Inventory-Based Rating System™ for Gravel Roads

To see how road condition is changing
To estimate future road condition

Not Registered?
Register online at www.ctt.mtu.edu

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

To estimate future road condition
To measure effectiveness of past improvements.

To determine what/where/when improvements are needed.

To submit data to the TAMC.

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

-- Public Act 499 (2002) Summary

MDOT & local agencies must report to the TAMC the following:
- Road and bridge condition
- 3-year project plan
- Expenditures

-- Public Act 199 (2007) Summary

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

Why Rate Gravel Roads?

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
Gravel roads comprise half of non-fed-aid network* (33% of entire Michigan road network)

Show investments on unpaved network

Aid in planning where upgrades are needed

Communicate to the public

*Source: Transportation Asset Management Council; Michigan Roads & Bridges 2013 Annual Report

Why Use the IBR System™?

Why Use the IBR System for Unpaved Roads?

Other systems have:

- frequent data collection needs
- unstable network-level measurements
Great surface condition…

…but inadequate width!

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

Example Road Segment

Why Use the IBR System for Unpaved Roads?

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

Surface Condition Rating System

IBR System™
Why Use the IBR System for Unpaved Roads?

With the IBR System™, all roads don’t have to be “good”.

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

IBR System™ for Unpaved Roads

PASER

PASER scoring can be used as a treatment selection tool.
Preventing maintenance
Heavy Maintenance
Light Rehabilitation
Heavy Rehabilitation
Asset Replacement

All rating team members must attend:
1. PASER - if not trained or certified in 2018, 2019, or 2020
2. IBR training - every 3 years

See the TARC Data Collection Policy for more details:
https://www.michigan.gov/tarc/0,7308,7-356-82161 transitional-448471--00.html
Preparing for Rating: Understanding the Role of the T AMC Coordinator

Reimbursement
Certification
Data collection policy
Reporting requirements

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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
Drainage Adequacy
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

22 feet

>7 inches

2 feet

Good

Good

Good

Good

Good

Good

Good

Good

Good

Good
...to Generate an IBR Number

- "good" surface width
- "good" drainage adequacy
- "good" structural adequacy

IBR # = 9

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

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

<table>
<thead>
<tr>
<th>Width</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>9'</td>
<td>22 feet</td>
<td>16 to 21 feet</td>
<td>15 feet or less</td>
</tr>
<tr>
<td>26'</td>
<td>22 feet</td>
<td>16 to 21 feet</td>
<td>15 feet or less</td>
</tr>
</tbody>
</table>

- Good
- Fair
- Poor

Unnecessary to reduce speed to pass.

Include drivable shoulders in SW measurement.

Surface Width Rating Tips

- Perception with flat foreslope
- Perception with close vegetation
- Orient (calibrate) yourself
Structural Adequacy Assessment

<table>
<thead>
<tr>
<th>Traffic Level</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>6&quot;</td>
<td>11&quot;</td>
<td>15&quot;</td>
</tr>
<tr>
<td>Good</td>
<td>7&quot;</td>
<td>12&quot;</td>
<td>17&quot;</td>
</tr>
<tr>
<td>Fair</td>
<td>9&quot;</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Poor</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?

No extensive field investigation

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 heavy rain

- Did not develop during the year: Good
- During thaw or very wet period: Fair
- During most of the year: Poor

Rating Exercises
Reminders

Collect when vegetation is low
Update IBR number after construction projects
Rate all Fed Aid unpaved roads in 2021
No certification exam for IBR

Reminders: Start & End Dates

START: First Monday of April
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