The NCMUG's vision is to provide a forum for sharing knowledge and experiences of using state-of-practice transportation modeling tools, techniques and innovations appropriate to answer transportation planning and policy questions for the State of North Carolina, and promote its implementation across the State.

2025 Spring NCMUG Meeting
Tuesday, April 15, 2025
10:00 AM-12:00 PM ET

Hotel Ballast, Wilmington
Room: Carolina Room

Agenda

Moderator: Roberto Miquel

Welcome

Model Development and Update Across NC (15 minutes)
NCDOT, Triad Region, Triangle Region, Metrolina Region

North Carolina Statewide Travel Model (NCSTM) Update (25 minutes)
Vince Bernardin, Ph.D., Caliper Corporation
Learning Objectives
- ➤ *Learning about key updates in NCSTM v5.*
- ➤ *Exploring how big data is implemented in NCSTM v5.*
- ➤ *Understanding five advanced modeling innovations in the new version.*

Abstract
NCDOT is investing in a major update to the North Carolina Statewide Travel Model (NCSTM) to produce NCSTM version 5. This update involves several basic updates to the model's fundamentals, processing and analysis of multiple sources of big data, and five advanced innovations including disaggregate machine learning trip generation models, nested long-distance destination choice models, work from home choice modeling, truck route choice modeling, and CAV scenario testing functionality. The presentation will provide an overview of all the major elements of the update.

Bio
Vince Bernardin, Ph.D. **vince@caliper.com**, Vice President, Caliper Corporation
Vince is a Vice President of Caliper Corporation. Vince has managed to work in over half the states and four foreign counties all working remotely from his home in Evansville, IN. He is best known for his work with transportation big data, statewide models, and hybrid models like the TRM, but is currently leading FHWA research on incorporating AI in travel models. He is a current chair of the TRB Subcommittee on Urban Big Data. He has a Ph.D. from Northwestern in Transportation Engineering and an undergraduate degree in Philosophy from Notre Dame.

Considering CAVs in Travel Models and Traffic Forecasts (25 minutes)
Dr. Leta Huntsinger, PE, WSP

> ### Learning Objectives
> ➢ *Understanding the potential impacts of CAVs on travel demand in North Carolina.*
> ➢ *Learning how to adapt travel models for different levels of CAV deployment.*
> ➢ *Exploring how CAV modeling can improve traffic forecasts by addressing risk and uncertainty.*

> **Abstract**
> By the year 2050 Connected and Automated Vehicles (CAVs) have the potential to significantly disrupt travel across North Carolina. As such, there is an urgent need to better understand the potential impacts and benefits of CAVs on travel demand and traffic forecasts. To address this need, NCDOT funded a research study to better understand these potential impacts and benefits, and to develop guidance on how travel demand models can be modified to best capture the supply and demand side changes that will likely result from different levels of CAV deployment.
>
> This presentation will provide an overview of the research findings and recommendations for considering CAVS in travel demand models considering both a basic and advanced approach. The presentation will also touch on how consideration of CAVs in travel models can support the development of traffic forecasts that better consider risk and uncertainty.

> **Bio**
> **Dr. Leta Huntsinger, PE, leta.huntsinger@wsp.com,** Senior Vice President, WSP
> Dr. Leta Huntsinger is a results-oriented leader with a strong focus on strategic thinking and communication. Her strong communication skills enable her to clearly articulate ideas, engage diverse stakeholders, and foster collaboration across teams. She enjoys working at the intersection of data analytics, multimodal transportation planning and people. Leta is a foodie who loves to cook, and an outdoor enthusiast.

Topology and Resilience: A Geospatial Analysis of Transportation Network In North Carolina (25 minutes)
Dr. Trung V. Tran, GISP, Fayetteville State University

> ### Learning Objectives
> ➢ *Understand the importance of transportation network resilience during extreme events.*
> ➢ *Learn how disruptions impact connectivity, evacuation, and recovery efforts.*
> ➢ *Explore methods for analyzing network resilience using geospatial and spatial analysis techniques.*

> **Abstract**
> Transportation network resilience has attracted multiple recent research as it ensures continued access to critical sites, particularly during and after extreme events like the damage from Hurricane Helene in western North Carolina in September 2024. Transportation networks are a fundamental part of infrastructure, providing daily accessibility and essential services to communities. Therefore, these systems must maintain adequate connectivity to key infrastructures when facing natural disasters or manmade disruptions. Transportation system failures can severely impact post-disaster evacuation, response, recovery efforts, and societal and commercial activities. Evaluating how transportation networks perform during disruptions and assessing their preparedness and functionality highlights the

importance of resilience measures. This research examines the resilience of North Carolina's transportation network by analyzing its topology with geospatial data and spatial analysis techniques.

Bio
Dr. Trung V. Tran, GISP, ttran1@uncfsu.edu, Associate Professor, Fayetteville State University
Dr. Trung V. Tran is an Associate Professor of Geospatial Science at Fayetteville State University. He leads the Geospatial Science Degree Program and directs the USGIF-Accredited GEOINT Certificate Program. He earned his Ph.D. in Geography from the University of Oklahoma, specializing in remote sensing, GIS, and land cover/land use change. His research and teaching focus on GIScience, geo-visualization, remote sensing, and UAS applications, particularly in transportation-community linkages and human-environment interactions. Current projects include NASA-funded flood monitoring, an NSF-funded study on clean energy and rural socioeconomic impact, and an NCDOT-funded infrastructure resilience project, among other geospatial research projects.

Idea collection/ "Tossed Salad" Session (30 min)
Facilitated by Dr. Leta Huntsinger, PE

In this interactive session, attendees will contribute their ideas for future in-depth discussions by submitting topics in a slip of paper into a "Tossed Salad" box. During the session, we'll randomly select and share these ideas with the group. Together, we'll explore and organize them into common themes to help shape the focus of roundtables and panels in future NCMUG meetings. Attendees are encouraged to come prepared with thoughtful suggestions.