Illinois’ Development & Implementation of Asset Management
Illinois Facts

1818 - 2018

• 1,892 Interstate Centerline miles
• 11,427 Other Marked Routes Centerline Miles
• 2,580 Unmarked Route Centerline miles
• Morton, IL is the “pumpkin capital of the world”
• Illinois is home to the Twinkie, Ice Cream Sundae and the Horseshoe
Outline

• TAMP Development
  • Looking back on IDOT’s previous practices
  • The change to pavement preservation
  • The New Bar
  • Expectations with new practices

• TAMP Implementation
  • Data
  • Tools
  • Guidance
  • Processes

• Questions
TAMP Development

Katie Zimmerman
Applied Pavement Technology, Inc.
IDOT’s Historical Approach

- Used performance measures focused on Backlog (repairs needed now or past due) & Accruing Backlog (will be a need in 6 years)
- Targeted repairs on deteriorated pavements
- Reported number of miles in Backlog condition
- Set targets that were unachievable
Backlog Definitions

- Based on CRS values (Condition Rating Survey) and traffic levels for each system
- CRS is a 0 to 9.0 scale, with ratings < 4.5 representing a Poor condition
- Other Backlog = current need
- Critical Backlog = past due need
IDOT’s TAM Goal Is To Raise the Bar

IDOT’s Asset Management Activities Are Raising the Bar by Taking Advantage Of:

- New technology
- New ways of doing business
- Improved transparency and accountability

IDOT is ... RAISING the BAR

by extending the useful lives of existing assets while reducing long-term preservation costs.

IDOT’s TAM Goal Is To Raise the Bar
Desired State of Acceptable Condition

- Interstate Mileage: CRS ≥ 5.5
- Other NHS Mileage: CRS ≥ 5.0
- Marked Route Mileage: CRS ≥ 5.0
- Unmarked Route Mileage: CRS ≥ 5.0

Legend:
- Excellent
- Good
- Fair
- Poor
- Acceptable
- Unacceptable
Predicted 10-Year Performance

Pavements

Percent of Network

- Interstate
- Toll Highways*
- Other NHS
- State Marked Routes
- State Unmarked Routes

NHS: Performance Gap
Non-NHS: Performance Gap
*Illinois Tollway and Skyway

Projected Conditions
Desired Conditions
IDOT’s Success Depends on Implementation
TAMP Implementation

John Senger
Illinois Department of Transportation
Current State of Highways

CRS Inputs

- International Roughness Index
- Rutting (HMA surface only)
- Faulting (PCC Surface Only)
- Functional and Structural Distresses
  - Weight increases with frequency and severity

Pavement CRS Metric

- Excellent
- Good
- Fair
- Poor

<table>
<thead>
<tr>
<th></th>
<th>Unmarked Routes</th>
<th>Marked Routes</th>
<th>Interstate</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Roughness Index</td>
<td>14%</td>
<td>19%</td>
<td>42%</td>
</tr>
<tr>
<td>Rutting (HMA surface only)</td>
<td>28%</td>
<td>28%</td>
<td>35%</td>
</tr>
<tr>
<td>Faulting (PCC Surface Only)</td>
<td>33%</td>
<td>32%</td>
<td>18%</td>
</tr>
<tr>
<td>Functional and Structural Distresses</td>
<td>25%</td>
<td>21%</td>
<td>5%</td>
</tr>
</tbody>
</table>
## Current State of Highways – PM2

<table>
<thead>
<tr>
<th></th>
<th>Poor Miles</th>
<th>Poor Percentage</th>
<th>Fair Miles</th>
<th>Fair Percentage</th>
<th>Good Miles</th>
<th>Good Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate</td>
<td>7.31</td>
<td>0.38%</td>
<td>689.03</td>
<td>36.26%</td>
<td>1132.5</td>
<td>59.60%</td>
</tr>
<tr>
<td>Non-Interstate</td>
<td>284.99</td>
<td>8.56%</td>
<td>2127.89</td>
<td>63.93%</td>
<td>876.93</td>
<td>26.53%</td>
</tr>
</tbody>
</table>
Data Collection and Usage

• Automated Data Collection and Identification
• Distress frequency and severity
• Pavement cross section and history
• Focused on trends and performance
The Black Box

- Pavement inventory, history, and condition ratings
- Updated Deterioration models
- Upgrading from in-house system
- Working with big data
Decision Trees

- Created a Pavement Working Group
- Created several iterations
- Districts retain lots of options
- Preservation, Minor Rehabilitation, Major Rehabilitation, Reconstruction
Initial Decision Screening

1. Do Nothing
   - Is the projected CRS above 7.5?
     - Yes
     - No
       - 7.5 - 10 int.
       - 7.5 - 5.0 Other
         - Projected CRS?
           - No: Rehabilitation
           - Yes: Standard Overlay (Figure 53-XX.X)
             - Distress:
               - Rut (0.20 in.) > 0.25
               - > 0.27
               - > 0.3 (Int)?
               - > 0.4 (Any)?
               - > 0.67
               - > 0.7?
                 - No to all
                 - To any
                   - Perform Investigation to determine scope of work:
                     1) Standard Overlay
                     2) Designed Overlay
                     3) Reconstruction

2. Pavement Preservation
   - 500s
   - 600s
   - Yes to any
   - Figure 3

3. Surface Type
   - Figure 2a
   - Figure 2b

4. PCC: yes to any
   - Perform Investigation to determine scope of work:
     1) Standard Overlay
     2) Designed Overlay
     3) Reconstruction
**Pavement Preservation**

- High and Low Preservation
- Patching only with full lane treatment
- Pavements only in the good and fair
- Preservation Committee

- **High Preservation**
  - SMART Overlay
  - CIR and HIR
  - Long. Joint Part-Depth Repair
  - UTBWC
  - LTR

- **Low Preservation**
  - Chip Seal
  - Micro-surfacing and slurry seal
  - Cape Seal
  - Half SMART

- **Maintenance**
  - Crack Filling/Sealing
  - Fog Seal
  - Milling
  - Diamond Grinding / Grooving
# Full-Depth HMA Options

## Asphalt-Surfaced Pavement Preservation Decision Matrix - 500s Pavement Type

<table>
<thead>
<tr>
<th>Surface Type</th>
<th>Preservation Treatment&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Allowable Treatments for Interstates</th>
<th>Distresses Best Mitigated with Preservation Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low (L1)</td>
<td>Low (M1, M2)</td>
</tr>
<tr>
<td>Crack Filling / Joint Filling / Joint Sealing</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Bituminous Surface Treatment (A-1, A-2, A-3)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Micro-Surfacing&lt;sup&gt;1&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Centerline/Longitudinal Joint Micro-Surfacing</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Longitudinal Joint Partial-Depth Repair</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Cape Seal</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Half S.M.A.R.T.</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ultra Thin Bonded Wearing Course</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>S.M.A.R.T. T. Overlay</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hot In-Place Recycling</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Cold In-Place Recycling</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/ ADT ≤ 25,000 use 1-pass; ADT &gt; 25,000 use 2-pass</td>
</tr>
<tr>
<td>2/ If this is the only distress present, use indicated treatments. If other distresses are also present, use the treatment that addresses the distresses across the full lane.</td>
</tr>
<tr>
<td>3/ Full-Depth and Partial-Depth patching will only be allowed as a mitigating activity. A maximum of 1.00 percent will be allowed with any preservation treatment.</td>
</tr>
</tbody>
</table>
# HMA Over PCC Pavements

## Asphalt-Surfaced Pavement Preservation Decision Matrix - 600s Pavement Type

<table>
<thead>
<tr>
<th>Surface Type</th>
<th>Preservation Treatment</th>
<th>Allowable Treatments for Interstates</th>
<th>Distresses Best Mitigated with Preservation Treatment</th>
<th>Oxidation/Weathering/Raveling/Segregation</th>
<th>Longitudinal Joint Cracking</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMA Over Concrete (600s)</td>
<td>Crack Filling / Joint Filling / Joint Sealing</td>
<td>X X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Bituminous Surface Treatment (A-1, A-2, A-3)</td>
<td>X X X</td>
<td>X X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Micro-Surfacing</td>
<td>X X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
</tr>
<tr>
<td></td>
<td>Centerline/Longitudinal Joint Micro-Surfacing</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
</tr>
<tr>
<td></td>
<td>Longitudinal Joint Partial-Depth Repair</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
</tr>
<tr>
<td></td>
<td>Cape Seal</td>
<td>X X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
</tr>
<tr>
<td></td>
<td>Half S.M.A.R.T.</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
</tr>
<tr>
<td></td>
<td>Ultra-Thin Bonded Wearing Course</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
</tr>
<tr>
<td></td>
<td>S.M.A.R.T. Overlay</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
</tr>
<tr>
<td></td>
<td>Hot In-Place Recycling</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
</tr>
<tr>
<td></td>
<td>Cold In-Place Recycling</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
</tr>
</tbody>
</table>

Notes:
1/ ADT ≤ 25,000 use 1-pass; ADT > 25,000 use 2-pass
2/ If this is the only distress present, use indicated treatments. If other distresses are also present, use the treatment that addresses the distresses across the full lane.
3/ Full-Depth and Partial-Depth patching will only be allowed as a mitigating activity. A maximum of 1.0 percent will be allowed with any preservation treatment.
### Concrete-Surfaced Pavement Preservation Decision Matrix

<table>
<thead>
<tr>
<th>Surface Type</th>
<th>Preservation Treatment(^3)</th>
<th>D-Cracking</th>
<th>Transverse Cracking</th>
<th>Trans. Joint Deterioration</th>
<th>Longitudinal Joint Deterioration</th>
<th>Longitudinal Cracking</th>
<th>Faulting</th>
<th>Map Cracking/Scaling</th>
<th>Popouts/High Steel</th>
<th>Permanent Patch Deterioration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCC (700b)</td>
<td>Crack and Joint Sealing</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>I1 - I3</td>
<td>J1 - J2</td>
<td>Low (K1)</td>
</tr>
<tr>
<td></td>
<td>Load Transfer Restoration</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>J1 - J2</td>
<td>Low (K1)</td>
</tr>
<tr>
<td></td>
<td>Diamond Grinding(^1)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>J1 - J2</td>
<td>Low (K1)</td>
</tr>
<tr>
<td></td>
<td>Cross-Stitching(^2)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>J1 - J2</td>
<td>Low (K1)</td>
</tr>
<tr>
<td></td>
<td>Ultra-Thin Bonded Wearing Course</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Low (K1)</td>
</tr>
</tbody>
</table>

**Notes:**

1/ If intermittent bump grinding, no additional activity necessary. However, if large areas or > 100 ft in length, must also perform diamond grooving.

2/ Requires an Experimental Feature.

3/ Full-Depth and Partial-Depth patching will only be allowed as a mitigating activity. A maximum of 1.00 percent will be allowed with any preservation treatment.
Changes to Rehabilitation Options

Standard Overlays and Designed Overlays

• Existing Policy Overlays
  • 2.25” Non-Interstate
  • 3.75” Interstate

• Standard Overlays
  • 2” – 3” Non-Interstate
  • 3” – 4.25” Interstate

• Designed Overlays
# Standard Overlay Options

**Interstate 3 – 4.25 in.**

**Non-Interstate 2 – 3 in.**

<table>
<thead>
<tr>
<th>Option</th>
<th>Lift Thickness (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL-19.0 (Interstate binder only)</td>
<td>2.25</td>
</tr>
<tr>
<td>IL-9.5</td>
<td>1.50</td>
</tr>
<tr>
<td>IL-9.5FG</td>
<td>1.25</td>
</tr>
<tr>
<td>IL-4.75* (binder only)</td>
<td>0.75 – 1.00</td>
</tr>
<tr>
<td>SMA 12.5</td>
<td>2.00</td>
</tr>
<tr>
<td>SMA 9.5**</td>
<td>1.75</td>
</tr>
</tbody>
</table>

*Use 1.00 inch on bare PCC.

**Will be adopted as standard specification soon**
Standardization of New Policies

- Updates to Bureau of Design and Environment Manual
- Programming Guidelines update
- CRS Ratings Changes
New Initiatives in HMA

Full Lane Sealant

Longitudinal Joint Seal
Thank You.

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