Nation Center for Asphalt Technology

- Established by 1986 NAPA-AU Joint Agreement
- Financial Endowment “Seed” from Contractors, Suppliers, & Equipment Manufacturers via NAPA-REF
- Facilities and Faculty from Auburn University
- “Improve the Performance of HMA Pavements via Practical Research, Education, and Information Services”
- Broke Ground at Test Track in September of 1998…
PROJECT OVERVIEW

- Materials and Methods (Not Thickness) are Study Variables
- Determine Which Mixes Perform Better Under Actual Traffic
- Identify Laboratory Tests That Best Indicate Field Performance
CONSTRUCTION (April – July, 2000)
QUALITY CONTROL SAMPLING
PAVING EXPERIMENTAL MIXES - April 2000
DENSITY TESTING
TRUCKING OPERATIONS

- 4 Trucks Currently Run 17 Hours a Day (2800 Miles, 1600 Laps)
- Truck ESAL’s Logged Continuously via VIS, Mileage Log, & Tubes
- No Trucking on Monday for Data Collection & Vehicle Maintenance
- On Schedule to Apply 10 Million ESAL’s (1.6 million Miles) by Nov 2002
FIELD PERFORMANCE
• Coarse Superpave Mix

• Stone Matrix Asphalt Mix

• Open Graded Friction Course
TIRE NOISE
ROUGHNESS DISTRIBUTION

Sections in Order of Construction

IRI (inches/mile)
EFFECT OF ROUGHNESS ON FUEL ECONOMY

\[ R^2 = 0.7202 \]

Fuel Consumption (mpg)

Roughness (inches/mile)
RUTTING DISTRIBUTION

Total Rutting in Each Section
(Numbered Counterclockwise where 1=E2, 10=N1, 23=W1, 33=S1, 46=E1)
AVG RUTTING OVER TIME

Average Track Rutting (mm) vs. Equivalent Single Axle Loadings

- 7 Day Avg High Air Temp (°C)
- Rut
- Temp

NCAT Pavement Test Track
MAT DENSIFICATION

CORES FROM LAST 25 FT EACH SECTION

Traffic Applied (ESALs)
Air Voids (%)
SURFACE FRICTION vs MIX TYPE

![Graph showing the relationship between millions of ESALs and coefficient of friction for different mix types.](Image)
SUPPLEMENTAL RESEARCH
PRELIMINARY FIELD RESULTS

• Temperatures in Summer 2001 were Very Mild, but…
• “Coarse” Superpave Mixes have Rutted About 20% Less than “Fine” Superpave Mixes
• Modified Binders have Rutted About 40% Less than Unmodified Binders
• Average Field Voids (Originally 6.4%) Will Equal Average Lab Voids (3.4% @ N_{des}) in the Second Half of the Service Life of Experimental Mixes
LAB PERFORMANCE

- Utilizes Specimens Made During Construction
- Target QC Air Voids Without Cutting or Coring
- What Test Can Predict Rutting Using QC-Type Pills?
## LAB vs PRELIMINARY FIELD

<table>
<thead>
<tr>
<th>TEST METHOD</th>
<th>Super Slg/Lms</th>
<th>SMA Slg/Lms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Friction</td>
<td>0.38</td>
<td>0.34</td>
</tr>
<tr>
<td>Field Roughness</td>
<td>23 inches/mile</td>
<td>24 inches/mile</td>
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<tr>
<td>Field Rutting</td>
<td>1.91 mm</td>
<td>1.57 mm</td>
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<tr>
<td>APA</td>
<td>1.51 mm</td>
<td>2.43 mm</td>
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<tr>
<td>Hamburg</td>
<td>2.50 mm</td>
<td>4.85 mm</td>
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<tr>
<td>Rotary</td>
<td>1.43 mm</td>
<td>1.68 mm</td>
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<tr>
<td>SGC Shear</td>
<td>0.71 GSR</td>
<td>0.57 GSR</td>
</tr>
<tr>
<td>COE Shear</td>
<td>0.97 GSI</td>
<td>1.03 GSI</td>
</tr>
</tbody>
</table>
SUPERPAVE vs SMA
Welcome to the home page for the NCAT Pavement Test Track. The primary objective of this site is to successfully communicate our experiences to the world as we strive to assist governmental agencies nationwide in streamlining the practical application of research designed to extend the life of flexible pavements. We appreciate your feedback.

Sponsor Meeting Information - This cooperatively funded research project provides 2 onsite meetings each year as a benefit of sponsorship. The purpose of these meetings is to ensure that research efforts are meeting sponsors’ expectations. During the last onsite meeting (on June 11th and 12th), sponsor representatives decided to hold next meeting some time in November or December. This timeframe is intended to

Recent Aerial Photograph of the 309 Acre Site Track Cam (Click to Stream)
Traffic Only (Rutting & Top Down Cracking)
Mill and Inlay (Another Rutting Comparison)
Structural (2002 Design Guide Validation)