Inventory-Based Rating System™
for Gravel Roads
Not Registered?

Be sure to fill out the self-certification survey!
Agenda

• Why rate roads?
• Why rate gravel roads?
• Why use the IBR System™?
• IBR System™
• Rating exercises
Why Rate Roads?
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 the TAMC
Why Rate Roads?

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

— Public Act 499 (2002) Summary

To submit data to the TAMC
Why Rate Roads?

MDOT & local agencies must report to the TAMC the following:

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

— Public Act 199 (2007) Summary

To submit data to the TAMC
Why Rate Roads?

Asset management plan for all roads, bridges, culverts and traffic signals required after October 1, 2020

— Public Act 325 (2018) Summary

To submit data to the TAMC
What is the TAMC?

Transportation Asset Management Council, a supporter of excellence in managing Michigan’s transportation assets by:

- developing a pavement management system
- advising the Legislature, the Michigan Infrastructure Council, and the State Transportation Commission
What is the TAMC?

Transportation Asset Management Council, a supporter of excellence in managing Michigan’s transportation assets by:

- promoting asset management principles
- advancing regional infrastructure AM pilot recommendations
- promoting tools and practices for road-owning agencies
TAMC Annual Report to the Legislature

Michigan’s 2019 Roads & Bridges Annual Report

Michigan Transportation Asset Management Council
TAMC Annual Report to the Legislature

Pavement Condition Forecast
2021-2031

<table>
<thead>
<tr>
<th>PERCENT ROAD CONDITION</th>
<th>MEASURED</th>
<th>FORECAST</th>
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<tbody>
<tr>
<td></td>
<td>20%</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>18%</td>
<td>33%</td>
</tr>
<tr>
<td></td>
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<tr>
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<td></td>
<td>21%</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>21%</td>
<td>30%</td>
</tr>
</tbody>
</table>


GOOD  FAIR  POOR
Figure 9
Source: 2020 TAMC
Reporting Data: 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 agency’s own roads
Why Rate Gravel Roads?
Why Rate Gravel Roads?

Gravel roads comprise 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?

Show investments on unpaved network
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.

- **Poor**: 38 miles (14%)
- **Fair**: 92 miles (33%)
- **Good**: 145 miles (53%)

**Why Better Drainage?**

Without proper drainage, roads will fail quicker. Lorem ipsum dolor sit amet, duo in diam nonumes incorrupte. Sed id dicam cu, an nullam lucilius has.. Vix id propriae electram liberavisse, stet tota cu vel. No adhuc placerat eloquentiam his, wisi definitiones in eos, eu dico animal admodum mel.

Ad rebum idque pri, has an probatus efficiendi. Cum te appareat adipiscing. Vis ficient scripserit in, ipsum detraxit cu pri, iusto omittantur mei ex. Magna accumsan petentium qui ut.

Vivendo prodesset interesset mea eu, mea ne stet vidit negligentur. Sit
Why Use the IBR System™?
Why Use the IBR System for Unpaved Roads?

Other systems have:

- frequent data collection needs
- unstable network-level measurements
Why Use the IBR System for Unpaved Roads?

Other systems:
- Focus heavily on surface distress
- Disregard other important factors

...but inadequate width!

Great surface condition...
Why Use the IBR System for Unpaved Roads?
Why Use the IBR System for Unpaved Roads?

Other systems:
- are not directly related to change in value or usability of the asset
IBR System™

- Days 1 to 12: Regrade
- Day 13: Regrade & add gravel
Why Use the IBR System for Unpaved Roads?

Inventory Based Rating System Pilot Data Collection and Implementation Report

December 8, 2015

Authors:

Tim Colling, PhD., PE
John Kiefer, PE
Pete Torola, PE
Why Use the IBR System for Unpaved Roads?

With the IBR System™, all roads don’t have to be “good”
IBR System™ for Unpaved Roads
Paved Roads Use PASER

Michigan Sealcoat Rating Guide
PASER scoring can be used as a treatment selection tool.
Unpaved Roads Use IBR System™
PASER versus IBR System™

IBR System™ is not a treatment selection tool
Preparing for Rating
Preparing for Rating

Rating Team
MDOT
county/city/village personnel
RPO/MPO
Preparing for Rating: Understanding the Data Collection Policy

All rating team members must attend:
1. PASER - if not trained or certified in 2019, 2020, or 2021
2. IBR training - every 3 years

See the TAMC Data Collection Policy for more details:
www.michigan.gov/tamc/
About Us
Council Policies

Michigan Transportation Asset Management Council
Preparing for Rating: Understanding the Funding Structure

Rating Team
(MDOT & county/city/village personnel)

Reimbursement
Time logs

Reimbursement
Time logs

MPO or RPO
(rating team)

Michigan Transportation Asset Management Council
Preparing for Rating: Understanding the Role of the TAMC Coordinator

Reimbursement
Certification
Data collection policy
Reporting requirements

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Michigan Transportation Asset Management Council
Preparing for Rating:  
Start & End Dates

START: First Monday of April
Weather permitting

END: Last Friday of November
Last day to collect

SUBMISSION: First Friday of December
Last day RPO/MPO to submit to CSS
IBR System™ Goals

To provide a network-level performance metric similar to paved roads
Measured Elements (or Features)...

Surface Width
Drainage Adequacy
Structural Adequacy
Measured Elements Receive an Assessment...

Surface Width
Drinkage Adequacy
Structural Adequacy

- Good
- Fair
- Poor

✓ “good” surface width
✓ “good” drainage adequacy
✓ “good” structural adequacy
...based on a Baseline Condition...

Baseline—or “good”—condition determined by characteristics considered acceptable by most road users

The baseline—or “good”—condition
...to Generate an IBR Number

- “good” surface width
- “good” drainage adequacy
- “good” structural adequacy

IBR # = 9

*Segment is < 1 year old
IBR Number: Its Basis

- Structure: 26%
- Drainage: 21%
- Width: 53%

Average of the Ratings
IBR Number: How to Calculate

IBR System Quick Guide

Roadsoft/LDC

Laptop Data Collector
IBR Number: Roadsoft/LDC Tools

Roadsoft 20XX.X*
Roadsoft GPS Laptop Data Collector
Framework Version XX*

Laptop Data Collector

* use latest version
IBR Number: Roadsoft/LDC Tools

1 to 9 IBR number is generated by Roadsoft
IBR Number: LDC’s IBR Mode
IBR System™ Assessment Guidance

Unpaved roads can be highly variable so base your assessment on the *overall* segment.

Break the segment if you have a definitive change.

Segments should not be smaller than 0.25 miles.
Surface Width Assessment

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

- 9’
- 26’
Surface Width Assessment

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

Unnecessary to reduce speed to pass
Surface Width Assessment

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

One driver must pull over to pass.
Surface Width Assessment

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

Include driveable shoulders in SW measurement.
Surface Width Rating Tips

Perception with flat foreslope

Perception with close vegetation

Orient (calibrate) yourself
Drainage Adequacy Assessment

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

Good

2 feet or more

Adequate separation of ditch water from base

Ditches need to be created

Poor

Less than 0.5’
If greater than 6” tall, drop Good to Fair
Drainage Adequacy Rating Tips

No ditch

2’ deep

Rate the worst side

Tall grasses hide ditches

Orient (calibrate) yourself
Drainage Adequacy Rating Tips

No ditch

Rate the worst side

2’ deep
Structural Adequacy Assessment

Good
> 7 inches gravel

Fair
4-7 inches gravel

Poor
< 4 inches gravel
Structural Adequacy Cycle of Life

SA influences:
- Surface condition
- Repair frequency

SA is influenced by:
- Traffic volume/loads
- Material properties/thickness
- Roadway drainage
- Construction methods
**Structural Adequacy Assessment**

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

Investigate the cause before adding gravel

Ask someone who knows the history

Rate during thaw/wet periods
Structural Adequacy Assessment: What if Thickness is Unknown?

Ask someone who knows the history
Structural Adequacy Assessment: What if Thickness is Unknown?

No extensive field investigation
Structural Adequacy Assessment: What if Thickness is Unknown?

Rely on institutional/local agency knowledge

PILOT STUDY: How Closely Did Local Agencies Estimate Gravel Thickness?
Structural Adequacy:
If Thickness is Still NOT Known…

Greater than 3 feet
Structural Adequacy: If Thickness is NOT Known

Rate during the thaw breakup or after a prolonged rain event

- Did not develop during the year
- During thaw or very wet period
- During most of the year

- Good
- Fair
- Poor
Reminders

Collect when vegetation is low
Update IBR number after construction projects
Rate 50% of Fed Aid network
No certification exam for IBR
Reminders: Start & End Dates

START: First Monday of April
       Weather permitting

END: Last Friday of November
       Last day to collect

SUBMISSION: First Friday of December
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