NCDOT Research and Development Overview

Current as of May 2020
Covered in this Presentation

- NCDOT Research and Development Program Basics
- Finding Completed Research
- National Activities
- Successful and Ongoing Projects
- How you can be involved!
NCDOT Research Program Basics
Research and Development Office Roles

- Contract Research with Universities and Consultants
- In-house research and implementation efforts with business units
- National Research Coordination
  - AASHTO, TRB, NCHRP, Pooled Funds
- NCDOT Research
- Library and reference services (documents, research etc)

https://connect.ncdot.gov/projects/research/Pages/default.aspx
Why do we conduct research?

- Improve Planning, Engineering and Business Practices
- Support NCDOT Operations and Maintenance Activities
- Produce Innovative Usable Products and Processes
- Develop relationships with researchers
What do we research?
(pretty much anything involving transportation)
Who conducts research?

Universities

Consultants
Annual Research Program

Match NCDOT research needs with expertise at universities and transportation research centers

Initiate ~20 - 30 new projects per year

More than 100 active research projects and programs

Nearly all NCDOT activities are eligible for research funding
Annual Research Program Goals

- Improve NCDOT Planning, Engineering and Business Practices
- Support NCDOT Operations and Maintenance Activities
- Conduct research that can be implemented
- Develop relationships with researchers so they understand the needs and operations of NCDOT to maximize research benefits
### Annual Program FAQ

<table>
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<tr>
<th>Question</th>
<th>Answer</th>
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<tr>
<td>Who typically submits Research Needs?</td>
<td>Anyone at NCDOT, with manager approval</td>
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<tr>
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<td>University researchers in coordination with DOT business units</td>
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<td>Who decides on what projects are funded?</td>
<td>NCDOT selects all projects through a multi step process</td>
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<td>How long does it take for an Idea to become a project?</td>
<td>Typically 1 year from close of solicitation period*</td>
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<td>*Contingency funds are available for rapid / off cycle needs</td>
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How long do Research Projects Last?

Variable
2 years is typical, can be as short as 6 months or as long as 3 years

What types of Projects are common?
- Laboratory / Field Testing and Analysis
- Policy / Practice / Design
- Best Practice Synthesis
- Etc, etc.

How are Projects managed?
- Research Unit handles fiscal and contract portion
- Steering Committee reviews technical content
- Committee Chair is often the idea submitter
Project Selection Oversight

Research and Development Unit Oversees Overall Program

- Solicits Ideas
- Research Engineers Manage Projects
- Coordinate all Activities
- Research Subcommittees Review and Recommend Proposals for Funding
  - Environmental
  - Structures and Geotech
  - Pavement, Materials, Maintenance
  - Planning, Policy and Transit
  - Traffic, Mobility and Safety

Research Executive Committee Approves Work Program
  - Senior Management
  - Executives
Universities Engaged in Research

- Appalachian State*
- East Carolina*
- Elizabeth City State*
- Fayetteville State*
- NC A&T*
- NC Central*
- NC State*
- UNC-Asheville*
- UNC-Chapel Hill*

* Master Agreements

- UNC-Charlotte*
- UNC-Greensboro
- UNC-Wilmington*
- Indiana State*
- Michigan State*
- Virginia Tech*
- Central Florida*
- Illinois
- Auburn

Current Research
How is Research Funded?

- State Planning and Research (SPR) Part B
- Federal Grants
- State Project Funds
- Federal Project Funds
Research Program Annual Timeline

- **May-June**: Solicit Research Ideas from DOT and Universities
- **July-August**: Research Ideas Evaluated by Research Committees
- **September-October**: Partner Universities Develop Proposals
- **November-December**: Proposals Evaluated by Research Committees
- **December-January**: Executive Committee Review
- **February**: Award Notifications
- **March-May**: FHWA Reviews Final Program
- **May-July**: Projects Start August 1
- **June-July**: Projects Start August 1
Technical Assistance

Need a quick hit project?

Lab testing?  White paper writing?  Survey conducted?

Try our technical assistance program

Managed by ITRE  Easily contract with expertise across the state  Limited to 80 hours of investigator time
Implementation and Technology Transfer ($T^2$)

**What is Implementation?**
- Moving completed state and national research into practice.

**How is this accomplished?**
- Training
- Workshops
- Development

**Why is this program important?**
- Assist NCDOT in using research products and processes.
Finding Completed Research
NCDOT Web Resources

https://connect.ncdot.gov/projects/research/Pages/default.aspx

Research Forms

Quarterly Newsletter

Current and Past Projects and Reports are Online

Easiest way to find us: Go to google and search for “NCDOT Research”
Online Transportation Report Research Resources

NCDOT Project Page
- https://connect.ncdot.gov/projects/planning/Pages/ProjectSearch.aspx

TRID Transportation Research Database
- Largest of its kind in the world
- https://trid.trb.org/

Google Scholar
- It’s Google, so you know there is a lot of data
- https://scholar.google.com/
Research Library Services
(If you need help finding anything)

Located in Century Center, Building B
On-staff Librarian, Lamara Williams-Jones, provides reference and research services
Many engineering and transportation related books, journals, specs and other documents
Historical information to the 1920s
Board of Transportation Minutes

Online Catalog: http://ncgov.nccardinal.org/eg/opac/home
National Research Activities
National Initiatives

LTPP
Long-Term Pavement Performance Study

SHRP2
Research Advisory Committee Representative

Pooled Fund – NCDOT Manager

National Representative

TCF
Coordinator for NCHRP Pooled Funds
Transportation Research Board (TRB)

http://www.trb.org/Main/Home.aspx

Largest Organization of Transportation Professionals in the World. Part of NASEM*

Annual Meeting Brings together 12,000 practitioners, researchers and policy makers. Attendance is free to NCDOT employees

Create a MyTRB count and become a Committee Friend or Member to stay on top of technical developments

Sign up for free topical newsletters

Free webinars! These often include PDHs and you can subscribe to notifications by topic

Hundreds of journals and articles free to download with your DOT email address. Hard copies available as needed.

*National Academies of Sciences, Engineering and Medicine
Managed by TRB, funded by States and FHWA. Ideas submitted by states and AASHTO committees

Approximately $44M annual budget (NC sends about $1.2M)

YOU can submit ideas! YOU can participate in project panels – includes synthesis and full projects

Practical expertise needed to guide projects and move research into practice

Selections made by AASHTO R&I Committee for full projects, synthesis projects selected by project panel

Standing NCHRP Project 20-44 supports implementation
Managed by FHWA with NCHRP Support

A group of states decides that “XYZ” needs researching.

Proposal is written, funding is solicited from peers. If commitment is met, research is advertised.

Each paying state gets at least 1 Technical Advisory Committee (TAC) Member.

NCDOT currently participating in about 20.

- If you see a project or solicitation of interest on the website above and have questions or wish to participate, let me know.

http://www.pooledfund.org/
AASHTO Technical Service Programs (TSPs)

https://www.transportation.org/technical-service-programs/

Funded by R&D and covers many support activities including:

- Lab Certification
- Continue access and update to LRFD
- Approved products evaluation
- Snow and ice support groups etc

DOT reps are assigned to each program

TC3 Curriculum is embedded in the NCDOT LMS
Local Technical Assistance Program (LTAP)

https://itre.ncsu.edu/focus/ltap/

- Managed by ITRE
- Technical and policy training for local agencies
- “Roads” Scholar Program to train transportation workers and supervisors
- NCTROADS is a mailing list for information exchange
Example Projects
2018-16 Mechanically Fastened CFRP to Retrofit Prestressed Concrete and Steel Bridge Beams

2017-04 Quantifying the Impact of Crack Sealant on Pavement Surface Friction

2018-11 Economic Contribution of NC Ferry System


Annually, North Carolina’s Ferry System supports:

- 5,860 Jobs (Direct, indirect, and induced)
- $217.3 million in North Carolina Employee Earnings
- $735.2 million in Statewide Economic Output
- $32.5 million in Local and State Tax Dollars
- $40.3 million in Ferry Passenger Benefits:
  - $18.1 million in vehicle cost savings
  - $13.9 million in travel time savings
  - $8.3 million in safety benefits
2017-15 Rail Corridor Trespass Severity Assessment

Annual Research & Innovation Summit

Getting Involved
## Getting Involved

| **Submit Research Ideas** | • The Research and Development Unit is available to assist  
• Forms are available on our [website](#) |
|--------------------------|----------------------------------------------------------------------------------|
| **Review Active AASHTO and FHWA Pooled Funds** | • [www.pooledfund.org](http://www.pooledfund.org)  
• Are there any in which you think NCDOT should participate? |
| **Submit NCHRP Ideas** | • Projects that are large, national issues  
• The R&D can assist in formulating ideas in detail |
| **Targeted research using Branch/Division/Unit funds** | • These agreements are low overhead  
• Projects can be established quickly |
| **Surveys: Need information on practices in other states?** | • We can distribute survey requests to all 50 states + AASHTO |
Engaging with Research

Submit Ideas!

• We’ll be happy to help refine them
• All ideas are good ideas

Participate on Steering and Implementation Committees

Participate in National Activities

• Pooled Funds: https://www.pooledfund.org/
• NCHRP Expert Panels: http://www.trb.org/NCHRP/NCHRP.aspx
• Transportation Research Board: http://www.trb.org/Main/Home.aspx
Transportation Research Board

Sign up for a free MyTRB account:

- [https://www.mytrb.org/](https://www.mytrb.org/)

Create an account with your **NCDOT Email Address** ← Very Important

- Free Training
- Browse and register for no-cost webinars
- Sign up for e-newsletters to get notified of upcoming webinars and events

Become friends with TRB Committees to learn about national activities and connect with national peers
We accept research ideas year round!
Annual due date is typically in July

R&D can help develop and refine Research Ideas
(or find someone that can)

Research Idea Guidelines

Research Idea Submittal Page
# Contact Info

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<thead>
<tr>
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Research Connect Page (for Forms, completed and active projects and more):
[https://connect.ncdot.gov/projects/research/Pages/default.aspx](https://connect.ncdot.gov/projects/research/Pages/default.aspx)

Research Directory Page:
Thank You