NCAT Pavement Test Track

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Pavement Preservation Research
NCAT Pavement Test Track

Pre-2015, 2015

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

FHWA

Minister Department of Transportation

National Center for Asphalt Technology
Content

- Track preservation sections
- Preservation on Lee Road 159
- Preservation on US-280
- Planning for MnROAD sections
Track Research Goals

- Preservation
- Mix & materials
- Thickness design
- Construction
Track Research Goals

- Preservation
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PG15 Experiment Design

• NCAT Pavement Test Track (accelerated)
  – Thinlay, micro surface, Cape seal, scrub/chip seals
• Lee Road 159 (low ADT, high percent trucks)
  – Single/double/triple chips, scrub, FiberMat, sealing
  – Single/double micro surface, Cape x 3, sealing
  – Track thinlay, neat binder, ABR variants, CCPR base
• US-280 (high ADT, moderate percent trucks)
  – 159 + CCPR/CIR, OGFC, durable/friction micro, etc.
• Duplicate NCAT preservation sections at MnROAD.
High RAP Mixes and WMA

Crack Map (Recent Cracks in Solid Red, Potential Reflective Cracks in Blue, Patches Outlined in Green, and Trucking Percent Complete via Height of Gray Map Date Box)

Virgin HMA

Longitudinal Distance from Far Transverse Joint (feet)

Approx. Cracked Areas: Lane: 10% LWP: 13%

Virgin WMA-F

Longitudinal Distance from Far Transverse Joint (feet)

Approx. Cracked Areas: Lane: 22% LWP: 56%

Virgin WMA-A

Longitudinal Distance from Far Transverse Joint (feet)

Approx. Cracked Areas: Lane: 14% LWP: 49% RWP: 6%

50% RAP HMA

Longitudinal Distance from Far Transverse Joint (feet)

Approx. Cracked Areas: Lane: 4% LWP: 3% RWP: 11%

50% RAP WMA-F

Longitudinal Distance from Far Transverse Joint (feet)

Approx. Cracked Areas: Lane: 16% LWP: 4% RWP: 32%
Track Pavement Preservation

- Chip seal
- Scrub seal
- Scrub Cape seal
- Micro surface
- Thinlay
- Thinlay Scrub Cape seals.
Track Pavement Preservation
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Lee Road 159 Low Traffic Preservation

Lee Road 159
Pavement Preservation Experiment to Reduce the Cost to Maintain Your Roads

Funding Provided by:
Alabama, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, and FP2 via Auburn University and the Lee County Commission
Benefits of Preservation

- Life extending benefit
- Condition improving benefit
- $f$ (pretreatment condition)
Benefits of Preservation

- Preservation
- Rehabilitation
- Reconstruction
Benefits of Preservation
Benefits of Preservation
Benefits of Preservation
Benefits of Preservation

![Graph showing treatment effectiveness over time]
Benefits of Preservation

![Graph showing the benefits of various preservation methods over time.

- 54% Aged FRAP Binder Thinlay
- 19% Aged PCRA Binder Thinlay
- Thinlay
- Thinlay Cape Seal
- Polymer Thinlay
- HiMA Thinlay]
Virgin Thinlay with Polymer Binder
Virgin Thinlay with Neat Binder
Virgin Thinlay on Cold Recycle Base
Virgin Thinlay on FiberMat Chip Seal
50% F-RAP Thinlay with Neat Binder
5% PC-RAS Thinlay with Neat Binder
Virgin Thinlay with HiMA Binder
US-280 High Traffic Preservation
US-280 High Traffic Preservation
US-280 High Traffic Preservation
US-280 High Traffic Preservation
US-280 High Traffic Preservation
$CCPR_{F,E}$ on US-280 (KMA220)
$CIR_{F,E}$ on US-280 (3800CR)
Cold Recycle$_{F,E}$ Mix
ABR Thinlays on Cold Recycle $F,E$

CCPR (KMA220)

CIR (3800CR)
HMA Thin Overlays on US-280

- 39 = ABR thinlay control
- 40 = CCPR with foam
- 41 = CCPR with emulsion
- 42 = Untreated (traffic loop)
- 43 = CIR with emulsion
- 44 = CIR with foam
Significant Interim Findings

- Durability of micro surface (Track and US-280)
- Viability of asphalt based high friction surfaces
- Performance of lightweight aggregate chip seal
- Differences in crack sealing (blow-band vs route-fill)
- Demonstration of unique treatment combinations
- Success of high traffic pavement preservation (CR)
- Short term condition improvement methodology
- Long term life extending benefit methodology.
MnROAD Partnership

- Nationwide life extending benefit experiment
- Duplication of work on LR-159 & US-280
- Regional aggregates & emulsion grades
- Both low (CR-8) & high (US-169) volume roads
- Focus on thermal cracking & snow plow damage
- Planning process ongoing with sponsor oversight
- Planning for summer 2016 placements.
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