Roadsoft®

Overcoming Obstacles to Effective Use

Roadsoft®

Center for Technology & Training
Michigan Technological University • Department of Civil & Environmental Engineering

Roadsoft: Overcoming Obstacles to Effective Use

Nick Koszykowski

Senior Software Architect

MTU – Center for Technology & Training

Larry Brown, P.E.

Road Commissioner, Allegan County

Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Today's Topics

- Agency Requirements, Wants, & Needs
- Obstacles for achievement
- Solutions using Roadsoft effectively

Agency Requirements

- Collect 50% Fed Aid PASER
- Report Completed & Planned Projects
- Road/Bridge Asset Management Plans (PA 325)

Agency Needs & Wants

- Improve/Maintain Road Condition
- Better planning for future projects
- Best bang for buck

Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Obstacles: Real or Perceived

- Time
- Money
- Knowledge
- Inexact Tools
- Time
- Money

Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Solution: Roadsoft

- Inventory
  - Know what you have
- Assessment
  - Know its condition
- Analysis
  - Make informed decisions

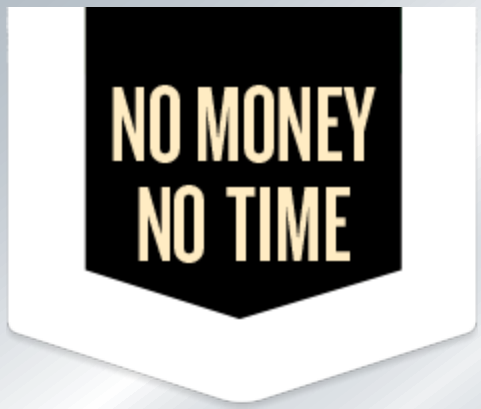
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Obstacle: No Time/Money

- Incomplete Data
- Invalid Data
- No Data



No Time/Money: Solutions

- Funding for local collection via Region
- Interns trained on PASER

Problem: Incomplete Data

- Missing ratings
- Missing Project Data

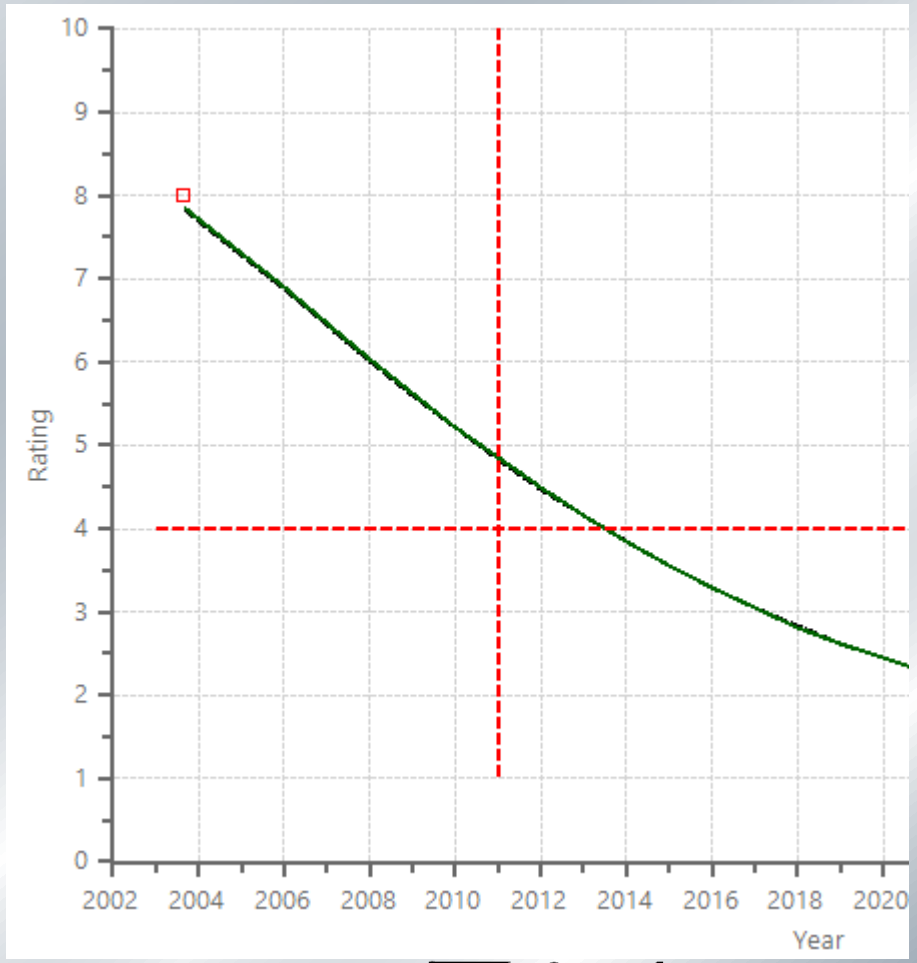
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Problem: Incomplete Data

Surface	
Surface SubType	Asphalt-Standard (As... Edit
MIRE Surface Type	Bituminous
Current PASER Rating	2 - Very Poor
RSL	-9
Confidence	99
YLR	
PASER Rating/Treatment History	
	Add PASER Rating/Treatment...
8/28/2003	
PASER Rating	8 - Very Good



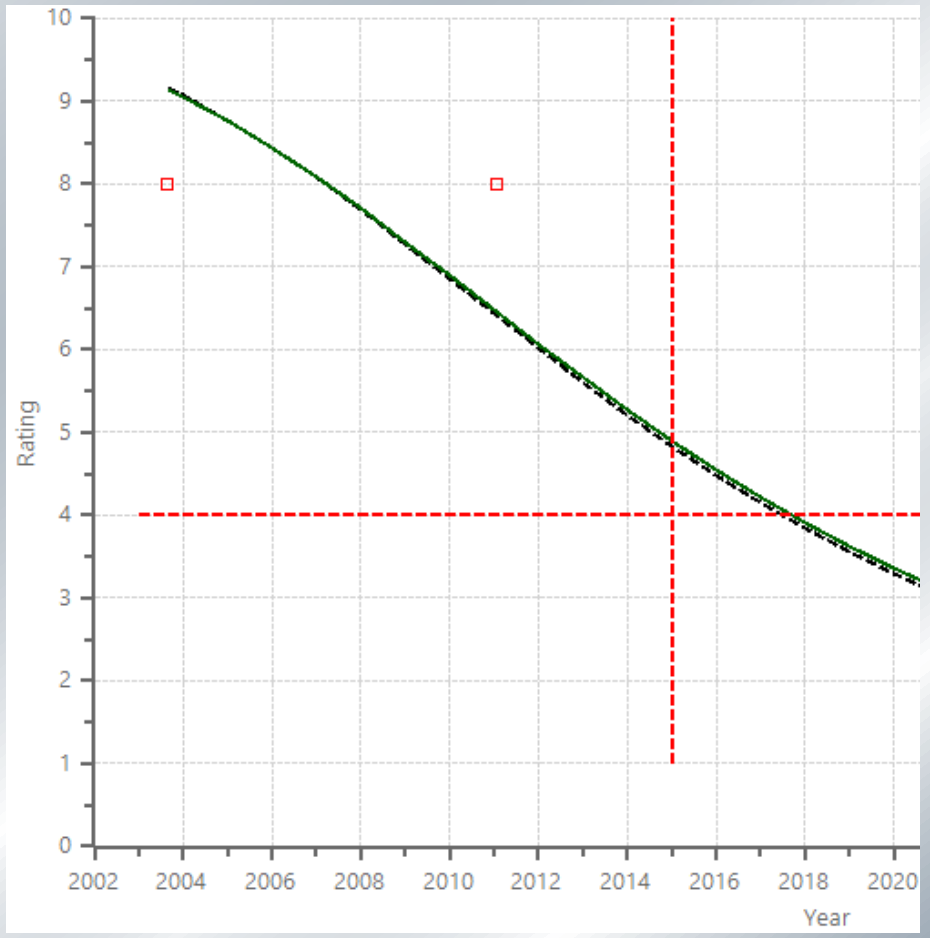
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Partial Solution: More Ratings

Surface	
Surface SubType	Asphalt-Standard (Asphalt)
MIRE Surface Type	Bituminous
Current PASER Rating	3 - Poor
RSL	-5
Confidence	85
YLR	
PASER Rating/Treatment History	
	Add PASER Rating/Treatment...
1/15/2011	
PASER Rating	8 - Very Good
8/28/2003	
PASER Rating	8 - Very Good



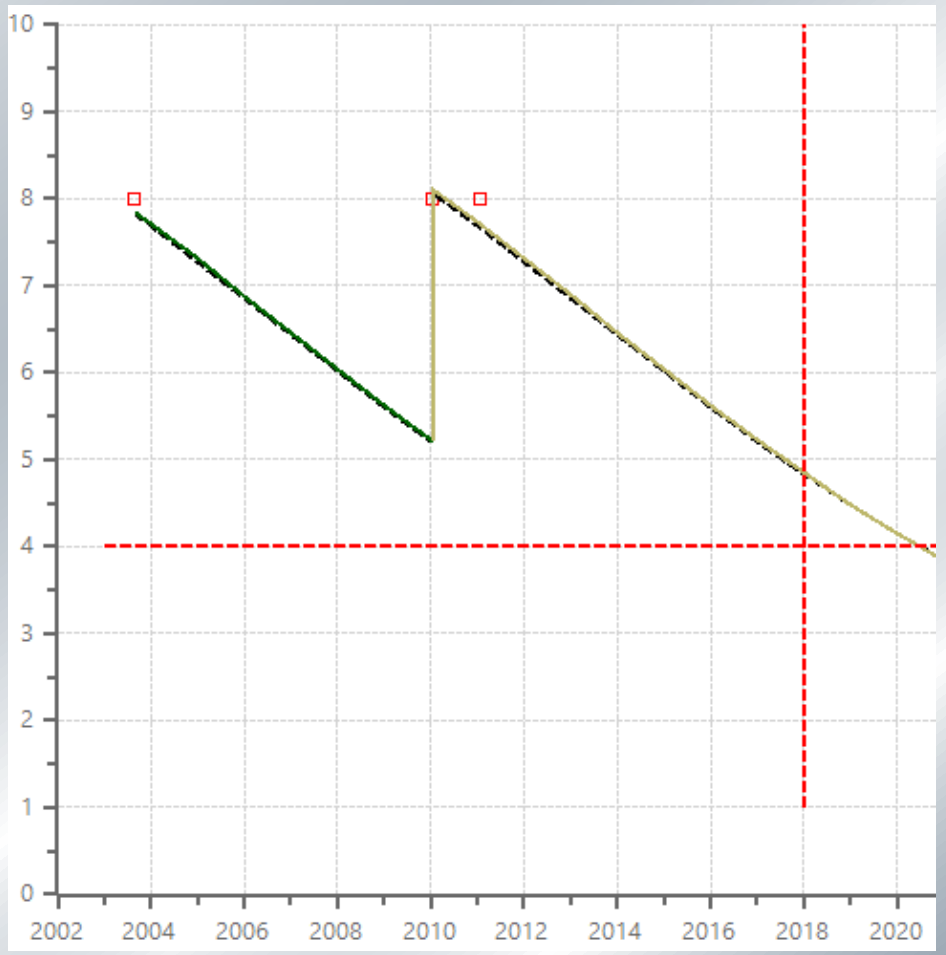
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Solution: Project Data

Surface	
Surface SubType	Asphalt-Standard (Asphalt)
MIRE Surface Type	Bituminous
Current PASER Rating	4 - Fair
RSL	-2
Confidence	97
YLR	
PASER Rating/Treatment History	
Add PASER Rating/Treatment...	
1/15/2011	
PASER Rating	8 - Very Good
1/15/2010 (Sealcoat)	
PASER Rating	8 - Very Good
8/28/2003	
PASER Rating	8 - Very Good



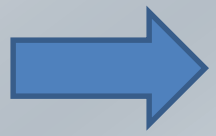
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Solution: Project Data

Surface	
Surface SubType	Asphalt-Standard (Asphalt)
MIRE Surface Type	Bituminous
Current PASER Rating	3 - Poor
RSL	-5
Confidence	85
YLR	
PASER Rating/Treatment History	
Add PASER Rating/Treatment...	
1/15/2011	
PASER Rating	8 - Very Good
8/28/2003	
PASER Rating	8 - Very Good



Surface	
Surface SubType	Asphalt-Standard (Asphalt)
MIRE Surface Type	Bituminous
Current PASER Rating	4 - Fair
RSL	-2
Confidence	97
YLR	
PASER Rating/Treatment History	
Add PASER Rating/Treatment...	
1/15/2011	
PASER Rating	8 - Very Good
1/15/2010 (Sealcoat)	
PASER Rating	8 - Very Good
8/28/2003	
PASER Rating	8 - Very Good

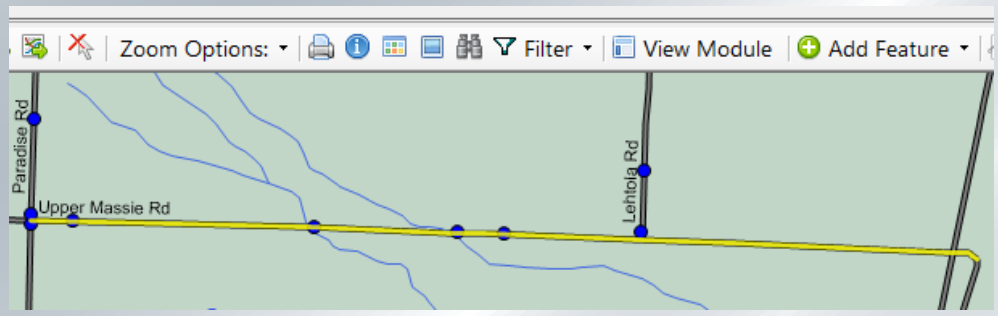
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Solution: Project Data

- 5-10 Minutes per Project to add
- Step 1:
  - Select Road Segments on Map



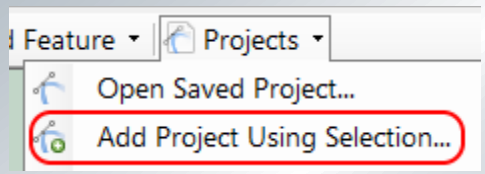
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Solution: Project Data

- 5-10 Minutes per Project to add
- Step 2:
  - Add Project Using Selection



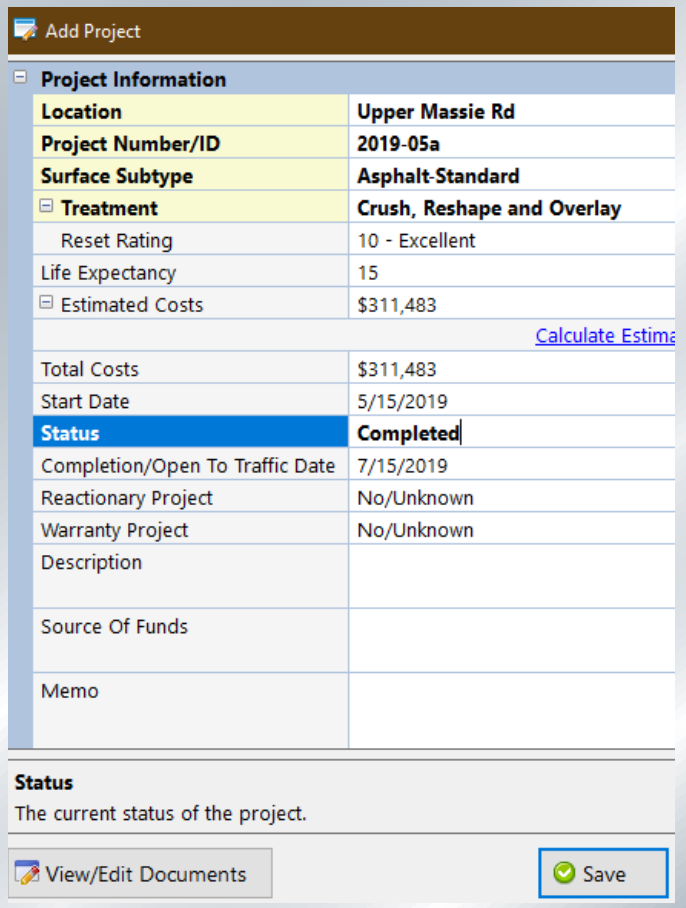
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Solution: Project Data

- 5-10 Minutes per Project to add
- Step 3:
  - Enter Project Info and Save



Roadsoft®

Center for Technology & Training

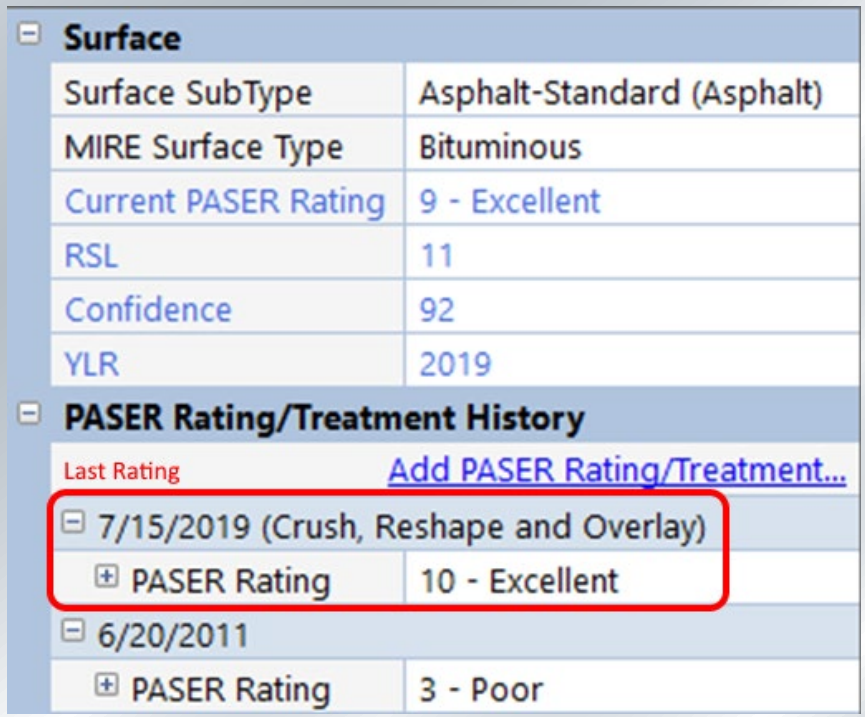
Michigan Technological University • Department of Civil & Environmental Engineering

Solution: Project Data

- 5-10 Minutes per Project to add
- 3 Major Benefits:
  1. More Complete Data = Better Calculations
  2. Data Ready for Submission to TAMC
  3. Data Ready for Asset Management Plan

Current Rating vs Last Rating

- 7/15/2019 PASER Rating 10 is Last Rating
- 9 is Current Rating
- Current Rating ≠ *Last Rating*



Surface	
Surface SubType	Asphalt-Standard (Asphalt)
MIRE Surface Type	Bituminous
Current PASER Rating	9 - Excellent
RSL	11
Confidence	92
YLR	2019
PASER Rating/Treatment History	
Last Rating	Add PASER Rating/Treatment...
7/15/2019 (Crush, Reshape and Overlay)	
PASER Rating	10 - Excellent
6/20/2011	
PASER Rating	3 - Poor

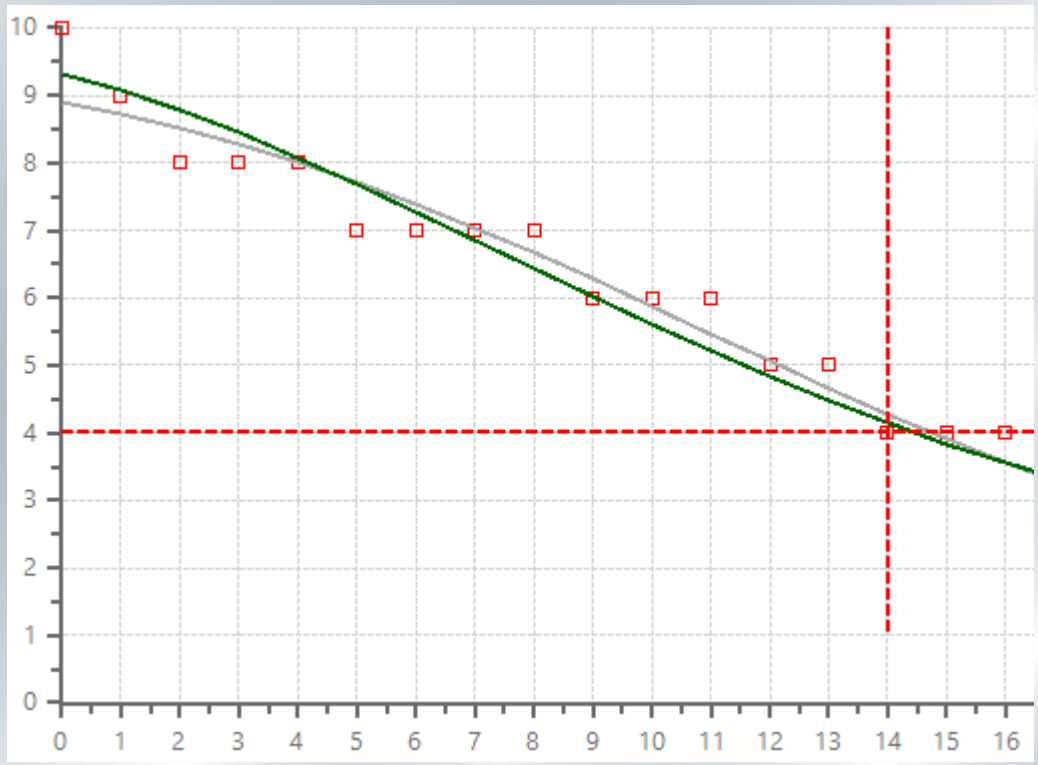
Current Rating vs Last Rating

- Current Rating = Calculated Rating
- Last Rating = Last Entered Rating

Current Rating = Calculated

Curve Name: Asphalt Curve

Rating	Years
10	1
9	1
8	3
7	4
6	3
5	2
4	3
3	3
2	5
1	0



Deterioration Curves
Suggested Model: Logistic Growth Model Unforced through Zero
Chosen Model: Gompertz Growth Model UnForced through Zero

Roadsoft®

Center for Technology & Training
Michigan Technological University • Department of Civil & Environmental Engineering

Current Rating = Calculated

Rating	Years
10	1
9	1
8	3
7	4
6	3

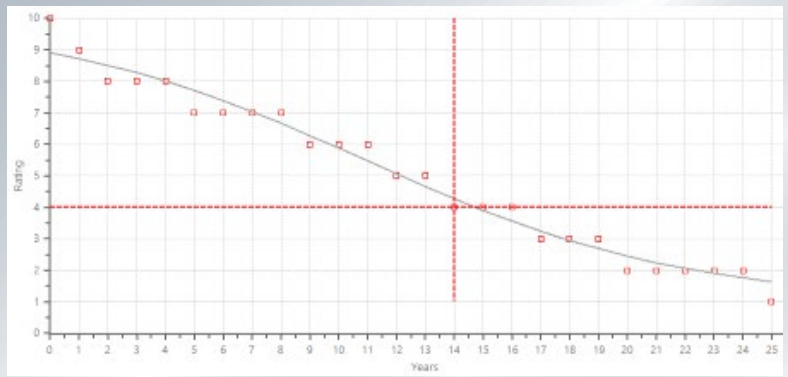
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Current Rating = Calculated

- Calculated based on deterioration curve (best fit)
- Pessimistic: 5.9999 = 5



Note: If Last Entered Rating Year = Current Year then Current Rating = Last Entered Rating

Roadsoft®

Center for Technology & Training

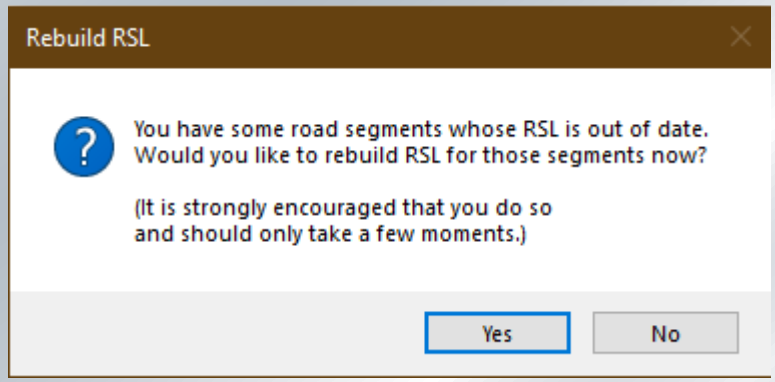
Michigan Technological University • Department of Civil & Environmental Engineering

When is Current Rating Calculated?

- New or historical rating is entered
- New or historical treatment is entered
- New calendar year begins

Current Rating Calculation

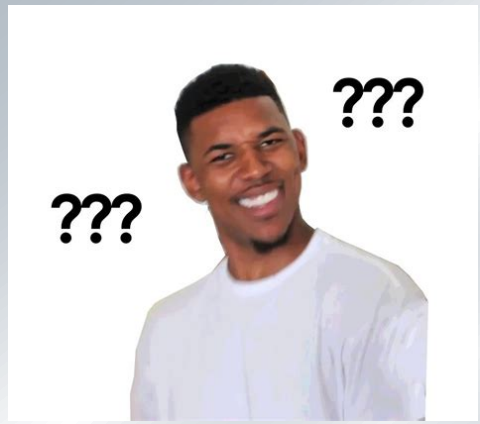
- First login of new year



Current Rating Calculation

- Roads treated at end of year deteriorate a whole year

Surface	
Surface SubType	Asphalt-Standard (Asphalt)
MIRE Surface Type	Bituminous
Current PASER Rating	9 - Excellent
RSL	11
Confidence	92
YLR	2019
PASER Rating/Treatment History	
Add PASER Rating/Treatment...	
10/13/2019 (Reconstruction - 6" base, 3" top)	
PASER Rating	10 - Excellent



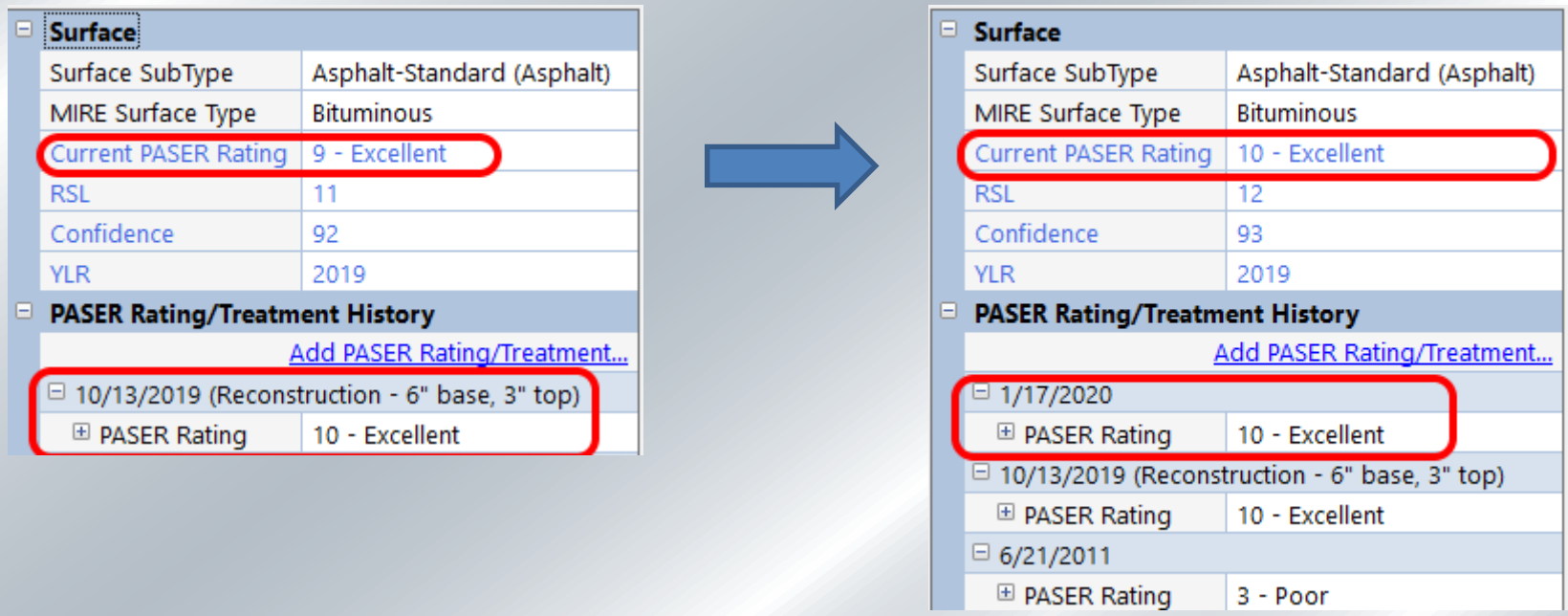
Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Current Rating Calculation

- One solution: Add another rating



Surface	
Surface SubType	Asphalt-Standard (Asphalt)
MIRE Surface Type	Bituminous
Current PASER Rating	9 - Excellent
RSL	11
Confidence	92
YLR	2019
PASER Rating/Treatment History	
Add PASER Rating/Treatment...	
10/13/2019 (Reconstruction - 6" base, 3" top)	
PASER Rating	10 - Excellent

Surface	
Surface SubType	Asphalt-Standard (Asphalt)
MIRE Surface Type	Bituminous
Current PASER Rating	10 - Excellent
RSL	12
Confidence	93
YLR	2019
PASER Rating/Treatment History	
Add PASER Rating/Treatment...	
1/17/2020	
PASER Rating	10 - Excellent
10/13/2019 (Reconstruction - 6" base, 3" top)	
PASER Rating	10 - Excellent
6/21/2011	
PASER Rating	3 - Poor

Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Last Rating Usage

- Selection Info
- PASER Submission
- Reports
- Filters

Selection Information : Road

PRNo	RoadName	Bmp	Emp	SurfaceType	SurfaceSubType	LastPASERRating	LastPASERRatingDate	CurrentPASERRating
1572606	Grant Ave	0.081	0.172	Asphalt	Asphalt-Standard	2: Very Poor	9/17/2019	2
1572606	Grant Ave	0.172	0.211	Asphalt	Asphalt-Standard	8: Very Good	9/17/2019	6
1572606	Grant Ave	0.211	0.272	Asphalt	Asphalt-Standard	7: Good	9/17/2019	5

Last Rating: Reports

- Compare Rating Histories Report
- Last Rating Entered Report
- Latest PASER Rating Mileage Summary
- Miles Rated (PASER) by City/Twp

Current Rating Usage

- Selection Info
- Reports
- Filters
- Good/Fair/Poor

Selection Information : Road

PRNo	RoadName	Bmp	Emp	SurfaceType	SurfaceSubType	LastPASERRating	LastPASERRatingDate	CurrentPASERRating
1572606	Grant Ave	0.081	0.172	Asphalt	Asphalt-Standard	2: Very Poor	9/17/2019	2
1572606	Grant Ave	0.172	0.211	Asphalt	Asphalt-Standard	8: Very Good	9/17/2019	6
1572606	Grant Ave	0.211	0.272	Asphalt	Asphalt-Standard	7: Good	9/17/2019	5

Current Rating: Reports

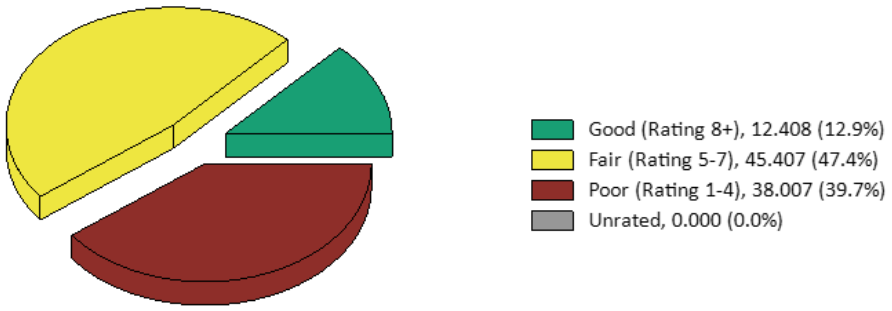
- Current PASER Rating Mileage Summary
- Current PASER Rating Report
- Good/Fair/Poor Summary w/Chart

Current Rating: Reports

Good/Fair/Poor Summary

Mileage Type: Lane miles
Road Class: Federal Aid Roads
Road Type: All Roads
Ownership: All Roads

Condition	Lane Miles	Percentage
Good (Rating 8+)	12.408	12.95%
Fair (Rating 5-7)	45.407	47.39%
Poor (Rating 1-4)	38.007	39.66%
Unrated	0.000	0.00%
Total Miles:	**95.822**	



* New in version 2020.1

Roadsoft®

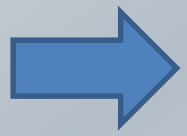
Center for Technology & Training
Michigan Technological University • Department of Civil & Environmental Engineering

Notes on Unpaved Roads

- PASER = Pavement Surface Evaluation and Rating
- Inventory Based Rating (IBR) system recommended for collection
- Good/Fair/Poor uses IBR for unpaved

Obstacles/Solutions

- Time
- Money
- Knowledge
- Inexact Tools



- Local Data Collection Funding
- Roadsoft Tools
- Training

Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering

Questions

- Nick Koszykowski:
  - roadsoft@mtu.edu
  - (906) 487-2102
  - www.roadsoft.org
  - nick@mtu.edu
- Larry Brown
  - (616) 813-5538
  - Larrywbrown.1953@gmail.com

Roadsoft®

Center for Technology & Training

Michigan Technological University • Department of Civil & Environmental Engineering