NC State University Center/Institute Annual Report

2023

Name of Center or Institute:	Institute for Transportation Research and Education
Center Acronym:	ITRE
Director name:	Billy M Williams
Director email:	bmwilli2@ncsu.edu
Director phone number:	919/515-7813
Contact person:	Carrie Ann Gage
Contact person title:	
Contact email:	cagage@ncsu.edu
Contact phone number:	919-515-8563

Building where Center/Institute's main office is located:
Research Building IV
Address of Center/Institute's main office:
909 Capability Drive, Suite 3600, Raleigh, NC 27606-3870
Location
Centennial Campus

Mission and Vision Statement

Institute for Transportation Research and Education (ITRE)carries out research, training and technical support activities in the areas of surface and air transportation for a host of national, state, and local clients to address the nation's critical transportation issues.

Research Impact

Institute for Transportation Research and Education (ITRE) research programs — and the Institute's related training and technology transfer activities — continue to have a significant impact on the transportation practice both locally and nationally. The following are highlights from ITRE's activities in this FY.

TRB COMMITTEES AND ANNUAL MEETING PRESENTATIONS

ITRE maintains an ongoing, high-profile presence and role in the Transportation Research Board (TRB), a division of the National Academy of Sciences, Engineering, and Medicine. ITRE research staff and affiliated faculty serve as active full members of nine standing TRB committees. Much of the important business of setting national transportation research direction is done by these committees at the TRB Annual Meeting held every January in Washington, D.C. In addition to critical committee work, ITRE researchers and affiliated faculty presented 15 research papers in poster sessions and 11 research papers in lectern sessions this year. For more information on TRB visit: https://trb.org

STRIDE CONSORTIUM

ITRE has conducted research annually since 2016 for the Southeastern Transportation Research, Innovation, Development and Education Center (STRIDE), a University Transportation Center (UTC) funded by a grant from the U.S. Department of Transportation (USDOT). As the UTC for Region 4 (Southeast U.S.), STRIDE is a multi-university research consortium that includes NC State and is housed at the University of Florida Transportation Institute (UFTI). The UTC grant provides the consortium with up to $14 million over

five years towards developing novel strategies for reducing traffic congestion. STRIDE research efforts are addressing congestion through new in-vehicle technologies, telecommunications advances, and the rise of shared mobility and autonomous vehicles. STRIDE is also working to strengthen the regional transportation workforce and practice through educational and technology transfer activities.

In this FY, ITRE's Public Transportation Group completed Phase II of a STRIDE project that combined three large datasets to identify where school and public transportation buses are impacted by congestion and how much this congestion costs. Phase II expanded on the Phase I research by developing a practitioner-ready tool that streamlines the process, enabling local governments to conduct the analysis themselves.

ITRE's Highway Systems Group completed three STRIDE projects this FY. The first project focused on the fusion of multiple emerging data sets to improve signalized arterial performance measurement. The second effort, conducted in collaboration with Auburn University, Georgia Tech, and the University of Alabama at Birmingham, developed methods to identify unpredictable sources of non-recurring road congestion and support the deployment of congestion mitigation strategies. The final effort, conducted in collaboration with the University of Florida and Florida International University, developed methods to improve corridor management through cooperative signal control in concert with ramp metering and other freeway operations strategies.

The above-mentioned projects also involve researchers at other member universities in the STRIDE consortium. For more information on STRIDE visit: https://stride.ce.ufl.edu

INTELLIGENT TRANSPORTATION SYSTEMS / CONNECTED AUTONOMOUS VEHICLES (ITS/ CAV)

ITRE has made significant strides in the realm of Intelligent Transportation Systems (ITS) and Connected and Autonomous Vehicles (CAV) over the past year. ITRE's data fusion project for signalized arterial performance measures leveraged the power of integrated data sources to enhance traffic flow efficiency and safety. This project, along with ITRE's initiative on integrated corridor management for urban and semi-urban settings, brought together transportation technologies, services, and applications into a unified system, leading to improved traffic management and congestion mitigation. These efforts have demonstrated ITRE's commitment to utilizing advanced technology to create a cohesive, interconnected transportation network that supports the optimization of current infrastructure, thereby maximizing safety and efficiency.

In the field of CAV, ITRE has been diligently working on multiple projects, emphasizing on preparing North Carolina's infrastructure for the advent of autonomous vehicles. ITRE's "CAV infrastructure readiness" project involved comprehensive evaluations of the state's current infrastructure and laid the groundwork for necessary updates and improvements. As part of a separate project to further strengthen the adoption and application of CAV, ITRE developed guidelines and recommendations for AV/CAV simulation. The team also made notable advancements in the study of autonomous vehicle behavior with a project focusing on developing novel methods for AV longitudinal and lateral behavior. Lastly, incorporating cutting-edge artificial intelligence technology, ITRE has started using deep learning techniques for traffic state estimation, longitudinal vehicle control algorithms, and automated drone data extractions. These initiatives have not only placed ITRE at the forefront of CAV research but also paved the way for North Carolina to become a leader in CAV readiness and implementation.

PORT AND FERRY

RP 2023-14: Natural Hazards Vulnerability Assessment of the NCDOT Ferry Division Assets

As the North Carolina Department of Transportation (NCDOT) plans for future transportation system resilience, there is a need for statewide assessment of current and future vulnerability of each of the transportation modes. The NCDOT Resilience Strategy Report (2021) describes NCDOT's short-term strategies for resilience, including "address[ing] gaps in resilience planning and standards for ferry." This is described as "assess[ing] ferry channels and conduct[ing] vulnerability and criticality assessments to address future impacts." The proposed research will directly address this specific short-term strategy.

The goals of this research project are (a) to assess the vulnerability of all of the Ferry Division's infrastructure assets with respect to natural hazards (present and forecast to the 2040 and 2060 planning horizons); (b) to assess the condition of ferry channels at present as well as potential climate impacts; (c) to prioritize assets for adaptation measures where needed; and (d) to provide recommendations on potential adaptation options as well as timeframes for implementation and ballpark cost estimates.

The Federal Highway Administration's (FHWA's) Vulnerability Assessment and Adaptation Framework, 3rd Edition (FHWA-HEP-18-020), will serve to guide the proposed vulnerability assessment of ferry assets. This framework is designed to help transportation agencies and their partners assess the vulnerability of transportation systems to extreme weather and climate effects. The five steps to conduct a vulnerability assessment include: 1) Set Objectives & Define Scope; 2) Compile Data; 3) Assess Vulnerability; 4) Analyze Adaptation Options; and 5) Incorporate Results Into Decision-Making.

RAIL

FRA Static Rail Trespass

The Federal Railroad Administration (FRA) contracted ITRE to expand previous static rail trespass work into South Carolina and Georgia. This involved selecting four sites, two in each state, and placing motion activated thermal cameras during a week in each of the four seasons to monitor incidences of rail trespass. Similar to the NCDOT Static Rail Trespass projects completed in recent years, the goal of this project is to inform the FRA on the frequency of trespassing on railroad tracks, as it is magnitudes higher than the number of actual pedestrian strikes, meaning the potential for more pedestrian strikes is much higher than previously estimated. This project is ongoing, and ITRE hopes to continue this research at future sites through project extensions.

NCDOT Dynamic Rail Trespass

NCDOT contracted ITRE to place cameras on the front of moving locomotives. With cooperation from Aberdeen and Carolina Western Railway and Blue Ridge Southern Railroad, approximately four terabytes of footage was captured. The footage has been parsed through and trespassers identified, and the footage featuring trespassers has been fed through an algorithm designed by Yuhan Chen, PhD candidate of the Computer Science Department at NC State. Evaluation of the algorithm is underway, and this project is ongoing.

NCDOT Rail Technical Assistance Request (TAR)

In 2020, NCDOT asked ITRE to obtain and analyze hospital records to determine how many rail trespass incidents go unreported to the FRA each year. After a years-long process of IRB review and HIPAA compliance, ITRE finally gained access to the data. The data was searched for injury codes and open text fields pertaining to rail related injuries. Unfortunately, the codes were often used in whatever way was most

advantageous for billing, and not description, and not all hospitals had the option to give open text answers– therefore the data obtained was incomplete. ITRE will soon deliver the report and meet with the North Carolina Department of Transportation, but until then, this project is ongoing.

Economic Contribution of Rail in North Carolina

This ITRE study was funded by a NCDOT research grant (RP2022-19) and captures the statewide economic contribution of North Carolina's rail system. The research utilizes NCDOT and ITRE-collected data, and an IMPLAN® model was used for analysis. The results of the study show that the North Carolina rail system has an annual economic impact of over $20 billion and supports 88,000 jobs in the state. The economic contributions of North Carolina rail are dispersed throughout the state.

To capture the rail-related businesses and associated employment numbers, the research team utilized Data Axle, a database that has an extensive catalog of business data including addresses, employment numbers, and North American Industry Classification System (NAICS) codes. Applying geospatial analysis to a data set that included all North Carolina business in Data Axle, the researchers compiled an initial list of all businesses within one mile of the rail corridor that had a NAICS code that is known to be heavily impacted by rail. After these businesses were documented, the research team validated each business using aerial photos, state business registry information, and websites associated with each business. All validated businesses were coded into one of three categories: (1) direct rail businesses, (2) rail-using businesses, and (3) rail-adjacent businesses. The three categories were used to assign specific jobs multipliers to each business based on their relationship to rail.

The study also analyzed passenger rail data to capture current ridership and highlight ridership recovery from pandemic-induced disruptions to Amtrak and state-sponsored NC By Train services. Additionally, rail based tourism was explored and the annual number of visitors was presented.

As a part of the research project, rail-associated businesses within the corridor were mapped and are being published on an online Geographic Information System (GIS) site. The online map presents rail lines, rail yards, intermodal and transload facilities, businesses shipping directly on the rail, and industrial parks within the rail corridor. The map has been designed with an edit request feature that allows map users to suggest updates and changes that would then be reviewed and approved by a map administrator allowing businesses and industrial parks to ensure their information is captured and displayed correctly and allow the map administrator to easily keep the map up to date with verified self-reported data.

BICYCLE AND PEDESTRIAN

Evaluating Coordination of Pedestrian-bicycle and Vehicular Movements at Continuous Flow Intersections

Pedestrians and bicyclists face unique challenges when crossing complex alternative intersections like continuous flow intersections (CFIs) due to their large sizes and other unique features. This project is evaluating the coordination of signals for pedestrian-bicycle movements, seeking improvements, and assessing the tradeoff with the coordination of vehicular movements. CFIs are beneficial to vehicular movements, particularly when there is high left-turn demand. However, their suitability for non-vehicular movements has been an under-researched topic. A past project led by ITRE assessed three types of crosswalks at CFIs, namely traditional, offset, and midblock crossing. It was found that while the offset crossing performed the best, it incurs a high number of stops to pedestrians and bicyclists. The midblock crossing incurs both a high number of stops and long delays. The current research has produced several workarounds to resolve these issues by improving the coordination of the signal phases. Generally, the

treatments that work best for pedestrian-bicycles have some negative effects on vehicular coordination, and the team will quantify the tradeoffs in delays and number of stops. The findings can be used to make an astute decision in regard to converting a traditional intersection to a CFI, setting up the signal timing plan, and choosing the crosswalk design for CFIs.

Assessment of Separated Bike Lane Applications in North Carolina

This project documents the experience of separated bike lane (SBL) planning and design in North Carolina. Separated bike lanes are a relatively new phenomenon in the state, and there are few examples of in-the-ground projects to serve as reference points. The research team sought to summarize existing research and guidance on these bicycle facilities both within and outside the state, assess the current state of practice in NC communities, and conduct safety evaluations of ongoing SBL projects to understand their impact on road users. The study monitored bicyclist-motorist interactions, avoidance maneuvers, conflicts, bicycle volume, and other cyclist behaviors via video data collected at 10 sites along four SBLs in Charlotte and Raleigh to better understand the safety and operational outcomes of SBL applications in North Carolina. Generally, results found that bicycling volume per day increased, the percentages of avoidance and conflict maneuvers decreased, percentages of helmet use increased, and the percentage of cyclists or scooter riders using a bikeshare or scooter share micromobility device increased after SBLs were installed, though there were some nuances in specific measures at the site level. Findings can be used to shape discussions around SBL planning and implementation in NC and offer guidance for agencies considering these bicycle facilities in their roadway improvements.

TRAFFIC SAFETY

The Highway Systems group was recently awarded three grants in the area of safety. The first grant, funded by NCDOT, develops movement-based safety performance functions (MBSPFs) that can calculate crash frequencies based on turning movement count data, conflict type, geometric data, and traffic control devices. This surrogate safety analysis method is based on real crash data, whereas all other surrogate methods are qualitative in nature. The method can be used to calculate expected crash rates for any intersection facility regardless of whether it has been constructed before.

Second, ITRE recently finished a safety evaluation of a controversial alternative intersection form known as the “continuous flow intersection” (CFI) on behalf of NCDOT. This type of intersection is known to be the most efficient intersection in existence; however, the prior safety evaluations done were not robust and found inconclusive evidence on whether they are safe for motorists. ITRE’s work concluded that CFI sites can be designed safely if attention is paid to certain attributes of the site, particularly the right turn treatment.

Third, the ITRE Highway Systems group was recently funded under the National Cooperative Highway Research Program (NCHRP) project 07-108 to evaluate several alternative intersection forms using crash and surrogate data. ITRE will act as a subcontractor to the University of North Carolina (UNC) Highway Safety Research Center (HSRC), and will primarily be responsible for surrogate analysis methods building off of work on MBSPFs in prior projects mentioned above.

PAVEMENT

Evaluating Primary and Secondary Roadway Pavement Conditions using Deep Learning

The Institute for Transportation Research and Education is working with UNC-Charlotte to conduct a feasibility study on the use of artificial intelligence/machine learning (AI/ML) to identify pavement cracks.

Images of these cracks are collected via standard GoPro action cameras attached to vehicles. This makes the field data collection very simple, and potentially able to be completed by utility, service, or transit vehicles already in the field with video being later used for crack identification. The hope is that this will simplify crack identification by automating this process using a machine learning algorithm to post-process passively-collected pavement image data. This project is ongoing.

TRANSIT

The Transit Program continues to have a strong relationship with NCDOT's Integrated Mobility Division (IMD) and the public transportation providers across the state while steadily increasing its connection to the Ferry Division. The primary tasks for the program are to provide expert opinions, technical assistance, data collection, reporting, analysis, and policy and finance guidance to these entities.

Transit Program staff led a four-university, multi-year project on access to healthcare in rural North Carolina. Known as "First Mile to Health," the consortium researched the impacts of NC's Medicaid Transformation, COVID-19, and technological changes on access to healthcare in northeastern North Carolina.

The team partnered with NC State's Department of Civil, Construction, and Environmental Engineering to conduct timely research on microtransit, an emerging mobility option. The project partners interviewed local community leaders who have or are planning on implementing microtransit, examined contract characteristics, and analyzed operating and financial data to compile lessons learned and best practices. The findings were widely disseminated through multiple conference talks and presentations to local leaders and elected officials. The microtransit work will continue with Phase 2 to begin in Summer 2023 while the team is awaiting news about National Science Foundation (NSF) funding for a related project.

The Transit team supported researchers at UNC-Chapel Hill on two different projects, one related to transit scheduling software and one concerning Medicaid Transformation. The team also completed Phase II of a Cost of Congestion research project sponsored by STRIDE out of the University of Florida. This project streamlined the methodology created in Phase I to enable faster and more accurate estimations of the cost of congestion on transit and school buses.

AVIATION

NC State, with ITRE as the lead, is a core university partner of the Alliance for System Safety of UAS through Research Excellence (ASSURE), the FAA's Center of Excellence for Uncrewed Aircraft Systems (UAS) Research. Since ASSURE's inception in 2015, ITRE aviation researchers have been part of seven funded research projects totaling over $1 million in awards. This Center of Excellence is aimed at continuing and enhancing the safe, successful integration of drones into the public airspace, and NC State's contributions include advanced use cases such as Shielded Operations and Disaster Preparedness and Response, as well as Economic and Market Impact analyses for various UAS related sectors.

Partnerships and collaborations are mainstays for ITRE and NC State. The Institute and university have worked with NCDOT, nonprofits, industry partners, the United States Army, and businesses to facilitate outreach and engagement in the community. Many of NC State's technology initiatives focus on youth development, in particular around science, technology, engineering and math (STEM) educational topics. Last year NC State launched a one-week STEM camp with a focus on drones for rising 10th grade students in partnership with NAF (formerly the National Academy Foundation) and the university's TRIO Pre-College

program. Through corporate support from Lenovo, a grant was awarded to purchase Tello EDU drones to help ignite students' passion for learning about and flying drones.

North Carolina's Research Triangle region has been selected for a $24 million NSF grant to build an advanced wireless communication testbed centered around programmable Uncrewed Aerial Vehicles (UAVs) and programmable radios called Aerial Experimentation Research Platform for Advanced Wireless, or AERPAW. On today's 4G networks, fixed cellular base stations communicate with mobile phones. On the AERPAW platform, the base stations can also be mobile, with the ability to transmit and receive radio waves from user devices while moving on-demand. For example, in the aftermath of a natural disaster such as a hurricane, existing cellular networks may be damaged. As a result, aerial base stations can position themselves to provide the best wireless coverage to victims and first responders who would otherwise have no cellular connectivity. The platform also has the potential to help pilots fly drones beyond line of sight, allowing for improved air traffic control under Federal Aviation Administration (FAA) regulations. NC State is leading the AERPAW research with ITRE staff as a co-principal investigator on the project.

NC State was selected by the FAA in the first group of universities and colleges to be recognized as a member of the UAS Collegiate Training Initiative (CTI). The FAA's UAS-CTI program recognizes institutions that prepare students for careers in unmanned aircraft systems. In order to qualify for the initiative, schools must offer a bachelors or associates degree in UAS or a degree with a minor, concentration, or certificate in UAS. Schools must provide curriculum covering various aspects of UAS training, including hands-on flight practice, maintenance, uses, applications, privacy concerns, safety, and federal policies concerning UAS.

NC State's Trusted Operator Program (TOP), developed by the Association for Uncrewed Vehicle Systems International (AUVSI), provides a certification process for pilots beyond their FAA part 107. TOP fills the gap between these minimally prescriptive operating regulations and a higher level of demonstrated knowledge, flight proficiency, safety and risk management practices that is expected to be valued by employers and customers of commercial UAS operators. TOP is a professional uncrewed systems community initiative aimed at supporting industry accepted remote pilot standards and protocols, which will result in the safe and sustainable advancement of the industry. NC State is one of only four institutions of higher education in the US that is accredited to deliver all AUVSI TOP levels of certifications for pilots. As a training provider the university is able to support student pilots and assist its community partners.

ECONOMIC AND POLICY ASSESSMENT

Evaluating the Economic, Physical Health, and Environmental Impacts of Completing Six Key Segments of the Carolina Thread Trail

ITRE conducted an economic impact analysis sponsored by the Catawba Lands Conservancy, Mecklenburg County, and the City of Mount Holly through an interagency initiative of the Carolina Thread Trail. The economic, physical health, and environmental impacts of six newly completed trails within the Carolina Thread Trail network were evaluated. With a total length of approximately 13 miles, these six new trails consist of less than 1 percent of the Carolina Thread Trail's 1,630+ miles of planned trail network; however, they facilitate notable benefits. Altogether, these six trails support 190 total jobs in the region (15 jobs per trail-mile), $3.9 million in annual health care savings (a benefit of approximately $7 per trip), $1.5 million in carbon emission reduction benefits (stemming from carbon storage, sequestration, the elimination of 104,000 car trips, and the reduction-in-mileage of 227,000 car trips annually). This study was featured on the Office of Research and Innovation's Newswire in March of 2023 (https://research.ncsu.edu/2023/03/08/itre-carolina-thread-trail/). Its findings were presented at the Carolina Thread Trail's 15th Annual Trail Forum,

the Piedmont Legacy Trail's 13th Annual Forum, the NCDOT Research and Innovation Summit, and the North Carolina Association of Metropolitan Planning Organizations Annual Conference in Greenville.

Measuring the Economic, Mobility, and Health Benefits of Multimodal Projects

This research is designed to provide data-driven, evidence-based approaches for measuring the benefits of non-highways (pedestrian, bicycle, transit, rail, ferry, and aviation) multimodal projects that can be effectively implemented in the STIP. The research team will focus on exploring and quantifying benefits associated with co-locating these project types in North Carolina, with a focus on benefits associated with Economic Competitiveness and Development, Mobility and Connectivity, Equity, and Community Health. This project is ongoing.

SYSTEMS PLANNING AND ANALYSIS

Triangle Regional Model (TRM)

The Triangle Regional Model Generation 2 (TRMG2) was put into practice and received top reviews from sponsors and consultants using the model to support planning work in the Triangle region. Work has initiated on data development and model updates to support the 2055 Metropolitan Transportation Plan.

• Model Investigations: Several model investigations were conducted in order to better understand the sensitivity of the TRM to change, the identify the need for future model enhancements, and to inform the development of improved reporting tools. Investigations related to equity, vehicle miles traveled (VMT), and transit mode share were presented at a state-wide conference for transportation planning professionals.

• Reporting Tools: Numbers reporting tools were developed and implemented into TRMG2 with a focus on end users. Tools include a model scenario comparison tool, a transit comparison tool, tools to improve data reporting and data access, tools for reporting various model performance measures related to VMT, mode share, and equity.

• Data Analytics: The current wave of the Triangle Travel Survey was used to better understand teleworking trends. Findings were presented at a state-wide conference for transportation planning professionals.

• Data Collection: Data was collected for the fourth wave of the recurring Triangle Travel Survey.

• User Forum: Two meetings of the TRM User Forum were conducted where model users (consultants and agency staff) shared ideas and views related to the TRM. Both meetings were held in-person and had strong attendance from around the region.

• Training: Training on the new TRMG2 and GitHub was provided for program sponsors.

Guidance for Including Connected and Autonomous Vehicles (CAVs) in Travel Demand Models

Research is being conducted that will provide guidance to NCDOT on possible modification of parameters and assumptions in travel demand models for consideration of CAVs. The guidance will be informed by scenario testing that will consider different levels of CAV market penetration.

NCDOT Transportation Planning Strategic Plan

ITRE is providing subject matter expertise and facilitation services as a subcontractor to Kittelson in the development of a new strategic plan for the Transportation Planning Division of NCDOT.

Using Vehicle Miles Traveled as a Metric for Conducting Traffic Impact Analysis

A technical assistance project for the City of Raleigh is currently underway. This project is focused on development and documentation of a method to calculate the change in vehicle miles traveled resulting from changes in land use for the City of Raleigh. The work leverages the Triangle Regional Model and will have applicability beyond the City of Raleigh.

EQUITY ANALYSIS AND PRACTICES

Including Equity in Benefit-Cost Analysis

Research on this project focused on analyzing data and developing and testing a methodology for two cross-modal measures against several case studies. Tools were developed that facilitate incorporating these measures into NCDOT's prioritization process for the purposes of leading to more equitable outcomes. The research is scheduled to conclude in July 2023.

Environmental Justice (EJ) and Historical Transportation Impacts

This research project is designed to look at past environmental injustices created or heightened by North Carolina transportation projects to improve NCDOT's capacity to prevent and reduce such impacts in the future and potentially rectify historic injustices. This study focuses on producing practitioner-ready deliverables and establishing a methodology framework that can help NCDOT implement sound practices that improve transportation equity across the state for generations to come.

MODELING AND COMPUTATION

Over the past year, ITRE has made meaningful progress in the development of tools, computations, and engines, underscoring ITRE's commitment to innovative research in the transportation sector. The tools have largely focused on the integration and analysis of complex transportation data. For instance, ITRE has developed systems for data integration that harmonize disparate data sources, allowing for a more comprehensive understanding of transportation trends and patterns. Furthermore, ITRE has developed visualization tools that make the interpretation of complex datasets more intuitive and accessible. In an effort to streamline data collection and analysis, the team has also employed computer vision and state-of-the-art AI/ML models for automated traffic data extraction. These cutting-edge techniques have dramatically increased the efficiency and accuracy of ITRE's data processing capabilities.

GEOVISUAL ANALYTICS AND DECISION MANAGEMENT (GADA)

GADA continues to partner with the NC Governor's Highway Safety Program (GHSP) and the NC State Highway Patrol (NCSHP) to support the shared mission of reducing traffic crashes and fatalities on North Carolina roads. The GADA team at ITRE provides technical and program support for the Commercial Vehicle Enforcement (CVE) section of the NCSHP, as well as North Carolina's NC Vision Zero (NCVZ) program.

COMMERCIAL VEHICLE ENFORCEMENT RESOURCE LAB (COVERLAB)

COVERLAB staff continue to support the Commercial Vehicle Enforcement (CVE) section of the NC State Highway Patrol (NCSHP) by providing technical and program assistance for the Federal Motor Carrier Safety Administration's (FMCSA) Motor Carrier Safety Assistance Program (MCSAP) and FHWA's Truck Size and Weight program. COVERLAB staff provide decision management services to help improve commercial vehicle enforcement effectiveness. This working partnership provides CVE with online performance measurement analytics, data-informed enforcement planning, on-demand requests, personnel allocation model development, performance optimization, grant writing assistance, special operations field support, and field research services. Learn more at https://coverlab.org.

NC VISION ZERO

NC Vision Zero (https://ncvisionzero.org) is North Carolina's collaborative initiative to eliminate roadway deaths and injuries in North Carolina. The goal of the NC Vision Zero initiative is to unify all safety stakeholders to reduce traffic fatalities. ITRE works collaboratively with North Carolina's GHSP, the UNC Highway Safety Research Center (HSRC), and UNC's Injury Prevention Research Center (IPRC), to host and maintain the NC Vision Zero website and related tools. This provides access to program content data visualization tools that service both the general public as well as traffic safety partners.

Among the online tools developed and maintained by ITRE for this initiative are:

• NC Vision Zero Analytics: A suite of data visualization tools for helping traffic safety partners and the general public measure and understand traffic fatality trends, locations, contributing circumstances, demographics, and more. These data visualization tools include login-based performance measurement tools to assist the NCSHP, GHSP, and other traffic safety stakeholders across North Carolina in tracking crash reduction performance goals, visualizing data for in-depth analysis, and streamlining reporting requirements.

• NC Vision Zero Target Tracking Dashboard: A gated online data analytics system for safety stakeholders to track traffic safety goals and identify effective data-informed strategies for reducing traffic fatalities in North Carolina. The state's crash reduction goals are visually presented to (and co-tracked by) both the North Carolina State Highway Patrol and NC GHSP staff. Users can see how well they are performing with "views" specific to their geographic location. This provides a common "ground truth" and the capability to more effectively prioritize safety countermeasure activities for reducing traffic crashes and fatalities.

• NC Vision Zero Public Dashboards: A series of public-facing data analytics tools for helping the general public answer questions about crash data, identify problem areas by geographic area, and enable insights for understanding crash data trends.

ITRE staff also organize and host traffic safety training events in partnership with NC GHSP including an annual webinar series, the biennial NC Traffic Safety Conference (http://nctrafficsafetyconference.org), and other safety-focused workshops. In this FY ITRE hosted the NC Traffic Safety Conference in Raleigh and produced three webinars on various traffic safety topics. See Appendix E of this report for more details on the conference and webinars.

OPERATIONS RESEARCH AND EDUCATION LAB (OREd)

The Operations Research and Education Laboratory (OREd) continues to provide essential long range facility planning services to public school districts across the state. For instance, many of North Carolina's fastest growing school districts rely on OREd's analysis to help guide the selection of new school sites.

Efficient school siting reduces congestion and emissions, while increasing walkability and healthy lifestyles for students. Optimally positioning new schools ensures school facilities are well positioned to serve the needs of student populations for decades to come.

OREd's presence in North Carolina also positions ITRE well to respond to new school planning challenges and opportunities in the state. Also this FY, in a first for North Carolina, a major automotive manufacturer announced plans to build a substantial presence in the state. VinFast, a Vietnamese electric vehicle manufacturer plans to bring a major factory and over 7,000 jobs to Chatham County. A perennial client of OREd, Chatham County Schools, is still a primarily rural district and quantifying the impact to schools of such a major human and capital investment became a major opportunity for OREd. Through developing new models and analytical approaches, OREd quantitatively assessed the major school facility needs Chatham County Schools will have well into the foreseeable future.

Another significant project of note this fiscal year was the development of an interactive web mapping application which visualizes current and proposed school attendance zones. Users can zoom in and out, find their address, and easily compare assignment plans with other user-friendly functions built in. The first deployment of the application was for Durham Public Schools (DPS) which has proposed a significant redistricting plan at the elementary school level for an upcoming school year. The web map has become the critical tool helping inform DPS parents, students, and other community members about the potential school assignment changes. To date, the web application has over 25,000 views.

PUPIL TRANSPORTATION INFORMATION MANAGEMENT

The Pupil Transportation Information Management System (TIMS) at ITRE is an ongoing statewide project focused on maintaining and improving upon efficiency in school bus transportation at the district level. In FY 2023, TIMS staff provided technical assistance and training for operating computer-assisted school bus routing and scheduling software to school district personnel. This routing system allows school districts to create effective bus routes and maintain student, transportation, and street network data at the local level, providing district personnel with access to the most accurate and current information related to pupil transportation. To support these efforts, TIMS staff provide dozens of training classes and events per year as well as daily software and technical support to TIMS routing managers from school districts across the state. See Appendix E of this report for a listing of TIMS training classes delivered in FY 2023.

As part of the long-term relationship with the North Carolina Department of Public Instruction (NCDPI), TIMS project leaders at ITRE were identified as key stakeholders and included as primary members of the evaluation team related to NC House Bill 256, "THE SMART SCHOOL BUS SAFETY PILOT PROGRAM" (https://www.ncleg.gov/Sessions/2021/Bills/House/PDF/H256v1.pdf). TIMS Project Leaders continue to be involved in the evaluation of alternative school bus routing software from developers not currently approved for use in North Carolina.

HIGHWAY SYSTEMS TRAINING

In addition to highway systems research described earlier in this report, ITRE delivers a wide range of training workshops, courses, webinars, and professional development events in the areas of highway engineering, preconstruction planning, operations, and safety. Training is designed for engineers, technicians, maintenance and operations staff, and related professionals across the United States working in transportation and traffic safety. Some activities are tailored specifically to NCDOT personnel. ITRE's Maintenance Operations and Safety Program is an established leader throughout the southeastern U.S. for training transportation department employees on work zone safety, flagging operations, and related safety

and maintenance topics. 43 courses and activities were offered this year with over 4100 participants. See Appendix E of this report for a listing of the Highway Systems training activities in this FY.

NORTH CAROLINA LOCAL TECHNICAL ASSISTANCE PROGRAM (NC LTAP)

The North Carolina Local Technical Assistance Program is one of the 51 Local Technical Assistance Program (LTAP) centers nationwide. After LTAP was established by the U.S. DOT Federal Highway Administration in 1982, North Carolina's center at ITRE was one of the first organized in 1986. LTAP's mission is to help local agencies tap into new technology, information, and training so they can operate more efficiently and safely. LTAP centers provide access to training and information that may not have otherwise been accessible. Centers provide local road departments with workforce development services, resources to enhance safety and security, solutions to environmental, congestion, capacity and other issues, technical publications, and training videos and materials. In this FY, NC LTAP trained nearly 3800 practitioners statewide through 44 course offerings and 170 total class sessions. See Appendix E of this report for a listing of NC LTAP training activities in this FY.

NORTH CAROLINA AIRPORT TECHNICAL ASSISTANCE PROGRAM (NC AIRTAP)

NC AirTAP is a joint effort of ITRE and the NCDOT Division of Aviation, with support from the NC Airports Association, to provide educational offerings, information resources, and related assistance to the state's public- and private-sector airport professionals. NC AirTAP helps North Carolina airports improve the safety, quality, and efficiency of their operations and increase the use of new aviation materials and technology. The program also helps airport staff build a community network for exchanging best practices.

In this FY, NC AirTAP continued offering the NC Airport Leadership and Management Program (ALMP), a 12-part training course series developed for the state's airport officials, managers, and operations staff. Ten ALMP courses are designed as in-person instruction and offered approximately every other month. Six courses in the series — four in-person and two online/on-demand — were offered during this FY:
• Course 2: Airport Administration and Governance
• Course 5: Airport Safety and Security
• Course 6: Airport Planning and Environmental
• Course 7: The Fixed Based Operator (On-Demand)
• Course 8: Airport Public Relations and Communications (On-Demand)
• Course 9: Airport Design and Construction

Participants who complete nine or more ALMP courses earn the "North Carolina Airport Professional" (NCAP) certification. Four participants were awarded NCAP certificates this FY. Nearly 300 professionals have participated in ALMP courses to date and 45 have earned their NCAP credential.

NC AirTAP is developing an Airport Board Member Training Course. This new online and on-demand course will help new airport board members understand how they can best support their airport and staff.

NC AirTAP staff in this FY also supported the NCDOT Division of Aviation with these activities:
• Hosting quarterly statewide virtual meetings of the NC Airport Community, including sponsors and administrators of the state's 72 public airports and their engineering/planning consultants.
• Technical assistance at the annual NC Airports Association conference.

<u>Budget</u>
Is the Center/Institute budget sufficient to continue operations for the next five years?

Yes

Personnel List

Number of faculty members currently affiliated with the Center/Institute

42

Last name	**First name**
Austin	Robert
Bardaka	Eleni
Barlaz	Morton
Boone	Kofi
Brill	Downey
Cahoon	Charles
Chen	Karen
Coupet	Jason
Dubljevic	Veljko
Dutta	Rudra
Fathi	Yahya
Feng	Jing
Floyd	Brian
Frey	Chris
Gabr	Mo
Grant	Eddie
Griffith	Emily
Guvenc	Ismail
Hajbabaie	Ali
Hajibabai	Leila
Han	Kevin
Handfield	Rob
Hess	George
Hipp	Aaron
Hollar	Seth
Jaselskis	Edward
Jing	Yun
Lin	Shih-Chun
List	George
Liu	Min
Lobaton	Edgar

McCoy	Emily
McLaughlin	Richard
Mitasova	Helena
Nau	Jim
Pasalar	Celen
Rasdorf	William
Roberson	Gary
Rouphail	Nagui
Sichitiu	Mihai
Vouk	Mladen
Welton	Steve

Number of staff members currently affiliated with the Center/Institute
50
Number of full time equivalent Center/Institute personnel supported by State-appropriated funds as of June 30
4.49

<u>Publications</u>
Total number of annual Publications
12
Particularly noteworthy publications:

- *Modeling Framework for Predicting Lane Change Intensity at Freeway Weaving Segments*
  Ahmed, I.; Karr, A.; Rouphail, N.M.; and Chase, R.T.
  Transportation Research Record
  This NCDOT-funded study is one of the first efforts of modeling lane change rate at freeway weaving segments using vehicle trajectory-level data from a variety of geometric and traffic operational conditions. The proposed models provide insights on what factors influence lane change rate at weaves, which directly influences how weaving segments should be designed and assessed. The study also demonstrates a successful application of automated video data processing and machine learning algorithm.
- *North Carolina: The State of Aviation — What Aviation Means To Our Economy*
  Findley, D., Hassett, R., and Bert, S.
  NCDOT Division of Aviation (publisher)
  North Carolina's public airports annually contribute $72 billion to the state's economy, supporting 330,000 jobs that generate $23 billion in personal income and returning $3.7 billion in state and local tax revenue. This report highlights the significant economic impacts generated by the state's public airports and the many assets that support a vibrant and competitive aviation and aerospace sector. View the report at: https://www.ncdot.gov/divisions/aviation/pages/state-of-aviation.aspx
- *The 2022 North Carolina Observational Survey of Seat Belt Use / North Carolina County Seat Belt Use Rates*
  Kearns, B. and Findley, D.
  North Carolina Governor's Highway Safety Program (publisher)
  This report provides the latest annual statewide seat belt use survey results to determine North Carolina's official seat belt use rate. The survey data are submitted to the National Highway Traffic Safety Administration. ITRE also completed data collection on county-level seat belt use rates for

all 100 NC counties. Statewide and county-level rates are also shared through an online dashboard at: ncvisionzero.org/visualizations/seat-belt-usage-dashboard

Activities Supported by the Center/Institute

- **NOTE**
  In this FY, ITRE conducted 129 training courses and related educational activities. See Appendix E of this report for a listing and descriptions of the activities.

Educational Impact

NC State Undergraduate students:	40
NC State Master's students:	17
NC State PhD students:	6
NC State students (unknown status):	3
Non-NC State Undergraduate students:	17
Non-NC State Master's students:	9
Non-NC State PhD students:	0
Non-NC State student (unknown status):	1
Non-NC State K-12 students:	0
Other (Postdocs, industry professionals, etc.):	10438

Does this Center/Institute house a recognized academic program (including official certificate programs)?
No

APPENDIX A – List of Graduate Students

Last name	First name	Graduated?	Continuing?
Bollineni	Sai	Yes	No
Daniels	Claire	No	Yes
Das	Tanmay	No	Yes
Degbotse	Nadia	No	Yes
Desai	Vishrut	No	Yes
Freeland	Andrew	Yes	No
Ghimire	Subid	No	Yes
Gupta	Muskan	Yes	No
Hassett	Ryan	No	Yes
Hecht-Nielsen	Clancy	Yes	No
Kanale	Ajit	Yes	No
Luftman	Natalie	Yes	No
Niroumand	Ramin	No	Yes

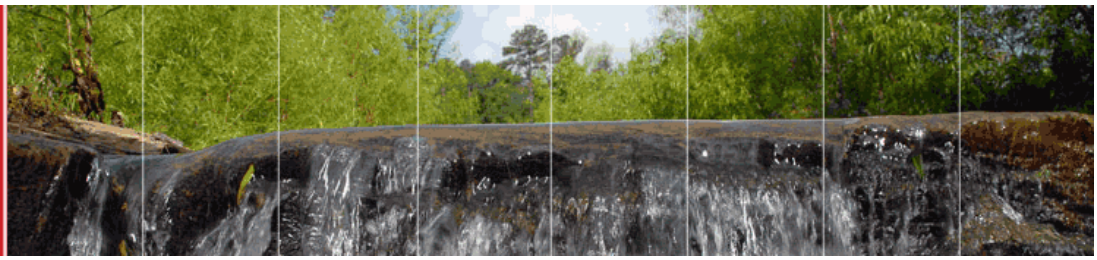
Nyayapathi	Ananya	Yes	No
Patel	Rashmita	No	Yes
Ram Prakash	Arvind	Yes	No
Ravichander	Nandhini Ravi	Yes	No
Sailla	Preethi	No	Yes
Shah	Jay Rajiv	Yes	No
Sharma	Soumya	No	Yes
Vidhan	Kunwar	Yes	No
Wang MD	Juan	No	Yes
Watt	Macy	No	Yes

APPENDIX B – Financial Report

Funds Received and Expended	Academic Affairs	Agricultural Research	Agency Funds	Auxiliary Sales and Services	Contracts and Grants	Endowments	F and A Receipts	Foundations	Gift and Loan Funds	FYTD Activity: Total
Total Revenues	$0	$0	($6,978)	($1,131,303)	($8,469,398)	$0	$0	($17,849)	$0	($9,625,528)
Personnel Expenditures	$575,510	$0	$0	$410,645	$4,881,542	$0	$178,938	$0	$0	$6,046,635
Operating Expenditures	$0	$0	$800	$523,692	$1,161,619	$0	$99,317	$0	$0	$1,785,429
Student Aid	$0	$0	$0	$0	$24,413	$0	$845	$0	$0	$25,258
Stipend Student	$0	$0	$0	$0	$17,046	$0	$0	$0	$0	$17,046
Stipend Non-Student	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subcontracts	$0	$0	$0	$0	$782,984	$0	$0	$0	$0	$782,984
Transfers & Reserves	$0	$0	$0	$0	$1,601,794	$0	$0	$0	$0	$1,601,794
Total FYTD Expenditures	$575,510	$0	$800	$934,337	$8,469,398	$0	$279,100	$0	$0	$10,259,146

Project IDs: 566896, 567573, 377807, 534044, 567702, 567816, 500484, 568293, 582779, 533003, 376291, 583791, 562772, 573980, 568125, 377813, 567413, 500224, 531633, 531881, 562537, 583662, 531873, 534216, 584007, 375713, 376375, 371587, 534023, 573769, 534090, 566109, 377805, 583691, 562850, 567406, 371569, 582455, 583736, 567834, 573236, 500515, 991625, 534060, 568362, 582372, 583802, 532096, 573650, 582583, 991627, 532056, 500658, 566772, 500289, 573432, 583323, 583684, 376165, 500288, 566793, 265261, 573569, 583743, 573613, 531777, 583566, 500036, 566994, 531642, 566600, 500113, 532656, 567743, 377802, 531893, 573927, 531740, 567734, 375786, 377811, 500290, 531788, 573587, 583127, 562295, 531770, 566649, 583060, 376763, 215261, 532012, 566962, 567343, 568222, 562418, 572297, 583386, 566788, 567404, 567001, 568306, 583951, 534031, 562104, 572309, 375903, 377808, 500189, 531692, 531774, 562405, 569141, 582909, 376496, 531901, 562644, 566709, 567582, 573586, 207261, 531990, 567108, 568128, 532321, 567838, 531526, 371546, 562262, 582937, 568176, 569192, 573316, 567490, 568292, 583915, 566651, 376284, 572310, 566650, 531764, 562461, 566997, 687172, 566734, 377803, 568384, 583682, 567342, 257261, 500244, 562696, 584052, 573126, 569240, 583598, 531763, 534020, 581536, 583787, 573684, 563057, 583981, 377804, 568429, 377801, 567815, 572409, 562409, 567370, 567501, 532422, 566634, 567949, 571603, 573778, 534108, 583903, 562692, 568308, 573550, 573585, 566765, 500470, 532158, 581825, 583963, 531838, 531272, 562914, 583970, 531540, 531945, 568305, 532187, 991626, 532099, 568160, 573237, 562794, 583320, 567861, 762215, 572937, 375711, 566920, 533763, 567437, 572630, 583746, 557533, 573347, 687172-F, 376337, 583276, 761173, 573120, 375712, 583944, 531318, 533684, 375898, 531756, 534052, 534037, 562090, 562529, 567839, 568300, 533739, 567925, 582936, 533921, 551285, 567581, 534041, 567385, 582739

RESEARCH ADMINISTRATION DATA + REPORTS (RADAR)



Print

NORTH CAROLINA STATE UNIVERSITY

Awards Received for the Period July 01, 2022 to June 30, 2023 by College and Department

center is Institute for Transportation Research & Education; no-cost extensions and deobligations suppressed; deobligations suppressed; pre-awards suppressed; internal projects suppressed

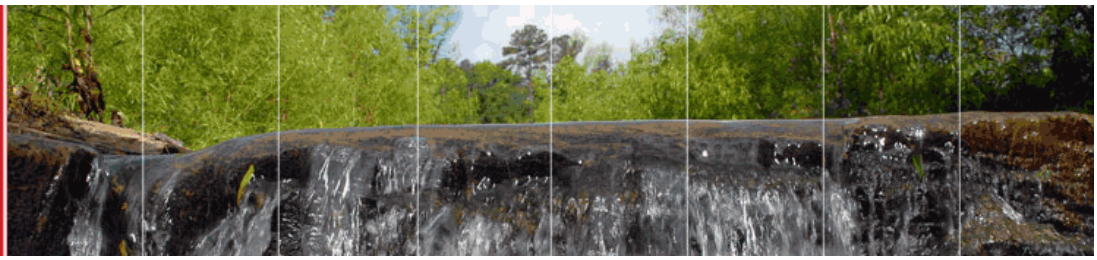
Project ID	Investigator(s)	SP	PI Department	Direct Sponsor	Amount	Type	Category	Title
RESEARCH, INNOVATION & ECONOMIC DEVELOPMENT								
2022-2608	Anderson, Tracy		Institute for Transportation Research & Education	NC Governors Highway Safety Program (NC Department of Transportation)	$295,844	New	Research	Governor's Highway Safety Program Conference & Event Support 2022/2023
2021-1851	Cunningham, Christopher		Institute for Transportation Research & Education	NC Department of Transportation	$100,000	Supplement	Research	Technical Assistance program 2021-2022
2022-1998	Cunningham, Christopher		Institute for Transportation Research & Education	UNC - UNC Chapel Hill (National Academy of Sciences)	$20,107	New	Research	NCHRP Project 17-108: Developing Crash Modification Factors for Alternative Intersections
2022-2435	Cunningham, Christopher		Institute for Transportation Research & Education	NC Department of Transportation	$103,551	New	Research	NCDOT Research and Innovation Summit
2023-0946	Cunningham, Christopher		Institute for Transportation Research & Education	NC Department of Transportation	$40,600	New	Research	TT NCDOT RP 2019-08_Rail Network Trespass Statewide Severity Assessment_Phase II
2023-2859	Cunningham, Christopher		Institute for Transportation Research & Education	NC Department of Transportation	$499,179	New	Public Service/Extension	Fundamental Engineering Principles FY24
2023-2965	Cunningham, Christopher Yang, Guangchuan		Institute for Transportation Research & Education	NC Department of Transportation	$232,648	New	Research	Impact of All-Way Stop Control Intersections Along Rural and Suburban Corridoors
2022-0968	Davis, Joy		Institute for Transportation Research & Education	toXcel (National Highway Traffic Safety Administration (NHTSA))	$60,000	New	Research	Law Enforcement Engagement and Toolkit to Prevent Illegal Passing of School Buses
2023-2585	Davis, Joy		Institute for Transportation Research & Education	NC Department of Transportation	$199,690	New	Research	Measuring the Economic, Mobility, Equity, and Health Benefits of Multimodal Projects
2023-2669	Davis, Joy		Institute for Transportation Research & Education	NC Department of Transportation	$54,353	New	Research	Implementation of Socioeconomic Geospatial Analysis for Strategic Prioritization
2023-2711	Davis, Joy Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$276,780	New	Public Service/Extension	NCDOT Customer Service Surveys 2022-24
2022-1850	Ferrara, Gregory Findley, Daniel		Institute for Transportation Research & Education	NC Governors Highway Safety Program (NC Department of Transportation)	$470,600	New	Research	NC Vision Zero Technical and Program Support 2022-2023
2023-0676	Ferrara, Gregory Lippert, Colleen		Institute for Transportation Research & Education	NC Department of Public Safety (NC State Highway Patrol (NCSHP))	$279,300	New	Research	MCSAP FY2023 Technical Support
2023-3229	Ferrara, Gregory		Institute for Transportation Research & Education	NC Department of Public Safety (NC State Highway Patrol (NCSHP))	$279,077	New	Research	ITRE FY2023-2024 Technical Support of NCSHP Commercial Vehicle Truck Size and Weight Enforcement Program

2022-1517	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation (Federal Highway Administration (FHWA))	$150,000	New	Public Service/Extension	T2-125631 Local Technical Assistance Program (LTAP) 2022
2022-1759	Findley, Daniel Martin, James		Institute for Transportation Research & Education	NC Department of Transportation	$193,862	Supplement	Research	NC Airport Technical Assistance Program 2022
2022-1788	Findley, Daniel		Institute for Transportation Research & Education	Federal Aviation Administration	$200,000	New	Research	A62-Disaster Preparedness and Emergency Response Phase III
2022-1789	Findley, Daniel		Institute for Transportation Research & Education	Federal Aviation Administration	$125,000	New	Research	STEM Outreach- A61
2022-2254	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$178,028	New	Research	Economic Contribution of North Carolina's Supply Chain
2022-2284	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$215,750	New	Research	Multimodal Trip Reductions Rates in Local Municipalities
2022-2692	Findley, Daniel		Institute for Transportation Research & Education	Kimley Horn and Associates, Inc. (National Academy of Sciences)	$18,000	New	Research	Communication, Implementation, and Outcomes of Airport Economic Impact Studies
2022-3019	Findley, Daniel		Institute for Transportation Research & Education	NC Governors Highway Safety Program (NC Department of Transportation)	$259,166	New	Research	2023 North Carolina Observational Survey of Seat Belt Use
2023-0287	Findley, Daniel Handfield, Robert	Joint Coll.	Institute for Transportation Research & Education	NC Department of Transportation	$250,000	New	Research	Port Operations Digital Transformation
2023-2772	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$285,340	New	Public Service/Extension	Professional Enhancement Program FY 2024
2023-3044	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$452,638	New	Research	2025 Airport Economic Contribution Study and Technical Services to the Division of Aviation
2023-3333	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$658,107	New	Research	2023-2024 Maintenance Technical Assistance Program
2023-1381	Freedman, Jonah Wright, John		Institute for Transportation Research & Education	NC Department of Transportation	$81,997	New	Research	TT 2014-44 - Non-Motorized Count Assurance Tool
2023-1313	Hart, Kevin		Institute for Transportation Research & Education	NC Department of Public Instruction	$293,552	New	Public Service/Extension	Technical Assistance to North Carolina Dept. of Public Instruction in the Implementation of the Transportation Information Management System (TIMS)
2022-2364	Huntsinger, Leta		Institute for Transportation Research & Education	NC Capital Area Metropolitan Planning Organization (CAMPO)	$152,566	New	Research	CAMPO: Triangle Regional Model Service Bureau 22-23 (Task Order 003)
2022-2365	Huntsinger, Leta		Institute for Transportation Research & Education	Go Triangle (formerly Triangle Transit Authority)	$214,397	New	Research	GoTriangle: Triangle Regional Model Service Bureau 22-23 (Task Order 03)
2022-2374	Huntsinger, Leta		Institute for Transportation Research & Education	Durham, NC	$152,566	New	Research	DCHC: Triangle Regional Model Service Bureau
2022-2864	Huntsinger, Leta Boone, Kofi	Joint Coll.	Institute for Transportation Research & Education	NC Department of Transportation	$284,376	New	Research	Assessing Environmental Justice & Historical Transportation Impacts in North Carolina
2023-1145	Huntsinger, Leta		Institute for Transportation Research & Education	Kittelson & Associates, Inc. (NC Department of Transportation)	$6,484	New	Research	Transportation Planning Division Strategic Plan

2023-3101	Huntsinger, Leta		Institute for Transportation Research & Education	Go Triangle (formerly Triangle Transit Authority) (Federal Transit Administration)	$243,097	New	Research	Triangle Regional Model Service Bureau 23-24
2022-2097	Monast, Karl		Institute for Transportation Research & Education	NC Department of Transportation	$632,731	New	Research	Transit Technical Assistance, Planning, and Technology Support
2022-2701	Pasalar, Celen Cunningham, Christopher		Institute for Transportation Research & Education	National Science Foundation (NSF)	$49,989	New	Public Service/Extension	CIVIC-PG Track B: Catalyzing Walkable, Sustainable, and Equitable Urban Development using Innovative Transportation Strategies
2018-3380	Samandar, Mohamad Chase Jr, Richard		Institute for Transportation Research & Education	University of Florida (US Dept. of Transportation (DOT))	$31,374	Supplement	Research	STRIDE: Data Fusion for Signalized Arterial Performance Measurement (Project N2)
2023-2959	Samandar, Mohamad Ahmed, Ishtiak		Institute for Transportation Research & Education	NC Department of Transportation	$283,456	New	Research	Managed Freeway Before Study
2023-0077	Scott, Jeremy		Institute for Transportation Research & Education	NC Department of Transportation	$72,411	New	Research	Training and Transportation Demand Management
2023-0158	Vaughan, Christopher		Institute for Transportation Research & Education	UNC - UNC Charlotte (NC Department of Transportation)	$90,271	New	Research	Evaluating Primary and Secondary Roadway Pavement Conditions using Deep Learning
2023-1588	Wright, John		Institute for Transportation Research & Education	NC Capital Area Metropolitan Planning Organization (CAMPO)	$15,000	New	Public Service/Extension	Maintenance of NMVDP Counter Inventory
Institute for Transportation Research & Education (062001):					$8,501,887	41		
RESEARCH, INNOVATION & ECONOMIC DEVELOPMENT Total:					$8,501,887	41		
Grand Total:					$8,501,887	41	41 projects	

Return to Report Menu

RESEARCH ADMINISTRATION DATA + REPORTS (RADAR)



Print

NORTH CAROLINA STATE UNIVERSITY

Proposals Submitted for the Period July 01, 2022 to June 30, 2023 by College and Department

center is Institute for Transportation Research & Education; revised proposals suppressed; pre-proposals suppressed; internal projects suppressed

Project ID	Investigator(s)	SP	PI Department	Direct Sponsor	Amount	Type	Category	Title
RESEARCH, INNOVATION & ECONOMIC DEVELOPMENT								
2023-2963	Ahmed, Ishtiak Samandar, Mohamad		Institute for Transportation Research & Education	NC Department of Transportation	$115,853	New	Research	Effectiveness of NCDOT's Dynamic Zipper Merge System
2023-3361	Anderson, Tracy		Institute for Transportation Research & Education	NC Governors Highway Safety Program (NC Department of Transportation)	$384,015	New	Research	Governor's Highway Safety Program Conference & Event Support 2023/2024
2021-1851	Cunningham, Christopher		Institute for Transportation Research & Education	NC Department of Transportation	$100,000	Supplement	Research	Technical Assistance program 2021-2022
2023-0427	Cunningham, Christopher		Institute for Transportation Research & Education	toXcel (National Highway Traffic Safety Administration (NHTSA))	$377,737	New	Research	Examining the Effectiveness of Lateral Control Warnings (ADAS) for Improving Driver Response
2023-0946	Cunningham, Christopher		Institute for Transportation Research & Education	NC Department of Transportation	$40,600	New	Research	TT NCDOT RP 2019-08_Rail Network Trespass Statewide Severity Assessment_Phase II
2023-2570	Cunningham, Christopher		Institute for Transportation Research & Education	Fujifilm Dimatix	$12,000	New	Research	Task: Transportation Alternatives for Fuji Site in Holly Springs NC
2023-2859	Cunningham, Christopher		Institute for Transportation Research & Education	NC Department of Transportation	$499,179	New	Public Service/Extension	Fundamental Engineering Principles FY24
2023-2965	Cunningham, Christopher Yang, Guangchuan		Institute for Transportation Research & Education	NC Department of Transportation	$232,648	New	Research	Impact of All-Way Stop Control Intersections Along Rural and Suburban Corridoors
2023-3197	Cunningham, Christopher		Institute for Transportation Research & Education	Georgia Department of Transportation	$0	Data Use Agreement	Research	Data Use Agreement with Georgia Electronic Accident Reporting System (GEARS) - George Department of Transportation
2023-2585	Davis, Joy		Institute for Transportation Research & Education	NC Department of Transportation	$203,437	New	Research	Measuring the Economic, Mobility, Equity, and Health Benefits of Multimodal Projects
2023-2669	Davis, Joy		Institute for Transportation Research & Education	NC Department of Transportation	$54,609	New	Research	Implementation of Socioeconomic Geospatial Analysis for Strategic Prioritization
2023-2711	Davis, Joy Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$276,780	New	Public Service/Extension	NCDOT Customer Service Surveys 2022-24
2023-0676	Ferrara, Gregory Lippert, Colleen		Institute for Transportation Research & Education	NC Department of Public Safety (NC State Highway Patrol (NCSHP))	$279,299	New	Research	MCSAP FY2023 Technical Support
2023-3229	Ferrara, Gregory		Institute for Transportation Research & Education	NC Department of Public Safety (NC State Highway Patrol (NCSHP))	$279,077	New	Research	ITRE FY2023-2024 Technical Support of NCSHP Commercial Vehicle Truck Size and Weight Enforcement Program

2023-3256	Ferrara, Gregory Findley, Daniel		Institute for Transportation Research & Education	NC Governors Highway Safety Program (NC Department of Transportation)	$490,129	New	Research	NC Vision Zero Technical and Program Support 2023-2024
2022-1759	Findley, Daniel Martin, James		Institute for Transportation Research & Education	NC Department of Transportation	$193,862	Supplement	Research	NC Airport Technical Assistance Program 2022
2023-0223	Findley, Daniel		Institute for Transportation Research & Education	US Army (NC Department of Transportation)	$0	New	Research	CRADA - USMA: Prioritizing NCDOT Bridge Preservation Projects Using Bridge Element Inspection Data
2023-0287	Findley, Daniel Handfield, Robert	Joint Coll.	Institute for Transportation Research & Education	NC Department of Transportation	$250,000	New	Research	Port Operations Digital Transformation
2023-2574	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation (Federal Highway Administration (FHWA))	$210,000	New	Public Service/Extension	T2-87658 Local Technical Assistance Program (LTAP) 2023
2023-2602	Findley, Daniel		Institute for Transportation Research & Education	Woolpert Inc	$60,000	New	Research	ACRP 10-35: Readiness and Feasibility of Automatic Dependent Surveillance-Broadcast (ADS-B) Data for Airport Use Cases
2023-2707	Findley, Daniel		Institute for Transportation Research & Education	Kansas State University (Kansas Department of Transportation)	$150,000	New	Public Service/Extension	Kansas Department of Transportation (KDOT) Performance Management Dashboards
2023-2772	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$285,340	New	Public Service/Extension	Professional Enhancement Program FY 2024
2023-3044	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$452,638	New	Research	2025 Airport Economic Contribution Study and Technical Services to the Division of Aviation
2023-3069	Findley, Daniel		Institute for Transportation Research & Education	Alliance for System Safety of UAS through Research Excellence (ASSURE) (Federal Aviation Administration)	$125,000	New	Research	A73 - Conduct Science Technology Engineering and Math (STEM) Outreach to Minority K-12 Students Using Unmanned Aircraft Systems (UAS) as a Learning Platform
2023-3329	Findley, Daniel		Institute for Transportation Research & Education	NC Governors Highway Safety Program (NC Department of Transportation)	$257,617	New	Research	2024 North Carolina Observational Survey of Seat Belt Use
2023-3333	Findley, Daniel		Institute for Transportation Research & Education	NC Department of Transportation	$658,107	New	Research	2023-2024 Maintenance Technical Assistance Program
2023-1381	Freedman, Jonah Wright, John		Institute for Transportation Research & Education	NC Department of Transportation	$81,997	New	Research	TT 2014-44 - Non-Motorized Count Assurance Tool
2023-0503	Hajbabaie, Ali List, George Williams, Billy Hajibabai Dizaji, Leila	Joint Coll.	Institute for Transportation Research & Education	University of Maryland, College Park (US Dept. of Transportation (DOT))	$300,000	New	Research	University of Maryland - National University Transportation Center
2023-1313	Hart, Kevin		Institute for Transportation Research & Education	NC Department of Public Instruction	$293,552	New	Public Service/Extension	Technical Assistance to North Carolina Dept. of Public Instruction in the Implementation of the Transportation Information Management System (TIMS)
2023-1145	Huntsinger, Leta		Institute for Transportation Research & Education	Kittelson & Associates, Inc. (NC Department of Transportation)	$6,842	New	Research	Transportation Planning Division Strategic Plan
2023-3101	Huntsinger, Leta		Institute for Transportation Research & Education	Go Triangle (formerly Triangle Transit Authority) (Federal Transit Administration)	$243,097	New	Research	Triangle Regional Model Service Bureau 23-24
2023-3166	Huntsinger, Leta		Institute for Transportation Research & Education	Triangle J Council of Governments	$179,345	New	Research	DCHC: Triangle Regional Model Service Bureau
2023-3285	Huntsinger, Leta		Institute for Transportation	NC Capital Area Metropolitan Planning	$179,345	New	Research	CAMPO: Triangle Regional Model Service Bureau

			Research & Education	Organization (CAMPO)				
2023-3357	Huntsinger, Leta		Institute for Transportation Research & Education	NC Department of Transportation	$179,345	New	Research	NCDOT: Triangle Regional Model Services Bureau
2023-3367	Huntsinger, Leta		Institute for Transportation Research & Education	Durham, NC	$79,065	New	Research	DCHC TASK ORDER #5 RECURRENT TRIANGLE TRAVEL SURVEY: FY 2024 – 2025
2023-0325	List, George		Institute for Transportation Research & Education	Arizona State University	$497,820	New	Research	RESET: Center for Resilient, Equitable, Sustainable, and Efficient Transit
2023-2768	List, George Williams, Billy Hajbabaie, Ali Hajibabai Dizaji, Leila Bardaka, Eleni Singh, Munindar Bottomley, Laura	Joint Coll.	Institute for Transportation Research & Education	US Dept. of Transportation (DOT)	$4,000,000	New	Research	Center for Mobility Innovation through Digital and Automated Systems (MIDAS)
2023-2520	Pasalar, Celen Cunningham, Christopher		Institute for Transportation Research & Education	National Science Foundation (NSF)	$999,449	New	Public Service/Extension	Catalyzing Walkable, Sustainable and Equitable Urban Development Using Innovative Transportation Strategies
2018-3380	Samandar, Mohamad Chase Jr, Richard		Institute for Transportation Research & Education	University of Florida (US Dept. of Transportation (DOT))	$31,374	Supplement	Research	STRIDE: Data Fusion for Signalized Arterial Performance Measurement (Project N2)
2020-0421	Samandar, Mohamad Lin, Shih-Chun Chase Jr, Richard		Institute for Transportation Research & Education	North Carolina A&T State University (NC Department of Transportation)	$318,717	Supplement	Research	Center of Excellence on Connected Autonomous Vehicles (NC-CAV)
2023-2959	Samandar, Mohamad Ahmed, Ishtiak		Institute for Transportation Research & Education	NC Department of Transportation	$238,456	New	Research	Managed Freeway Before Study
2023-0077	Scott, Jeremy		Institute for Transportation Research & Education	NC Department of Transportation	$72,411	New	Research	Training and Transportation Demand Management
2023-0158	Vaughan, Christopher		Institute for Transportation Research & Education	UNC - UNC Charlotte (NC Department of Transportation)	$115,144	New	Research	Evaluating Primary and Secondary Roadway Pavement Conditions using Deep Learning
2023-1588	Wright, John		Institute for Transportation Research & Education	NC Capital Area Metropolitan Planning Organization (CAMPO)	$15,000	New	Public Service/Extension	Maintenance of NMVDP Counter Inventory
2023-2317	Wright, John		Institute for Transportation Research & Education	UNC - UNC Chapel Hill (NC Department of Transportation)	$15,000	New	Research	NCDOT Non-motorized Volume Data Program and Safety Program Support
Institute for Transportation Research & Education (062001):					$13,833,886	45		
RESEARCH, INNOVATION & ECONOMIC DEVELOPMENT Total:					$13,833,886	45		
Grand Total:					$13,833,886	45	45 projects	

Return to Report Menu

Title of Journal Paper, Report or other Publication	Author(s)	Name of Journal, Publisher or Client	Date Published
Economic Contribution of Rail in North Carolina	Brock, T.; Hassett, R.; Lippert, C.; Erian, N.; Daniels, C.; List, G.; Bert, S.; and Findley, D.J.	Rail Division, North Carolina Department of Transportation	In Press
Enhancing the Strategic Prioritization Process with Socioeconomic Geospatial Analysis	Davis, J.C.; Coupet, J.A.; Nicholas, D.C.; Wright, W.; Murphy, N.; and Monast, K.	North Carolina Department of Transportation	2022
Identifying and Prioritizing Bridges Critical to Commerce: A Case Study of Weight-Restricted Bridges in North Carolina	Nicholas, D.; Dudley, T.; Head, W.; Bert, S.; Norboge, N.; List, G.; and Findley, D.J.	International Journal of Transportation Science and Technology	Sep 2022
Modeling Framework for Predicting Lane Change Intensity at Freeway Weaving Segments	Ahmed, I; Karr, A; Rouphail, N; and Chase, R.T.	Transportation Research Record	Apr 2023
NCDOT Statewide Customer Service Survey 2020-21	McCaleb, E.; Davis, J.C.; and Findley, D.J.	North Carolina Department of Transportation	Aug 2022
North Carolina: The State of Aviation — What Aviation Means to Our Economy	Findley, D.J.; Hassett, R.; and Bert, S.	Division of Aviation, North Carolina Department of Transportation	Jan 2023
Public Microtransit Pilots in the State of North Carolina: Operational Characteristics, Costs, and Lessons Learned	Bardaka, E; Monast, K.; Ghimire, S.; Scott, J.; Wang, J.; and Wright, J.	North Carolina Department of Transportation	Jan 2023
Public Perceptions of Transportation Fees and Electric Vehicles in North Carolina	McCaleb, E.; Davis, J.C.; Findley, D.J.; and Cobb, M.	North Carolina Department of Transportation	2022
Quadrant Roadway Intersections: Tradeoffs Between Control Delay Savings and Extra Travel Time	Yang, G.; Cunningham, C.; and Brown, M.	Transportation Research Record	In Press
The 2022 North Carolina Observational Survey of Seat Belt Use / North Carolina County Seat Belt Use Rates	Kearns, B. and Findley, D.J.	North Carolina Governor's Highway Safety Program	Sep 2022
Threats to Public Transportation Performance Measurement: Specific Examples of Performance Measurement Shortcomings	Monast, K.	University of North Carolina at Chapel Hill	2022
Waiting Time Estimation at Ferry Terminals Based on License Plate Recognition	Yang, G.; Coble, D.; Vaughan, C.; Peele, C.; Morsali, A.; List, G.; and Findley, D.J.	Journal of Transportation Engineering, Part A: Systems	Sep 2022

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
AVIATION (NC AIRTAP; NGAT; UAS)					
ALMP Course 2: Airport Administration and Governance	This one-day, in-person training course focuses on different ways airports can be organized and governed. Participants will also learn how their local airport fits into the national and state airport systems, and understand the many responsibilities of operating an airport.	Classroom	1	6.00	46
ALMP Course 5: Airport Safety and Security	This one-day course explores how airport managers can counter physical and cyber threats to their airport and potential liability.	Classroom	1	6.00	47
ALMP Course 6: Airport Planning and Environmental	This one-day course informs participants about how proper planning can improve airport operations and prepare the airport for the future.	Classroom	1	6.00	44
ALMP Course 7: The Fixed Based Operator (On-Demand)	This course examines the role of an FBO, its services and management options, and how to create a good customer service climate at the airport.	Online	1	6.00	28
ALMP Course 8: Airport Public Relations and Communications	This course discusses how to create and update communication, marketing and public relations plans for the airport.	Online	1	6.00	32
ALMP Course 9: Airport Design and Construction	This course examines the many aspects of airport design and construction including architecture, engineering, environmental issues and program management.	Classroom	1	6.00	44
UAS-TOP Level 1 Training	The Trusted Operator Program™ (TOP) provides a certification process for commercial uncrewed aircraft system (UAS) pilots beyond their FAA Part 107. TOP Level 1 operators are identified as skilled for flying missions that don’t utilize waivers and for aircraft weighing less than 5 pounds.	Online	1	12.00	23

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
UAS-TOP Level 2 Training	The Trusted Operator Program™ (TOP) provides a certification process for commercial uncrewed aircraft system (UAS) pilots beyond their FAA Part 107. TOP Level 2 operators are skilled for flying missions that utilize waivers, visual observers, or sensor operators and operate with elevated risk factors and complexity.	Online	1	16.00	5
HIGHWAY SYSTEMS (PE/FE; FEP; HEC; MAINTENANCE OPERATIONS & SAFETY; BIKE/PED; TRAFFIC SAFETY/VISION ZERO)					
2022 NC Traffic Safety Conference & Expo	The premiere biennial event for North Carolina professionals to learn about traffic safety education, programming, research, technologies and law enforcement from local and national experts. Participants include state and local law enforcement officers, child passenger safety technicians, judicial officials, transportation engineers and planners, public health professionals and university researchers.	Classroom	1	36.00	645
2023 NCDOT Preconstruction Workshop	This 1½ day workshop brings together those involved in preconstruction activities. The workshop provides opportunities to hear the direction that NCDOT is going in project delivery and have face-to-face discussions with our industry partners and NCDOT peers.	Classroom	1	12.00	358
2023 NCDOT Research & Innovation Summit	A two-day interactive, knowledge-sharing event for in-person and virtual participants, open to university researchers, students and transportation professionals working in public and private sectors. Topics include environmental, geotechnical, structures, traffic and safety, rail, connected and autonomous vehicles (CAV) and Unmanned Aerial Vehicles (UAVs).	Hybrid	1	10.00	316
2023 SPSF Outreach	For SPSF firms to introduce themselves and have multiple short conversations with the NCDOT business units and division staff to build awareness of the firm and its capabilities and opportunities.	Classroom	1	2.00	57

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Basic Work Zone Installer Safety	This workshop teaches the basics of work zone traffic control. The course covers short-term operations – no longer than one work shift – and focuses on daytime activities.	Online	7	8.00	251
Basic Work Zone Installer Safety	This workshop teaches the basics of work zone traffic control. The course covers short-term operations – no longer than one work shift – and focuses on daytime activities.	Classroom	4	8.00	81
Detection, Investigation and Prosecution of Cannabis Impaired Driving	A two-day training summit for NC law enforcement, judicial and advocacy professionals. Sponsored by the NC Governor's Highway Safety Program. Organized by the NC Conference of District Attorneys and the Institute for Transportation Research and Education at NC State University.	Classroom	1	12.00	130
Escort Vehicle Operator: Training the Trainer	This course is designed to meet the training requirements set by the NC Department of Transportation to certify Oversize-Overweight load escort vehicle Instructors. Course components consist of defensive driving, escort driver requirements, Federal Guidelines, skills training, and an exam.	Classroom	1	8.00	6
Flagger Certification	This workshop is designed to train participants to be effective flaggers by teaching the basics of flagging operations and procedures.	Online	10	4.00	323
Flagging Instructor Training	This workshop teaches participants the basics of flagging operations and then instructs them how to teach their own personnel these concepts	Online	2	8.00	36
Flagging Instructor Training	This workshop teaches participants the basics of flagging operations and then instructs them how to teach their own personnel these concepts	Classroom	1	8.00	18
Flagging Instructor Training - Recertification	This workshop teaches participants the basics of flagging operations and then instructs them how to teach their own personnel these concepts	Online	1	4.00	11
Fundamentals of Engineering (FE) - Self-Paced	This is a review course for the civil engineering exam only and covers approximately 16 topics.	Online	1	130.00	10
Fundamentals of Engineering (FE) - Self-Paced - NCDOT	This is a review course for the civil engineering exam only and covers approximately 16 topics.	Online	1	130.00	34

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Fundamentals of Engineering (FE) - Self-Paced - NCSU	This is a review course for the civil engineering exam only and covers approximately 16 topics.	Online	1	130.00	15
Fundamentals of Engineering (FE) - Tues/Fri	This is a review course for the civil engineering exam only and covers approximately 16 topics.	Online	1	130.00	4
Fundamentals of Engineering (FE) - Tues/Fri - NCDOT	This is a review course for the civil engineering exam only and covers approximately 16 topics.	Online	1	130.00	21
Fundamentals of Engineering Principles (FEP) Program	The FEP Program is a series of courses offering introductory engineering education for transportation technicians. FEP courses build a deeper conceptual understanding of transportation design, inspection, and field practices.	Online	2	366.00	359
Guardrail Installation and Repair	This workshop teaches the basics of guardrail installation and repair	Online	1	16.00	13
Highway Engineering Concepts (HEC) Program - NCDOT	The HEC course reviews and reinforces the Fundamental Engineering Principles (FEP) course content through a project-based curriculum that applies engineering principles to real-world transportation engineering projects.	Classroom	1	130.00	25
Intermediate Work Zone Safety	This workshop builds on the information covered in the Basic Work Zone Safety course, with particular emphasis paid to multi-lane urban streets. Multi-lane intersection work zones, detours, and mobile operations are covered in detail. Basic Work Zone Safety Training is a prerequisite for this course.	Online	9	8.00	236
Intermediate Work Zone Safety	This workshop builds on the information covered in the Basic Work Zone Safety course, with particular emphasis paid to multi-lane urban streets. Multi-lane intersection work zones, detours, and mobile operations are covered in detail. Basic Work Zone Safety Training is a prerequisite for this course.	Classroom	4	8.00	81
NCDOT Executive Education Program - Financial, Budget, and Procurement Processes (Advanced)	This comprehensive training course provides advanced training on NCDOT's various procurement procedures.	Online	1	30.00	28

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
NCDOT Executive Education Program - Financial, Budget, and Procurement Processes (Introduction)	This comprehensive training course provides introductory training on NCDOT's various procurement procedures. Also included is a big picture overview of NCDOT's financial processes, including the annual budget.	Online	1	10.00	62
Professional Engineering (PE) - Friday/Saturday	This is a civil engineering professional engineering exam review course which covers breadth and depth topics in construction, geotechnical, transportation, and water resources and environmental. Only breadth topics are covered in the structural discipline.	Classroom	1	98.00	7
Professional Engineering (PE) - Friday/Saturday - NCDOT - Classroom	This is a civil engineering professional engineering exam review course which covers breadth and depth topics in construction, geotechnical, transportation, and water resources and environmental. Only breadth topics are covered in the structural discipline.	Classroom	1	98.00	20
Professional Engineering (PE) - Self-Paced	This is a civil engineering professional engineering exam review course which covers breadth and depth topics in construction, geotechnical, transportation, and water resources and environmental. Only breadth topics are covered in the structural discipline.	Online	1	66.00	78
Professional Engineering (PE) - Study Aid	This is a civil engineering professional engineering exam review course which covers breadth and depth topics in construction, geotechnical, transportation, and water resources and environmental. Only breadth topics are covered in the structural discipline.	Online	1	66.00	5
Professional Engineering (PE) - Study Aid - NCDOT	This is a civil engineering professional engineering exam review course which covers breadth and depth topics in construction, geotechnical, transportation, and water resources and environmental. Only breadth topics are covered in the structural discipline.	Online	1	66.00	11

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Professional Engineering (PE) - Tuesday	This is a civil engineering professional engineering exam review course which covers breadth and depth topics in construction, geotechnical, transportation, and water resources and environmental. Only breadth topics are covered in the structural discipline.	Classroom	1	66.00	9
Professional Engineering (PE) - Tuesday Synchronous Online	This is a civil engineering professional engineering exam review course which covers breadth and depth topics in construction, geotechnical, transportation, and water resources and environmental. Only breadth topics are covered in the structural discipline.	Online	1	66.00	45
Professional Engineering (PE) - Tuesday Synchronous Online NCDOT	This is a civil engineering professional engineering exam review course which covers breadth and depth topics in construction, geotechnical, transportation, and water resources and environmental. Only breadth topics are covered in the structural discipline.	Online	1	66.00	16
Professional Engineering (PE) - Wednesday	This is a civil engineering professional engineering exam review course which covers breadth and depth topics in construction, geotechnical, transportation, and water resources and environmental. Only breadth topics are covered in the structural discipline.	Classroom	1	66.00	17
Roadway Drainage	This workshop teaches the basics of roadway drainage	Online	5	16.00	130
Site Development & Highway Access – Introductory Level	This class is meant to be a comprehensive introduction to highway access principles discussed in the NCDOT Driveway Access Manual and associated manuals.	Classroom	4	8.00	79
Site Development & Highway Access – Practitioner Level	This class looks at more complex case examples with discussions on government/developer involvement/interaction. The course is intended for TIA preparers; NCDOT district and traffic engineering staff; local government planning, transportation and traffic staff; and site developers. It is recommended that you complete the Introductory Level before you enroll in the Practitioner Level.	Classroom	4	12.50	56

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Traffic Safety Webinar — After the Conviction: Using Evidence Based Practices in Assessment, Sentencing, and Treatment to Reduce Recidivism of High-Risk Impaired Drivers	In 2019, over a million drivers in the United States were arrested for DWI. Research shows that convictions and incarceration alone won't reduce new offenses from high-risk impaired drivers. This presentation provides an overview of evidence-based practices to address assessment and treatment of high-risk impaired drivers after their conviction. This includes research on assessment tools and behavioral characteristics of high-risk impaired drivers. Participants will learn best practices in treatment strategies, available alcohol countermeasures and issues surrounding poly-substance abuse to help criminal justice and treatment professionals maximize their effectiveness in reducing risk to the community.	Online	1	1.00	36
Traffic Safety Webinar — Crash Data and Traffic Safety: The Importance of Details in the DMV 349	This webinar addresses the importance of crash data at a statewide level and how NCDOT uses crash data to direct its safety programs and funding. Webinar presenters (1) show how crash data is used to identify locations where safety improvements are needed and how engineers decide which improvements will be installed; (2) discuss why the location information from the crash report form is so important and common challenges that arise with locating crashes to the map; (3) demonstrate a new web based lat/long tool that enables officers to identify the coordinates of a crash location by clicking on the map and quickly and easily copy the numerical values into a crash reporting software form; and (4) present on the importance of crash data from the perspective of a local municipality.	Online	1	1.00	114

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Traffic Safety Webinar — Law Enforcement Interaction and Communication with People Who Have Hearing Loss	Have you experienced trying to communicate with individuals who have hearing loss? Communication with drivers and/or passengers who are Deaf, Hard of Hearing or DeafBlind can be a challenge. Each individual has their own communication preferences based on their onset of loss and upbringing. Which tools are the best to communicate with them? This webinar shares examples of drivers and/or passengers who are Deaf, Hard of Hearing or DeafBlind experiences with law enforcement officers. Solutions for different scenarios are discussed.	Online	1	1.00	32
Work Zone Traffic Control Supervisor	This course is designed for NCDOT, larger municipalities, and highway contractors that work on all highway systems, including two-lane roads, multi-lane roadways, and high-volume, high-speed, controlled access facilities. This course covers traffic control plan reading and development, positive protection, work zone capacity, night work, and inspection. Part 6 of the MUTCD and state DOT "Roadway Standard Drawings" are used as the text for this course. Additional handouts are used to supplement these materials. All work zone durations are covered in this course. Participants will be tested at the conclusion of the workshop for NCDOT Work Zone Supervisor certification.	Online	5	17.50	135
Work Zone Traffic Control Supervisor	This course is designed for NCDOT, larger municipalities, and highway contractors that work on all highway systems, including two-lane roads, multi-lane roadways, and high-volume, high-speed, controlled access facilities. This course covers traffic control plan reading and development, positive protection, work zone capacity, night work, and inspection. Part 6 of the MUTCD and state DOT "Roadway Standard Drawings" are used as the text for this course. Additional handouts are used to supplement these materials. All work zone durations are covered in this course. Participants will be tested at the conclusion of the workshop for NCDOT Work Zone Supervisor certification.	Classroom	3	17.50	56

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Work Zone Traffic Control Supervisor-Recertification	This workshop is intended for people who have completed ITRE's 'Work Zone Traffic Control Supervisor' course and now need recertification. This course will address updates in work zone safety, including any changes to NCDOT Roadway Standard Drawings and Part 6 of the Manual on Uniform Traffic Control Devices. All participants who successfully complete the course will be certified for another 4 years as a Work Zone Traffic Control Supervisor.	Online	4	8.00	88
Work Zone Traffic Control Supervisor-Recertification	This workshop is intended for people who have completed ITRE's 'Work Zone Traffic Control Supervisor' course and now need recertification. This course will address updates in work zone safety, including any changes to NCDOT Roadway Standard Drawings and Part 6 of the Manual on Uniform Traffic Control Devices. All participants who successfully complete the course will be certified for another 4 years as a Work Zone Traffic Control Supervisor.	Classroom	4	8.00	80
NC LOCAL TECHNICAL ASSISTANCE PROGRAM (NC LTAP)					
ADA in Temporary Traffic Control	This workshop describes the challenges faced by individuals with disabilities as they travel in the built environment, and includes a discussion of the relevant legal authorities (ADA, PROWAG, MUTCD). The basic requirements of the Pedestrian Access Route are reviewed including width, protruding objects, cross slope, grade, surfaces and curb ramps/detectable warnings. The requirements for the alternate pedestrian access route are reviewed. Tools to minimize the impacts of construction/maintenance/utility operations on pedestrians will be discussed. The session will conclude with an interactive review/discussion of various work zone scenarios and best practices.	Classroom	3	4.00	39

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
ADA in Temporary Traffic Control	This workshop describes the challenges faced by individuals with disabilities as they travel in the built environment, and includes a discussion of the relevant legal authorities (ADA, PROWAG, MUTCD). The basic requirements of the Pedestrian Access Route are reviewed including width, protruding objects, cross slope, grade, surfaces and curb ramps/detectable warnings. The requirements for the alternate pedestrian access route are reviewed. Tools to minimize the impacts of construction/maintenance/utility operations on pedestrians will be discussed. The session will conclude with an interactive review/discussion of various work zone scenarios and best practices.	Online	1	2.00	27
ADA Self Evaluations/Elements of PROWAG	With the 25-year anniversary of the passage of ADA, it is critical that local governments recognize their obligation to upgrade streets, sidewalks and facilities for accessibility. ADA requires that public agencies perform self-evaluations and prepare transition plans. They were to have been completed by July 26, 1992 and be updated periodically. The morning portion of the workshop examines the background to, contents of and enforcement of the self-evaluation and transition plan requirements. Several landmark court cases are also highlighted. A case study is presented to illustrate these items. Participants will leave the session with a “To Do” list of next steps they need to take and a toolkit of helpful resources. The afternoon session overviews the current criteria for accessible public rights-of-way including the pedestrian access route, curb ramps and detectable warnings, accessible pedestrian signals, street furniture, on-street parking and temporary traffic control requirements for pedestrians.	Online	1	6.00	12

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
ADA Self Evaluations/Elements of PROWAG	With the 25-year anniversary of the passage of ADA, it is critical that local governments recognize their obligation to upgrade streets, sidewalks and facilities for accessibility. ADA requires that public agencies perform self-evaluations and prepare transition plans. They were to have been completed by July 26, 1992 and be updated periodically. The morning portion of the workshop examines the background to, contents of and enforcement of the self-evaluation and transition plan requirements. Several landmark court cases are also highlighted. A case study is presented to illustrate these items. Participants will leave the session with a "To Do" list of next steps they need to take and a toolkit of helpful resources. The afternoon session overviews the current criteria for accessible public rights-of-way including the pedestrian access route, curb ramps and detectable warnings, accessible pedestrian signals, street furniture, on-street parking and temporary traffic control requirements for pedestrians.	Classroom	1	6.00	7
Advanced Computer Skills: Practical Applications	This full-day workshop is entirely focused on practical applications of spreadsheets, reports, and presentations in your organization. The workshop will demonstrate the effectiveness of various computer programs with actual files that you use regularly.	Classroom	1	6.00	4
Asphalt Pavement Maintenance	This workshop covers pavement evaluation, asphalt mix materials, hot plant mix production and pavement construction methods, routing pavement maintenance techniques, and pothole patching.	Classroom	2	6.00	38
Basic Computers: Reports and Presentations	This full-day workshop is focuses on practical applications of spreadsheets, reports, and presentations in your organization. The workshop will demonstrate the effectiveness of various computer programs with actual files that you use regularly.	Classroom	2	6.00	19

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Basic Concepts of Supervision	The Basic Concepts of Supervision focuses on the elements that new supervisors should be aware of: tasks of a leader, being a role model, motivation techniques, communication skills, problem solving and decision making, conflict and time management, customer service and stress management. The workshop is interactive with lecture, small and large group exercises and skill practices. Participants will have opportunities to ask and answer questions related to the subjects as described.	Classroom	1	7.00	26
Basic Concepts of Supervision	The Basic Concepts of Supervision focuses on the elements that new supervisors should be aware of: tasks of a leader, being a role model, motivation techniques, communication skills, problem solving and decision making, conflict and time management, customer service and stress management. The workshop is interactive with lecture, small and large group exercises and skill practices. Participants will have opportunities to ask and answer questions related to the subjects as described.	Online	2	6.00	42
Basic Drainage/Roadway Drainage Maintenance	There are three things you need to have a good road: drainage, drainage, and drainage. This program covers drainage principles, drainage policy, ditches, pipes, and other drainage features, including installation maintenance and construction of drainage components.	Online	4	6.00	94
Basic Work Zone Installer Safety	This workshop teaches the basics of work zone traffic control. The course covers short-term operations (no longer than one work shift) and focuses on daytime activities. This course must be completed before taking Intermediate Work Zone Safety Training.	Classroom	37	8.00	712

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Chain Saw Safety	Use of a chain saw requires a whole host of special personal protective equipment, including special glasses, gloves, chaps, and more. This hands-on class will cover basic chain saw operational safety awareness (e.g. proper protective wear, starting, kick back prevention, cutting do's and don'ts) as well as body position during cutting and a few advanced topics. Each attendee will don the proper PPE for a routine sawing operation of felled trees, inspect the condition of the saw, check fluid levels, crank the saw and perform a successful cutting operation.	Classroom	1	4.00	23
Communicating with the Public and Media	Effective communication with the public can prevent confusion and complications during transportation projects. This course covers strategies and guidelines for communicating important information with the public and media organizations, including strategic communication planning, message development, audience specification, press release development, social media, and interacting with news organizations.	Classroom	1	7.00	7
Concrete: What? When? and How?	This class features the basics of concrete installation from the composition of concrete to an actual student hands on session demonstrating placing and finishing techniques. This course is geared to anyone interested in improving concrete skills and will provide students with a general knowledge of concrete. Part of this workshop will be hands-on working with concrete.	Classroom	2	7.00	23
Confined Space Entry and Lockout/Tagout	This workshop is a follow-up to the Trenching Competent Person workshop. It is a must for any field supervisor who has crews working in confined spaces, such as: manholes, catch basins, meter vaults, and excavations deeper than four feet.	Classroom	7	8.00	155

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Construction Mathematics for Transportation Personnel	This class covers very practical areas for those who need to read plans, order and solve problems dealing with materials and supplies. Topics include reading blueprints; orienting plans (north arrow, vicinity map, or other clarifying features); measurements using scale; calculating area; materials factoring for asphalt, concrete, and stone; and estimating areas for odd shapes such as circles and triangles.	Classroom	1	6.00	18
Designing Pedestrian Facilities for Accessibility	Facilities in the public right-of-way (including walkways, ramps, curb ramps and landings, crosswalks, and pedestrian overpasses and underpasses) must be designed, constructed and maintained to serve all users. This course identifies the applicable laws, regulations, guidelines and standards pertaining to accessibility for persons with disabilities. Requirements for ensuring accessibility in existing facilities versus work in new construction and alternations will be discussed. Design elements necessary for achieving accessibility in the public right-of-way will be reviewed. Best practices will be identified.	Classroom	1	7.00	12
Emergency Management	This course covers how to develop, practice, and maintain emergency management plans that reflect what must be done before, during, and after a disaster. Participants will receive an overview of FEMA guidelines.	Online	1	6.00	15
Erosion Control	The seminar will focus on current methods of erosion control. The material will be targeted toward non-engineers, but include valuable information and reviews for everyone no matter their experience or skill level. The class style will include data, pictures, graphs, and, of course, what we can all learn from previous project failures.	Classroom	2	6.00	43

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Ethics and Rules of Professional Conduct - NCBELS	This webinar focuses on teaching the newly-revised Continuing Professional Competency Rules along with guidance and examples of ethics and professional conduct. Satisfies the new requirement for the 1-hour Professional Development Hour (PDH) in Ethics or Rules of Professional Conduct.	Online	1	1.00	803
Ethics in Public Works	This course focuses on the importance of ethics in Public Works. Course content includes legal requirements and restrictions under North Carolina state law that apply to public officials and employees – conflicts of interest in public contracting, prohibitions on accepting gifts and favors from vendors and contractors, misuse of confidential information, and misuse of public resources (otherwise known as embezzlement).	Online	1	6.00	15
Excavation Safety	This workshop will not only teach the participants to recognize danger, but will equip them with the tools to prevent dangerous accidents.	Classroom	2	7.00	32
Fall Protection	According to the Occupational Safety and Health Administration (OSHA) Fall Protection requirements, workers in local and state government, as well as construction firms can be subject to general industry regulations while performing some duties and construction industry regulations on other occasions. In addition, federal OSHA has issued quite a number of fall protection interpretations that pertain, but are not included in the two books of OSHA regulations. This class provides an overview of these many different fall protection provisions, interpretations and grandfathered work environments.	Classroom	2	7.00	22
Flagger Certification	This workshop is designed to train participants to be effective flaggers by teaching the basics of flagging operations and procedures.	Classroom	29	4.00	554

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Fundamentals of Government	This course provides an overview of the American federal system with a focus on local government in North Carolina, particularly municipalities, including the organization and operation of municipal governments and their interactions with the community and in the intergovernmental system.	Online	1	6.00	11
How to Keep Yourself and Your Agency Out of Court	This workshop provides an understanding of the importance and implications of tort liability risk for road agencies. The class will cover risk management principles, review risk management activities, and identify ways to reduce risk. Students will study examples that show the importance of considering human behavior when planning for their city or town.	Classroom	1	7.00	4
Inspecting Curb Ramps	This class will introduce the ADA requirements for the pedestrian access route. Requirements for ensuring accessibility in existing facilities versus work in new construction and alternations will be discussed. The focus of the class will be curb ramps in the public right-of-way.	Classroom	1	4.00	26
Intermediate Work Zone Safety	This workshop builds on the information covered in the Basic Work Zone Installer course, with particular emphasis paid to multi-lane urban streets. Multi-lane intersection work zones, detours, and mobile operations are covered in detail. Basic Work Zone Installer Training is a prerequisite for this course.	Classroom	10	7.00	172
Maintenance and Repair of Utility Cuts	This workshop expands on the discussion of utility cut repairs presented in the Asphalt Pavement Maintenance workshop and includes an in-depth review of the use of flowable fill concrete for utility cut maintenance and repair.	Classroom	1	4.00	14

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Management Techniques for Experienced Managers	The Management Techniques for Experienced Managers is for supervisors and managers with some years of experience in their positions. Subjects include: resource management, negotiation skills, ethics, delegation, coordination with other units, team building, planning, setting priorities. A variety of instructional strategies is used: lecture, large group discussions, small group exercises and skill practices. The final activity brings all of the elements discussed earlier into focus by having the small groups complete a case study.	Online	2	6.00	17
Managing Conflict with the Public and Employees	This class focuses on three primary topics: conflict styles, strategies for de-escalating conflict, and steps for negotiating a mutually beneficial resolution to conflict. Participants will have the opportunity to practice conflict management strategies in role-play situations.	Classroom	3	7.00	46
OSHA 10-Hour	This workshop is an important tool in meeting the Occupational Safety and Health Administration (OSHA) requirements to provide employees with an awareness of the basic hazards that exist in the field. Over a 10-hour period, this workshop covers many important basic safety requirements that field employees must know that are in OSHA's Standards for the Construction Industry. OSHA inspectors can enforce these safety rules for field employees working in the public or private sector.	Classroom	2	10.00	25
Reducing Roadway Departure Crashes	More than half of the annual fatal crashes in the U.S. relate to roadway departures, and they are the leading cause of traffic deaths in many states. This workshop provides participants with some tools for addressing roadway departure crashes. Topics covered include a discussion of engineering countermeasures as well as implementation strategies.	Classroom	1	7.00	6

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Road Safety 365	A one-day workshop that focuses on processes for incorporating safety into all aspects of local and rural road projects, and on making safety a priority through inclusion in the traditional decision-making process—365 days a year. The main goal of this workshop is to raise the safety awareness of practitioners on how to incorporate safety into project development and everyday work. It stresses the importance of road safety, and illustrates how it can be integrated into rural/local transportation project development at all stages: planning, design, construction, implementation, operations, and maintenance.	Classroom	2	7.00	32
Silica Standards – Strategies for Municipal Compliance	The Occupational Safety and Health Administration (OSHA) limits the permissible exposure level (PEL) for workers exposed to respirable crystalline silica to be 50 micrograms per cubic meter over an average 8-hour period. Municipalities and construction contractors are particularly impacted by this regulation because of the variety of tools that are routinely used on concrete pavement, sidewalk and curbing, asphalt pavement and other concrete related products in their day-to-day work activities. This seven-hour program helps large and small organizations plan for, implement and comply with this workplace standard.	Classroom	3	8.00	40
Snow and Ice Control	In this workshop, participants learn snow and ice control procedures, properties of snow and ice and appropriate treatments, common deicing chemicals and alternative materials, winter storm preparation, and storm removal equipment and operations.	Classroom	4	7.00	104
Soil Fundamentals	This workshop focuses on the important aspects of highway sub-grade preparation, including soil classifications, compaction of fills, soil compaction tests, proof rolling, and the importance of proper drainage.	Classroom	2	6.00	28

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Storm Water Hydrology	This workshop is an introduction to stormwater hydrology and drainage design. The morning session will concentrate on the movement of water over the earth's surface. The afternoon session will deal with the design elements of urban stormwater systems.	Classroom	1	8.00	11
TEAMwork	Together Everyone Achieves More. TEAMwork. It is such a foundational concept to organizational success but it takes work! TEAMwork is a workshop designed to help existing teams work better together. Topics covered include the foundation of team work, team dynamics and keeping the team moving. This is an activity-driven class, and participants will examine what being a team means to them and how to be the best team member they can be.	Classroom	1	7.00	14
Traffic Calming	Traffic engineers, street supervisors and other public officials face a growing number of complaints about high motor vehicle speeds and volumes in residential neighborhoods. This can occur on classifications from local streets to minor arterials. The issue can also occur on state highways passing through small- and medium-size communities. This workshop will discuss typical traffic problems in neighborhoods and their causes. Geometric design features and traffic control strategies to provide safer and more livable neighborhoods will be described, including residential area traffic circles, curb extensions (bulb-outs), median islands, realigned intersections, speed humps, chokers and diverters. Impacts of these features on roadway users (pedestrians/bicyclists, emergency vehicles, transit and maintenance and related vehicles) will be reviewed along with legal and liability issues. Attention will also be given to the process of traffic calming, including public participation, identification of the problem and plan development, approval and implementation.	Classroom	1	7.00	3

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Traffic Sign Retroreflectivity/Pavement Markings	Traffic signs provide an important means of communicating information to road users. They need to be visible to be effective. The nighttime environment presents many sign visibility challenges. Since drivers cannot see as many visual cues as they can during the day, this places greater reliance on signs and other traffic control devices. To provide nighttime sign visibility, most signs are made from retroreflective sheeting. Retroreflectivity is the property of a material that re-directs light back to the originating source. Since the retroreflective properties of signs deteriorate over time, road and street officials should assess their schedules for inspecting, cleaning and replacing signs to ensure that these maintenance activities meet the objectives of the Manual on Uniform Traffic Control Devices and, more importantly, the needs of drivers at night. This workshop will help practitioners gain a better understanding of sign retroreflectivity issues in order to improve the overall nighttime visibility of traffic signs.	Classroom	1	6.00	12
Trenching Competent Person	The Occupational Safety and Health Administration (OSHA) safety regulations for trenching and other types of excavations require a trained “competent person” to be at the excavation whenever any employees are involved working in or near the hole. This course teaches required OSHA technique for proper hands-on classification of soils that trained competent persons must be able to perform in order to meet the requirements of OSHA for soil types A, B and C.	Classroom	9	8.00	114

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Work Zone Traffic Control Supervisor	This three-day course is designed for NCDOT, larger municipalities, and highway contractors that work on all highway systems, including two-lane roads, multi-lane roadways, and high-volume, high-speed, controlled access facilities. This course covers traffic control plan reading and development, positive protection, work zone capacity, night work, and inspection. Part 6 of the MUTCD and state DOT "Roadway Standard Drawings" are used as the text for this course. Additional handouts are used to supplement these materials. All work zone durations are covered in this course. Participants will be tested at the conclusion of the workshop for NCDOT Work Zone Supervisor certification. Certification for the Basic and Intermediate Work Zone Safety Courses are both included in this course.	Classroom	10	20.00	202
Work Zone Traffic Control Supervisor-Recertification	This workshop is intended for people who have completed ITRE's 'Work Zone Traffic Control Supervisor' course and now need recertification. With NCDOT requiring recertification every 4 years, this course will address updates in work zone safety, including any changes to NCDOT Roadway Standard Drawings and Part 6 of the Manual on Uniform Traffic Control Devices. All participants who successfully complete the course will be certified for another 4 years as a Work Zone Traffic Control Supervisor.	Classroom	8	7.00	135
PUBLIC TRANSPORTATION / TRANSIT					
Implementing the Transportation Requirements of the Americans with Disabilities Act (ADA) Part 1 - ADA Requirements for All Types of Agencies	ADA is a Federal Transit Administration (FTA) compliance area. The purpose of the training is to review ADA transportation requirements with public transportation agencies (public and non-profit) involved in providing public transit, human services transportation, or general public demand responsive transportation in North Carolina and to discuss key implementation issues.	Online	8	2.00	186

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Implementing the Transportation Requirements of the Americans with Disabilities Act (ADA) Part 2 - ADA Requirements for All Types of Agencies	ADA is a Federal Transit Administration (FTA) compliance area. The purpose of the training is to review ADA transportation requirements with public transportation agencies (public and non-profit) involved in providing public transit, human services transportation, or general public demand responsive transportation in North Carolina and to discuss key implementation issues.	Online	8	2.00	181
Implementing the Transportation Requirements of the Americans with Disabilities Act (ADA) Part 3 - Additional ADA Requirements for Public Fixed Route Service Providers	ADA is a Federal Transit Administration (FTA) compliance area. The purpose of the training is to review ADA transportation requirements with public transportation agencies (public and non-profit) involved in providing public transit, human services transportation, or general public demand responsive transportation in North Carolina and to discuss key implementation issues.	Online	4	3.00	67
Operating Statistics Reporting	How to collect and report transit operating statistics.	Online	6	1.00	47
Transportation Leadership Development Program	This 12-week Transportation Leadership Development Program (TLDP) mixes self-study materials and seminars. During the course of study, participants work through exercises that promote a deeper understanding of effective decision-making, employee motivation, teamwork, and practical applications of creative ideas.	Classroom	2	62.00	17
TRANSPORTATION INFORMATION MANAGEMENT SYSTEM (TIMS)					
2022 TDTIMS Overview	Webinar providing an Overview of the 2022-2023 TDTIMS Process	Online	1	2.0	97
2022 TDTIMS Preview	Webinar providing a Preview and Demo of the TDTIMS Submission Process	Online	1	2.0	86
Back to School\Open House Reports	TIMS Course focusing on Reports and Data Available for Open House and Back to School Prep	Online	1	2.00	27
ESQL Tips and Tricks	TIMS Demo, Q&A showcasing the eSQL Routing Module	Online	2	2.0	88

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
Fall & Summer Planning Webinar	Webinar covering the complexities and logistics of Fall & Summer Planning	Online	1	2.0	53
Geocode Certification (MARIS 1 & 2)	TIMS 2-Part Geocode Certification Course	Online	2	20.0	25
LEA Planning Sessions	Webinar Discussions of various LEAs, Common Practices and Techniques for Planning.	Online	3	1.5	130
MARIS 3	Geocode Refresher for Certified Staff, Advanced Tips & Tricks	Online	2	4.0	33
NCPTA: Awards Ceremony	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	2.0	250
NCPTA: Batch Fill Data Tricks	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	49
NCPTA: Data Management Tips & Tricks	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	26
NCPTA: General Session	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	227
NCPTA: MARIS Tips & Tricks	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	13
NCPTA: TIMS - Preview New Service Indicators Report	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	2	1.0	40
NCPTA: TIMS Boundary Refresher	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	18
NCPTA: TIMS Competition	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	4.0	12
NCPTA: TIMS eSQL Experience	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	47
NCPTA: TIMS for Directors & Supervisors	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	39
NCPTA: TIMS Reports	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	26

Title of Course or Activity	Description	Instructional Format	Sessions Offered	Contact Hrs per Session	Total Participants
NCPTA: TIMS Through The Year	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	16
NCPTA: Transfer Stops & Mid-Day Routes	Training session at 2023 NC Pupil Transportation Association Conference.	Classroom	1	1.0	61
Reports & Worklists	TIMS Course focusing on TIMS Reports and Report Creation\Modification	Online	3	4.00	111
Summer School Data Management	Webinar covering Best Practices within TIMS from an Operators Perspective	Online	1	1.5	47
TIMS Boundary & Enrollment Analysis	TIMS Course focusing on School Boundary Creation, Edits, Updates, Student Tallies and Enrollment Projections	Online	2	12.00	23
TIMS Data Management	Webinar covering best practices for TIMS Data Management	Online	1	1.5	60
TIMS for Directors	Webinar focusing on Director Level processes and reports	Online	1	2.0	42
TIMS New Users	TIMS New Users Class	Online	3	12.0	37
Transfer Stops & Mid-Day Routes	Creating and Working with Transfer Stops and Mid-Day Routes	Online	2	8.0	23
UPSTU & EMU	TIMS Course focusing on Student Updates and the TIMS EMU Module	Online	2	4.0	73
TOTAL PARTICIPANTS FOR ALL COURSES AND ACTIVITIES					**10,438**