

Period Covered: October 1, 2008 through December 31, 2008 (Quarterly Report)

**ALDOT Progress Report for the**  
**State Planning and Research Program**

<b>PROJECT TITLE:</b> Accelerated Performance Testing on the 2006 NCAT Pavement Test Track		
<b>PROJECT MANAGER(S):</b> R. Buzz Powell, PhD, PE Ph #: (334) 844-6857	<b>SPR Project No:</b> TPF-5(124) ALDOT Research Project No. 930-637P	<b>Project is:</b> <input type="checkbox"/> PLANNING <input checked="" type="checkbox"/> RESEARCH & DEVELOPMENT
<b>Annual Budget</b>	<b>Multi Year Project</b> Total Budget for Project: \$9,412,225.00 Total Cost to Date for Project: \$8,190,420.57	

**Background**

The Pavement Test Track is a full-scale accelerated performance test (APT) facility managed by the National Center for Asphalt Technology (NCAT) at Auburn University. The project is funded and directed by a multi-state research cooperative program in which the construction, trafficking, and pavement evaluation are carried out on 46 different 200-foot test sections around the 1.7-mile oval test track. Each test section is constructed utilizing the asphalt materials and design methods used by individual sponsors. A fleet of heavy trucks is operated on the track in a highly controlled manner in order to apply a design life-time of truck traffic (10 million equivalent single axle loads, or ESALs) in two years. The current project represents the third three-year research cycle of the NCAT Pavement Test Track.

**Objectives**

The primary objectives of the project are to: (1) identify pavement structures and materials with superior field performance and lower life cycle costs; and (2) provide information for the calibration and validation of the Mechanistic-Empirical Pavement Design Guide (MEPDG).

**Design and Construction of Test Sections**

When each research cycle is completed, test sections are either left in place for the application of additional traffic or rebuilt in the manner that best meets the needs of sponsors. The third research cycle includes: (1) eight sections built in 2000 (all mix performance sections), 16 sections built in 2003 (12 mix performance sections and four structural sections) and 22 sections built in 2006 (15 mix performance sections and seven structural sections). Mix performance sections are perpetual pavements in which distresses are confined to various combinations of experimental surface mixes. Structural sections are typically thinner, highly instrumented pavements that are intended to provide information for the MEPDG.

## **Trucking Operations**

Trucking operations for the third phase of the NCAT Pavement Test Track began after the completion of the reconstruction activities in November of 2006. A fleet of five trucks ran two shifts a day. An AM driver shift ran from 5:00 AM until approximately 2:00 PM, and a PM driver shift ran from 2:00 PM until approximately 11:00 PM.

At the end of the reporting period, a total of 10,017,560 ESALs (100 percent of the 10 million ESAL goal) had been safely applied to the surface of the 2006 NCAT Pavement Test Track. This means that the eight sections originally placed in 2000 had been subjected to over 30 million ESALs and the sixteen sections built in 2003 had been subjected to over 20 million ESALs. All mixes in both previous studies were designed for 10 million ESALs.

## **Laboratory Performance Testing**

There are 31 unique asphalt mixtures that consist of 27 Superpave and Stone Matrix Asphalt (SMA) mixtures as well as four Permeable European Mix (PEM) and Open Graded Friction Course (OGFC) mixtures. The laboratory testing plan focuses on evaluation of the 27 Superpave and SMA mixtures. NCAT has finished testing of binder, dynamic modulus, flow number and rutting susceptibility using the Asphalt Pavement Analyzer (APA). A report that summarizes the laboratory testing results is being prepared.

## **Structural Pavement Study**

Dynamic data collection continued on a weekly basis through the end of traffic in December, 2008. Each week, three passes of each truck in each test section were captured. The data were then processed and added to their respective databases.

Now that traffic is complete, work will commence on conducting forensic investigations of each of the structural sections. Cores and trench locations were marked for further testing in the next quarter. The cores will be used to identify depth of cracking. The trenches, in select locations, will be used to establish rutting contributions from the pavement layers in addition to extent and severity of cracking. These measurements are needed to conduct mechanistic-empirical transfer function calibration.

## **Pavement Performance Evaluation**

Every Monday, trucking was suspended so that vehicle maintenance could be performed and pavement performance could be quantified. An inertial profiler equipped with a full lane width dual scanning laser "rutbar" was run weekly around the entire track in order to determine individual wheelpath roughness, right wheelpath macrotexture and individual wheelpath rutting for every experimental section. Additionally, three random locations were selected within each section in a stratified manner to serve as the fixed test location for nondestructive wheelpath densities. Transverse profiles were measured along these same locations regularly so that rutting could be calibrated with a contact method. Figures 1 and 2 illustrate rutting performance and International Roughness Index (IRI) of test sections at the NCAT Pavement Test Track at the end of reporting period. Forensic testing was initiated following the completion of trucking operations on December 6, 2008. Final data collection

requiring a continuous surface (e.g., roughness, friction, etc.) was completed before the end of the calendar year. Destructive forensics (e.g., trenching, coring, etc.) will be completed by the time of the Track Conference.

### **Test Track Conference**

A Test Track Conference will be hosted on February 10<sup>th</sup> and 11<sup>th</sup> of 2009 for the purpose of disseminating findings from the third research cycle to the pavement community. The final 6-month sponsor meeting will be hosted in a concurrent manner in order to optimize travel for attendees. The following draft agenda describes the general content of the Conference:

#### **Monday**

6:00 PM Early Registration Begins  
6:30 Private Sponsor Meeting with Dinner Provided  
8:00 Early Registration Ends

#### **Tuesday**

7:00 AM Breakfast at Marriott  
8:00 Open Conference  
9:30 Break  
10:00 Performance Comparison Session  
11:30 Break and Bus to Track  
12:30 Lunch at Track  
1:30 Track Tours and Demonstrations  
3:00 Break and Bus to Marriott  
4:00 Mechanistic Pavement Analysis Session  
5:15 Adjourn  
6:00 Reception  
6:45 Dinner

#### **Wednesday**

7:00 AM Breakfast  
8:00 Lab versus Field Session  
9:30 Break  
10:00 Implementation and Panel Discussion Session  
12:00 Adjourn  
1:30 Optional NCAT Tour

### Rutting Performance

Cycle of Construction Shown by Color (Black=2000, Blue=2003, Red=2006), N1-N10 & S11 Structural (M-E)

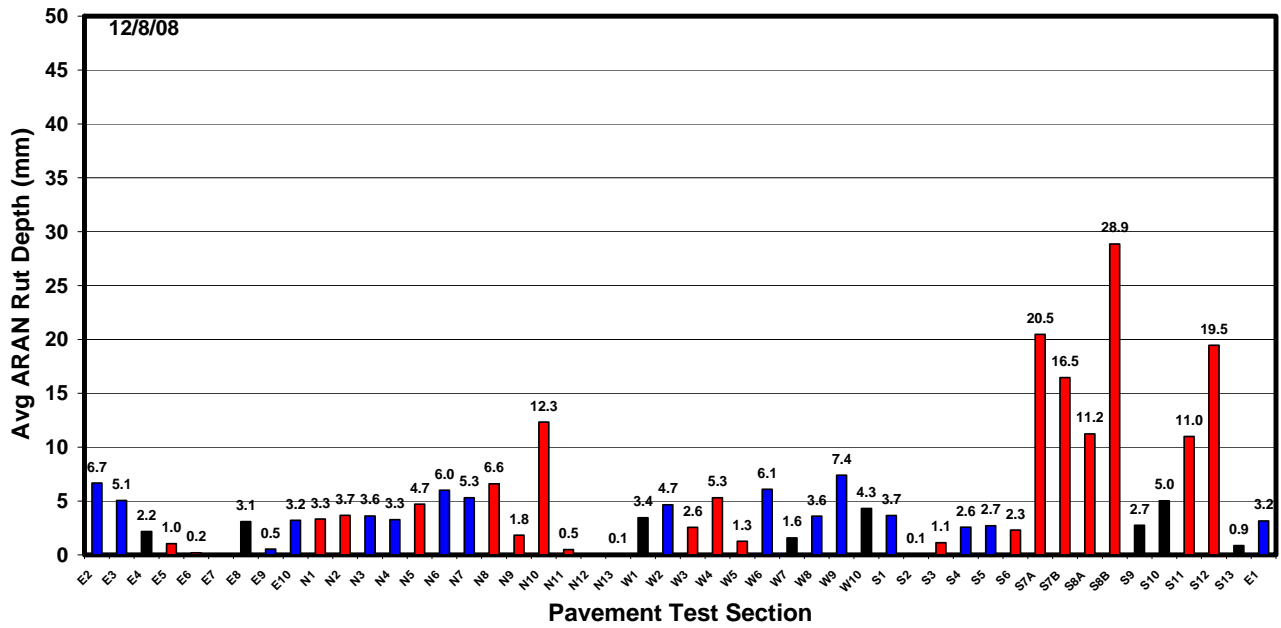
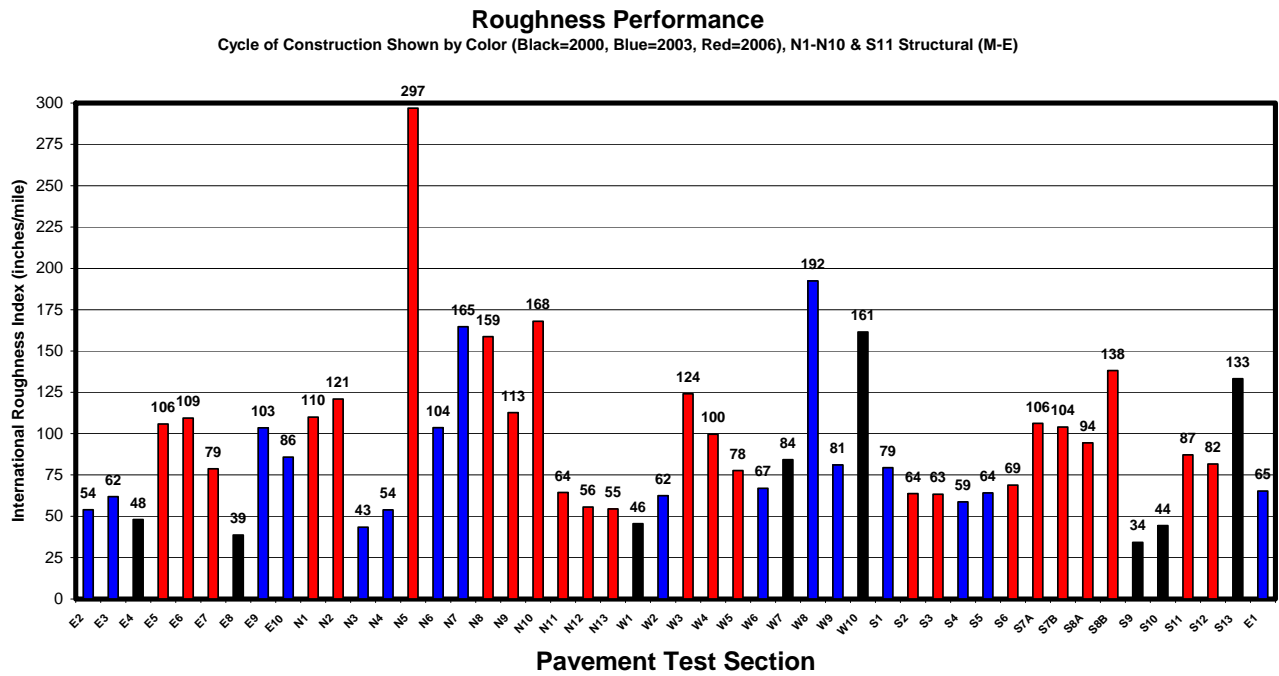


Figure 1 Rutting Performance of Test Sections at the End of Reporting Period



**Figure 2 IRI of Test Sections at the End of Reporting Period**

### **Status and Completion Date**

Percentage of work completed to date for total project 87.2 %

Project is: X on schedule        behind schedule, explain:

Expected Completion Date: August 31, 2009

Please note that this project has continued with renewed requests for services and additional funding obligations and may be extended beyond the current Expected Completion Date listed above.