Midwestern Partnership Reports
Indiana Department of Transportation

Bill Tompkins- Operations Field Engineer
Todd Shields – Systems Assessment Manager
Pavement Preservation Initiative (PPI)

HMA Treatments
1. Seal Coat – In-House
2. Micro-Surface- Contract
3. QC/QA HMA Surface 4.75mm – Contract
4. UBWC - Contract

PCCP Treatments
1. PCCP Patching – Contract
2. PCCP Joint Sealing - Contract
3. PCCP Profiling/Retexturing – Contract
4. PCCP Dowel Bar Retrofit- Contract
Best Success

- Revised Seal Coat aggregate specifications
- Increase in PPI Contract funding beginning FY 13 from 12 million to 18 million.
- Funding for In-House Chip Seal Approx. 12 million
Program Highlights/ Strides

Pavement Preservation Initiative Accomplishments (In-House and Contract)
Program Highlights/ Strides

Pavement Preservation Initiative Accomplishments (In-House Chip Seal)

<table>
<thead>
<tr>
<th>Year</th>
<th>Lane Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2009</td>
<td>444</td>
</tr>
<tr>
<td>FY 2010</td>
<td>705</td>
</tr>
<tr>
<td>FY 2011</td>
<td>1161</td>
</tr>
<tr>
<td>FY 2012</td>
<td>1402</td>
</tr>
<tr>
<td>FY 2013 (Planned)</td>
<td>1482</td>
</tr>
</tbody>
</table>
Iowa Department of Transportation

Asset Management & More
Related Key Functions

Strategic Communication

Strategic Planning

Asset Management

Performance Management

* With thanks to GDOT for the kernel of this concept
Kansas Department of Transportation
KS – Best Success

• T-WORKS still going…
• Placing attention on maintaining the travelway, not shoulders.
• PP tool box is big and flexible!
• No buzzard wings!
KS – Program Highlights

About T-WORKS

In May 2010, the Kansas Legislature passed Transportation Works for Kansas (T-WORKS), an $8 billion 10-year transportation program. T-WORKS is designed to create jobs, preserve highway infrastructure, and provide multimodal economic development opportunities across the state.
KS – Program Highlights

**T-WORKS Funding**

T-WORKS projects are funded primarily through a 4/10 cent sales tax. Below is a breakdown of how much funding each program will receive over the 10 years of the program.

<table>
<thead>
<tr>
<th>Project</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway Preservation Projects</td>
<td>$4.2 Billion</td>
</tr>
<tr>
<td>Highway Modernization &amp; Expansion Projects</td>
<td>$1.8 Billion</td>
</tr>
<tr>
<td>Transit Services</td>
<td>$100 Million</td>
</tr>
<tr>
<td>Aviation Projects</td>
<td>$46 Million</td>
</tr>
<tr>
<td>Rail Projects</td>
<td>$40 Million</td>
</tr>
<tr>
<td>Special City County Highway Fund (Local Roads)</td>
<td>$1.6 Billion</td>
</tr>
<tr>
<td><strong>Total Program</strong></td>
<td><strong>$7.8 Billion</strong></td>
</tr>
</tbody>
</table>
KS – Advancing Pav. Pres.

- RAP, RAS, Blending Chart
- Pull Off Test (tack adhesion)
- Black Topping (D-cracking)
- White Topping (stability)
- No buzzard wings!
- New NOS van
Manitoba Infrastructure and Transportation

Nicole Fleury
Construction Programming Engineer
Contract Services Branch

Tara Liske
Surfacing Materials Engineer
Materials Engineering Branch
Strides Taken to Advance Pavement Preservation

- AST Strategy
- Highway Asset Management Study
- 3 preservation treatment trial (~12 miles each) for Microsurfacing, Slurry Seal, and Sealcoat.
- Investigating possible applications for Reclamite and TRMSS
Best Success

• Increased Microsurfacing Program
• Cold-in-place recycling and concrete pavement restoration
• In house sealcoat treatment performance
• Implemented specification changes to ensure construction of smooth pavements
• Increased awareness and focus at all levels on preserving the existing highways
Program Highlights

• Continued focus on:
  – Bituminous overlays, Microsurfacing, Sealcoat.
  – Concrete pavement restoration: diamond grinding, dowel bar retrofit, full and partial depth concrete repairs.
  – Improving our data and pavement management system
Questions?
Fix Type Categories

- **Surface Sealing**
  - Micro-Surface
  - Chip Seal
  - Ultra Thin Overlay (Low and Medium Volume)
  - Paver Placed Surface Seal
  - HMA Crack Treatment
  - Overband Crack Fill Pretreatment
  - Concrete Crack Treatment
  - Concrete Joint Sealing with Minor Spall Repair

- **Functional Enhancement**
  - Non Structural HMA Overlay (1.5”)
  - Surface Milling with Non-Structural HMA Overlay (1.5”)
  - HMA Shoulder Ribbons
  - Full Depth Concrete Pavement Repairs
  - Diamond Grinding
  - Dowel Bar Retrofit
  - Concrete Pavement Restoration
2013 Program

• $92.21 Million Budget
  – Surface Sealing
    • $26.42 Million
    • 416 Lane Miles
  – Functional Enhancement
    • $62.95 Million
    • 505 Lane Miles
Strides Taken to Advance Pavement Preservation

• Research Project – Cost Effectiveness of Preventive Maintenance
• FHWA Technical Appraisal
• Overband Crack Fill Test Section
• Investigating the Use of Tack Coat on Micro-Surfacing Projects
• Joint Training with Michigan Road Preservation Association
Minnesota Department of Transportation

Jerry Geib
Research Operations Engineer
New Product Test Sections

- Longitudinal Joint Deterioration
  - Joint Treatment, Joint Adhesive, FHWA/Asphalt Institute Workshop

- Highly Modified Asphalt, 76-34
  - [http://www.tsp2.org/pavement/other-information/research-pavement/](http://www.tsp2.org/pavement/other-information/research-pavement/)

- Highly Modified Micro Surfacing
  - 49-34 base asphalt
Advancing Innovative Products

- MnDOT Destination Innovation
  - Micro-milling and a new surface
- MPPP “contacts” made this week!!
- Proprietary products
Advancing Innovative Products

- MnDOT Seal Coat program
- DOT comment
  - Do what we know. Do it right.
Pavement Preservation at the Missouri Department of Transportation

R. Todd Miller, P.E.
Keep Good Pavements Good

Years of Service Life

Pavement Condition (%)

- Pavement Condition
- Threshold (Good/Bad)
- Properly Preserved Pavement
- Improperly Preserved Pavement
- Wrong Solution

2012 NATIONAL PAVEMENT PRESERVATION CONFERENCE
Transportation Planning Developed Pavement Planning Tool
### MoDOT Pavement Selection Matrix
#### Regionally Significant Minor Roads

<table>
<thead>
<tr>
<th></th>
<th>2 ¼” AC</th>
<th>1 ¼” AC</th>
<th>UBAWS</th>
<th>1” CLC</th>
<th>Microsurface</th>
<th>Coarse Aggregate Chip Seal (&lt;2,500 AADT)</th>
<th>Fine Aggregate Chip Seal (&lt;2,500 AADT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$140,000/Mile</td>
<td>$70,000/Mile</td>
<td>$60,000/Mile</td>
<td>$30,000/Mile</td>
<td>$35,000/Mile</td>
<td>$10,000/Mile</td>
<td>$8,000/Mile</td>
</tr>
<tr>
<td>Life</td>
<td>12-15 years</td>
<td>8-10 years</td>
<td>7-9 years</td>
<td>8-12 years</td>
<td>6-8 years</td>
<td>5-7 years</td>
<td>3-5 years</td>
</tr>
</tbody>
</table>

| Contractor | MoDOT |

### MoDOT Pavement Selection Matrix
#### Minor Roads > 400 AADT

<table>
<thead>
<tr>
<th></th>
<th>1” CLC</th>
<th>Cold Mix Overlay</th>
<th>Coarse Aggregate Chip Seal (&lt;2,500 AADT)</th>
<th>Fine Aggregate Chip Seal (&lt;2,500 AADT)</th>
<th>Fog Seal/Fly Coat</th>
<th>Hot or Cold Mix Partial Overlay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$25,000/Mile</td>
<td>$13,000/Mile</td>
<td>$10,000/Mile</td>
<td>$8,000/Mile</td>
<td>$2,200/Mile</td>
<td>$2,000/Mile</td>
</tr>
<tr>
<td>Life</td>
<td>12-15 years</td>
<td>4-5 years</td>
<td>5-7 years</td>
<td>3-5 years</td>
<td>1-2 years</td>
<td>2-3 years</td>
</tr>
</tbody>
</table>

| Contractor | MoDOT |

### MoDOT Pavement Selection Matrix
#### Minor Roads < 400 AADT

<table>
<thead>
<tr>
<th></th>
<th>Cold Mix Overlay</th>
<th>Coarse Aggregate Chip Seal</th>
<th>Fine Aggregate Chip Seal</th>
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<th>Hot or Cold Mix Partial Overlay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$13,000/Mile</td>
<td>$10,000/Mile</td>
<td>$8,000/Mile</td>
<td>$2,200/Mile</td>
<td>$1,200/Mile</td>
</tr>
<tr>
<td>Life</td>
<td>4-5 years</td>
<td>5-7 years</td>
<td>3-5 years</td>
<td>1-2 years</td>
<td>2-3 years</td>
</tr>
</tbody>
</table>

| Contractor | MoDOT |

[Image: MoDOT logo]
Traffic numbers have dramatically increased in western North Dakota.

From 2009 to 2012:

- **US 85 south of Williston** - ADT increased from 2,685 to 13,245 (393%) and trucks increased from 590 to 5,560 (842%)

- **ND 23 east of Watford City** - ADT increased from 2,220 to 9,450 (325%) and trucks increased from 700 to 3,445 (392%)

- **ND 1806 north of Watford City** – trucks increased from 85 to 750 (782%)
Increased Traffic Volume
# NDDOT Preservation Program Highlights

Distribution of dollars by work type

<table>
<thead>
<tr>
<th>Work Type</th>
<th>Interstate</th>
<th>Inter-Regional</th>
<th>State Corridor District Corridor Collector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventative Maintenance</td>
<td>45% 17%</td>
<td>20% 28%</td>
<td>35% 55%</td>
</tr>
<tr>
<td>Minor Rehabilitation/Structural Overlay</td>
<td>27% 18%</td>
<td>42% 39%</td>
<td>42% 31%</td>
</tr>
<tr>
<td>Major Rehab/Reconstruction</td>
<td>38% 73%</td>
<td>26% 46%</td>
<td>16% 29%</td>
</tr>
<tr>
<td>Structures</td>
<td>3% 1%</td>
<td>3% 0%</td>
<td>3% 5%</td>
</tr>
<tr>
<td>Safety</td>
<td>5% 1%</td>
<td>3% 2%</td>
<td>3% 3%</td>
</tr>
</tbody>
</table>

Target % of Federal Dollars vs. **Actual 2012 % of Federal Dollars**

<table>
<thead>
<tr>
<th>Work Type</th>
<th>Interstate</th>
<th>Inter-Regional</th>
<th>State Corridor District Corridor Collector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventative Maintenance</td>
<td>27% 7%</td>
<td>26% 13%</td>
<td>36% 32%</td>
</tr>
<tr>
<td>Minor Rehabilitation/Structural Overlay</td>
<td>27% 18%</td>
<td>42% 39%</td>
<td>42% 31%</td>
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<tr>
<td>Safety</td>
<td>5% 1%</td>
<td>3% 2%</td>
<td>3% 3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>100% 100%</th>
<th>100% 100%</th>
<th>100% 100%</th>
</tr>
</thead>
</table>
## Lane Miles Treated by Type

<table>
<thead>
<tr>
<th>Project Type</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thin Lift Overlay</td>
<td>300</td>
<td>523</td>
<td>589</td>
<td>444</td>
<td>74</td>
</tr>
<tr>
<td>CPR</td>
<td>29</td>
<td>74</td>
<td>39</td>
<td>63</td>
<td>39</td>
</tr>
<tr>
<td>Microsurfacing</td>
<td>121</td>
<td>40</td>
<td>38</td>
<td>131</td>
<td>75</td>
</tr>
<tr>
<td>Slurry Seal</td>
<td>118</td>
<td>166</td>
<td>80</td>
<td>166</td>
<td>62</td>
</tr>
<tr>
<td>Chip Seal</td>
<td>540</td>
<td>242</td>
<td>171</td>
<td>276</td>
<td>196</td>
</tr>
<tr>
<td>Crack Sealing</td>
<td>38%</td>
<td>21%</td>
<td>34%</td>
<td>18%</td>
<td>-</td>
</tr>
</tbody>
</table>
Strides Taken

Lime in Asphalt Pavement: Will be incorporating lime into “a few” asphalt projects in 2013.

Recently added a “Bridge Maintenance” program into our Maintenance Manual.
Precast Concrete Pavement Slabs

• An alternative to Fast Track concrete
High Early Strength Concrete Roadbase

- Variety of concrete mix designs
- Require 24, 48 or 72 hours for adequate strength gain
Joint and Crack Treatments

- Rout and seal
- Strip repair
- Microsurfacing
Selective Resurfacing

• 3-year+ holding strategy
• Single lift milling and patching
• Full lane width
• Patches can be short (50 ft.) to address critical deficient surface areas
Ontario

- Partial Paved Shoulders
- Microsurfacing

BEFORE

3 Year Performance
Saskatchewan Ministry of Highways & Infrastructure

ADVANCING PAVEMENT PRESERVATION IN SASKATCHEWAN
Measuring Distresses

• ARA Rolling Weight Deflectometer
  – 500 km trial underway

• EBA INO Laser Crack Measuring System
  – 200 km trial underway
Treatments

- Fibre-Reinforced Seals
- Sandwich Seal
- Thin Lift Overlays
- Stress Absorbing Interlayer with TLO
Management Tools

• Preservation Policy
• New Performance Measures
  – Benefits for Taxpayers & Road Users
• Needs Based Maintenance Planning & Reporting
  – Proactive & Reactive Maintenance
Illinois Pavement Preservation

LaDonna Rowden
Ron Price
Status of Program

• Commitment to industry to program projects each year.
• Treatments used for commitment same as previous years.
Targeted Treatments

• Emulsion Based Surface treatments
  – Bituminous Surface Treatment (Chip Seal)
  – Cape Seal
  – Micro-surfacing
  – Slurry Seal

• Most promising
  – Micro-surfacing of centerline
  – Several districts impressed with initial performance
## Pavement Preservation Program

<table>
<thead>
<tr>
<th>Treatment</th>
<th>FY 2012</th>
<th>FY2013</th>
<th>Total per Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bituminous Surface Treatment</td>
<td>$545,000</td>
<td>$676,000</td>
<td>$1,221,000</td>
</tr>
<tr>
<td>Cape Seal</td>
<td>$1,600,000</td>
<td>$500,000</td>
<td>$2,100,000</td>
</tr>
<tr>
<td>Micro-Surfacing</td>
<td>$435,000</td>
<td>$700,000</td>
<td>$1,135,000</td>
</tr>
<tr>
<td>Slurry Seal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total per FY</td>
<td>$2,580,000</td>
<td>$1,876,000</td>
<td>$4,456,000</td>
</tr>
</tbody>
</table>
Future of Program

• Continue efforts to advance program
  – Encourage districts to use pavement preservation treatments to impact more miles with fewer dollars.
  – Encourage industry to expand list of treatments allowed to meet commitment.
Streets, Roads & Highways Preserved with GSB-88
Preservation is about starting sooner…

Aging, hardening begins in the Hot Mix Process…

Refineries, Modern Binders aging more quickly than they used to …

Why wait so many years while the most important attribute (flexibility) escapes?
**Gilsonite** - Nothing Else Like it...

*Gilsonite* resin acts like binders used to act...

- **Tougher**, traffic wear non-issue
- **More resilient** against environment
- **Better adhesion** to aggregates
- **Oxidizes much more slowly**
GSB-88 = High Performance

Made with Gilsonite, Sealer Binder & Rejuvenator...

- Adds superior binder into matrix
- Stops aging of pavement better
- Lasts longer
- Lowest Life Cycle Cost (NAVFAC Study)
GSB-88 = Lowest Cost

**Applied to:**
- Chip seals, halts chip loss
- Primary road surfaces
- Shoulders
- Rumble Strips
- Parks departments, parking lots, trails

More info at [geeasphalt.net](http://geeasphalt.net)
Pavement Technology, Inc.

Celebrating 40 Years

A Noteworthy 2012 Project
Pavement Abrasion & Asphalt Rejuvenator Application on I-40 for NCDOT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

DIVISION 03

CONTRACT PROPOSAL

WBS ELEMENT NUMBER: 46280.3.1 & 3CR.10311.129
TIP#: I-5203A
ROUTE: I-40 (East and West Bound Lanes at Various Mile Post) and NC 903
COUNTY: Duplin, New Hanover & Pender
DESCRIPTION: Pavement Abrasion & Asphalt Rejuvenator
BID OPENING: May 24, 2012
• Project addressed approximately 20 lane miles on I-40 near Wilmington

• Involved using surface abrasion by SKIDABRADER to increase skid numbers to a level that would be acceptable for interstate traffic after the application of Reclamite® Asphalt
GOAL:

Extend the life of the interstate pavement surface by using a maltene based *asphalt rejuvenator* to improve the asphalt binder’s condition through improving its viscosity and elasticity and to increase surface friction for safety.
Project Involved:

- Taking pavement cores for testing before and after abrasion and Reclamite application

- Conducting Skid Test before abrasion then before and after Reclamite application
THE PROCESS:

Surface abrasion by SKIDABRADER

Reclamite® application
## Skid Numbers Before & After

**Average Skid Test **Before: **39.34**

**Average Skid 30 Minutes After Skidabrader/Reclamite Process:** **47.33**

**Average Skid 24 Hours After Skidabrader/Reclamite Process:** **51.7**

**Average Skid 48 Hours After Skidabrader/Reclamite Process:** **54.6**

### Testing Summary

<table>
<thead>
<tr>
<th>Location</th>
<th>Lane</th>
<th>Direction</th>
<th>Test</th>
<th>Average SNR40</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP 417.73 to 418.37</td>
<td>Right</td>
<td>East</td>
<td>Before</td>
<td>36.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After abrasion</td>
<td>79.34</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After spray</td>
<td>46.88</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After 24 hrs</td>
<td>51.94</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After 48 hours</td>
<td>49.77</td>
</tr>
<tr>
<td>MP 417.73 to 418.37</td>
<td>Left</td>
<td>East</td>
<td>Before</td>
<td>40.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After abrasion</td>
<td>74.58</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After spray</td>
<td>49.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After 24 hrs</td>
<td>50.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After 48 hours</td>
<td>61.02</td>
</tr>
<tr>
<td>MP 418.37 to 417.73</td>
<td>Right</td>
<td>West</td>
<td>Before</td>
<td>41.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After abrasion</td>
<td>67.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After spray</td>
<td>44.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After 24 hrs</td>
<td>52.43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After 48 hours</td>
<td>50.63</td>
</tr>
<tr>
<td>MP 418.37 to 417.73</td>
<td>Left</td>
<td>West</td>
<td>Before</td>
<td>39.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After abrasion</td>
<td>73.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After spray</td>
<td>48.86</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After 48 hours</td>
<td>57.01</td>
</tr>
</tbody>
</table>
CORE TESTS RESULTS

Pavement core samples were taken and tested by Tri Mat Materials Testing two weeks before and after the Reclamite was applied.

The asphalt binder’s **Viscosity** had an average improvement of 40.25% at 4 of the 5 locations.

Table 1 - Core Results for Pre and Post Treatment

<table>
<thead>
<tr>
<th>Sample Number and Location</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3374 MM 418 W</td>
<td>230.0</td>
</tr>
<tr>
<td></td>
<td>3375 MM 418E</td>
<td>209.0</td>
</tr>
<tr>
<td></td>
<td>3376 MM 411 In</td>
<td>283.0</td>
</tr>
<tr>
<td></td>
<td>3377 MM 411 Out</td>
<td>294.0</td>
</tr>
<tr>
<td></td>
<td>3378 MM 409</td>
<td>257.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex Modulus, 60C, G* (kPa)</td>
<td>230.0</td>
<td>227.0</td>
</tr>
<tr>
<td>Viscosity, 60C, (Pa-s)</td>
<td>230000</td>
<td>227000</td>
</tr>
<tr>
<td>Phase Angle, 60C (degrees)</td>
<td>60.6</td>
<td>57.6</td>
</tr>
<tr>
<td>Percent Reduction</td>
<td>1%</td>
<td>4%</td>
</tr>
</tbody>
</table>

- Extraction and recovery testing performed as per ASTM D1856 and D5404.
- Asphalt binder viscosity tested per AASHTO Test Method T315.
Stop at Booths 26 & 27
For More Information