2012 Track Research Cycle

- Implementation of higher recycled content mixes
- Durability of safer drainable pavements
- Alternative binders and binder modifiers
- Preservation Group (PG) experiment
2012 PG Experiment

• Traffic continuation on 2009 GE+ test sections
• GE+ contains high RAP, two WMA, PFC sections
• Stop traffic when trigger distress(es) reached
• Apply consensus PP treatments to GE+ sections
• Duplicate / expand study in off-Track research
• Connection with state DOT preservation studies
• Additional accelerated testing in FHWA’s ALF
## 2009 Group Experiment (+)

<table>
<thead>
<tr>
<th>Conventional Dense HMA</th>
<th>Permeable Surface on Dense HMA</th>
<th>High RAP % HMA</th>
<th>High RAP % Warm Mix</th>
<th>Foamed Warm Mix</th>
<th>Additized Warm Mix</th>
<th>Thiopave Warm Sulfur</th>
<th>Thiopave Warm Sulfur</th>
<th>Kraton Modified Mix</th>
<th>TLA Modified Mix</th>
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</thead>
<tbody>
<tr>
<td>7 inches</td>
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<td>5.76 inches</td>
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<tr>
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<tr>
<td>Stiff Subgrade</td>
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</tr>
</tbody>
</table>

Private Sector Funding
2009 GE+ Cracking Expectations

Forecast Cycles to Failure via AASHTO (millions)

- Control: 0.07
- PFC: 0.07
- RAP: 0.02
- Foam RAP: 0.04
- Foam: 0.07
- Additive: 0.07
- Thiopave-7: 0.08
- Thiopave-9: 0.08
- Kraton: 0.88
- TLA: 0.09
2009 GE+ Cracking Expectations

Actual

Forecast Cycles to Failure via AASHTO (millions)

- Control: 0.3
- PFC: 0.2
- RAP: 1.6
- Foam RAP: 3.8
- Foam: 0.6
- Additive: 0.6
- Thiopave-7: 0.6
- Thiopave-9: 5.6
- Kraton: 8.1
- TLA: 1.0
Mechanistic-Empirical Pavement Design

Tested to $2 \times 10^7$ ESALs

Microstrain

Percentile

No Fatigue
Fatigue

at Auburn University
Potential 2012 PG Treatments

- Chip seals (Various agg sizes, design processes, application rates)
- Scrub seals
- Micro-surface
- Cape seals
- Thin-lift HMA (Inlays vs overlays, conventional vs low cost)
- "HMA Cape seals"
- Fog seals (Traditional fog seals vs low pen recycled rubber)
- Micro-milling
- Etc...
Off-Track Test Sections

NCAT Pavement Test Track

NCAT

Martin Marietta Quarry + EAP Plant

Lee Road 159
Loaded Trucks in Outbound Lane

- Martin Marietta Quarry
- EAP's Auburn Plant
- Lee Road 159
Condition of Outbound Lane
Condition of Outbound Lane

Original 1-Lane Quarry Road Buildup
Condition of Outbound Lane

Original 1-Lane Quarry Road Buildup

Widening

Widening
Condition of Outbound Lane

Original 1-Lane Quarry Road Buildup

Left WP
Good

Widening

Widening
Condition of Outbound Lane

Original 1-Lane Quarry Road Buildup

Left WP: Good
Right WP: Distressed

Widening
Proactive vs Reactive “Preservation”

Original 1-Lane Quarry Road Buildup

Widening

Left WP
Good

Right WP
Distressed
FDOT US 98 Preservation Study 2012

- Micro-surfacing
- 4.75 NMA mix overlays (½ inch vs ¾ inch)
- 9.5 NMA mix 1 inch thick overlay
- 9.5 NMA mix 1 inch thick mill/inlay
- 12.5 NMA mix 1½ inch thick mill/inlay
- Bonded friction course (¾” spray paved FC-5)
- Hot in-place recycling 1½ inch thick
Oklahoma Friction Study 2008-2009
FHWA ALF Experiment 2012

4 Test Sites for Each Lane

12 x 4 m = 48 m

Lane Number

100 mm AC

CR-AZ

PG 70-22

Air-Blown

SBS LG

CR-TB

Ter-polymer

Fiber

PG 70-22

SBS 64-40

Air-Blown

SBS LG

Ter-polymer

100 mm of New No. 21A CAB Under All 12 Lanes

Removal of 50 mm of Existing CAB

Existing VDOT No. 21A Crushed Aggregate Base (CAB)
(25-mm Nominal Maximum Aggregate Size)

Bottom of CAB to Pavement Surface is 660 mm

Re-compacted AASHTO A-4 Subgrade Soil
FHWA ALF Experiment 2012

4 Test Sites for Each Lane

Lane Number

100 mm AC

100 mm of New No. 21A CAB Under All 12 Lanes

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Re-compacted AASHTO A-4 Subgrade Soil
2012 Track Time Line

• 9/26 green light from Lee County Commission
• ALDOT 10/3/2011 RAC approval (PF + PG)
• Pooled fund advertisement in fall 2011
• Sponsor commitments by 12/31/2011
• ALDOT Letter of Direction by 3/1/2012
• Summer 2012 reconstruction (trucks by 8/31)
• PF payments due 2/29/12, 10/1/12, & 10/1/13
Pavement Test Track Conference

February 28-29, 2012
The Hotel at Auburn University and Dixon Conference Center

www.ncat.us
Questions ?