NCAT Pavement Test Track

Preservation Update
Track Research Sponsors


Private Sector Sponsors
- Cargill Deicing Technology
- FP2
- Kraton Polymers
- Modified Asphalt Solutions
- Oldcastle Materials
- Polycon Manufacturing
- Seneca Petroleum
- Shell Sulfur Solutions
- Trinidad Lake Asphalt

National Center for Asphalt Technology at Auburn University
Content

- NCAT Pavement Test Track
- Lee Road 159
- 2015 research cycle (US-280)
2012 Track

- Green Group (GG) study
- 100% RAP CCPR base mix (+FDR)
- Surface crack prevention
- Crack and rut resistant thin overlays
- Perpetual pavement design
- HiMA for new/rehab pavements
- Preservation Group (PG) study.
2012 Track

- Green Group (GG) study
- 100% RAP CCPR base mix (+FDR)
- Surface crack prevention
- Crack and rut resistant thin overlays
- Perpetual pavement design
- HiMA for new/rehab pavements
- Preservation Group (PG) study.
2012 Track
2012 Track
2012 Track
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
<table>
<thead>
<tr>
<th></th>
<th>Pavement Preservation on Lee Road 159</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Rejuvenating Fog Seal</td>
</tr>
<tr>
<td>2.</td>
<td>Fibermat</td>
</tr>
<tr>
<td>3.</td>
<td>Control</td>
</tr>
<tr>
<td>4.</td>
<td>Control</td>
</tr>
<tr>
<td>5.</td>
<td>Crack Seal (CS)</td>
</tr>
<tr>
<td>6.</td>
<td>Single Layer Chip Seal</td>
</tr>
<tr>
<td>7.</td>
<td>CS + Single Layer Chip Seal</td>
</tr>
<tr>
<td>8.</td>
<td>Triple Layer Chip Seal</td>
</tr>
<tr>
<td>9.</td>
<td>Double Layer Chip Seal</td>
</tr>
<tr>
<td>10.</td>
<td>Microsurfacing + Single Chip (Cape)</td>
</tr>
<tr>
<td>11.</td>
<td>Microsurfacing</td>
</tr>
<tr>
<td>12.</td>
<td>CS + Microsurfacing</td>
</tr>
<tr>
<td>13.</td>
<td>Double Layer Microsurfacing</td>
</tr>
<tr>
<td>14.</td>
<td>Fibermat + Microsurfacing (Cape)</td>
</tr>
<tr>
<td>15.</td>
<td>Scrub Seal + Microsurfacing (Cape)</td>
</tr>
<tr>
<td>16.</td>
<td>Scrub Seal</td>
</tr>
<tr>
<td>17.</td>
<td>Distress Demo Section</td>
</tr>
<tr>
<td>18.</td>
<td>Fibermat + HMA thinlay (HMA Cape)</td>
</tr>
<tr>
<td>19.</td>
<td>HMA Thinlay (PG 67-22)</td>
</tr>
<tr>
<td>20.</td>
<td>HMA + 100% Foamed Recycle Inlay</td>
</tr>
<tr>
<td>21.</td>
<td>HMA Thinlay (PG 76-22)</td>
</tr>
<tr>
<td>22.</td>
<td>Ultra Thin Bonded Wearing Course</td>
</tr>
<tr>
<td>23.</td>
<td>HMA Thinlay (50% RAP)</td>
</tr>
<tr>
<td>24.</td>
<td>HMA Thinlay (5% PCRAS)</td>
</tr>
<tr>
<td>25.</td>
<td>HMA Thinlay (High Polymer)</td>
</tr>
</tbody>
</table>
Quality

• Good material supply
• Designs with actual stockpiles
• Contractor quality commitment
• Equipment setup and calibration
• Test section preparation
• Good execution.
Emulsion Calibrated Prior to Placement
Emulsion Calibrated Prior to Placement
Chip Rate Checked Prior to Placement
Plastic for Startup Variability
Plastic for Overrun with Sample Pans
Plastic for Overrun with Sample Pans S8B
Tack & Chip Rate QC Measurements
Alternative to Plastic
Target versus Measured Emulsion Application Rates

Application Rate (gal/yd²)

Cell

Target
Measured
Sample Treated Section on Lee Road 159 Pretreatment (July, 2012)

- Outside Wheelpath Driving Towards Quarry
- Inside Wheelpath Driving Towards Quarry
Sample Treated Section on Lee Road 159
August, 2012

Outside Wheelpath Driving Towards Quarry

Inside Wheelpath Driving Towards Quarry
Sample Treated Section on Lee Road 159
July 2, 2013
Sample Treated Section on Lee Road 159
September 12, 2013
Sample Treated Section on Lee Road 159
October 29, 2013
Sample Treated Section on Lee Road 159
December 17, 2013
Sample Treated Section on Lee Road 159
January 31, 2014
Sample Treated Section on Lee Road 159
February 26, 2014
Sample Treated Section on Lee Road 159
March 25, 2014
Sample Treated Section on Lee Road 159
April 22, 2014
Sample Treated Section on Lee Road 159
May 27, 2014
Sample Treated Section on Lee Road 159
June 19, 2014
Sample Treated Section on Lee Road 159
August 12, 2014
Sample Treated Section on Lee Road 159
October 7, 2014
Sample Treated Section on Lee Road 159
October 7, 2014
Sample Treated Section on Lee Road 159
October 7, 2014
Sample Treated Section on Lee Road 159
October 7, 2014
Sample Treated Section on Lee Road 159
October 7, 2014
Sample Treated Section on Lee Road 159
October 7, 2014
Pavement Preservation on Lee Road 159
Pavement Preservation on Lee Road 159

Condition Improving Benefit

Life Extending Benefit

Prevention
Rehabilitation
Reconstruction

Time / Traffic

National Center for Asphalt Technology at Auburn University
Pavement Preservation on Lee Road 159
Pavement Preservation on Lee Road 159

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
Pavement Preservation on Lee Road 159

![Graph showing average cracked area over time for different treatments: Control, Crack Seal Only, Single Chip Seal, Crack Seal then Chip Seal, and Scrub Seal.](image-url)
Pavement Preservation on Lee Road 159

The graph shows the average cracked area (SF) over time from 7/2/13 to 10/16/14. The x-axis represents the date, and the y-axis represents the average cracked area. The graph compares the performance of different treatments:
- Control
- Single Chip Seal
- Double Chip Seal
- Triple Chip Seal

The control treatment shows a sharp increase in cracked area starting around 1/6/14, whereas the sealed treatments show a more gradual increase or no significant change.
Crack sealing appears to be beneficial in all cases
Differences between route/seal and blow/band
Scrub seal appears to exhibit crack seal benefit
Preservation treatments reduce subgrade moisture, but...
Durability of micro surface in accelerated traffic
Objective life extending benefit curves developing
Interim results presented at 2015 Track Conference.
2015 Pavement Test Track Conference

March 3-5, 2015
The Hotel at Auburn University and Dixon Conference Center
Auburn, Alabama

- WMA & High RAP/RAS/GTR Mixes
- Optimized Structural Design
- Pavement Preservation Implementation

Official registration information will soon be available at www.ncat.us
Options in the 2015 Research Cycle

- Traffic continuation
- Mill/inlay sections
- Structural sections
- Pavement preservation
Preservation Group (PG15) Study

- Continue monitoring ‘12 sections (Track & 159)
- Capture life extending benefit curve data
- Partnership with MnROAD for nationwide scope
- Build new sections on higher ADT roadway.
Preservation Group (PG15) Study

- Continue monitoring ‘12 sections (Track & 159)
- Capture life extending benefit curve data
- Partnership with MnROAD for nationwide scope
- Build new sections on higher ADT roadway.
NCAT+MnROAD Preservation Partnership

To facilitate high value pavement research that addresses national needs using full-scale pavement testing facilities in both warm and cold climates on flexible, rigid, and composite pavement structures.
NCAT+MnROAD Preservation Partnership

To facilitate high value pavement research that addresses national needs using full-scale pavement testing facilities in both warm and cold climates on flexible, rigid, and composite pavement structures.
Higher ADT Off-Track Preservation

MnROAD Cells (Past and Future) + Minnesota Offsite Sections (High and Low Volume)

NCAT Sections

+ Alabama Offsite Sections

Lee Road 159 (Low Volume) + US-280 (High Volume)
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
- Repeat Lee Road 159 (±)
- Add CCPR$_F$, CIR$_F$, HIR, etc.
- High ABR thin overlays
- Connection to Cracking Group.

7¾” Asphalt Pavement
10” Aggregate Base
Performance data for each section can be viewed by positioning your mouse over the section in question and left-clicking. Based on feedback from our research sponsors, the performance reports have been revised to include crack maps. The 2009 performance reports are now a fully integrated and active part of the web presentation.

- N1 - N11, S5 - S6, and S8 - S13 are structural sections.
- All other sections have deep perpetual foundations.
- Research cycle of surface placement shown by color.
- Off-Track sections on Lee Road 159 shown below.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Dr. R. Buzz Powell, PE
Assistant Director & Test Track Manager

277 Technology Parkway
Auburn, AL  36830

Phone: (334) 844-6857
Cell: (334) 750-6293

Email: buzz@auburn.edu
Web: www.pavetrack.com
Twitter: www.twitter.com/pavetrack