



Research Ideas Needed

After a successful and active development cycle, the FY2016 Research Program has been approved and will be launching on August 1, 2015. Twenty new projects in FY2016 range across the broad spectrum of NCDOT activities from Guardrail Safety to Concrete Curing to Performance Measures to Wetland Modeling and everything in between.

As the 2016 program launches R&D is now soliciting your new ideas for research topics for the FY2017 program. Nearly every aspect of the Department’s business is eligible for research funding. Whether it is pavement, structures, planning, safety, mobility or transit, your needs and ideas can be turned into a research project. We are looking for ideas that can be turned into real, working solutions for DOT.

The Research Need Statement form has been heavily revised and updated to make clear what is needed to clearly define a research idea and to provide researchers with the information they need to get started on quality proposals. In addition, there is now a two-page instruction document to help answer questions and guide you through the process. It also contains contact information for all of the engineers assigned to various topics.

[Click here for the new Research Need Form](#)
[Click here for the form instructions](#)

If you have an idea and don’t know how to get it down on paper, please contact me or any of the R&D engineers. We will assist you and help to connect you to other, experienced idea generators. **The initial deadline for RNS submission is July 2, 2015.**

Neil Mastin
Research & Development Unit Manager



Table of Contents

- “Research Ideas Needed” (a note from the R&D manager)..... 1
- Evaluating the Potential Effects of Widening U.S. 64 on the Black Bear and Red Wolf by John Kirby 2
- FHWA’s Long-Term Pavement Performance (LTPP) program in North Carolina By Mustan Kadibhai, PE . 3
- New TRB Publications 5
- Events Calendar. 5
- Librarian’s Corner:
by Lamara W. Jones & Chris Mulder 6
- Staff List and contact information 7

Past Success: Evaluating the Potential Effects of Widening U.S. 64 on the Black Bear and Red Wolf; and Cost Effective Wildlife Crossing Structures which Minimize Highway Barrier Effects

John W. Kirby

These three reports summarize research for the proposed expansion of U.S. Highway 64 in Washington, Tyrell and Dare counties, North Carolina. Results of a hurricane evacuation study, which projected tourist occupancy through 2030, showed that the US 64 project is needed to evacuate the North Carolina Outer Banks within 18 hours. The primary focus of the research projects was to develop information that will facilitate selecting a preferred alternative that avoids and minimizes adverse effects on wildlife.

The Alligator River National Wildlife Refuge is located within the project plans for the U.S. 64 expansion, thereby legally obligating the U.S. Fish and Wildlife Service to conduct a Compatibility Determination. In 1987, the U.S. Fish and Wildlife Service began an experimental restoration program by releasing Federally endangered red wolves (*Canis rufus*). Currently, the local wolf population consists of about 100 individuals, and is the world's only free-ranging population of red wolves. The purpose of the first two studies was to identify sites frequently utilized by black bears and red wolves. The third study was performed to identify the types of wildlife crossing structures suitable for this particular highway expansion.

A variety of research methods were employed to monitor the patterns of black bear including; roadside barbed wire collection, GPS collar deployments, remote camera trapping, road kill surveys and driving surveys. Data from 16 red wolves fitted with GPS collars was used to evaluate home range size and habitat selection, road permeability, and significant highway crossing locations. The cost effective wildlife crossing structures study utilized the products of habitat use and wildlife movement patterns to make recommendations for cost-effective design and construction measures to minimize adverse impacts to wildlife and increase highway safety. In addition, the crossing structures project performed road-kill surveys and track monitoring for additional data. Field surveys documented 134 different species.

The impact of these studies was to ensure the North Carolina Department of Transportation would meet the requirements to receive a favorable compatibility determination which is issued by the U.S. Fisheries and Wildlife Service and the Alligator River National Wildlife Refuge. These studies were on the critical path for the U.S. 64 widening project. The projects were completed within a two-year time frame to coincide with the road widening project schedule. Without a favorable compatibility determination the widening project could not move forward.

Links to Full-text Reports

2009-24 [Evaluating potential effects of widening US 64 on the black bear population of Alligator River National Wildlife Refuge, Dare County, North Carolina](#)

2009-25 [Evaluating potential effects of widening US 64 on red wolves in Washington, Tyrrell, and Dare Counties, North Carolina](#)

2009-26 [Cost Effective Wildlife Crossing Structures which Minimize the Highway Barrier Effects on Wildlife and Improve Highway Safety along US 64, Tyrrell County, NC](#)



FHWA's Long-Term Pavement Performance (LTPP) program in North Carolina

Mustan Kadibhai, PE

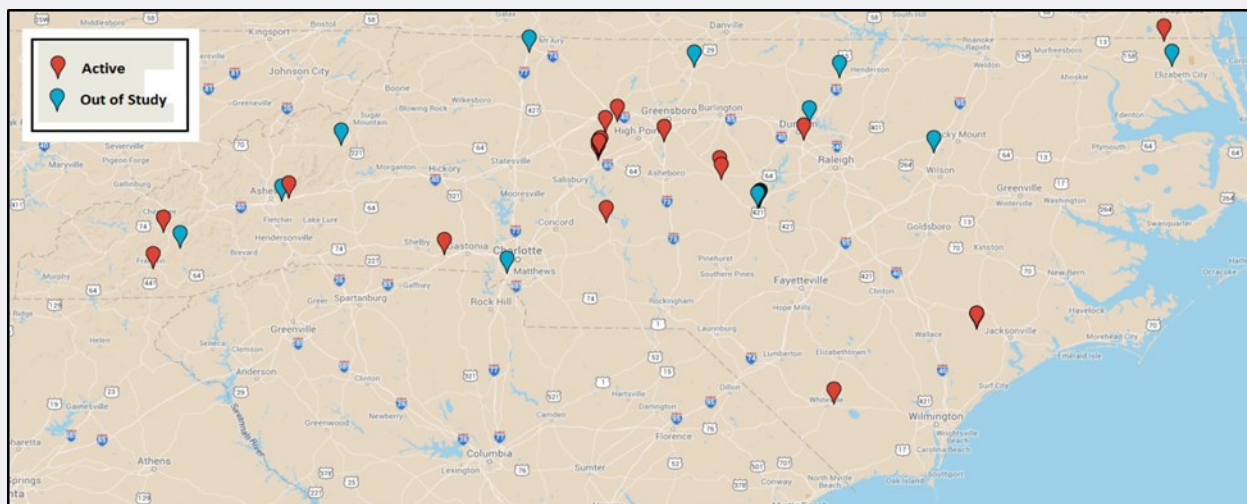


The Federal Highway Administration's (FHWA) Long-Term Pavement Performance (LTPP) program was initiated in 1987 and is the largest pavement study ever conducted. The LTPP program was established to collect pavement performance data as one of the major research areas of the Strategic Highway Research Program (SHRP). The LTPP program is a large research project that includes two fundamental classes of studies and several smaller studies to investigate specific pavement related details that are critical to pavement performance. The fundamental classes of study are the General Pavement Study (GPS) and the Specific Pavement Studies (SPS).

The combined GPS and SPS programs consist of over 2,500 test sections located on in-service highways throughout North America and Canada. The program's goal is to understand how and why pavements perform as they do. As highway agencies transition to a performance-based approach to managing highway investments, this goal is more important than ever. The collected data include information on seven modules: Inventory, Maintenance, Monitoring (Deflection, Distress, and Profile), Rehabilitation, Materials Testing, Traffic, and Climatic. The data is housed in the LTPP Database - the world's largest pavement performance database, and made available to the public via the LTPP Database web interface – LTPP InfoPave™ (www.infopave.com). LTPP data has been utilized to provide over an estimated \$2 billion in savings. It provides enormous potential for research and the development of products to further improve pavement technology for decades to come.

LTPP Program in North Carolina

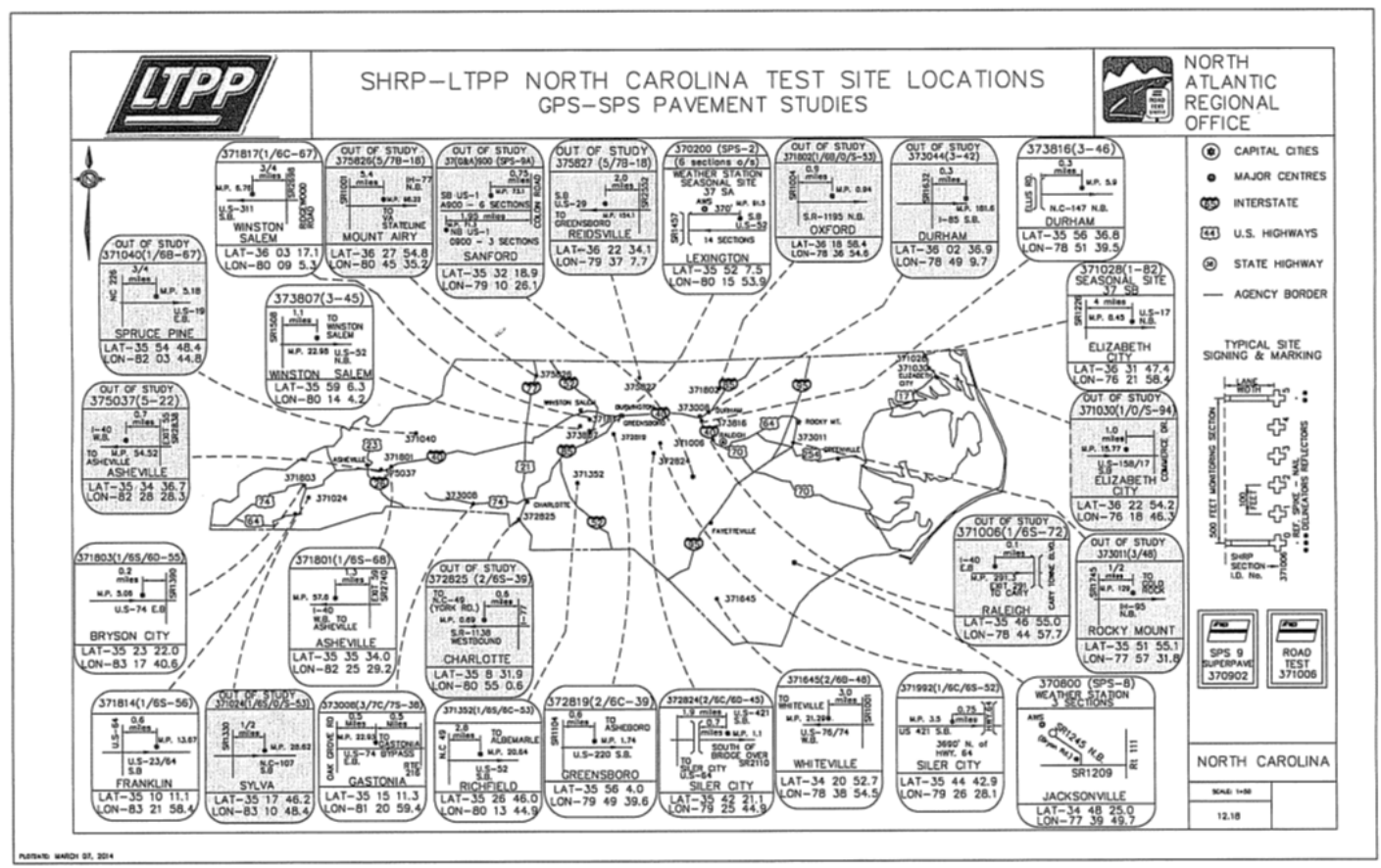
The LTPP program is broken into four geographical regions with North Carolina (NC) in the North Atlantic region. Stantec Consulting Ltd. is the regional contractor for this area. There are a total of 58 test sections in NC, 30 of which are closed (out of study) and 28 remaining active, as shown on the map below.



The LTPP program recently visited NCDOT to discuss the possibilities of NCDOT participating in LTPP's programs newest experiment, the Warm Mix Asphalt experiment. Monitoring this type of mix design and construction on pavements from the time of placement to the end of performance will confirm how beneficial this relatively new technology is to agencies. LTPP also provided NCDOT with an update on current and future activities at the LTPP program – including the undertaking of another new experiment, the Pavement Preservation experiment. Access to all of NC's LTPP data, and further information can all be found at www.infopave.com

Message to the NCDOT Divisions

The LTPP-SHRP protocol requires that if there is any repair, resurfacing or rehabilitation done to a test section located in your area, then we need to perform certain tests and collect data before and after such an event. If you anticipate any such work at any time in the future, please let me know, and I will take necessary actions. If you have any question, please contact me by calling at (919) 508-1819 or by email mkadibhai@ncdot.gov



*Shaded sections are out of study.

New Publications from TRB

[Alternative Funding and Financing Mechanisms for Passenger and Freight Rail Projects](#): National Cooperative Rail Research Program (NCRRP) Report 1

This report identifies alternative funding and financing tools that can be used to realize passenger and freight rail project development, including capital investments, operations, and maintenance.

[Guidebook for Designing and Managing Rights-of-Way for Carbon Sequestration and Biomass Generation](#): National Cooperative Highway Research Program (NCHRP) Report 804

This guidebook explores the operational concerns, programmatic issues, and market conditions associated with utilizing highway rights-of-way (ROWs) to develop carbon sequestration projects. These projects are designed to generate saleable carbon offsets or to grow marketable biomass for sale into bioenergy markets.

[The Role of U.S. Airports in the National Economy](#): Airport Cooperative Research Program (ACRP) Report 132

This report examines the economic role of U.S. airports and the national airport system to help communicate the national aggregate value of airports to communities and aviation stakeholders.

[Volume Reduction of Highway Runoff in Urban Areas: Guidance Manual](#): National Cooperative Highway Research Program (NCHRP) Report 802

This manual explores practices for the reduction of stormwater volumes in urban highway environments. The report outlines a five-step process for the identification, evaluation, and design of solutions for runoff volume reduction based on site-specific conditions. The manual also includes a set of volume reduction approach fact sheets and a user guide for the Volume Performance Tool.

[Products with an Impact or Potential Impact on Current Highway Practice](#): National Cooperative Highway Research Program Innovations Deserving Exploratory Analysis (IDEA)

This report highlights some of the successful projects from the NCHRP's IDEA program from its inception in 1993 until 2015. Notable examples include: Automated bridge deck anti- and de-icing system, pavement quality indicator, computer vision traffic sensor for fixed and pan-tilt-zoom cameras as well as many other innovative ideas.

[Properties of Foamed Asphalt for Warm Mix Asphalt Applications](#): National Cooperative Highway Research Program (NCHRP) Report 807

This report presents methods for measuring the performance-related properties of foamed asphalts and designing foamed asphalt mixes with satisfactory aggregate coating and workability.

Many more publication links can be found on [NCDOT's TRB News Feed](#)



Calendar of Events 2015

June 2015

- NC DOT Board of Transportation Meeting, June 3-4, 2015
- Special Libraries Association Annual Conference, Boston, MA, June 14-16, 2015

July 2015

- NC DOT Board of Transportation Meeting, July 8-9, 2015
- National RAC and TRB State Reps Meeting, Portland, OR, July 27-30, 2015

Librarian's Corner

By Lamara W. Jones with Chris Mulder

NCDOT Research Library

A visit to the NCDOT Library today would not give the visitor any idea of how the collection used to look. The Library has had an amazing transformation in the past 5 years.

The North Carolina Department of Transportation (NCDOT) library collection was originally housed in the former Highway Building and began primarily as a place to store NCDOT Board Minutes. Other items were subsequently donated by staff as well as materials from transportation memberships, which culminated in a collection that was broad but not organized or cataloged. So, any visitor would have found it difficult, at best, to locate the information they needed. After 2009, however, things began to change.

Project Timeline

- ◆ September 2010, Lamara Williams-Jones with 13 years' experience in research and reference, was hired as the first librarian dedicated to just library duties.
- ◆ May 2011, re-established working relationship with the State Library, enabling us to house our collection records in their database.
- ◆ June 2011, Dr. Moy Biswas initiated a Library Peer Exchange to solicit the advice of other National and State DOT agencies.
- ◆ July 2011, we joined the Pooled Fund which would allow us to take advantage of national databases and other services.
- ◆ September 2011, Christine Mulder, a cataloger with 20 years' experience, was hired as a contract cataloger.
- ◆ October 2011, began the work of organizing, cleaning, and cataloging of the collection, and ordering supplies and equipment.

Project Highlights

- ◆ Weeded and organized of approximately 6000 items, not only on the shelves but also in three adjacent rooms.
- ◆ Approximately 14,000 shelf inches were handled. That's the equivalent of 3,500 Snickers bars laid end to end, or nearly 4 football field lengths.
- ◆ Dealt with mold and other damage to some of the documents.
- ◆ Created a Reading Room for use by the Staff of the Research Unit, and also by visitors and patrons.
- ◆ Created a Library Staff workroom for handling and processing of library materials and storage of supplies and equipment.
- ◆ Cataloged items and added collection records to the State Library's online, searchable, database.



Contact the NCDOT Librarian, Lamara Williams-Jones, for assistance: 919-508-1820, Monday through Friday from 8:30 to 4:30. Since there is only one Librarian, customers should call before visiting the Library. Watch this space for future articles about the Library's services and helpful topics. We look forward to serving you!

NCDOT Research and Development Unit General Information

How to find us:

We are located at 104 Fayetteville Street, Raleigh, in the Transportation Technology Center (formerly The Raney Building).

The Research & Development [web page](#) contains more information about the Unit and what we do.

The Research Library's [catalog](#) is also available on the web.

NCDOT RESEARCH AND DEVELOPMENT

The Research & Development Unit oversees transportation-related research that investigates materials, operations, planning, traffic and safety, structures, human environments, natural environments, and more. Please contact one of our engineers listed on this page if you have questions.

J. Neil Mastin, PE
Manager
(919) 508-1865; Email: jmastin@ncdot.gov

Mustan Kadibhai, PE
Pavement, Maintenance and Materials
(919) 508-1819; Email: mkadibhai@ncdot.gov

John W. Kirby
Planning, Environment and Transit
(919) 508-1816; Email: jkirby@ncdot.gov

Ernest Morrison, PE
Traffic, Safety and Roadway Design
(919) 508-1874; Email: eemorrison@ncdot.gov

F. Rasay Abadilla, PE, MSCE
Structures, Construction and Geotechnical
(919) 508-1832; Email: rabadilla@ncdot.gov

Melvena Sams
Administrative Services Assistant V
(919) 508-1795; Email: msams@ncdot.gov

Lamara C. Williams-Jones
Research Librarian
(919) 508-1820; Email: lcwilliams2@ncdot.gov

Christine S. Mulder
Cataloging Librarian (Contract)
(919) 508-1823; Email: csmulder@ncdot.gov



RESEARCH & DEVELOPMENT