NCAT Pavement Test Track

Buzz Powell
South Carolina Research Update
NCAT Pavement Test Track

Pre-2015, 2015

FHWA

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

Minnesotan Department of Transportation

National Center for Asphalt Technology
at Auburn University
Content

- Track research overview
- South Carolina sponsored research
- Research funded by other DOTs
- Update on 2015 Track
Track Research Goals

• Help state DOTs implement positive change
• Promote real innovation for the industry.
2015 Track Research Focus

- Preservation
- Mix & materials
- Thickness design
- Construction

(1) Flexible Fatigue Resistant Asphalt
(2) High Modulus Rut Resistant Asphalt
(3) SMA, OGFC or SUPERPAVE

Pavement Foundation
South Carolina on the 2015 Track

• Preservation Group (PG15) study
  – Continued data collection on 2009 Track GE sections
  – Continued data collection on Lee Road 159 (2012)
2015 Track Traffic Continuations

• Long term performance (cracking, raveling)
• Durability of porous surfaces
• Cold recycle (CR) structural contribution
• Crack resistant interlayers (HMA vs chip)
• Durability of surplus sand thinlay
• Pavement preservation (PG15).
2015 Track Traffic Continuations

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Track Pavement Preservation
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Lee Road 159 Low Traffic Preservation
Benefits of Preservation

- Life extending benefit
- Condition improving benefit
- $f$ (pretreatment condition)
Benefits of Preservation
US-280 High Traffic Preservation
US-280 High Traffic Preservation
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CCPR$_{F,E}$ on US-280 (KMA220)
$\text{CIR}_{F,E}$ on US-280 (3800CR)
Cold Recycle$_{F,E}$ Mix
ABR Thinlays on Cold Recycle

CCPR (KMA220)

CIR (3800CR)
ABR Thinlays on Cold Recycle
2015 Track Mill-Inlay/Overlay Sections

- Optimization of reclaimed/recycled materials
- Increasing RAP in polymer surfaces
- Benefit of rejuvenator in RAP+RAS mix
- Innovative porous surface mix design
- Asphalt based high friction alternatives
- Lower cost thinlay rutting and cracking
- Mix improvements on longitudinal joint.
2015 Track Mill-Inlay/Overlay Sections
Finer Mixes with Lower $N_{des}$
Polymer Binders in Higher RAP Mixes
Cracking Group (CG) Section Surfaces

- 20% RAP control $N_{1@20/0}$
- High density control $N_{2@20/0}$
- Low AC/density control $N_{5@21/0}$
- Control + 5% RAS $N_{8@20/14}$
- Control + 15% RAP with PG58-28 $S_{5@33/0}$
- Control with HiMA $S_{6@19/0}$
- 15% RAP AZ rubber with ARB20 $S_{13@7/0}$
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Cold Recycle from a Hot-Mix Plant
Cold Recycle from a Hot-Mix Plant
Cold Recycle from a Hot-Mix Plant
Big Picture

- Use of fine/small blends
- Reduced design gyration levels
- Healthy (balanced) binder content
- Reclaimed/recycled materials
- Need for a cracking test(s)!
Status Report

• High level of construction quality achieved
• ≈1¾ million ESALs on Track with no early concerns
• ≈½ million ESALs on LR-159 with good results
• ≈1 million vehicles on US-280 with good results
• Weekly data collection on Track, 159, & 280
• Planning for MnROAD treatments summer 2016.
End-of-Cycle Track Conference

- High RAP/RAS balanced mix designs
- Nationwide pavement preservation
- Preventing reflective distresses
- Optimized structural design
- Implementation

Pavement Test Track Conference

March 6-8, 2018

The Hotel at Auburn University and Dixon Conference Center

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