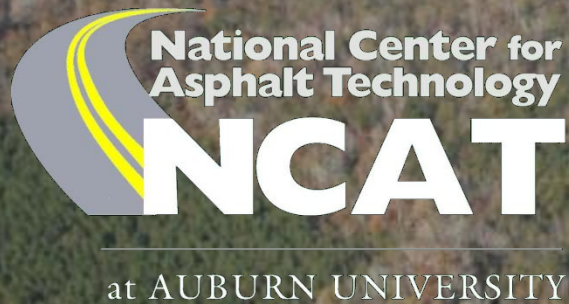


2012 NCAT Pavement Test Track



- Recycling and Sustainability

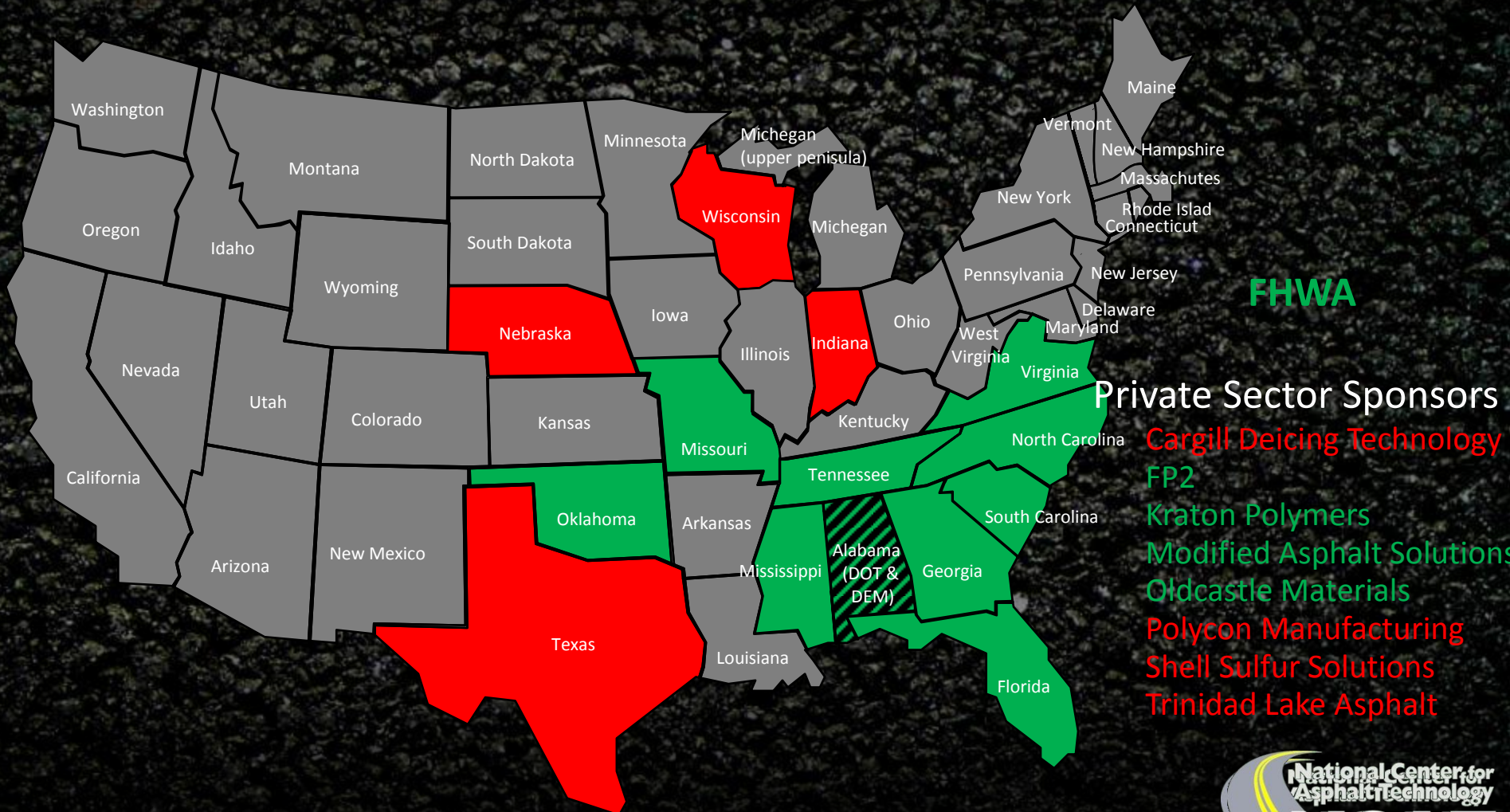
Content

- Track overview
- VDOT Recycle sections
- Planned testing

Accelerated Pavement Damage



2012 NCAT Pavement Test Track



FHWA

Private Sector Sponsors

- Cargill Deicing Technology
- FP2
- Kraton Polymers
- Modified Asphalt Solutions
- Oldcastle Materials
- Polycon Manufacturing
- Shell Sulfur Solutions
- Trinidad Lake Asphalt

2012, Pre-2012



2012 Research Cycle

Sponsor	PG Study	GG Study	Individual Studies
Alabama	X	X X	New OGFC x 3
Florida			Rebuild N1 & N2 (tack), New DGA x 4
Georgia			Chip Seal vs OGI Interlayer
Mississippi	X		Continue S2, Rebuild S3 (LVR)
Missouri	X		
North Carolina	X	X	
Oklahoma	X		Continue N8 & N9, New OGFC x 2
South Carolina	X	X	
Tennessee	X		Rebuild S4 (OGFC w/ PCRAS)
Virginia			CCPR w/ Overlay x 3, Quiet PFC x 2
FHWA			Safety Edge, Epoxy Friction Surfaces
FP ²	X		
Kraton Polymers			Continue N7
Modified Asphalt Solutions			Continue S7

Paving Track Sublots 7/11 to 9/11



VDOT Recycled Contents

- 30% RAP in DGA binder mix
- 11% RAP in SMA surface mix
- 10% RAP in PFC surface mixes
- 100% RAP in CCPR base mix

100% Recycle Foamed CCPR Base Mix

- VDOT's "N3" on 6" CAB with 6" overlay
- VDOT's "N4" on 6" CAB with 4" overlay
- VDOT's "S12" on FDR base with 4" overlay

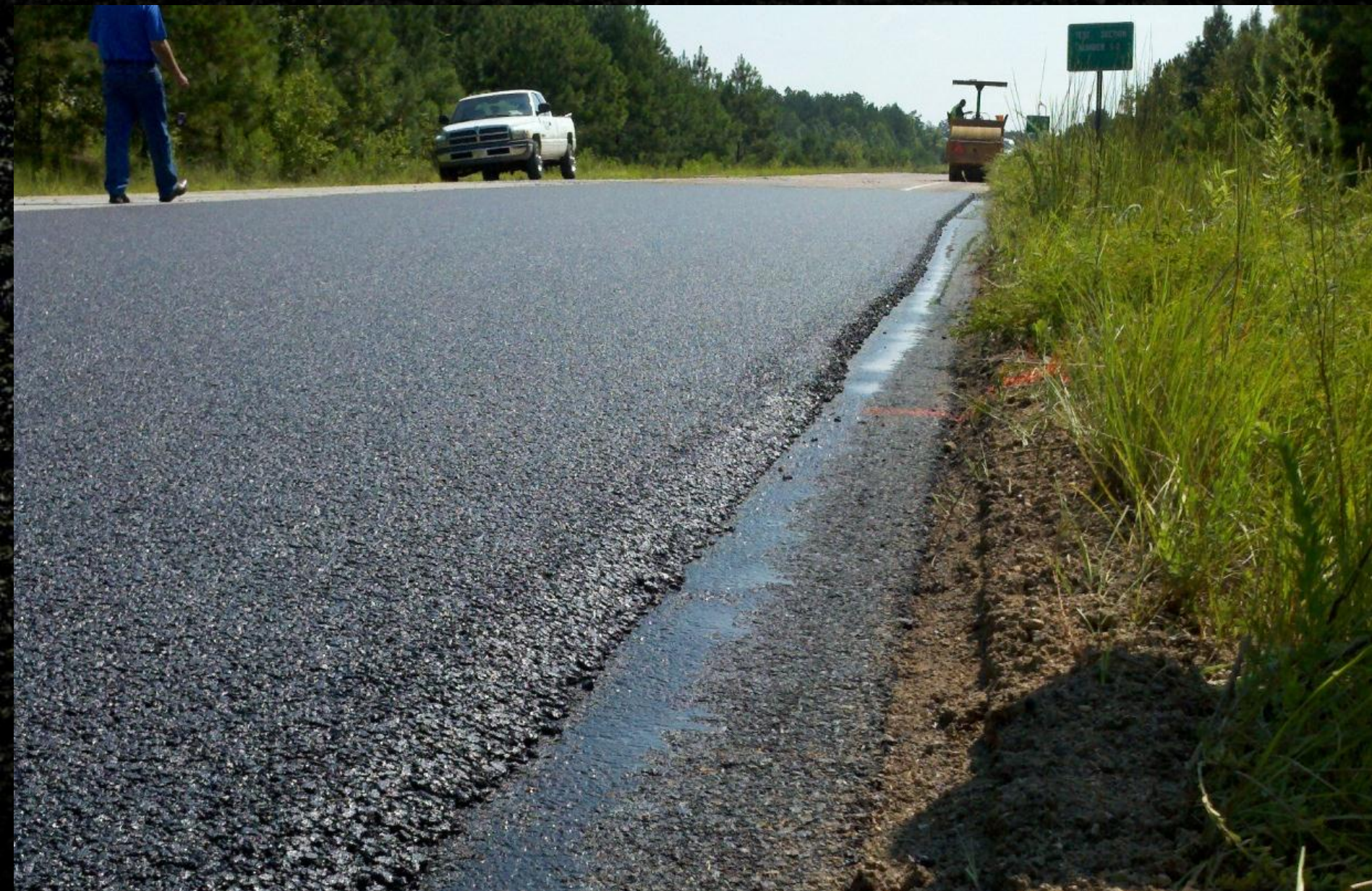
VDOT Full Depth Reclamation



VDOT Quiet Pavement Study

- W10 conventionally modified PFC
- S1 ground tire rubber modified PFC
- S12 conventionally modified SMA

VDOT PFC (w/ and w/o Safety Edge)



All PFC Surfaces

- E9A, E9B, E10 mix design (durability)
- N1A, N1B, N2 tack method (cracking)
- W10, S1 binder modifier (noise)
- S4 recycled material (durability)
- S8A, S8B rejuvenation (PG durability)
- E1 mix design & tack method (durability)

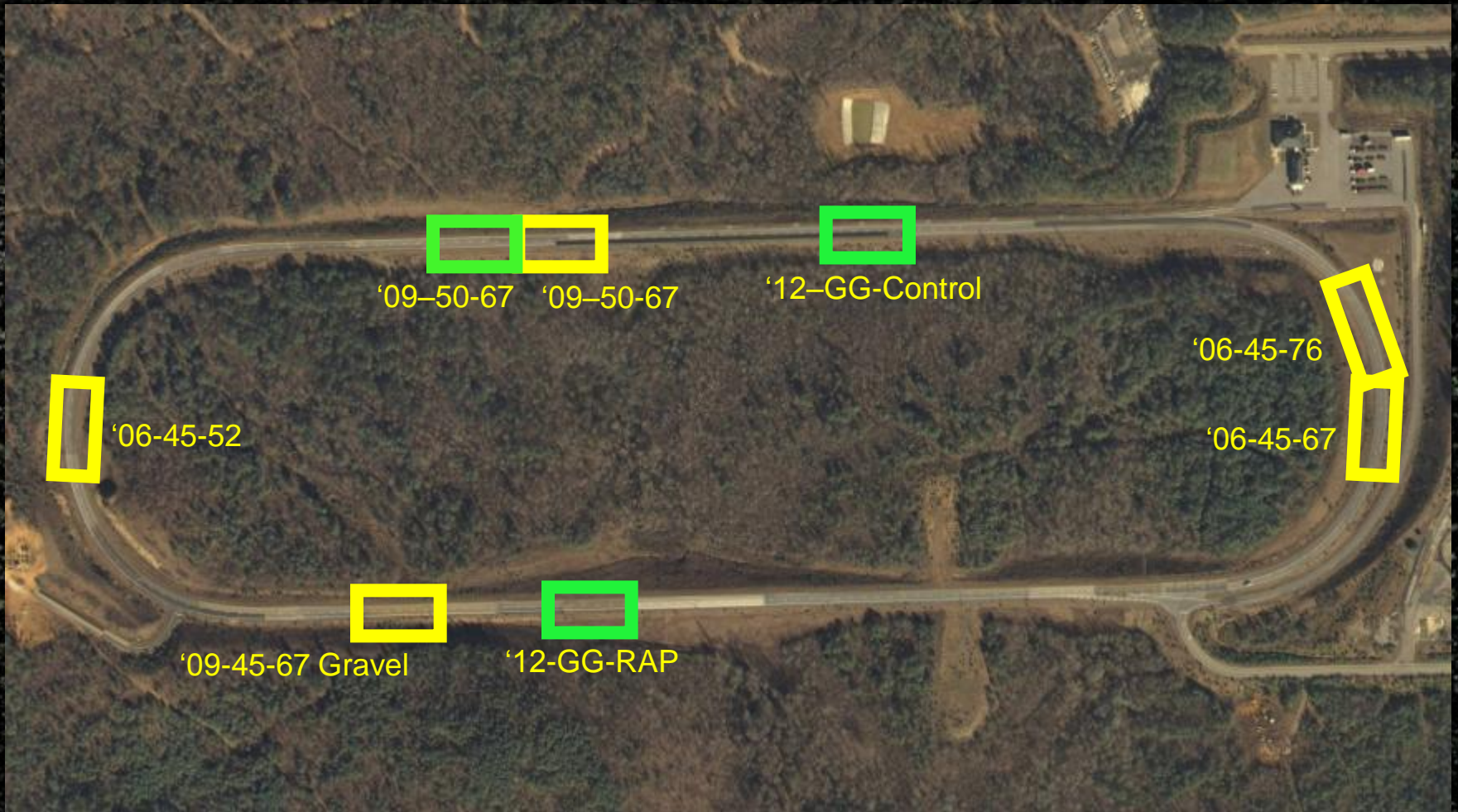
Ground Tire Rubber

- E7B dense surface (cracking)
- E9B drainable surface (durability)
- S1 drainable surface (quiet)
- S7 dense surface (long term)
- S13 Green Group (optimized)

Green Group (GG) Study

N5 Control	S5 Higher RAP	S6 RAP+RAS	S13 Recycled Tires
20% RAP 67-22 DGA	25% RAP 67-22 SMA	5% RAS 67-22 SMA	VIRGIN ARB12 SMA
35% RAP 67-22 DGA	50% RAP 67-22 DGA	50% AGED 67-22 DGA	35% RAP ARB12 DGA
35% RAP 67-22 DGA	35% RAP 88-22 DGA	25% RAP 76-22+ DGA	VIRGIN ARB20 AZ

High RAP Test Sections



PC-RAS

- FDOT's E8B DGA with 20% RAP + 5% PC-RAS
- TDOT's S4 OGFC with 3% PC-RAS
- GG's S6-1 SMA with 5% PC-RAS
- GG's S6-2 DGA with 50% aged binder

Lab Performance Data

- Asphalt Pavement Analyzer
- Flow Number
- Dynamic modulus

- Flow number
- Dynamic modulus

- Dynamic modulus
- Bending beam
- Endurance limit
- Cracking tests...

Track Performance Data

- Rutting
- Roughness
- Texture
- Cracking
- High-speed response

- Density
- Friction

- Permeability
- Reflectivity
- Noise

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Opelika, AL
Get the 10 day forecast

61°F
Cloudy

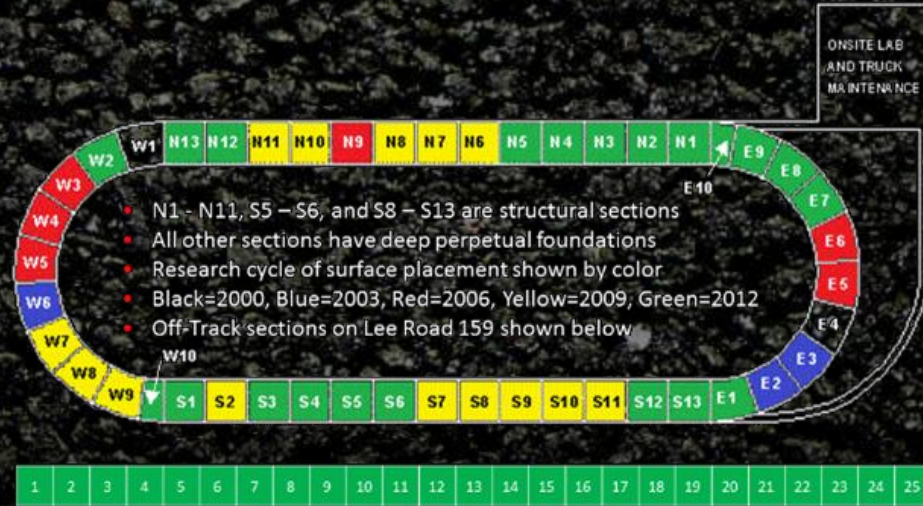
Feels Like: 61°F
Humidity: 81%
Wind: SE at 8 mph

Enter city/zip **GO!**

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HOTLINKS to download PAVE reports, review upcoming NCAT training courses, query historical weather data, view current color radar or preview local forecast.

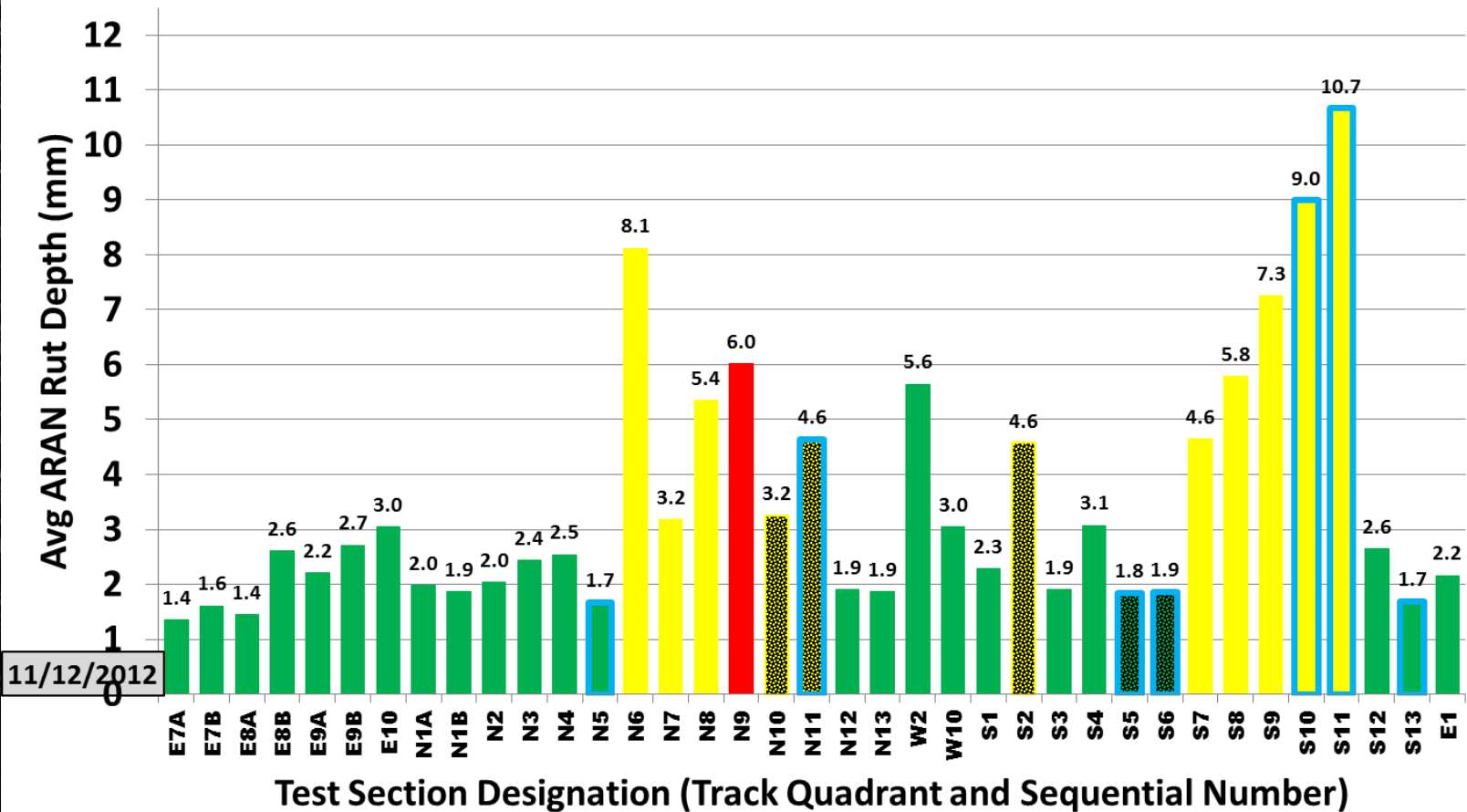
Performance data for each section can be viewed by positioning your mouse over the section in question and left-clicking. Based on feedback from our research sponsors, the performance reports have been revised to include crack maps. The 2009 performance reports are now a fully integrated and active part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



0. ESALs as of 2300 hours on

Performance Measurements

N1 - N11, S5 - S6, and S8-S13 are thinner structural sections;
 All other sections have deep perpetual foundations;
 Research cycle shown by color (red=2006, yellow=2009, green=2012;
 Blue outline for WMA and hatching for high recycled contents



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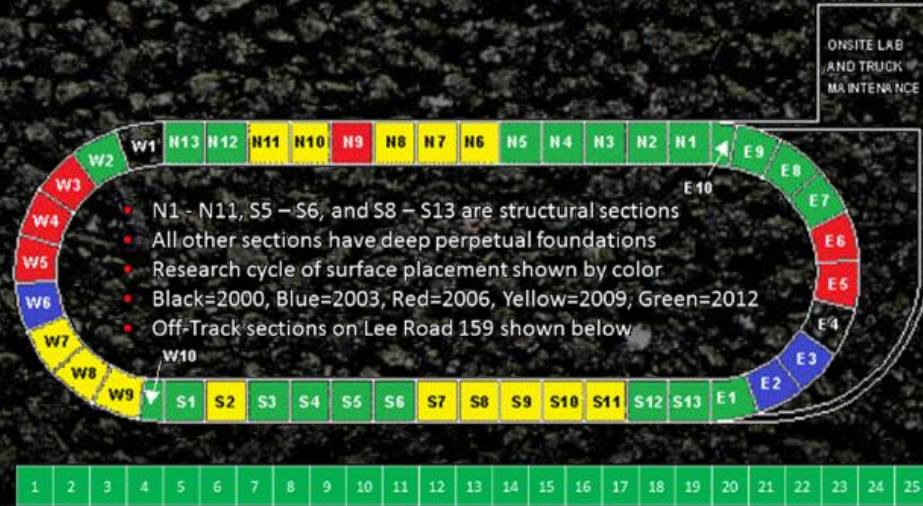
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0. ESALs as of 2300 hours on



Performance Measurements

11/14/2012

Quadrant: S
Section: 11

Surface Mix and Materials

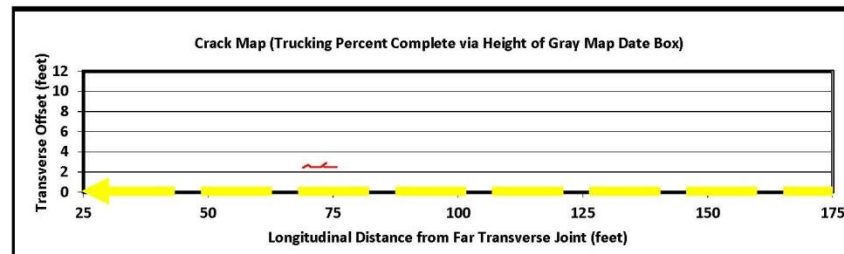
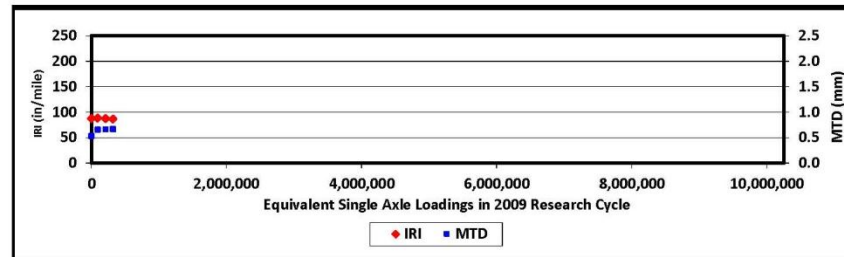
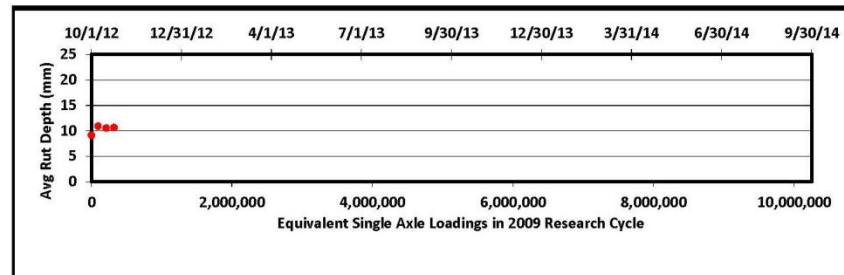
Year of Completion: 2009
Mix Design Methodology: Superpave
Specified Binder: PG76-22
Surface Mix Stockpiles: Granite/Sand/Limestone

Structural Buildup Information

Study HMA (in): 7
Total HMA (in): 7
Base Material: Granite
Subgrade: Stiff

Research Objective: GE Additized WMA & M-E Design + PG

Preliminary Field Performance Data



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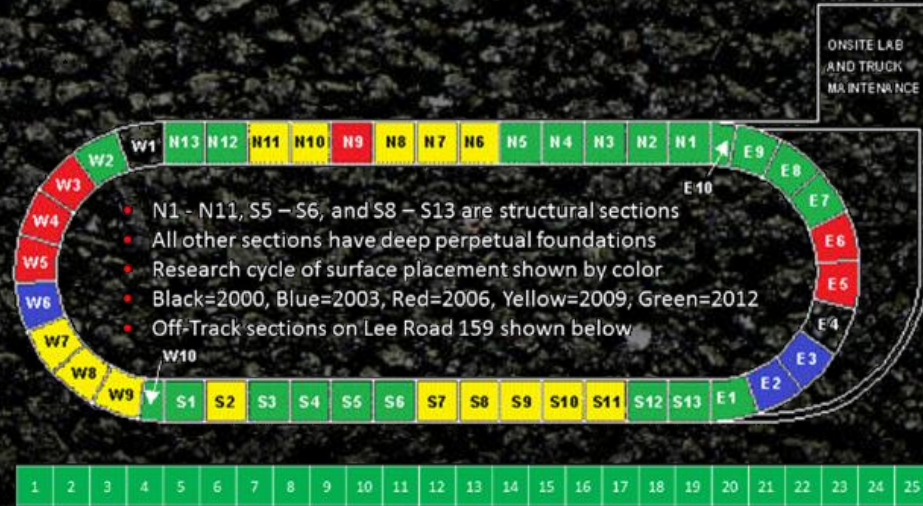
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0. ESALs as of 2300 hours on

2012 Preservation Group (PG) Study

- Fog seals (with and without rejuvenators)
- Crack seals (routing/filling, hot air lance, go-type)
- Chip seals (single, double, triple, scrub, FiberMat)
- Cape seals (on chip/scrub seals, FiberMat)
- Micro surfacing (single, double, Capes)
- Plant mix overlays (4.75 screening mix variations)
- Ultra thin bonded wearing course
- Lightweight aggregates for surface treatments
- 100% recycle foamed CCPR base

Questions ?



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