North Carolina Center of Excellence for Mobility and Congestion

Center Summary
NCDOT Research Project TCE2020-02

August 2023

NC STATE UNIVERSITY

ITRE
Institute for Transportation
Research and Education

RESEARCH & DEVELOPMENT

The NC State University Institute for Transportation Research and Education (ITRE) formed the Center of Excellence (CoE) for Mobility and Congestion in response to the NCDOT's inaugural CoE solicitation of June 26, 2019. NCDOT aimed to drive the creation of collaborative academic research centers that would be "forward-looking and strategically focused and produce work that is accessible to and usable by transportation decision-makers."

The center consortium included NC State, Fayetteville State University, Duke University, NC A&T State University, and UNC-Chapel Hill. ITRE assembled the consortium in full alignment with NCDOT's goals to:

- Leverage **"multi-disciplinary skills and knowledge across multiple universities"**
- Draw on strengths in North Carolina's **"Historically Black Colleges and Universities and Minority Serving Institutions"**
- Provide **"a long-term view and cutting-edge approach"**
- Explore multifaceted research as outlined in the CoE solicitation

The consortium first designed the center's themes by mapping the solicitation's mobility and congestion-related research goals to three core center research themes:

Research Goals

- ITS and data usage
- Active/adaptive congestion management
- Alternative intersection and interchange designs
- The role of transit in improving mobility and reducing congestion
- The role of transit and Mobility as a Service (MaaS) in improving economic and healthcare access for underserved populations

Core Themes

- Big Data and Data-Driven Transportation Management and Decision Support
- Active Transportation Management/Integrated Corridor Management
- Transit and MaaS

All interested faculty at the five consortium universities were invited to submit research ideas under the established center themes. Approximately forty submitted research ideas. Fourteen candidate project ideas emerged from the submissions, and the participants evaluated and ranked the ideas. This collaborative project development process resulted in the three projects that the center completed:

- Theme 1: Deep Learning Software for Traffic State Prediction
- Theme 2: Smart Connected and Automated Vehicle Fleet Management: Developing Regional Dispatch Decision Support for Congestion Mitigation
- Theme 3: First Mile to Health: Improving Healthcare Access in North Carolina

The center's research efforts concluded in February 2023. Final reports for each of the three projects are available on NCDOT's Research and Development unit website:

https://connect.ncdot.gov/projects/research/pages/ProjDetails.aspx?ProjectID=TCE2020-02