2017 PASER Training
Part 1: Distress Identification

Presenters

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  Research Engineer
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  Sr. Software Engineer

Agenda

Why Rate Roads?

Distress Identification for Rating:
  • Asphalt
  • Concrete
  • Sealcoat

Stop distractions!

Not Registered?

Call (906) 487-2102 after training

Poll Question
Why is TAMC Rating Roads?

Public Act 499 (2002) Summary

All public roads in Michigan will be managed using the principles of asset management.

Public Act 199 (Dec. 2007)

TAMC shall develop a pavement management system.

MDOT and local agency reporting to the council is mandatory.

- Road and bridge condition
- 3 year project plan
- Expenditures

TAMC Annual Report To Legislature

Poll Question
2006-2015 Pavement Condition of Federal Aid Eligible Roads

Why Should You Rate Roads?

- See how road condition is changing
- Estimate future road condition
- Measure effectiveness of past improvements
- What, Where and When improvements are needed

Estimating Deterioration

Cost Effectiveness of Treatments

Data Collection Policy

“Anyone who participates in the annual PASER condition data collection of the federal-aid system and influences the rating activity must attend on site PASER training in the same year the data collection occurs. This does not discourage observers from riding in the data collection vehicles for information purposes.”

“New raters (never attended PASER training before) and seasoned raters (who did not attend PASER training the year prior) must attend one (1) supplemental PASER webinar...”
Training & Data Collection Effort Is Funded

Raters: MDOT, County, City or Village

TAMC Coordinator Assists With:

Reimbursement
Certification
Data collection policy
Reporting requirements

Preparation for Rating

A Tale of Two Data Collections....

• TMC federal aid data collection
• Non-federal aid data collection
  • Agency decides what to collect
  • Agency must get approval first to be eligible for reimbursement
  • Agency rater does their own roads

Who? What? How?

What Tools Are Used?

Roadsoft 7.10.5*
Roadsoft GPS Laptop Data Collector 7.10.5*
Framework Version 17

*or latest as of April 1 2017
Start Date / End Date

- April 3rd, 2017
  Weather permitting
- November 24th, 2017
  Last day to collect
- December 1st, 2017
  Last day RPO/MPO to submit to CSS

4 Major Pavement Types & 3 Manuals

<table>
<thead>
<tr>
<th>Hot Mix Asphalt (HMA)</th>
<th>Composite</th>
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</thead>
<tbody>
<tr>
<td>Hot Mix</td>
<td>Mix</td>
</tr>
<tr>
<td>Steel Base</td>
<td>Steel Base</td>
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<tr>
<td>Sand Sub-Base</td>
<td>Sand Sub-Base</td>
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<td>Relievers</td>
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<table>
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<td>Sand Sub-Base</td>
<td>Sand Sub-Base</td>
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<tr>
<td>Transverse Cracks at 40 foot Spacing</td>
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</tbody>
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Rutting Less Than ½ Inch

First Signs of Block Cracking

Longitudinal Joint Cracks Present

Asphalt Distress Types

- Structural
- Age-related
- Surface defects
- Limited extent (generally)
- Others (potholes and patches)
Load Distribution

- Asphalt
- Gravel Base
- Sand Sub-Base
- Native Soil (sub grade)

Rigidity

Cost

Traffic

- Rutting
- Cracking in Wheel Path
- Alligator Cracking

Structural Distresses
Structural Distress
Rutting

Surface (mix) Rutting

Range of depths
½” to 1”
1” to 2”
> 2”

Deep Rutting

Longitudinal Cracking in Wheel Path

Signs of Rutting

Signs of Rutting

Range of depths
½” to 1”
1” to 2”
> 2”
Shear Cracking

Longitudinal Cracking in Wheel Path

First Sign

Poll Question

Structural Distress Edge Cracking

First Sign

Edge Cracking

Edge Cracking

First Sign
Primary Age-related Distresses

- Transverse cracking
- Longitudinal joint cracking
- Block cracking

Environment

First Distress

Water Intrusion

Base Weakening & Loss of Support
Distress Propagation

Primary Aging Distress
Transverse Cracking

Spacing
- > 40'
- 10' to 40'
- < 10'

Poll Question

Primary Aging Distress
Longitudinal Joint Cracking

Common Construction Joint

Second Pass
First Pass
Asphalt
Gravel Base

Longitudinal Construction Joint (Tapered)

Asphalt
Gravel Base
Longitudinal Tapered Joint Cracking

Primary Aging Distress Block Cracking

Primary Aging Distress Block Cracking Progression

Primary Aging Distress Block Cracking

Primary Aging Distress Block Cracking

Primary Aging Distress Block Cracking

First Signs (6’ to 10’ blocks)

Moderate (1’ to 5’ blocks)

Severe (<1’ blocks)
Primary Aging Distress
Block Cracking

Severe
(looks like alligator)

Widths of Cracks
Tight

Width of Cracks
Open

Secondary

More Than Just a Crack.....

Structural

Pop Quiz – Where on Michigan Roads?
Pop Quiz – Where on Michigan Roads?

Surface Defects

- Raveling
- Flushing/bleeding
- Polishing

Surface Defect

- Slight
- Moderate
- Severe

Surface Defect

- Slight to Moderate
Flushing / Bleeding

Polishing

Limited Extent Distress Slippage Crack

Surface Defect Polishing

Slight to Moderate

Extensive to Severe

Asphalt Limited Extent Distresses

- Slippage cracks
- Shoving & rippling
- Heave & settling

Slippage Cracking
Limited Extent Distress
Heave & Settling

Differential Settlement

Break Time

Concrete Pavement

Ask the Audience

Concrete Distress Types

• Deformations
• Joint Distress
• Cracking
• Surface Distress
### Concrete Deformations

- Blowups
- D-cracking
- Faulting

![Concrete Deformations Image](image)

### Deformations Blowups

Non-compressible Material

![Deformations Blowups Image](image)

### Deformations Blowups or Tenting

![Deformations Blowups or Tenting Image](image)

### Cracking – Durability Crack

![Cracking – Durability Crack Image](image)
Cracking
Durability Crack

Deformations – Faulting

Faulting

Concrete Cracking
- Transverse cracking
- Meander cracking
- Corner cracking
Cracking
Transverse Crack

Isolated

Cracking
Transverse Crack

Multiple

Cracking
Meander Crack

Settlement – Utility Trench

New Construction
Meander Crack

Settlement – Utility Trench
Cracking
Corner Break and Crack

Slab Curling

Ask the Audience

Spalling Happens On:
- Transverse joints
- Longitudinal joints
- Transverse cracks
- Meander cracks
- Corner cracks
- Shallow reinforcing steel

Joint Distress - Spalling

Dowel Bars (load transfer)
Incompressible Material Causes Joint Spalling

Partial Depth Joint Repair

Full Depth Needed

Full Depth Joint Repair

Joint and Crack - Spalling

First Sign
Concrete Surface Distresses

- Due to shallow reinforcement
- Scaling
- Pop outs
- Map cracking
- Polishing
Surface Distress
Shallow Reinforcement
Corrosion

Surface Distress - Scaling

Surface Scaling

< 25%
25% to 50%
> 50%
Surface Distress
Pop Outs

Surface Distress
Map Cracking

Surface Distress
Polishing

Surface Distress
Polishing

Moderate

Severe

Pop Quiz – What is this a picture of?
Sealcoat Pavements

Sealcoat Pavement

Gravel Base
Sand Sub-Base
Native Soil (sub grade)

Sealcoat Pavement Close Up

Gravel Base

Chip Seal or Sealcoat On HMA

Asphalt
Gravel Base
Sand Sub-Base
Native Soil (sub grade)

Asphalt vs. Sealcoat

Hot Mix Asphalt
Sealcoat

Sealcoat Distress Types

Raveling
Edge Cracks
Lane Cracks/Ruts
Edge Distress

Gravel Base

Sand Sub-Base

Sealcoat

Lane Cracking

Percent of Worst Lane

Raveling

Percent of Worst Lane

Rutting

Depth in Inches

Final On-site Training for Employees

- February 28 – March 2
- March 28 – 30
- April 4 – 6
- June 7 in West Branch
Final Thoughts

• Register for final On-Site training if not attended yet
• Safety when Rating
• PASER Resources:
  http://michiganltap.org/paser-resources

Questions? Contact the CTT at 906-487-2102 or ctt@mtu.edu