHASE I (S. MP26)
- **Segment 3**
  - SJ
  - Santa Clara (S of Lafayette Bld)
  - Segment 2
    - Santa Clara (N of Lafayette Bld)
    - Sunnyvale
    - Mountain View
    - Palo Alto
    - Menlo Park
    - Atherton
    - Redwood City (S Dumbarton Spur)

### PHASE II (N. MP26)
- **Segment 2**
  - Redwood City (N Dumbarton Spur)
  - SMC
  - San Carlos
  - Belmont
  - San Mateo
  - San Bruno
  - SSF (S of Oyster Point)
- **Segment 1**
  - SSF (N of Oyster Point)
  - Brisbane
  - SF

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- **Segment 1 (SSF – SF)** 8 Miles
- **Segment 2 (Santa Clara - SSF)** 36 Miles
- **Segment 3 (San Jose - Santa Clara)** 8 Miles
Milestones (Entire Corridor)

DCS Installation*
Wayside Installation*
BCCF Office Installation
CCF Office Installation
On-Board Installation
Segment 1 CB OSS PTC Dynamic, FRA & FRA Testing*
Segments 2 & 1 CB OSS PTC Dynamic Testing *
6 Month RAM Demonstration Testing

Installation Work Update

• DCS Installation
  – Potholing, boring, conduit, fiber, base stations
  – Segment 3 / 2 (S. MP26): 100% complete
  – Currently working in San Carlos, Belmont, San Mateo

• Wayside Installation
  – Modules installed at key system points
  – Associated gate activity
  – Segment 3 / 2 (S. MP26): 100% complete
  – Currently working in a variety of locations with wayside equipment
Installation Work Continued

• BCCF and CCF Installation
  – Modify space and install equipment
  – BCCF fit out 100% complete, installing servers

• On-board Equipment Installation
  – 6 of 8 pilot vehicle installations complete
  – #7 in progress

Testing (Pilot) Segment 3

• Dynamic Pre-FRA Testing
  – Scheduled to begin January 2015
  – Ongoing verification / validation track database

• FRA Testing
  – Expected first quarter 2015
Installation Pictures 1

Potholing

Installing Conduit

Installation Pictures 2

Preparing to install fiber

End of work ground verification test
Installation Pictures 3

Fiber Slicing

Confirming no dust or dirt on the fiber

Installation Pictures 4

Onboard Equipment

Simulator for training
Challenges

• Construction on an active railroad!
Outreach To Date

• Activities
  – CSCG (5 meetings)
  – LPMG (4 meetings, next 9/25/14)
  – One-on-one (each of the 17 cities/3 counties)
  – Community Groups, as requested (8 meetings)

• Communication tailored to location
  – Direct mailers (28), flyers stations
  – Website, social media, email, phone
  – City/County Staff coordination

Complaints 12+ months

• First six months
  – 5 people (noise, foliage disturbed, mud on street)
  – questions about the project

• Next six months
  – none
  – questions about the project
Next Steps

• Activities
  – Community Groups Meetings (as requested)

• Communication
  – Direct mailer residents
  – Website, social media, email, phone
  – Separate installation and testing notices

• City/County Staff coordination

Questions