Advanced Signal System
CBOSS PTC

Project Overview/Update

LPMG Meeting
August 22, 2013

CBOSS PTC - What is it?

• 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

• Caltrain
  – 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>
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</thead>
<tbody>
<tr>
<td>Project Planning and Procurement</td>
<td>$5</td>
<td>2010 - 2011</td>
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<tr>
<td>Phase 1 - Critical Design</td>
<td>$25</td>
<td>2012 – 2013</td>
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<tr>
<td>Phase 2 - Final Design, Data Communications Subsystem &amp; Fiber Backbone Installation</td>
<td>$51</td>
<td>2013 – 2014</td>
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<td>Total</td>
<td>$231</td>
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</table>
**Installation Milestones (Entire Corridor)**

- **DCS Installation**
- **DCS Test**
- **Wayside Installation**
- **BCCF Office Installation**
- **CCF Office Installation**
- **On-Board Installation**

**Segments 2 & 1 CBOSS PTC Static & Dynamic Testing**

**Segments 3 CBOSS PTC Static, Dynamic, Pre-FRA & FRA Testing**

**6 Month Demonstration Testing**

Revenue Service (Oct 15)

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
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</thead>
</table>

**Segments – South to North**

- **Segment 1 (SSF – SF) 8 Miles**
  - SSF (N of Oyster Point)
  - SSF (S of Oyster Point)
  - Brisbane
  - SF

- **Segment 3 (San Jose - Santa Clara) 8 Miles**
  - SJ: Santa Clara (S of Lafayette St)
  - Sunnyvale
  - Mountain View
  - Palo Alto
  - Menlo Park
  - Atherton
  - Redwood City
  - SMC
  - San Carlos
  - Belmont
  - San Mateo
  - San Bruno
  - SSF (S of Oyster Point)

- **Segment 2 (Santa Clara - SSF) 36 Miles**
  - Santa Clara (N of Lafayette St)
  - Sunnyvale
  - Mountain View
  - Palo Alto
  - Menlo Park
  - Atherton
  - Redwood City
  - SMC
  - San Carlos
  - Belmont
  - San Mateo
  - San Bruno
  - SSF (S of Oyster Point)
### Milestones (Example San Jose)

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<tr>
<th></th>
<th>Fall '13</th>
<th>Winter '13/14</th>
<th>Spring '14</th>
<th>Summer '14</th>
<th>Fall '14</th>
<th>Winter '14/15</th>
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<td>RF Base Stations</td>
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<td><strong>Fiber Installation</strong></td>
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#### Fiber Installation

- **Trench** *(42” deep x 9.5” wide, within the Caltrain right of way)*
- **Boring** *(required at many crossings, within the Caltrain right of way)*
- **Conduit on tunnel or bridge** *(clamps/hangers, may require lane closure during off-peak hours)*
Base Station Installation

Example 80' pole already on right of way

Pour foundation

Base station footprint

Outreach

• Activities (March – August 2013)
  – CSCG (3 meetings)
  – LPMG (2 meetings)
  – One-on-one (each of the 17 cities/3 counties)

• Next Steps
  – Permits / Installation coordination
  – Outreach plan and implementation (each jurisdiction)
Q/A