MnROAD-NCAT
Pavement Preservation Study

NEAUPG
Burlington, Vermont
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Pavement Preservation

“A program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations”

- FHWA Pavement Preservation Expert Task Group
Pavement Preservation

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Pavement Preservation Study

Objectives:
1) Quantify life extending benefit of study treatments
2) Sampling/testing methods for construction quality
Pavement Preservation

- Prevention
- Rehabilitation
- Reconstruction

Time / Traffic
Pavement Preservation
Pavement Preservation

- Prevention
- Rehabilitation
- Reconstruction

Time / Traffic

Life Extending Benefit
Condition Improving Benefit
Pavement Preservation
Pavement Preservation on Lee Road 159

- Low ADT roadway
- **Very high % trucks**
- 14-year old 5½” pavement
- Diverse pavement condition
- Load data provided by quarry and asphalt plant
Pavement Preservation on Lee Road 159

1. Rejuvenating Fog Seal
2. Fibermat
3. Control
4. Control
5. Crack Seal (CS)
6. Single Layer Chip Seal
7. CS + Single Layer Chip Seal
8. Triple Layer Chip Seal
9. Double Layer Chip Seal
10. Microsurfacing + Single Chip (Cape)
11. Microsurfacing
12. CS + Microsurfacing
13. Double Layer Microsurfacing
14. Fibermat + Microsurfacing (Cape)
15. Scrub Seal + Microsurfacing (Cape)
16. Scrub Seal
17. Distress Demo Section
18. Fibermat + HMA thinlay (HMA Cape)
19. HMA Thinlay (PG 67-22)
20. HMA + 100% Foamed Recycle Inlay
21. HMA Thinlay (PG 76-22)
22. Ultra Thin Bonded Wearing Course
23. HMA Thinlay (50% RAP)
24. HMA Thinlay (5% PCRAS)
25. HMA Thinlay (High Polymer)
Pavement Preservation on Lee Road 159

- Rutting, roughness, texture
- Surface friction
- Subgrade moisture contents
- Falling weight deflectometer (FWD)
- Visual and video based cracking measurement
Rates Checked Prior to Placement
Actual Rates Verified During Placement
Subgrade Moisture

Change in Gravimetric Moisture Relative to Control Sections (%)

Date Under Traffic from Quarry and Asphalt Plant

- Crack Seal Only
- Chip Seal
- Crack Seal then Chip Seal
- Scrub Seal

NCAT at Auburn University
MNROAD-NCAT PARTNERSHIP
PG 2015
MnROAD & NCAT Partnership

- Development
  - Informal in the past
  - June 2014 @ MnROAD
  - October 2014 @ NCAT
  - Formalized in 2015
  - FP² / NCPP Participation

- Partnership Benefits
  - Individual Strengths of Each Other
  - Operations / Data Sharing / Analysis
  - Greater National Appeal
PG 2012 Research Sponsors
PG 2015 Research Sponsors

Map of the United States with states highlighted in purple. The text in the image is not legible.
MnDOT

The 29,300 lane mile state highway system is 74% of State-owned capitol assets
Thermal Crack
2015 Preservation Continuation/Expansion

- Continue monitoring ‘12 sections (Track & 159)
- Capture life extending benefit curve data
- Partnership with MnROAD for nationwide scope
  - Build low-volume and high-volume sections in MN
- Build sections on higher ADT roadway in AL.
# MnROAD-NCAT Partnership

<table>
<thead>
<tr>
<th>NCAT</th>
<th>MnROAD</th>
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<tbody>
<tr>
<td><strong>Analysis</strong></td>
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<tr>
<td>- Subsections to develop life-extending</td>
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<tr>
<td>benefit curves</td>
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<tr>
<td><strong>Higher Volume (US 280)</strong></td>
<td><strong>Higher Volume (TBD)</strong></td>
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<tr>
<td>Control sections</td>
<td>Control sections</td>
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<tr>
<td>Treated sections</td>
<td>Treated sections</td>
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<tr>
<td>Replicate LR 159 treatments</td>
<td>Replicate LR 159 treatments</td>
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<tr>
<td>Additional treatments (CIR, ABR thin</td>
<td>Possibly additional treatments</td>
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<td>overlay, etc.)</td>
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<tr>
<td><strong>Low Volume (LR 159)</strong></td>
<td><strong>Low Volume (TBD)</strong></td>
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<tr>
<td>2 control sections</td>
<td>Control sections</td>
</tr>
<tr>
<td>23 treated sections</td>
<td>Treated sections</td>
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Higher ADT Off-Track Preservation

- US-280 3 miles to east of Track
- 17,000 ADT, ≈9 year old surface
- Westbound outside lane
- ≥ MP 128.0 to MP 132.6
- Tenth mile sections
Treatments

- Control Sections
- Surface Treatments
  - Crack Sealing
  - Fog Seal
  - Chip Seals
  - Scrub Seals
  - Microsurfacing
  - Combinations (Cape Seals)
- Cold Recycling + 1” overlay
  - Cold-in-place (CIR)
  - Cold Central Plant Recycle (CCPR)
- Thin Overlays (3/4”)
  - Dense Graded (4.75 mm)
  - OGFC
  - UTBWC
  - Combinations
Timeline

Spring/Summer 2015: “South” Treatment Layout/Designs

Dec 2015: Sponsor Meeting @ NCAT

2015-2016: “North” Treatment Layout/Designs

Fall 2016: Sponsor Meeting @ MnROAD

Aug/Sept 2015: “South” Construction

Spring 2016: Sponsor Meeting @ NCAT

Summer 2016: MnROAD Construction

Minnesota Department of Transportation

National Center for Asphalt Technology
South Treatments Placed Aug/Sept 2015
Questions?

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