Inventory-Based Rating System™ for Gravel Roads

Not Registered?

Call (906) 498-2102 after this training
Agenda

- Why rate roads?
- IBR System™
- Pilot study results
- Collecting data

Why Rate Roads?

To see how road condition is changing
Why Rate Roads?

To estimate future road condition

Why Rate Roads?

To measure effectiveness of past improvements
Why Rate Roads?

To determine what/where/when improvements are needed

Why Rate Roads?

To submit data to TAMC
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
To support excellence in managing Michigan’s transportation assets by:

Advising the Legislature and State Transportation Commission

Promoting asset management principles

Providing tools and practices for road agencies
2007-2016 Pavement Condition of Federal Aid Eligible Paved Roads

Training & Data Collection Effort Is Funded

Rating Team: MDOT, County, City or Village

TAMC Coordinator

MPO or RPO

Reimbursement

Time Logs
Data Collection Policy

All rating team members must attend:
1. PASER webinar - new raters and raters that did not do item 2
2. Onsite PASER training - in the same year of collection
3. IBR training - every 3 years

See the TAMC Policy for more details:


TAMC Coordinator Assists With:

Reimbursement
Certification
Data collection policy
Reporting requirements

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TAMC Transportation Planner
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Gravel roads are half of Non-Fed Aid network* (33% of entire Michigan Road Network)

*Source: Transportation Asset Management Council; Michigan's Roads & Bridges 2013 Annual Report
Why Rate Gravel Roads?

Aid in planning where upgrades are needed

Why Rate Gravel Roads?

38 miles of our County gravel roads need drainage improvement

Communicate to the public

Why Better Drainage?

Without proper drainage roads will fail quicker.

Vivendum prodissent interdum mea, in ea sed vel vulputate.
Why Do We Need Another Rating System?

- Unstable network-level measurements
- Frequent data collection

Other Unpaved Road Rating Systems

- Focus heavily on surface distress
- Disregard other important factors
Other Unpaved Road Rating Systems

Are not directly related to change in value or usability of the asset
Paved Roads Use PASER

Unpaved Roads Use IBR

User Manual

Coming Soon!
Goal of the IBR System™

Network level performance metric similar to paved roads

The rating scale is...

Good
Fair
Poor
Measured Features

Surface Width
Drainage Adequacy
Structural Adequacy

IBR System™ Overview

1 to 9 IBR number is generated by Roadsoft
**IBR System™ Overview**

Not a treatment selection tool like with paved roads

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Prevention Maintenance</th>
<th>Heavy Maintenance</th>
<th>Light Rehabilitation</th>
<th>Heavy Rehabilitation</th>
<th>Asset Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**IBR System™ Overview**

Based on cost to build to the baseline condition

- 22 feet
- >7 inches
- 2 feet
Example Road Segment

Surface Condition Rating System

Days

Rating

0 1 2 3 4 5 6 7 8 9 10

2018
Surface Width Assessment

- **Good**: 22 feet
- **Fair**: 16 to 21 feet
- **Poor**: 15 feet or less

- **9'**: Good
- **26'**: Fair

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*IBR System™*
Surface Width Categories Philosophy

Good – Reducing speed to pass is unnecessary

Fair – Drivers should reduce speed to pass

Poor – One driver should pull over to pass

Include drivable shoulders in width measurement

Surface Width Rating Tips

Flat foreslope gives perception of larger width
Surface Width Rating Tips

Tall grass gives perception of smaller width

Surface Width Rating Tips

Orient (calibrate) yourself
**Drainage Adequacy Assessment**

- **Good**: 2 feet or more
- **Fair**: 0.5 to < 2 feet
- **Poor**: Less than 0.5’

**Drainage Adequacy Categories Philosophy**

- **Good** – Adequate ditch water separation from base
- **Fair** – Ditches or swales need to be cleaned out
- **Poor** – Ditches need to be created
Extra Drainage Adequacy Details

If greater than 6” tall, drop Good to Fair

Secondary ditch

Drainage Adequacy Rating Tips

Rate the worst side

No ditch 2’ deep
Drainage Adequacy Rating Tips

Tall grass hides ditches

Drainage Adequacy Rating Tips

Calibrate yourself
### Structural Adequacy Assessment

**Gravel Thickness**

- **Good**: >7 inches
- **Fair**: 4 to 7 inches
- **Poor**: < 4 inches

### Structural Adequacy Categories Philosophy

<table>
<thead>
<tr>
<th>Relative Quality of Roadbed Soil</th>
<th>Traffic Level</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td></td>
<td>6”</td>
<td>11”</td>
<td>15”</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>7”</td>
<td>12”</td>
<td>17”</td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td>7”</td>
<td>12”</td>
<td>17”</td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td>9”</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Very Poor</td>
<td></td>
<td>10”</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

* Higher type pavement design recommended

U.S. Climatic Region III recommended aggregate base thickness from the AASHTO Design Catalogs given in the Gravel Roads Maintenance and Design Manual
What if Thickness is Unknown?

No Extensive Field Investigation
Structural Adequacy Influences

Condition of surface (speed)
Required maintenance frequency
Rehabilitation frequency
Structural Adequacy Distress – Potholes

Greater than 3 feet

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Adding Gravel

Investigate the cause of structural problems

Structure may be “Good” but saturated

More gravel is not always a remedy for bad cross slope
Alternate Criteria for Thickness

1” Ruts or 3’ Potholes

Did not develop throughout the year

Emergency Maintenance

Was not required

Rate it:

Good

Alternate Criteria for Thickness

1” Ruts or 3’ Potholes

During the thaw or very wet periods

Emergency Maintenance

Necessary during wet periods

Rate it:

Fair
Alternate Criteria for Thickness

1” Ruts or 3’ Potholes  Emergency Maintenance  Rate it:
During most of the year  Required frequently throughout the year  Poor
Rate during the thaw breakup or after a heavy rain

Preparing for Rating
A Tale of Two Data Collections....

- TAMC 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?

Raters
- County or City
- MDOT
- RPO or MPO
What Tools Are Used?

Roadsoft®

Laptop Data Collector

Roadsoft 2018.3*
Roadsoft GPS Laptop Data Collector 2018.3*
Framework Version 17

*or latest as of April 1 2018

LDC IBR Mode
Using the Project Builder

Start Date / End Date

- First Monday of April
  Weather permitting

- Last Friday of November
  Last day to collect

- First Friday of December
  Last day RPO/MPO to submit to CSS
Rating Tips

Unpaved roads can be highly variable so rate the overall assessment of the segment

Break segment if you have a definitive change

Segments should not be smaller than 0.25 miles

Rating Exercises
Agency Concerns

Gravel for Good is too thick

Good-Fair-Poor designations

Ratings would be used to redistribute funding
All Roads Don’t Have to be “Good”

Positive Agency Feedback

“We are looking forward to using the (IBR) system instead of the Gravel PASER Manual.”

“We will use the data to aid townships in setting budgets.”

“The beauty of the system is the ratings are not going to be changing quickly over time.”

“I fully support IBR at a statewide level.”
IBR Collection Accuracy

Antrim, Baraga, Huron, Kalamazoo and Van Buren

661 miles of gravel rated

Exact Match
72.2 % with exact IBR rating
92.9% within one IBR rating

Comparing IBR Pilot against Michigan PASER Collection

- Low PASER Diff. (2008)
- IBR Pilot (2015)
How Closely Did Local Agencies Estimate Gravel Thickness?

IBR Rating Speed

Lowest – Antrim at 6.3 rated mph
Highest – Huron at 28.3 rated mph
Overall Average – 12.3 rated mph
IBR and PASER together – 20 rated mph
Recommendations

Collect when vegetation is low
Update IBR number after construction projects

Data Collection Rules

Rate all Fed Aid unpaved roads every 2 years
No certification exam for IBR
Fed-Aid IBR data will need to be sent to TAMC
TAMC Data Collection Policy is now final
Value of Rating Gravel Roads

“We are excited to build our gravel roads asset management data into our normal asset management program. These roads cannot be forgotten and are also key to our overall network.”

Joanna Johnson
TAMC Chair
RCKC Managing Director

PASER Part 1:
Webinar – Distress Identification

February 6 – 9:00 AM to 11:30 AM
February 22 – 1:00 PM to 3:30 PM
March 8 – 9:00 AM to 11:30 AM
March 22 – 1:00 PM to 3:30 PM
Part Two of PASER Training: On-site

- February 27 – March 1
- March 27 – 29
- April 10 – 12
- TBD

Reminders

- Register for:
  - PASER Webinar
  - PASER On-Site training
  - Certification Testing (if invited)
- Review PASER Manuals prior to On-Site training
PASER Rater Certification Test

- Not required
- Relief from webinar & on-site training next year
- 3 or 6 years (prior to 2018) rating experience and training required
- Pre-registration required

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