Organization

MnDOT Bridge Office
Construction and Maintenance Section
• Bridge Operations Support Unit

  • Supports statewide bridge operations and maintenance in the areas of:
    • Training
    • Best Practices
    • Research
    • Maintenance Data Tracking and Reporting
    • Maintenance Performance Measures
    • Asset Management
MnDOT Districts

- 8 Districts
- 17 Bridge Maintenance Supervisors
- 20 Bridge Maintenance Crews
- Approximately 150 Bridge Workers statewide
• Systematic approach to managing bridges
• Invest in the right bridge, with the right strategy at the right time
• Assure public safety and minimize life cycle costs
Definitions

- Preservation
- Major Preservation
- Bridge Maintenance
  - Preventive Maintenance
  - Reactive Maintenance
- Improvement
  - Bridge Rehabilitation
  - Bridge Replacement
• **Preservation** is a program of cyclical and condition-based maintenance activities that keep bridges in sound condition and slow their deterioration rate.

- **Preventive Maintenance** includes routine maintenance activities performed according to an assigned frequency, as well as periodic minor repairs.

- **Reactive Maintenance** includes those activities that are scheduled in response to an identified condition that may compromise public safety or bridge structural function.
## Bridge Management Strategy

<table>
<thead>
<tr>
<th>NBIS CONDITION CODE</th>
<th>MANAGEMENT STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 – New</td>
<td>Preventive Maintenance</td>
</tr>
<tr>
<td>8 – Very Good</td>
<td>Preventive Maintenance</td>
</tr>
<tr>
<td>7 – Good</td>
<td>Preventive Maintenance</td>
</tr>
<tr>
<td>6 – Satisfactory</td>
<td>Preventive Maintenance / Major Preservation</td>
</tr>
<tr>
<td>5 – Fair</td>
<td>Major Preservation/ Rehabilitation</td>
</tr>
<tr>
<td>4 – Poor</td>
<td>Rehabilitation / Replacement</td>
</tr>
<tr>
<td>3 – Serious</td>
<td>Replacement</td>
</tr>
<tr>
<td>2 – Critical</td>
<td>Replacement</td>
</tr>
<tr>
<td>1 – Closed</td>
<td>Replacement</td>
</tr>
</tbody>
</table>
Preventive Maintenance can slow these deterioration rates and delay the need for major capital investments.
Preventive Maintenance

Joint Repair
Condition Based

Cost effective strategies that slow deterioration and extend the service life of bridges.

Crack Sealing
Cyclical: 3-5 year interval

Spring Flushing
Cyclical: Annually or as often as constraints allow
**HIGH PRIORITY REACTIVE MAINTENANCE** is in response to bridge conditions that may impair the safe function of the bridge or deteriorate to critical if not repaired within 1 year.

**MEDIUM PRIORITY REACTIVE MAINTENANCE** is in response to bridge conditions that are expected to deteriorate within 3 years to a High Priority condition.

**LOW PRIORITY REACTIVE MAINTENANCE** is in response to bridge conditions that are easily recognizable as having no impact on structural function or user safety and may be deferred 3 years or more.
Bolt Replacement

Reactive Maintenance

In response to an identified condition.

Rail Repair

Spall Repair

Debris Removal

Approach panel foam jacking

Tipped Bearing
• **Major Preservation** refers to those activities, beyond ordinary maintenance, that are intended to slow or stop the deterioration of bridge elements. These activities prolong service life, and generally maintain the existing design features of the bridge.
## Maintenance Program

<table>
<thead>
<tr>
<th>ELEM NBR</th>
<th>ELEMENT NAME</th>
<th>ENV</th>
<th>REPORT TYPE</th>
<th>INSPE. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
<th>QTY CS 5</th>
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<tbody>
<tr>
<td>988</td>
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<td>Routine</td>
<td></td>
<td></td>
<td>08/16/2011</td>
<td>1 EA</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>N/A</td>
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</tr>
</tbody>
</table>

Notes: [2009] MINOR AMOUNT OF BRUSH GROWING ON INSLOPE. SE DITCH, CM PIPE IS ERODED ALONG ONE SECTION OF PIPE.

<table>
<thead>
<tr>
<th>ELEM NBR</th>
<th>ELEMENT NAME</th>
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<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
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<tbody>
<tr>
<td>026</td>
<td>Top of Concrete Deck (No Overlay - Epoxy Rebar)</td>
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<td>Update</td>
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<td>7611</td>
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<td></td>
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</tr>
</tbody>
</table>

Notes: [2011] WEST PAVING BLOCK HAS 2 LF X 0.5' S 2 INCHES DEEP SPALL AT APPROX CENTERLINE AND CONCRETE REPAIR IS STARTING TO SPALL.
Data Tracking and Reporting

Oracle Business Intelligence

SIMS Maintenance Module
• BRIM Process:
  • Ranking each bridge based on the probability and consequence of a service interruption (Bridge Planning Index).
  • Identifying preservation and improvement needs.
  • Conducting an expert review.
Bridge Maintenance Training

- Bridge Maintenance Academy (BMA I – III)
- Welding
- Shotcrete
- High Angle Rescue
- Statewide annual worker conferences
Bridge Maintenance Training

- Preventive Maintenance eLearning Modules
  - Crack Sealing
  - Gland Repair
  - Flushing (in progress)
  - Poured Joint Sealing (in progress)
  - BMA I (in progress)
- http://www.dot.state.mn.us/bridge/training.html
- Bridge Maintenance Manual – soon to be on the MnDOT Bridge Office website
- 2018 Midwest Bridge Preservation Conference
Current initiatives to improve bridge preservation within MnDOT include:

- Improving the early scoping process
- Developing a preventive maintenance performance measure
- Improving predictive tools for forecasting future bridge conditions
- Quantifying benefits of preservation treatments
- Developing best practices for non bridge asset maintenance needs
- Better tools to help explain agency costs of bridge maintenance activities for asset management
Thank you!

Kevin Western
State Bridge Engineer