



CTAMS Caltrain Transit Asset

3708 HEATHER CT
Management

*FTA Presentation
December 11, 2013*



Outline

- **Overview**
- **Features**
- **Demonstration**
- **Development Process**
- **Lessons Learned**

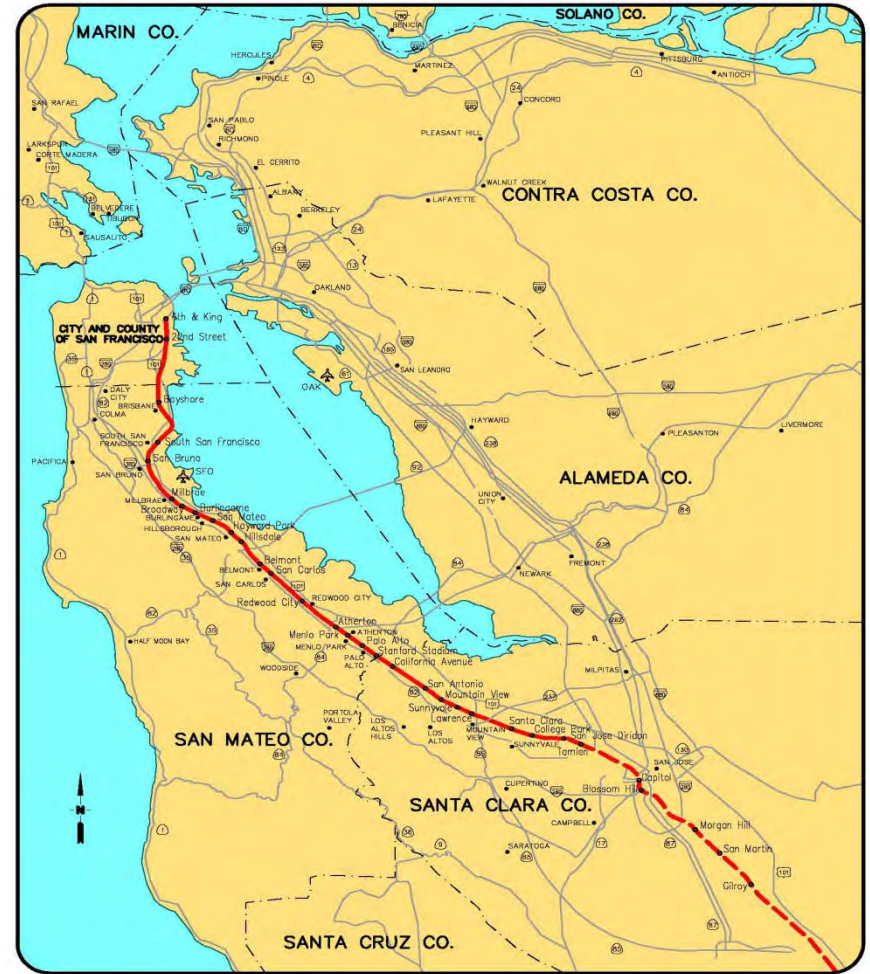


Overview



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.

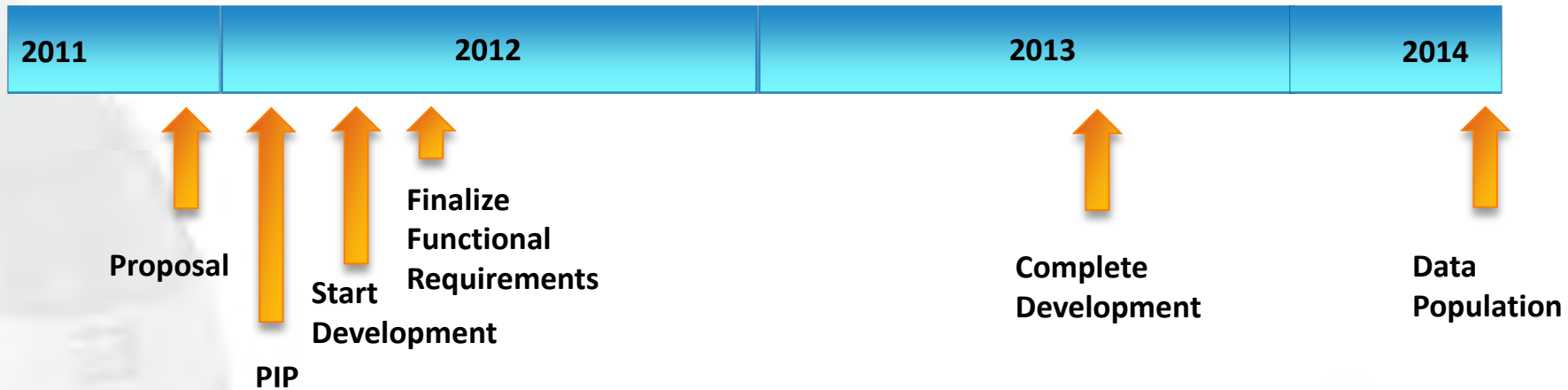


Overview

- **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**



Asset Management

Photo
Gallery

General
Asset
Information

Asset
Documents

Asset
Rating

The screenshot displays the CTAMS web application interface. At the top, there is a navigation bar with 'Home', 'Assets', 'Search', and 'Admin' options, along with a 'Quick Search' field and user information. Below this is a breadcrumb trail: 'Home > Structures > Bridges > San Franciquito Creek'. The main content area is titled 'Bridge San Franciquito Creek' and includes 'edit', 'move', and 'delete' buttons. A tabbed interface shows 'Asset Info' as the active tab. On the left, a table lists asset details:

Field	Value
Railroad	Caltrain
Asset Type	Bridge
Name	San Franciquito Creek
Milepost	29.69
Bridge No.	29.69
Name	San Franciquito Creek
No. of Spans	1
Span Length	100 ft
Total Length	104 ft
Bridge Type	TG TT
GoogleEarth	
Latitude	37.44727476
Longitude	-122.17039678
Year Built	1902
Year Reconstructed	

On the right, a 'Slideshow' section displays a large photo of the bridge and a grid of smaller thumbnail images. Below the slideshow, the 'Latest Assessment' is shown: 'San Franciquito Creek-assessment-2013-08-02.16.11.03', with a 'Template: Bridge Form (manual)' and 'Status: Pending'. The 'Overall Rating' is (4) with a yellow square icon. A 'Rating Legend' at the bottom explains the color coding: 1 - Excellent (blue), 2 - Good (green), 3 - Fair (yellow), 4 - Improvement Needed (orange), 5 - Immediate Attention (red), 0 - No data (grey). A table below shows specific ratings for 'General' (3), 'Paint Yr.' (3), 'Action Under Trains' (2), 'Approach-Track' (2), and 'Track On Bridge' (2).



General
Asset
Information

Asset Management

The screenshot shows a web application interface for asset management. The top navigation bar includes 'Home', 'Assets', 'Search', and 'Admin', along with a 'Quick Search' input field and user login/logout options. The main content area is divided into sections: 'Stations', 'Equipment', and 'Right of Way'. A large red circle highlights the 'Value' section, which contains the following data:

Field	Value
Railroad	Caltrain
Asset Type	Bridge
Name	San Franciquito Creek
Milepost	29.69
Bridge No.	29.69
Name	San Franciquito Creek
No. of Spans	1
Span Length	100 ft
Total Length	104 ft
Bridge Type	TG TT
Year Built	1902
Year Reconstructed	
Latitude	37.44727476
Longitude	-122.17039678
GoogleEarth	

Below the 'Value' section, there are status indicators for 'Paint', 'Action Under Trains', 'Approach-Track', and 'Track-On Bridge', each with a count and a colored dot. To the right, there are buttons for 'edit', 'move', and 'delete', and a gallery of images showing the bridge structure.



Asset Management



No. of Spans	1
Span Length	100 ft
Total Length	104 ft
Bridge Type	TG TT
GoogleEarth	
Latitude	37.44727476
Longitude	-122.17039678
Year Built	1902
Year Reconstructed	



1 original

Latest Assessment: San Franciquito Creek-assessment-2013-08-02.16.11.03
Template: Bridge Form(manual)
Status: Pending

Overall Rating: (4)

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

General (3)	rating	notes
Paint Yr.	(3)	
Action Under Trains	(2)	
Approach-Track	(2)	
Track On Bridge	(2)	

Asset Management

CTAMS 0.63 Home Assets Search Admin Quick Search

Photo Gallery

Home > Structures > Bridge San Francisco

Asset Info Attach

Field	Val
Railroad	Cal
Asset Type	Brig
Name	San
Milepost	29.4
Bridge No.	29.4
Name	San
No. of Spans	1
Span Length	100
Total Length	104
Bridge Type	TG
GoogleEarth	
Latitude	37.4
Longitude	-122
Year Built	190
Year Reconstructed	


Latest Assessment: S
Template: B
Status: P

Overall Rating: (4)

General (3)


Paint Yr.
Action Under Trains
Approach-Track
Track On Bridge

slideshow < previous next >



san-franciquito-1 original

1 2 next >



Right of Way

love delete

0 - No data

Asset Management

CTAMS 0.63 Home Assets Search Admin Quick Search tin | logout

Communication Crossing Signals **Asset Rating** Track Train Stations Equipment Right of Way

Home > Structures > Bridges > San Franciquito Creek

Bridge San Franciquito Creek (Caltrain) edit move delete

Overall Rating: (5) ●

Rating Legend: 1 - Excellent

General (5) ●	rating	notes
Paint Yr.	(1) ●	
Clearance Signs	(1) ●	
Highway Minimum Clearance	(5) ●	
Insignia	(1) ●	
Load Limit Sign	(1) ●	
Fire Protection	(5) ●	
Action Under Trains	(5) ●	
Approach-Track	(1) ●	
Track On Bridge	(1) ●	
Painting on the side	(1) ●	

Stream Conditions (2) ●	rating	notes
Paving (through bridges)	(1) ●	
Sheet Piling	(1) ●	
Scour (Top of Rail to Streambed)	(2) ●	
Rip Rap	(2) ●	
Fender System	(2) ●	

Approach-Track	(2) ●	
Track On Bridge	(2) ●	

4 - Improvement Needed 5 - Immediate Attention 0 - No data



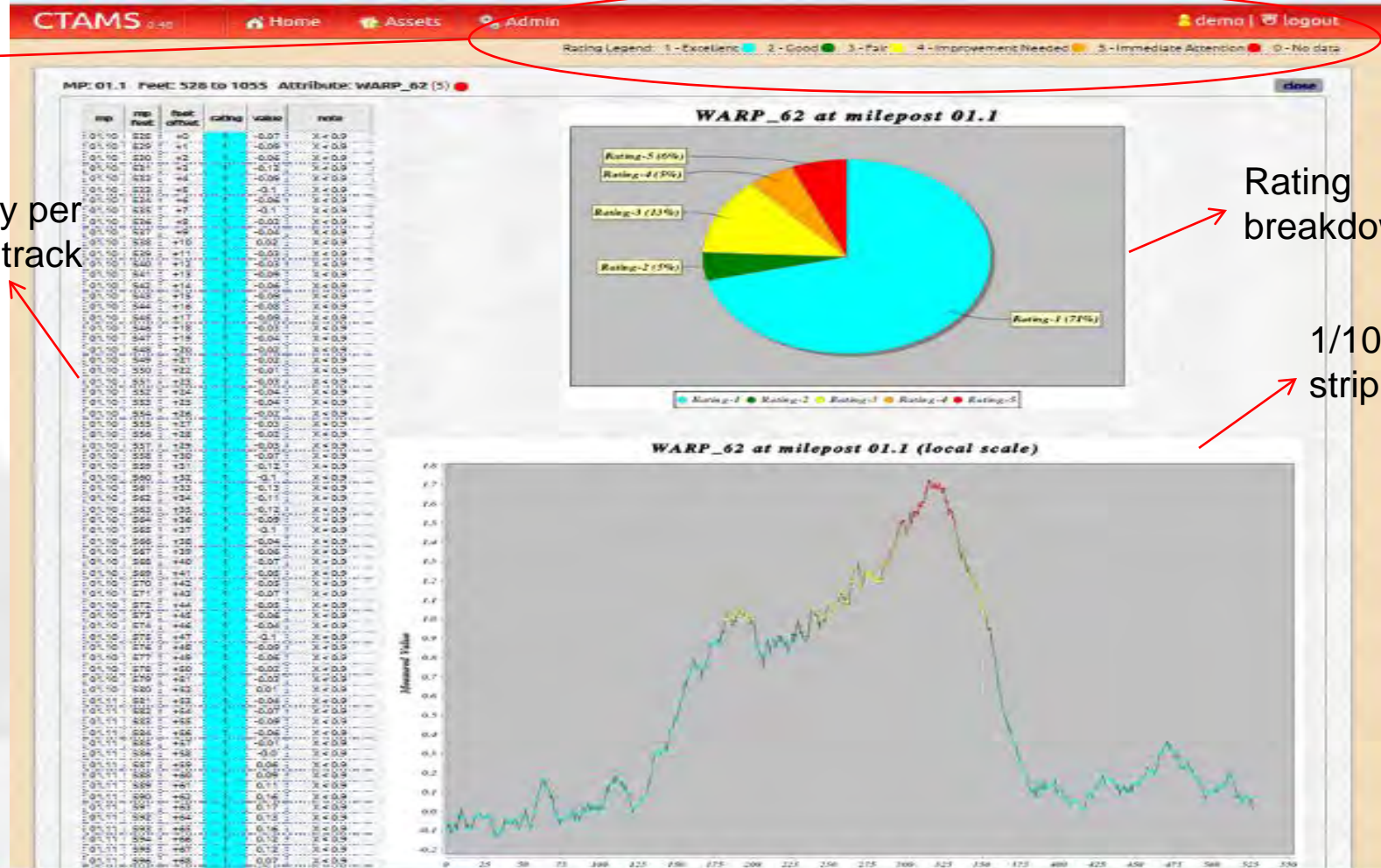
Condition Assessment

- **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

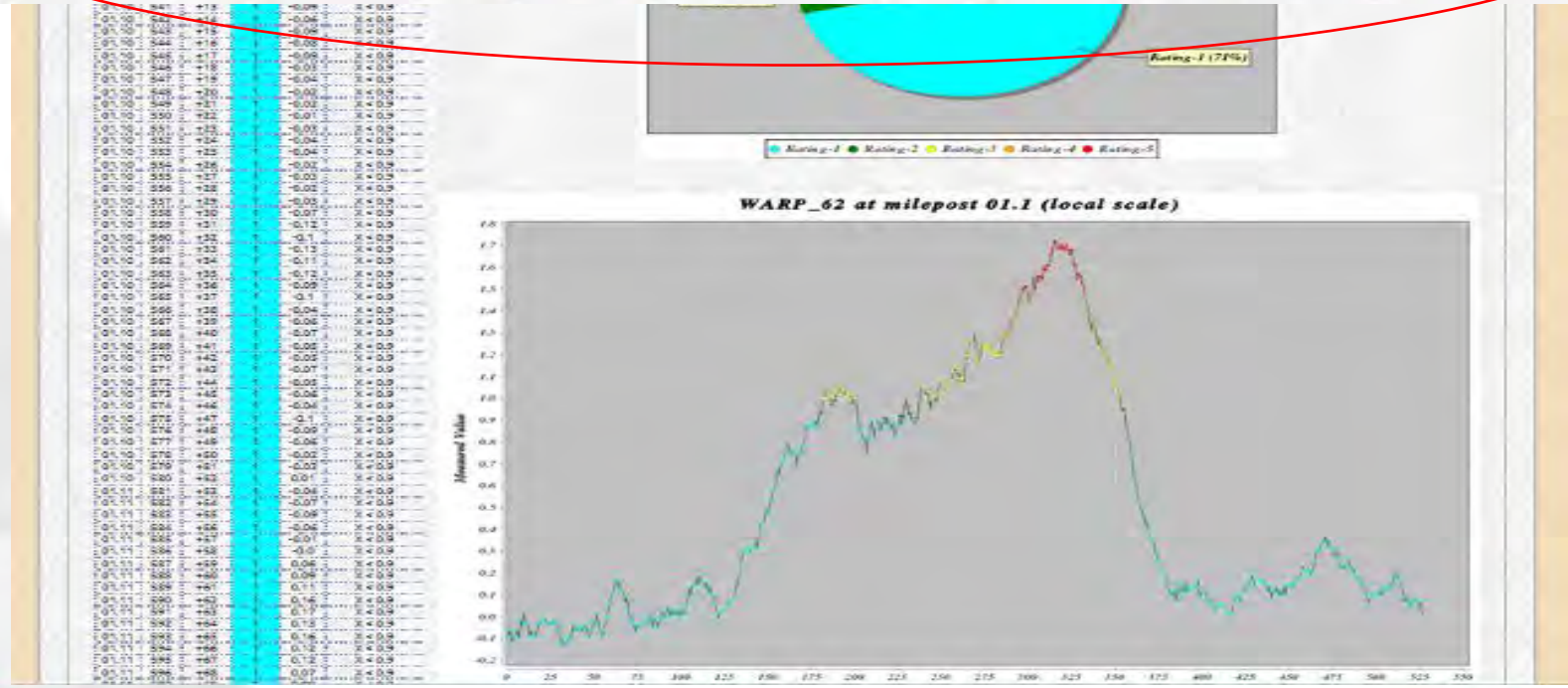
Automatic Track Geometry Assessment

CTAMS 2.40 Home Assets Admin

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

MP: 01.1 - FREE 528 to 1055 Attribute: WARP_62 (5)

Rating Legend

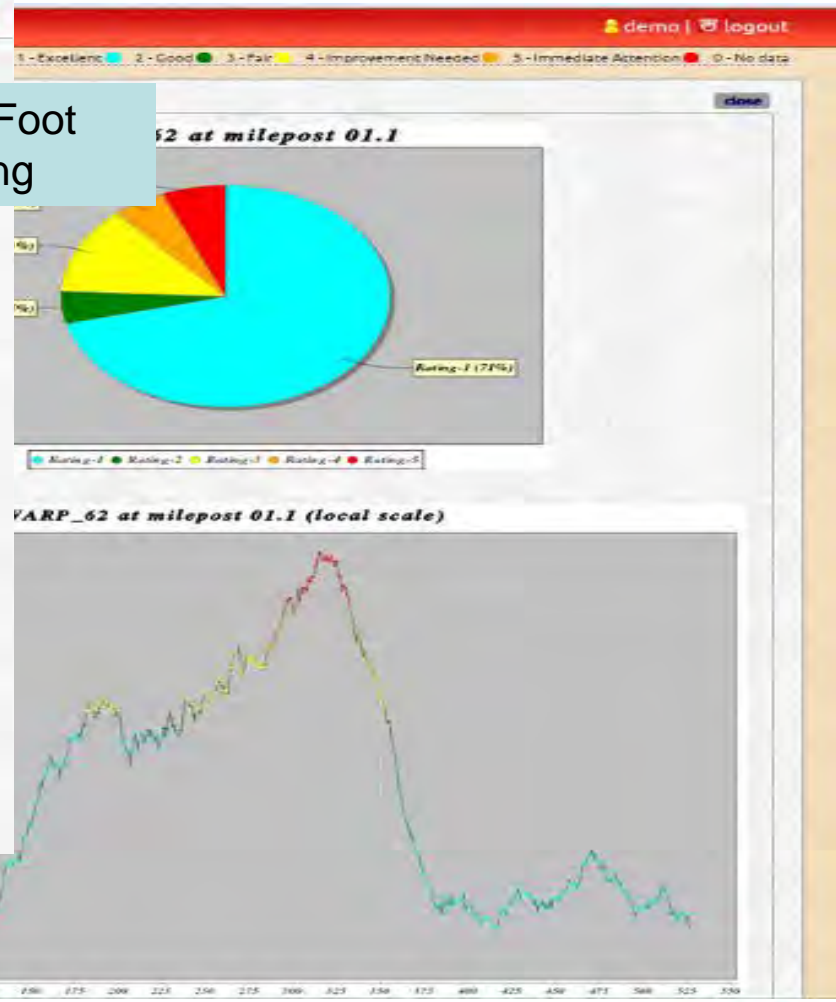


Automatic Track Geometry Assessment

MP: 01.1 Feet: 528 to 1055 Attribute: WARP_62 (5)

mp	mp feet	feet offset	rating	value	note
01.1000	528	+0	1	-0.07	X < 0.9
01.1001	529	+1	1	-0.09	X < 0.9
01.1003	530	+2	1	-0.06	X < 0.9
01.1005	531	+3	1	-0.12	X < 0.9
01.1007	532	+4	1	-0.09	X < 0.9
01.1009	533	+5	1	-0.1	X < 0.9
01.1011	534	+6	1	-0.06	X < 0.9
01.1013	535	+7	1	-0.1	X < 0.9
01.1015	536	+8	1	-0.02	X < 0.9
01.1017	537	+9	1	-0.04	X < 0.9
01.1018	538	+10	1	0.02	X < 0.9
01.1020	539	+11	1	-0.03	X < 0.9
01.1022	540	+12	1	-0.03	X < 0.9
01.1024	541	+13	1	-0.09	X < 0.9
01.1026	542	+14	1	-0.06	X < 0.9
01.1028	543	+15	1	-0.09	X < 0.9
01.1030	544	+16	1	-0.08	X < 0.9
01.1032	545	+17	1	-0.09	X < 0.9
01.1034	546	+18	1	-0.03	X < 0.9
01.1035	547	+19	1	-0.04	X < 0.9
01.1037	548	+20	1	-0.02	X < 0.9
01.1039	549	+21	1	-0.02	X < 0.9
01.1041	550	+22	1	-0.01	X < 0.9
01.1043	551	+23	1	-0.03	X < 0.9
01.1045	552	+24	1	-0.04	X < 0.9
01.1047	553	+25	1	-0.04	X < 0.9
01.1049	554	+26	1	-0.02	X < 0.9
01.1051	555	+27	1	-0.03	X < 0.9
01.1053	556	+28	1	-0.02	X < 0.9
01.1054	557	+29	1	-0.03	X < 0.9

Per-Foot Rating



Automatic Track Geometry Assessment

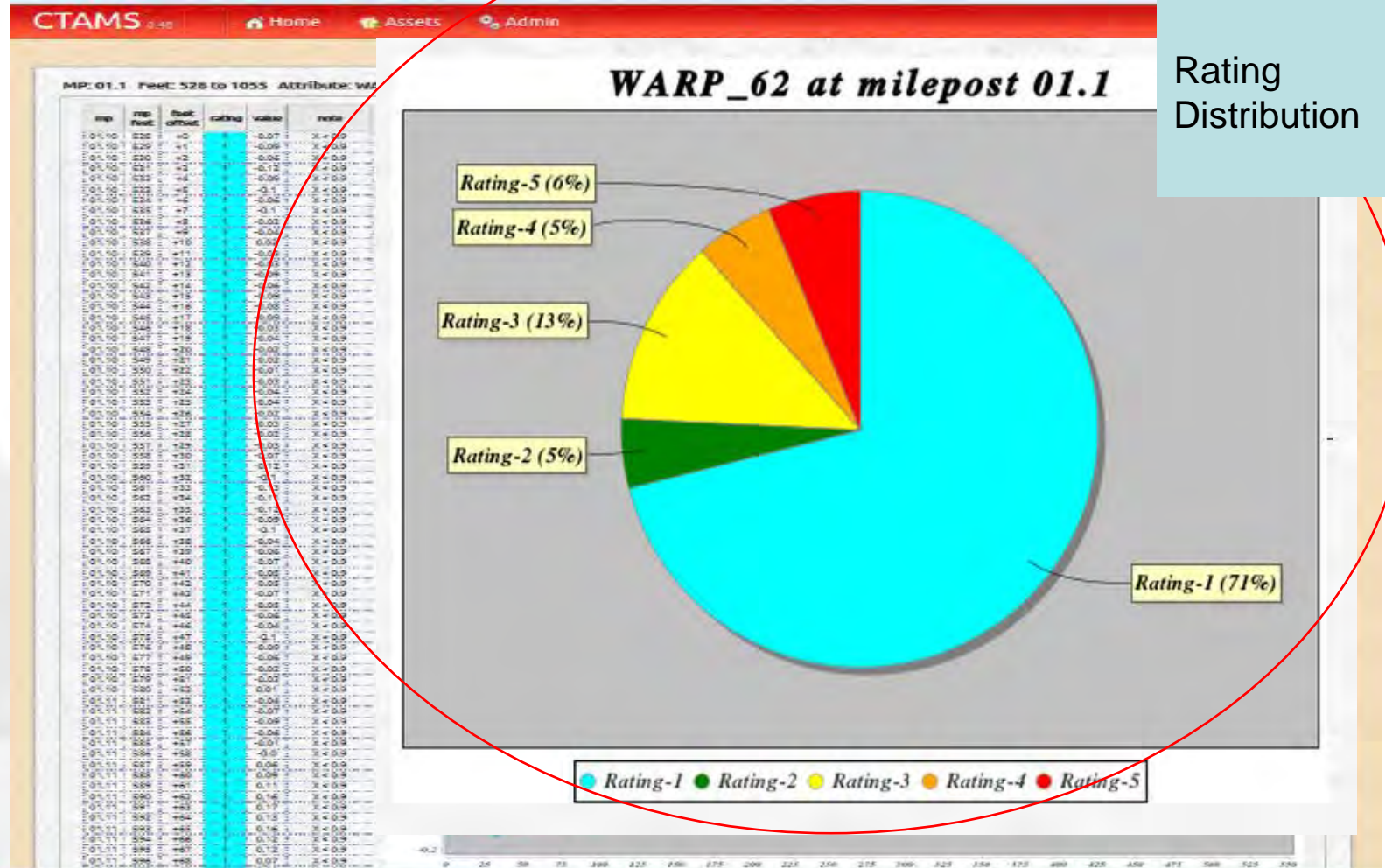
1/10 Mile Strip Chart

CTAMS 2.40 Home

MP: 01.1 Feet: 528 to 1055 Addr

MP	MP FEET	Foot OFFSET	GRADE	VALUE
01.10	528	+0		-0.07
01.10	529	+1		-0.09
01.10	530	+2		-0.06
01.10	531	+4		-0.13
01.10	532	+4		-0.06
01.10	533	+4		-0.06
01.10	534	+5		-0.1
01.10	535	+4		-0.06
01.10	536	+7		-0.17
01.10	537	+6		-0.04
01.10	538	+10		0.03
01.10	539	+8		+0.11
01.10	540	+10		-0.08
01.10	541	+11		-0.13
01.10	542	+6		-0.06
01.10	543	+14		-0.06
01.10	544	+16		-0.06
01.10	545	+19		-0.06
01.10	546	+19		-0.06
01.10	547	+17		-0.06
01.10	548	+18		-0.01
01.10	549	+19		-0.06
01.10	550	+18		-0.06
01.10	551	+17		-0.01
01.10	552	+12		-0.01
01.10	553	+12		-0.01
01.10	554	+12		-0.01
01.10	555	+12		-0.01
01.10	556	+12		-0.01
01.10	557	+12		-0.01
01.10	558	+12		-0.01
01.10	559	+11		-0.01
01.10	560	+12		-0.1
01.10	561	+12		-0.1
01.10	562	+12		-0.1
01.10	563	+12		-0.1
01.10	564	+12		-0.09
01.10	565	+12		-0.09
01.10	566	+12		-0.1
01.10	567	+12		-0.1
01.10	568	+12		-0.04
01.10	569	+12		0.01
01.10	570	+12		0.01
01.10	571	+12		0.01
01.10	572	+12		0.01
01.10	573	+12		0.01
01.10	574	+12		0.01
01.10	575	+12		0.01
01.10	576	+12		0.01
01.10	577	+12		0.01
01.10	578	+12		0.01
01.10	579	+12		0.01
01.10	580	+12		0.01
01.10	581	+12		0.01
01.10	582	+12		0.01
01.10	583	+12		0.01
01.10	584	+12		0.01
01.10	585	+12		0.01
01.10	586	+12		0.01
01.10	587	+12		0.04
01.10	588	+12		0.04
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01.10	590	+12		0.04
01.10	591	+12		0.04
01.10	592	+12		0.04
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01.10	783	+12		0.04
01.10	784	+12		0.04
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01.10	786	+12		0.04
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01.10	813	+12		0.04
01.10	814	+12		0.04
01.10	815	+12		0.04
01.10	816	+12		0.04

Automatic Track Geometry Assessment



Automatic Track Geometry Assessment





Manual Assessment

CTAMS 0.46

[Home](#)

[Assets](#)

[Admin](#)

[demo](#) | [logout](#)

Manual Assessment

Assessment Name: Army Street-assessment-2013-02-25.13.48.14

Template: *Bridge Form* (BridgeForm1)

Asset: Army Street, Caltrain, 2013-01.Q1, Bridge

Status: Pending

Gallery: [all photos](#)

Overall Rating: (5) ●

Rating Legend: 1 - Excellent ● 2 - Good ● 3 - Fair ● 4 - Improvement Needed ● 5 - Immediate Attention ● 0 - No data ●

Category (Count)	1	2	3	4	5	Rating	Notes
General (4) ●							
Paint Yr.	✓	✓	✓	✓	✓	(1) ●	
Clearance Signs	✓	✓	✓	✓	✓	(2) ●	
Highway Minimum Clearance	✓	✓	✓	✓	✓	(2) ●	
Insignia	✓	✓	✓	✓	✓	(1) ●	
Load Limit Sign	✓	✓	✓	✓	✓	(1) ●	
Fire Protection	✓	✓	✓	✓	✓	(4) ●	
Action Under Trains	✓	✓	✓	✓	✓	(4) ●	
Approach-Track	✓	✓	✓	✓	✓	(4) ●	
Track On Bridge	✓	✓	✓	✓	✓	(1) ●	
Painting on the side	✓	✓	✓	✓	✓	(1) ●	
Stream Conditions (5) ●							
Paving (through bridges)	✓	✓	✓	✓	✓	(5) ●	
Sheet Piling	✓	✓	✓	✓	✓	(2) ●	
Scour (Top of Rail to Streambed)	✓	✓	✓	✓	✓	(2) ●	
Rip Rap	✓	✓	✓	✓	✓	(1) ●	
Fender System	✓	✓	✓	✓	✓	(2) ●	
Masonry (2) ●							



Assessment Approval

Navigation: Communication Crossing Signals Stations **Structures** Track Equipment Right of Way

Home > Structures > Bridges > 22nd street

Bridge 22nd street (Caltrain)

edit move delete

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

Rating Legend: 1 - Excellent (blue) 2 - Good (green) 3 - Fair (yellow) 4 - Improvement Needed (orange) 5 - Immediate Attention (red) 0 - No data (grey)

Latest Approved Rating: (4) (yellow)

Assessment	Rating	Status
22nd street-assessment-2013-10-23.08.40.51	(4) (yellow) ✓	Approved
22nd street-assessment-2013-10-23.13.24.21	(5) (red)	Completed
22nd street-assessment-2013-10-18.16.20.40	(3) (yellow)	Approved

new auto assessment new manual assessment

Template	command
013 09:09AM BridgeForm1	edit delete work order
013 01:40PM BridgeForm1	edit delete work order
013 08:40AM Test1	edit delete work order

Update Assessment Status

- Pending
- Completed
- Approved**
- Inactive

Update Close



Work Order Management

- **Create work orders**
- **Track progress**
- **Review work history**



Work Order Management

CTAMS 0.63 Home Assets Search Admin Quick Search Structures Track Equipment admin | logout

Home > Structures > Bridges > 22nd street > Work Order > Work Order Detail

Work Order Bridge-22nd street-2013-10-23.1 of type Bridge Repairs [export to excel](#)

Work Order Id	Bridge-22nd street-2013-10-23.1
Work Order Number	123
Work Order Type	Bridge Repairs
Status	In-Process
Priority	Medium
Track	Both
Assessment	22nd street-assessment-2013-10-23.13.24.21
Asset	Bridge, 22nd street, Caltrain
Created By	admin
Created Date	Wed 10 23 2013 01:49PM
Last Updated	Wed 10 23 2013 01:50PM

Problem Description
Need new paint

Work Description
Out source to outside vendors

Note
Don't put on blue paint.

Attachments

Attachment	Type	Size	Modified Time
CTAM_security	doc	112.5 KB	Wed Oct 23 2013 01:50pm

Defect Description

Work order status

Description of work



Work Order Management

CTAMS 0.63 Home Assets Search Admin Quick Search Equipes admin | logout

Work Order *Bridge-San Franciquito Creek-2013-12-05* of type Bridge Repairs [export to excel](#)

Work Order Id	Bridge-San Franciquito Creek-2013-12-05
Work Order Number	12345
Work Order Type	Bridge Repairs
Status	New
Priority	High
Track	Both
Assessment	San Franciquito Creek-assessment-2013-12-03.21.31.37
Asset	Bridge, San Franciquito Creek, Caltrain
Created By	lin
Created Date	Thu 12 05 2013 07:14AM
Last Updated	Thu 12 05 2013 07:14AM

Attachments

Attachment	Type	Size	Modified Time
CTAM_security	doc	112.5 KB	Wed Oct 23 2013 01:50pm

Work order status



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**

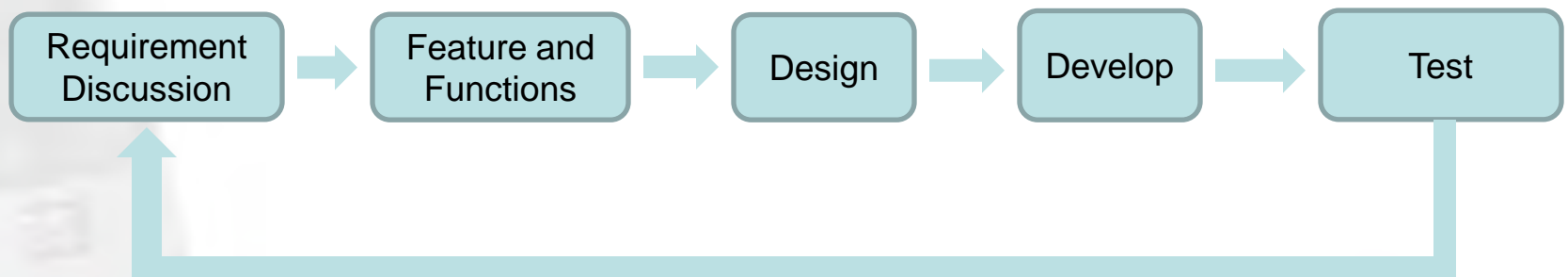
Development Process

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**



Q & A



Special Acknowledgement

- **Caltrain Team**
 - **SOG R 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**