Outline

• Overview
• Features
• Demonstration
• Development Process
• Lessons Learned
Overview
About Caltrain

- Commuter Rail
- San Francisco to Gilroy
- 92 trains per day
- 52 miles of double track
- 28 stations serviced
Project Goal

Develop a more efficient Transit Asset Management Program to maintain assets in a state of good repair.
Overview

• Pilot program

• *Caltrain and Rail Surveyors and Engineers (RSE)* partnership
  - Caltrain - oversight and direction
  - RSE - application development
Schedule

- Dec 2011: Proposal
- Feb 2012: Project Implementation Plan approved
- Mar 2012: Development begin
- Aug 2013: Development completion
System Features
Core Functions

- Asset management
- Condition assessment
- Work order management
Asset Management

- Centralize information
- Organize documents and media
- Monitor asset conditions
- Integrate with Google Earth
<table>
<thead>
<tr>
<th><strong>Value</strong></th>
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<tr>
<td>Railroad</td>
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<td>Asset Type</td>
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<tr>
<td>Name</td>
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<tr>
<td>Milepost</td>
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<tr>
<td>Bridge No.</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>No. of Spans</td>
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<tr>
<td>Span Length</td>
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<tr>
<td>Total Length</td>
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<tr>
<td>Bridge Type</td>
</tr>
<tr>
<td>Year Built</td>
</tr>
<tr>
<td>Year Reconstructed</td>
</tr>
<tr>
<td>Latitude</td>
</tr>
<tr>
<td>Longitude</td>
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<tr>
<td>Google Earth</td>
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Asset Management

Asset Documents

- Asset Info
- Attachments
- Assessments
- Asset Work Order
- Change Log
- Capital Project

Bridge Details:
- No. of Span: 1
- Span Length: 100 F'
- Total Length: 104 F'
- Bridge Type: T to T
- GoogleEarth
- Latitude: 37.4471476
- Longitude: -122.1703976
- Year Built: 1960
- Year: Reconstruction

Latest Assessment:
- San Francquique Creek assessment 2013-08-02 16:11:33
- Template: Bridge Form (manual)
- Status: Finding

Overall Rating: (4)

Eating Legend:
1. Excellent
2. Good
3. Fair
4. Improvement Needed
5. Immediate Attention
6. Rebuild

- Paint
- Action under Truss
- Approach Path
- Track of Bridge

Note:
- No further details provided.
Asset Management

Photo Gallery

san-franciquito-1

Original
Asset Management
Condition Assessment

- Automated evaluation – track only
- Electronic inspection forms – all assets
- Online review and approval of inspection
Automatic Track Geometry Assessment

Rating legend

Rating table by per foot of track

Rating breakdown

1/10 mile strip chart
Automatic Track Geometry Assessment

Rating Legend: 1 - Excellent  2 - Good  3 - Fair  4 - Improvement Needed  5 - Immediate Attention  0 - No data
Automatic Track Geometry Assessment

Per-Foot Rating
Automatic Track Geometry Assessment

1/10 Mile Strip Chart
Automatic Track Geometry Assessment

Rating Distribution

- Rating-1 (71%)
- Rating-2 (5%)
- Rating-3 (13%)
- Rating-4 (5%)
- Rating-5 (6%)
Manual Assessment

Assessment Name: Army Street Assessment 2013-02-25 13:48:14
Template: Bridge Farm (BridgeFormat)
Asset: Army Street, Caltrain, 2013-01-21, Bridge
Status: Pending
Gallery: 4 all photos

**Overall Rating:**  (5)

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<td>Paint Yr.</td>
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<td>Clearance Signs</td>
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<td>Highway Minimum Clearance</td>
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<td>Local Limit Sign</td>
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<tr>
<td>Fire Protection</td>
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<tr>
<td>Action Under Trains</td>
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<td>Approach-Track</td>
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<tr>
<td>Track On Bridge</td>
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<td>✔</td>
<td>✔</td>
<td>✔</td>
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<td>Peeling on the side</td>
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**Stream Conditions** (5)

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<tr>
<td>Scour (Top of Rail to Streambed)</td>
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<td>✗</td>
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**Masonry** (2)

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Rating Legend: 1 - Excellent  2 - Good  3 - Fair  4 - Improvement Needed  5 - Immediate Attention  0 - No data
Assessment Approval
Work Order Management

- Create work orders
- Track progress
- Review work history
Work Order Management

Defect Description

Description of work

Work order status
## Work Order Management

### Work Order

**Bridge-San Franciquito Creek-2013-12-05** of type **Bridge Repairs**

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<td>Work Order Type</td>
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<td>Track</td>
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<td>Bridge, San Franciquito Creek, Caltrain</td>
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<td>Created By</td>
<td>lin</td>
</tr>
<tr>
<td>Created Date</td>
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<tr>
<td>Last Updated</td>
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</table>

### Work order status

- **Status:** New
- **Priority:** High
- **Track:** Both

### Attachments

<table>
<thead>
<tr>
<th>Attachment</th>
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<tr>
<td>CTAM_security</td>
<td>doc</td>
<td>112.5 KB</td>
<td>Wed Oct 23 2013 09:33am</td>
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Extended Features

- Customizable
- Web based
- Enhanced security
- Quick search
- Standardized data format
- Asset change log
Demo

Caltrain Asset Management System
Future Enhancements

• Cost tracking
• Automated trending and forecasting
• Life cycle analysis
• Defect alerts
• Module expansion
  • PTC
  • Rolling Stock
  • Electrification
Development Process
Define Baseline Requirements

- End user needs – Engineering, contract operator, operations
- Grant requirements
- Agency IT standards
- System security
Iterative Development Process

1. Discuss requirements
2. Define features and functions
3. Design
4. Develop
5. Review and test
6. Repeat
Caltrain Experience

- Review existing Caltrain SOGR Excel database
- Define system requirements
- Evaluate technology
- Select software applications
- Build workable framework
- Implement specific features
- Test and launch application
- Migrate data
Lessons Learned
What Worked

• Industry experts work closely with developer
• Small, diverse, and stable core project team
• Iterative development approach
• Weekly working sessions with specific deliverables
• Open to new ideas
What Could Be Better

• Aggressive schedule
• Involvement of other internal customers
• User interface design
Challenges Ahead

- Data migration
- Transition
- Maintenance
- Expansion of modules
- Addition of features
Special Acknowledgement

• Caltrain Team
  • SOGR Manager and technical expert – Pete Gutierrez
  • Project Oversight – Stephen Chao

• RSE Team
  • Database architect – William Wong
  • Project Support – James Chan, Jennifer Ma, Phil Leong, Stacy Ingersoll