NCMUG Vision: 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.

2020 Fall NCMUG Meeting

Wednesday, December 2, 2020
1:00 – 5:00 p.m.
Zoom Meeting Link: https://ncsu.zoom.us/j/91050131255

Agenda

Moderator: Joe Schirripa, CDM Smith

- **INTRODUCTION**

- **COVID19 IMPACT**
  01:00-01:40 PM (40 minutes)
  COVID-19 Impacts on North Carolina Traffic Data[1]
  Kerry Morrow, Traffic Survey Group Supervisor, NCDOT

  Learning Objectives:
  ➢ Understand how COVID-19 and associated mitigation efforts presented challenges for traffic data collection in North Carolina.
  ➢ Learn about the pandemic's impacts on traffic volumes and travel trends in North Carolina in 2020 and beyond.

  Abstract
  The COVID-19 pandemic had sudden, drastic, and unprecedented impacts on travel behavior all over the world, as it did right here in our state. This presentation describes the challenges in capturing those impacts in North Carolina through traffic monitoring efforts and examines the travel trends that have been observed thus far. The presentation will also discuss decisions that lie ahead on how to analyze data to properly characterize annualized travel data for North Carolina.

  Bio
  Kerry Morrow, kmorrow@ncdot.gov, Raleigh, NC
  Kerry Morrow has been leading NCDOT's Traffic Survey Group since November 2018. In this role, she oversees North Carolina's statewide traffic monitoring program and the multi-faceted team that keeps it running smoothly. Prior to her current position, Kerry served in various roles in Transportation Planning Division, including coordination with Rural & Metropolitan Planning Organizations, comprehensive transportation plan development, travel demand modeling and long-range statewide planning initiatives. Kerry is a proud graduate of NC State University. In her spare time, Kerry also works as a full-time chef, coach, teacher, housekeeper, therapist, and art instructor for her two young daughters, since March 2020.

  01:40-02:20 PM (40 minutes)
  Covid-19's Impact on Traffic, Travel Patterns, and Transportation System Performance[2]
  Jaehoon Kim, Transportation Modeler, Jake Ford, Transportation Modeler, Durham-Chapel Hill-Carrboro MPO

  Learning Objectives

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[1] NCMUG_2020-11-17_PresenterInfo_Covid19TrafficCount_10-23_KerryMORROW_NCDOT.docx
[2] NCMUG_2020-11-17_PresenterInfo_Covid19TravelChPerformance_10-09_JKim_JFord_frYPZhang_DCHC.docx

- ➢ Review the transportation system metrics before and during different phases of COVID-19 pandemic. This includes but not limited to number of accidents, vehicular speed by facility type and travel time reliability
- ➢ Analyze how overall travel was affected during the pandemic, including local transportation network usage, vehicle miles traveled and transit ridership at Durham transit center.
- ➢ Understand the travel pattern changes, including percent and travel time changes by trip purpose and mode.

Abstract

The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) monitors travel changes and measures transportation system by using the location based services (LBS) data from Streetlight Data, the Regional Integrated Transportation Information System (RITIS) and other resources. These data sets were validated and then further used to understand the changes of travel and transportation system performance in the DCHC MPO area, including, but not limited to, vehicular speed by facility, travel time reliability, vehicle miles traveled, transit ridership at Durham transit center as well as percent and travel time changes by trip purpose and mode.

Bio

Jaehoon Kim, Jaehoon.Kim@Durhamnc.gov, Durham-Chapel Hill-Carrboro (DCHC) MPO
Jaehoon Kim is a transportation modeler at DCHC MPO. He has over 8 years of professional experience in transportation industry, and received his Ph.D degree in Civil Engineering at University of Alabama in Huntsville. Prior to joining DCHC MPO, he was a supervisor of the modeling team at Tennessee State DOT.

Jacob Ford, Jacob.Ford@Durhamnc.gov, Durham-Chapel Hill-Carrboro (DCHC) MPO
Jacob is a Transportation Modeler at the DCHC MPO. Jacob specializes in the development of the Triangle Regional Model, including network enhancements, validation and calibration, and data maintenance. Data analytics and visualization of travel behavior are an additional focus. Jacob holds a bachelor's degree from Allegheny College, and a masters of public policy from Georgetown University. He is also a full-time parent of a rescue greyhound.

02:20-03:00 PM (40 minutes)
COVID-19's Impact on Travel Patterns and Mode Choice[3]
Jorge A. Barrios, Senior Engineer; Mike Aronson, Principal Engineer, Kittelson & Associates, Inc.

Learning Objectives
- ➢ Understand the impact of the COVID-19 pandemic on NC's travel patterns (so far)
- ➢ Learn about potential future shifts based on stated preference survey data
- ➢ Learn about data sources to continue tracking impacts and long-term changes
- ➢ Identify considerations for long-range travel forecasts and planning

Abstract

The COVID-19 pandemic brought sudden and massive shifts to how people in North Carolina travel. This presentation will provide a synthesis of data from several sources across multiple modes of transport to help understand the magnitude and evolution of the pandemic's impact. The presentation will also cover data from stated preference surveys to provide insights into what may happen once COVID-19 is no longer a threat. Finally, considerations for future travel forecasts will be presented.

Bio

Jorge A. Barrios, jbarrios@kittelson.com, Orlando, Florida
Jorge Barrios is a Senior Engineer with Kittelson & Associates in Orlando and enjoys working at the intersection of transport and land use. He leads Kittelson's data analytics practice and is always looking for ways to use data to answer his clients' burning questions.

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[3] NCMUG_2020-11-17_PresenterInfo_Covid19TravelCh_10-08_JBarrios_MAronson_Kittelson_frBSchroeder.docx

Mike Aronson, maronson@kittelson.com, Oakland, California
Mike Aronson is a Principal Engineer with Kittelson & Associates and provides senior oversight for all of Kittelson's travel forecasting across the US. Mike has over 35 years of experience in data analysis and development of travel forecasting models as well as practical applications and extensions to evaluate transportation innovations. He particularly enjoys training and teaching agency and consultant staff about the real-world quirks of travel models.

03:00-03:40 PM (40 minutes)
Longitudinal Surveys to Understand Short- and Long-Term Impacts of COVID-19[4]
Michelle Lee, Director; Abigail Rosenson, Senior Analyst, RSG

Learning Objectives:
- Survey methodology to achieve representative samples using panels.
- Key COVID-19 travel implications, nationally and in North Carolina.
  - Particular focus on demographic implications and attitudes about travel resumption.
- Primary panel data applications.

Abstract
The shifts in travel patterns caused by the COVID-19 pandemic will continue to evolve in concert with the severity of and public response to the pandemic. While publicly available, passively collected location-based service (LBS) data are valuable for understanding the changes, these aggregate data sources cannot answer several important planning questions. To further evaluate the ongoing changes in travel behavior due to COVID-19, RSG has conducted the COVID-19 Transportation Insights Panel (TIP) – a national, longitudinal survey using a representative panel of U.S. adults – approximately every six weeks since May 2020. The TIP surveys collect demographic, work, school, travel behavior, health, and attitudinal data to understand which peoples and households are most affected, how travel purposes are changing, and expectations for travel resumption in the future. This presentation will include an overview of the study methodology, key findings, and primary data applications.

Bio
Michelle Lee, michelle.lee@rsginc.com, Merritt Island, FL
Michelle Lee, GISP, PMP is a nationally experienced project manager who specializes in transportation, health, and environmental projects. Michelle develops innovative, efficient solutions for her clients and excels at prioritizing agency needs and priorities over the entire lifecycle of projects. In her 15 years working directly on surveys with transportation agencies of all sizes, Michelle has also continually advanced the state-of-the practice on GPS-based travel data collection. Michelle lives on Florida's Space Coast and enjoys boating, golfing and volunteering with the local Parrothead Club in support of environmental causes.

Abigail Rosenson, abigail.rosenson@rsginc.com, Arlington, VA
Abby Rosenson is a senior market research analyst at RSG who leads and supports a range of online and GPS smartphone travel surveys for public agencies and academic researchers. Abby is currently involved in both national and regional COVID-19 travel surveys and excels in innovative survey design and effective data visualization. When she's not working on surveys, Abby can be found on the tennis court or counting the number of scooter and bikeshare companies she passes on her daily walks.

- ## BIG DATA – USE
  03:40-04:20 PM (40 minutes)
  ### Big Data & Pivoting in the NC Statewide Model (NCSTM)[5]
  Stephen Tuttle, Senior Consultant, Steven Trevino, Consultant, RSG

  ### *Learning Objectives*
  - Overview of the LBS data processing & expansion methodology used in the NCSTM
  - The application of passive data to the NCSTM via the pivot process

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[4] NCMUG_2020-11-17_PresenterInfo_Covid19Survey_MLee_ARosenson_RSG_10-07.docx
[5] NCMUG_2020-11-17_PresenterInfo_BigDataPivotNCSTM_10-09_STuttle_STrevino_RSG.docx

- ➢ Review of the results from data expansion
- ➢ Further opportunities for Big Data applications, including (post) COVID applications and forecast scenarios

Abstract

RSG and CDM Smith were tasked to provide NCDOT with the next update (GEN4) to the NC Statewide Model. Included in that effort was the processing, expansion, and application of passive data. As part of the Big Data application, a pivoting framework was implemented to support easier and more frequent updates to the model's base year. This framework was adopted from work done by RAND Europe for the Sydney, Australia Strategic Model and is well documented from a pair of papers (2005, 2012) and a TMIP Webinar (2015). RSG has incorporated this framework for multiple statewide models, including Tennessee, Michigan, Illinois, and North Carolina. This presentation will detail the Location-Based Service (LBS) data, the methodology used in processing & expanding this data, and its application to the NC Statewide Model. The presentation will also discuss how passive data could be used to establish a new base scenario or support forecasting (post) COVID scenarios.

Bio

Stephen Tuttle, Stephen.Tuttle@rsginc.com, Chicago, IL
Steve has 10 years of experience in travel demand modeling and has managed much of RSG's recent work on the Illinois, New Mexico, and Michigan statewide models. Steve has developed passive data products for several clients and has used big data to examine seasonal, weekend, and COVID-19 related travel variation. Steve's other work includes developing toll assignment models based on multinomial and mixed logit choice models. Steve holds a master's degree in Transportation Science.

Steven Trevino, Steven.Trevino@rsginc.com, Evansville, IN
Steven has 10 years of experience in travel modeling and has spent the majority of his career at RSG. He is a developer and contributor to many travel models across the nation, including the North Carolina Statewide Model. His focus has been advancing the use of passive "Big Data" and its applications to support travel modeling. Steven has experience in GIS and data science programming languages, notably TransCAD's GISDK, Python, and R. He has worked with passive data from many vendors (Safegraph, StreetLight, INRIX, ATRI, AirSage) and is involved in RSG's LBS products & services, rMerge.

04:20-05:00 PM (40 minutes)
Microsimulation Model Calibration During a Pandemic – How Big Data Saved the Day[6]
Graham Malone, Traffic Engineer, HDR; Michael Dennis, SC Public Traffic Lead, Ramey Kemp and Associates

Learning Objectives
- ➢ Using alternative means to calibrate model
- ➢ Using big data to develop better large OD tables to make calibration easier
- ➢ How big data can be used to supplement turning movement counts (TMC) during a pandemic

Abstract

The South Carolina Department of Transportation (SCDOT) selected HDR to design the replacement of an existing bridge over an abandoned rail line on a major thoroughfare (US 21/US 176/Elmwood Avenue) in downtown Columbia. The bridge is heavily traveled and carries up to 50,000 cars per day. The bridge itself is located at the terminus of I-126, an eight-lane freeway that is one of the only five routes across the Congaree River. SCDOT tasked the design team to develop a design and construction staging plan that considers the total construction cost, construction methods and duration, as well as impacts to daily traffic. HDR teamed with Ramey Kemp and Associates (RKA) to provide traffic simulation and operation analysis services on the project. Phase 1 of the project included a comprehensive TransModeler microsimulation model of approximately one-square mile of the downtown grid system along with the major external connections, including I-126. Shortly after the project began, the COVID-19 pandemic began affecting the United States, and traffic volumes became increasingly difficult to measure. Fortunately for the project, much of the study area had been counted previously in 2019; however, the project team quickly realized there were still many intersections where counts would still be needed, and that calibrating the model could potentially be difficult. Through the use of historic Streetlight Data, HDR and RKA were able to build origin-destination matrices for the various external and internal nodes within the model, which helped facilitate model development and calibration. Streetlight Data also allowed HDR and RKA

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[6] NCMUG_2020-11-17_PresenterInfo_BigData_Use_MicroSimCalibIn_10-09_GMalone_HRD_MDennis_RKA.docx

to gather approximate turning movement counts (TMC) at intersections with missing information, allowing the team to fill in gaps and produce turning movements for the microsimulation models. Model calibration, which would normally include field-collected travel time measurements, was also impacted by COVID-19. The project team made use of SCDOT's Iteris real-time traffic information to produce average travel speeds for modeled corridors, allowing modelers to seamlessly continue with the calibration process. Through the use of big-data resources, HDR and RKA were able to dynamically adjust to a worldwide pandemic, and complete the development and calibration of a microsimulation model on-time and provide results for four construction-staging scenarios. This allowed the overall design project to continue on-schedule, without interruption.

Bio

Graham E. Malone, graham.malone@hdrinc.com, Charleston, SC

Graham has 10 years of engineering experience and has a background in transportation planning, traffic operations and safety. He is a two-time graduate for Clemson University, where he received his Bachelor's degree in Civil Engineering in 2007, and where he also received his Master degree with a focus in Transportation Engineering in 2013. He has worked as a consultant for several municipalities and state Department of Transportation in Georgia, South Carolina, North Carolina and Florida and is a currently the South Carolina Traffic Lead for HDR. He also serves as an adjunct professor at The Citadel University.

He is currently working on several projects in the South Carolina Lowcountry, including the state's first Bus Rapid Transit system, and a movable bicycle and pedestrian drawbridge across the Ashley River, which will connect the suburban community of West Ashley with downtown Charleston when complete.

Michael Dennis, mdennis@rameykemp.com, Columbia, SC

Michael Denis spent 25 years at SCDOT, mainly in the Planning Office, before going to work with RKS 2 years ago. At the SCDOT, he worked with, developed, or oversaw all TDM for the DOT. He also worked on PM3 development and a number of interstate corridor studies. At RKA, he has worked on ITRs, TISs, project traffic analysis, and TransModeler. Michael has a BS and MS from Clemson and is a PE in SC, NC, and GA.

Other Notes:
Four (4) PDHs can be earned at the meeting.