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 Fall NCMUG Meeting

Thursday, Nov 20, 2025
1:00 PM-4:00 PM ET

Room CH-14 (Basement Level)
Charlotte-Mecklenburg Government Center (CMGC)
600 E 4th St, Charlotte, NC 28202

MS Teams Option
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Meeting ID: 288 878 383 283 9
Passcode: zQ6SD6BX

Agenda

Moderator: Roberto Miquel

Welcome

Model Development and Long-Range Planning Across NC (15 minutes)
NCDOT, Triad Region, Triangle Region, Metrolina Region

Making the Most of Modern Models (35 minutes)
Jeremy Raw, P.E.

Learning Objectives

- List some "next generation" modeling tools
- Identify strategies for aligning models with planning goals
- Recognize the benefits of "right-sized" models in supporting responsive planning processes

Abstract
Improving the models we use to support planning decisions continues to be a difficult process. We still don't know enough about human behavior, especially when circumstances shift rapidly and dramatically (we're still considering the fallout from Covid). The wealth of "big data" sometimes just manages to be frustrating when we try to figure out what it all means. And while artificial intelligence gives us a greater ability to mine data and even our opinions about data, it tells us less than ever about how our future planning actions might lead to future outcomes. Yet all is not lost! This presentation argues that what we need is a return to basics: getting clear about what we are seeking from our models relative to our planning and policy evaluation purposes. Rather than deploying new techniques and tools to explain "everything", the most sensible approach may be to look for "just enough" to ensure that our decisions are not ignoring obvious data and trends. From a practical standpoint, our ability to set up and run new models cheaply and rapidly (be they strategic models like VisionEval or even activity-based models like ActivitySim) and to better understand what is already built into our models (perhaps through the TMIP

Exploratory Modeling and Analysis Tool) allows us to hedge our bets and gain confidence in our decisions. Making good decisions is not about arriving at certainty, but rather about using models to help harmonize what we want with the best available information, and then to constantly and efficiently reassess where we might be headed as new information becomes available.

Bio

Jeremy Raw, P.E.
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Jeremy is a professional engineer and urban transportation planner with many years of experience in software design and development, data management and analysis, transportation planning, and travel demand modeling. He has worked on travel modeling and data analysis for the Durham-Chapel Hill-Carrboro MPO, the Virginia DOT, and the Federal Highway Administration, from which position he is recently retired. Jeremy's past projects have included collecting and analyzing data about non-motorized transportation, scenario planning, performance-based planning, and new transportation technologies. Other areas of work included forecasting for NEPA studies and development of planning strategies to manage complete streets, digital infrastructure, automated vehicles and shared mobility. Jeremy is still the principal code maintainer of the VisionEval Strategic Modeling system (https://visioneval.org), and he recently worked with the Ohio Travel Model Users Group to deliver a multi-week web-based training on travel demand modeling.

An introduction to Caliper's Activity-Based Modeling platform (35 minutes)

Kyle Ward

Learning Objectives

- How ABMs differ from trip, hybrid, and tour models.
- Understand what made ABMs complicated in the past and why CCABM feels so simple.
- Advantages of ABMs for things like EJ and transit analysis.

Abstract

An introduction to Caliper's Activity-Based Modeling platform. The presentation will briefly cover some ABM basic concepts as well as innovations specific to Caliper's standard model. The Oahu, HI implementation will be used as a reference.

Bio

Kyle Ward, Senior Data Scientist, Caliper Corporation
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Kyle has 18 years of experience in travel modeling. He started at the Capital Area MPO, worked on models around the world while at WSPs Raleigh office, and now supports various states including North Carolina as the Senior Data Scientist at Caliper Corporation.

Integrating Generative AI with Traditional Urban Economics for Long-Range LUTI Modeling: The Asheville Region Experience (35 minutes)

Colby Brown

Learning Objectives

- Understand how transformer-based language models can be applied to predict land use transitions at the parcel level, including model architecture selection, training approach, and integration with traditional spatial allocation frameworks.

- Understand how socio-economic land use forecasting models can operate across multiple geographic resolutions to deliver required inputs for transportation modeling efforts while incorporating appropriate sensitivity to detailed factors impacting development patterns.
- Learn techniques for integrating land use and transportation models through feedback mechanisms, including the use of accessibility measures, market pressure indices, and iterative forecasting procedures that capture the dynamic relationship between development patterns and travel behavior.

Abstract
This presentation introduces an innovative methodology for long-range socioeconomic land use forecasting that combines traditional urban economics principles with generative artificial intelligence (AI) techniques. Developed for the French Broad River MPO's 2050 Metropolitan Transportation Plan, the Asheville Region Land Use Model (ARLUM) represents a significant advance in land use-transportation interaction (LUTI) modeling. The land use forecasting system integrates a transformer-based language model for predicting parcel-level land use change with a detailed block-level real estate development microsimulation model and bid-rent socio-economic analysis at the TAZ level to support traffic forecasting using a conventional trip-based travel demand model. Attendees will learn how this approach addresses real-world challenges including scenario development, data integration from multiple sources, and computational efficiency considerations.

Bio
Colby Brown, CEO, Manhan Group
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Colby Brown Colby Brown is Managing Partner and CEO of Manhan Group LLC, where he specializes in land use forecasting models supporting regional transportation planning. An internationally recognized expert in land use-transportation interaction (LUTI) modeling and bid-rent analysis, Colby has developed over twenty land use models for metropolitan areas across the United States and serves as an advisor to modeling teams worldwide. He holds an MS in Transportation Technology and Policy from UC Davis and completed MIT's Certificate in Modeling and Simulation of Transportation Networks. Prior to founding Manhan Group, Colby served as Director of Citilabs' Local Government Platform and held positions at the Metropolitan Council of the Twin Cities and Wilbur Smith Associates.

Introduction of the North Carolina Regional Travel Demand Model Framework (35 minutes)

Heejoo Ham Ph.D. & Steve Kim, Ph.D.

Learning Objectives

- Modeling Framework and Methodologies: Understand the structure of the RTDM, as demonstrated through the Region 17 model, including trip generation, distribution, mode choice, and assignment, as well as enhancements for CAV and visitor modeling.
- Data Inputs and Model Outputs: Learn about the types of data required for RTDM model development—such as socioeconomic forecasts, network data, and travel surveys—and outputs available for planning analysis.
- Model Implementation and Application: Explore the steps involved in running and applying the RTDM.

Abstract
Stantec has developed a regional travel demand model (RTDM) framework for North Carolina, encompassing both MPO and non-MPO jurisdictions. We developed the framework while developing NCDOT region 16 and 17 models. The RTDM supports the analysis and evaluation of highway and

transit systems, long-range transportation plans, and land use growth scenarios. Built on the conventional four-step modeling framework, the model integrates innovative components such as forecasts for Connected and Autonomous Vehicles (CAVs) and visitor travel behavior. The model is designed to inform decision-making across a wide range of planning contexts, from corridor-level studies to regional policy development.

Bio

Heejoo Ham, Ph.D., Stantec Consulting Services, Inc.
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Dr. Heejoo Ham is a Senior Technical Leader and Travel Demand Modeler with nearly three decades of experience in transportation planning and modeling. He specializes in the development, calibration, and validation of highway and transit models, and has led numerous projects involving model integration, corridor studies, toll traffic and revenue forecasting, and BRT/LRT feasibility analysis. Heejoo's work is grounded in rigorous data management and technical innovation, making him a trusted expert in regional and corridor-level modeling efforts.

Steve "Kyeongsu" Kim, Ph.D., Stantec Consulting Services, Inc
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Dr. Steve Kim is a senior transportation modeler, project manager, and data strategist with nearly 20 years of experience in behavioral analysis, predictive modeling, and performance evaluation. With a multidisciplinary background in planning, modeling, and economic geography, he brings a distinctive lens to solving complex challenges. Steve is recognized for his ability to apply non-traditional, adaptive approaches that respond to emerging priorities and evolving client needs. His work consistently delivers innovative, data-driven solutions that go beyond conventional methodologies—providing actionable insights that shape policy, guide investment, and improve operations.

Model On Spotlight:

Overview of the New 2025 Metrolina Regional Travel Demand Model (MRM25) (25 minutes)

Martin Kinnamon, P.E.

Abstract

The MRM is now a fully disaggregate tour-based model. This presentation will provide a brief overview of all components of the model, including the new mode-choice model and user interface. Use cases to date, challenges and next steps will be discussed.

Bio

Martin Kinnamon P.E, Regional Modeling, Analysis, and Coordination Section Manager, CDOT
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Martin Kinnamon has 25 years of transportation experience. After eight years in traffic analysis and operations, he joined the Metrolina modeling team in 2008. For the past two years, he has managed the Regional Modeling, Analysis, and Coordination section at Charlotte DOT, overseeing the Metrolina model, traffic and data analysis, and GIS.