Dear Stakeholders and Partners,

I am thrilled to share with you exciting news about the remarkable growth and achievements of the Center for Transportation Research. With great pride and enthusiasm, I convey our center’s tremendous progress and impact in the last year. The center has undergone a remarkable transformation and expansion, and I am delighted to highlight some of the key accomplishments and developments that have taken place.

Our center has established itself as a hub of cutting-edge research, innovation, and collaboration in the state. Our dedicated team of faculty, researchers, and students have worked tirelessly to advance knowledge in transportation. We were successfully selected as the lead institution for the Center for Freight Transportation for Efficient and Resilient Supply Chain (FERSC) by the United States Department of Transportation. This effort is housed within CTR and is led by Dr. Ming Jin, Department Chair of Industrial Systems Engineering and Director of the Institute for a Secure and Sustainable Environment. We are contributing to solving some of the most pressing challenges facing the transportation industry today, from sustainable mobility solutions to cutting-edge traffic management systems.

In addition, we were selected as a consortium member for the Center for Pedestrian and Bicyclist Safety (led by the University of New Mexico) and the Center for Regional and Rural Connected Communities (led by North Carolina A&T University). These partnerships have allowed us to expand the reach of our research and outreach.

Our commitment to fostering collaboration and interdisciplinarity has also driven our success. We have forged partnerships with government agencies, private sector organizations, and other academic institutions to develop innovative solutions that benefit our local and global communities. The TEAM TN (Technology Enabled Advanced Mobility) effort brings together over 100 partners from throughout the state. This effort has shown the leadership of CTR and the university in building a mobility future that drives economic growth in the state of Tennessee.

Looking ahead, we are committed to further growth and progress. We aim to continue pushing the boundaries of transportation research, further deepening our collaborations, and expanding our influence in shaping the future of transportation systems. Our vision is to become a global leader in transportation research, setting new standards and pioneering innovations that transform how we move and connect with the world. The development of the Future Mobility Institute as a gateway for research at the university is continuing. The web presence for this initiative is located at https://mobility.utk.edu. I encourage you to check it out.

In closing, I express my deep appreciation for the dedication and hard work of everyone who has been a part of this journey. The success of the Center for Transportation Research is a testament to the commitment of our community, and I have every confidence that our future will be even brighter.

Sincerely,
Kevin Heaslip, Ph.D., PE
Director, Center for Transportation Research
University of Tennessee Knoxville
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Continuing to Move Transportation Safety and Innovation Forward

In 1972, The University of Tennessee Center for Transportation Research was established through a Memorandum of Agreement with the Tennessee Department of Transportation, known then as the Department of Highways. CTR’s first task was to develop guides, manuals, operating policies, and procedures to ensure a modern and integrated highway network. The center began working on programs to aid urban and rural transportation to safely, efficiently, and economically accommodate all highway travel. CTR began to impact the state as a child restraint safety seat legislation leader in this endeavor. Tennessee was the first state in the nation to adopt a Child Safety Seat Law. This work led to many Tennessee Department of Highway Safety proposals introducing subsequent traffic safety laws, including the Adult Occupant Protection law. Tennessee is now showing 92% seat belt usage among adults, according to research CTR conducted in 2022.

Today, work continues safety and transportation-related innovation through collaboration, such as partnering with other universities and departments across The University of Tennessee campuses. CTR supports the education and research activities of more than 1,800 students, leading the federally funded research consortia, the Southeastern Transportation Center for 20 years, improved mobility for underserved populations, added to the STEM curriculum of area K-12 schools, improved teacher preparation and supported policy decisions in our state. In 2022, CTR received the NSF Engine Type 1 Development Engine Award; this award provides seed money and direction for CTR to launch a new endeavor that will bring together technology and research across Tennessee as TEAM TN.

The Tennessee Technology-Enhanced Advanced Mobility Initiative seeks to leverage the investment by the state in the automotive industry and the considerable research abilities of our universities and national labs to create a comprehensive innovation ecosystem. TEAM TN brings together higher education, industry, government, and communities to create a future where innovative technologies originate in Tennessee, get manufactured in Tennessee, and lift the economy and end of all Tennesseans, especially those in economically distressed and rural areas. In addition, CTR continues to build collaborations with researchers at other University of Tennessee colleges, such as The Baker School of Public Policy and Public Affairs and The Institute for a Secure and Sustainable Environment, and grow our partnerships at Oak Ridge National Laboratory.
CTR CELEBRATES fifty years

Tennessee State Senator Becky Duncan Massey presents a proclamation to CTR Director Dr Kevin Heaslip in recognition of 50 years.

CTR Staff present for the 50th Anniversary Celebration.
Making an Impact
Through Research

Technology is changing how people and supplies move from place to place. Micromobility options such as electric bikes and scooters are providing more social mobility for those living in cityscapes. Mass transit vehicles such as buses and trains are changing how communities think about travel for those with disabilities or seeking more budget-friendly and environmentally conscious transportation. Electric cars are moving into the minds and onto the streets as present and future alternatives to combustion engines. Faculty, staff, and students are teaming up to improve the quality of life for residents through mobility research and doing so with the health of the environment at the forefront of their work.

Moving supplies from place to place efficiently and effectively requires research and innovation. The cost of moving goods impacts the overall economy and the Earth’s nonrenewable resources. Cross-disciplinary research is being conducted with business and industry partnerships to create long-term solutions to overcome the current challenges of product transportation.

The following pages represent work in future mobility solutions. As CTR continues to move forward, more work will be done to advance mobility safety, cost-effectiveness, and environmentally responsible transportation to positively impact the future of transportation for the next generations.
Future Mobility Initiative
Interdisciplinary research, education, public service, and outreach in the field of transportation

The Future Mobility Initiative connects UT faculty and students from multiple disciplines with a growing network of industry and government partners throughout the state and beyond.

The initiative will build upon and expand the research and partnerships the Center for Transportation Research started. Work will contribute and adapt to the rapid technological changes already underway in transportation and mobility.

As the automotive and transportation industries continue to undergo rapid technological change, there is a need to meet the heightened demand for advanced mobility research and development initiatives. This cluster will impact two major areas — the greening of transportation and the building of a green transportation economy that will drive economic growth for the state. Faculty will explore, invent and validate new technologies, processes, systems and services that are responsive to mobility consumer and industry needs; prepare a workforce to contribute to Tennessee’s mobility economy through education, reskilling and upskilling; and create shared research testbeds and facilities that support developing and deploying cutting-edge mobility solutions in real-world environments.

Collaborators

College of Arts and Sciences
Haslam College of Business
Howard H. Baker Jr. Center for Public Policy
Tickle College of Engineering

Future Mobility Cluster
Led by Kevin Heaslip, Director, Center for Transportation Research
The University of Tennessee is a partner in two other University Transportation Centers

**Center for Freight Transportation for Efficient and Resilient Supply Chain**
University of Tennessee Knoxville

**Focus Area:** Improving the Mobility of People and Goods

**Consortia Members:**
California State University Long Beach
North Carolina A&T State University
Oregon State University
Texas A&M University
University of Illinois Chicago

“The state of Tennessee plays a critical role in the U.S. freight network, and UT is committed to conducting transformational work in future mobility in support of both new technology advancements and the creation of a skilled workforce for Tennessee and the nation.”

- UT Vice Chancellor for Research Deb Crawford.

The University of Tennessee is a partner in two other University Transportation Centers

**University Transportation Center for Regional and Rural Connected Communities**
North Carolina A&T State University
**Focus Area:** Improving the Mobility of People and Goods

**Consortia Members:**
Clemson University
Florida Atlantic University
University of Alabama Tuscaloosa
University of Georgia
University of Kentucky
University of Tennessee Knoxville

**Center for Pedestrian and Bicyclist Safety**
University of New Mexico
**Focus Area:** Promoting Safety

**Consortia Members:**
San Diego State University
University of California Berkeley
University of Tennessee Knoxville
University of Wisconsin Milwaukee
Seat Belt Usage Increases in Tennessee

Each state is required to conduct an annual measure of seat belt use as one of the key requirements to receive Section 402 highway safety funds. The annual survey of belt use provides both the National Highway Transportation Safety Administration (NHTSA) and the Tennessee Highway Safety Office (THSO) with an important measure of our state’s occupant protection outreach, education, and enforcement efforts. This annual survey is performed in compliance with NHTSA’s Uniform Criteria for State Observational Surveys of Seat Belt Use.

About the Research

1. The 2023 Statewide Observational Survey of Seat Belt Use was conducted in March and April.

2. Over a 34-day period, CTR’s survey team visited 190 pre-selected observation sites in 16 Tennessee counties.

3. Observers remain at each site for at least 45 minutes to observe the belt use of all front-seat passenger vehicle occupants.

4. CTR’s 2023 survey efforts returned belt use observations for 26,836 vehicle occupants in 22,796 vehicles.

The survey’s preliminary average seat belt use rate of 92.0% is an all-time high for Tennessee and is an increase of 1.5% over the state’s 2022 survey average.
What is Team TN?

TEAM TN is a partnership with the National Science Foundation and is an alliance of academics, industry, and technical societies led by The University of Tennessee, Knoxville. TEAM TN seeks to place Tennessee in the vanguard of transportation electrification and digitization while reducing reliance on carbon-intensive energy sources, mitigating greenhouse gas emissions, and creating a more equitable transportation system.

TEAM TN will create a self-sustaining innovation ecosystem where advanced industries and Tennessee communities thrive, including diverse innovation assets.

“"There is no limit to what we can achieve given the assets we have to build on, including our leadership in automotive manufacturing, the collective strengths of our K-12 and higher education partners, the vision of our innovation-focused industry partners, and the alignment among our community and economic development organizations.”

- Kevin Heaslip

Visit TeamTN.org for more information
Our T-SCORE research on nationwide transit ridership trends is important to help understand the factors that caused recent declines in ridership— including during the pandemic — and is critical to helping the transit industry recover.”

Candace Brakewood

Brakewood’s research is making an impact through her focus on “smart” transportation systems. The goal is to use new information and communication technologies to improve urban transportation networks.

Recent Publications


Kevin Heaslip
Professor, Director of Center for Transportation Research

Heaslip’s lab in the Center for Transportation Research conducts research to address critical areas of transportation and national security in three technological thrusts: 1) future transportation concepts (electrified connected automated transportation), 2) transportation operations (freeway, transit, and integrated corridor management), and 3) cybersecurity (transportation and critical infrastructure).

Candace Brakewood
Professor, Department of Civil and Environmental Engineering

Research Interests
- Public Transportation
- Shared Mobility
- Transportation Planning
- Intelligent Transportation Systems

Christopher Cherry
Civil & Environmental Engineering
Associate Department Head of Undergraduate Studies and Professor

Research Interests
- Sustainable Transportation
- Non-Motorized Transportation Safety
- Travel Behavior and Demand
- Transportation Economics
- Commercial Vehicle Safety
- Transportation and the Environment
- Multimodal Transport
- Planning & Operations
- Transit Security
- Shared Roadways

Lee Han
Professor, Department of Civil and Environmental Engineering

Research Interests
- Established a Transportation Systems Laboratory eFacility for file transferring
- Traffic Engineering, Application of advanced technologies to transportation
- Traffic flow theory, Traffic operations, transportation data, and information systems, emergency evacuation and management, crash records and analysis, transportation logistics, operations research and 3D visualizations
Professors/Researchers

Qiang He
Professor, Department of Civil and Environmental Engineering
Research Interests
- Biological treatment processes
- Water and wastewater quality
- Environmental microbiology
- Renewable energy

Baoshan Huang
Civil & Environmental Engineering
Research Interests
- Infrastructural materials: engineering characterization and multi-scale modeling of asphalt cement, asphalt paving mixtures, portland cement concrete, and other infrastructural materials
- Pavement engineering: pavement design, testing and evaluation, pavement maintenance, and highway asset management
- Geotechnical engineering: soil improvement, slope stability, deep excavations, drill shaft and other deep foundations.

Asad Khattak
Civil & Environmental Engineering
Special Advisor, Journal of Transportation Safety & Security
Research Interests
- Intelligent transportation systems
- Transportation safety
- Sustainable transportation

Z. John Ma
Professor, Department of Civil and Environmental Engineering
Research Interests
- Evaluation of ASR-affected structures
- 3D Printing of Concrete
- Bond Behavior Between Rebar and Concrete
- Behavior of Prestressed Concrete Bridges
- Accelerated Bridge Construction for Durability
Professors/Researchers

**Matthew Mench**

Dean, Tickle College of Engineering, Condra Chair, and Chancellor’s Professor

**Research Interests**
- Electrochemical power conversion and storage including polymer electrolyte fuel cells, flow battery systems, and biological energy systems.
- Multi-phase transport visualization and characterization.
- Computational simulation of electrochemical power conversion and storage systems.
- Electrochemical methods of hazardous waste conversion.
- Simulation of the influence of rapidly evolving socio-cultural factors on decision making and group opinion dynamics.

**Jonathon Overly**

Institute for a Secure & Sustainable Environment
Director, East Tennessee Clean Fuels Coalition (ETCleanFuels)

**Research Interests**
- Energy efficiency in state buildings, improving energy and materials use in current and advanced vehicles
- Products and their related energy, environmental, and manufacturing aspects to life-cycle assessment (LCA)-based and energy-based projects.

**John S. Schwartz**

Professor, Department of Civil and Environmental Engineering

**Research Interests**
- The study of stressed natural systems, leading to a better understanding of adjustments in physical, chemical, and biological processes resulting in the degradation of rivers and streams. Improving our understanding on how natural processes are degraded is essential to developing innovative methodologies for watershed assessment and management, and stream restoration design

**Andrew Yu**

Professor, Director of Engineering Management Program

**Research Interests**
- Production and maintenance planning and scheduling
- Facility and asset maintenance planning and prioritization
- Supply chain and logistics planning and optimization
- Supply chain risk mitigation for electronics components
- Data management and customization in enterprise solutions
- Systems engineering

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*Image credit: [Institute for a Secure & Sustainable Environment](https://www.utc.edu/secure/) (Jonathon Overly), [Matthew Mench](https://www.utc.edu/secure/), [John S. Schwartz](https://www.utc.edu/secure/), [Andrew Yu](https://www.utc.edu/secure/)*
Impact Through Outreach, Community Engagement

CTR collaborated with partners across the state and the broader transportation field last year through community outreach and engagement activities.

Our #GetConvinced program promoted safe driving among teenagers through events to enhance road safety in East Tennessee. CTR provided technical assistance to transportation projects through TTAP, facilitating smoother operations. By way of TN Vans, we directly impacted the transportation resources of nonprofits to equip these nonprofits with transportation solutions to serve the residents of Tennessee better. Engagement in the Child Safety Seat Program underscores our commitment to safety at every age.

Participation in community events such as TwoBikes’ Summer Soiree and local police departments’ Night Out events has strengthened community relations and increased awareness of dangerous driving, especially in teens. Additionally, we had the opportunity to share our research, safety, and training programs at events such as the Airport Ground Transportation Association conferences, the Smart Mobility Expo, and the Transportation Research Board, furthering education and innovation in transportation.

CTR’s research translated into practical solutions throughout Tennessee and globally through our work with visiting scholars and international partnerships. The faculty staff, state, and community partnerships collectively enable these programs to create a safer and more efficient transportation system.
51% of teen drivers who died in car crashes 2021 were unbuckled*

*National Highway Traffic Safety Administration

Keeping Tennessee Teens Safe on the Roads

“I know that our students are getting better through your program. I’ve heard them talk about it on an everyday basis. So, I know that it’s impacting them and I know they’re getting better at driving because of it and they’re a safer driver because of it.”

- Wade Wester
CCHS Driver’s Ed Teacher and #GetConvinced partner

Seatbelt Convincer

The Seatbelt Convincer safely simulates a low-speed crash (5-7 MPH) by sliding riders down the ramp into a bumper. Realizing that even a slow crash feels that intense even with a seatbelt can convince them that it is worth it to buckle up every time they get in a vehicle. It is available to the community by request.

Events

In the past year CTR’s #GetConvinced Program participated in 11 events reaching 1058 teens and 400 children/adults with their highway safety messages and interactive learning activities.

#GETCONVINCED

Marrissa Maurer
Marketing and Events

Dr. Jerry Everett
Associate Director

Visit getconvinced.org for more information
Impacting the Safety of the Community Through Technology

Portable Driving Simulator

This driving simulator shows teens how to drive safely around large trucks and buses. There are eight scenarios in a variety of circumstances, such as wide turning and passing distance plus experiencing a large truck’s large blind spot called the No-Zone. Additionally, weather conditions (snow, rain, fog) as well as rural roadways and nighttime driving can be added. This simulator has three large monitors plus a vehicle seat with seat belt, steering wheel, gas pedal, brakes, turn signals, and a horn.

“The kids love it. They ask to do it. That’s the most important part. They are getting practice at driving it without really even knowing it.”

“One of the simulator driving parts has a deer coming across the street and they always are on the lookout for deer now.”

- Wade Wester
  CCHS Driver’s Ed Teacher and #GetConvinced partner

Virtual Reality Goggles

CTR commissioned a 5-minute video, filmed in Knoxville, to be viewed on the Oculus Go VR Goggles. This video puts the viewer in a car with three other teens where they experience a variety of distracted and dangerous activities as front-seat passengers. To show the dangers of distracted driving, the viewer has a 360° view of all that’s going on in the car; then the ride ends with a crash on Neyland Drive.
**What is TN Vans?**

Tennessee Vans (TN Vans) is a social enterprise that works with nonprofit community agencies across the state.

The service delivery and design approach used by Tennessee Vans has evolved over time in response to growing demands for transportation resources among diverse population groups throughout Tennessee. These demands fostered the need to develop a focus on designing mobility options with people rather than for people.

**Who Uses TN Vans?**

- **Disability Services**
  individuals with developmental, intellectual, or physical disabilities. Trips generally are for medical appointments, day programs, shopping trips, and field trips.

- **Recovery Services**
  individuals recovering from addiction, incarceration, and homelessness. Trips generally are for group meetings, medical appointments, work training, family events, and other recreational activities.

- **Community Outreach Services**
  individuals of all ages and outreach. Trips generally are for social services, shopping, cultural outings, and community-wide events.

- **Youth Services**
  individuals of teenage or younger ages. Trips generally are for afterschool programs, summer programs, the arts, educational activities, and field trips.

- **Senior Services**
  individuals of the Senior population. Trips generally are for medical appointments, shopping tips, daily transportation, and other recreational activities.

- **Workforce Services**
  individuals seeking employment. Trips generally are for job training, work trips, and job interviews.
Making a difference one non-profit and one van at a time.

Michelle Fisher, the Executive Director of a participating nonprofit, has this to say about the TN Vans program.

“In the past few years, the supply of mini-vans has drastically diminished. Long gone are the days of showing up to a car lot and having the ability to ‘pick your color’ of a new car. Searching for a new mini-van proves to be even more difficult, as they are seemingly gone before they even hit the lot. With the support and assistance of Tennessee Vans, we have been able to make much-needed upgrades to our vehicle fleet. We desperately needed to replace some old and worn out vans, and were able to buy just what we needed from Tennessee Vans.

We are very thankful for our partnership with Tennessee Vans, as Tennessee Vans has made it possible for us to transport people safely and keep them comfortable. We rely on our vehicle fleet to transport adults to their medical appointments, as well as their daily community outings. Having safe and reliable transportation is a necessity for us, and thanks to Tennessee Vans, we are covered!”

Michelle Fisher, Executive Director
Rhea of Sunshine, Inc.

The Stats
Since 1990

1,130 vehicles have been distributed to program participants across Tennessee

350 different nonprofits across the State of Tennessee

Served participants in 35 of the 95 counties of Tennessee

8 New Tennessee organizations were added in 2023

Staff

DeAnna Flinchum
Director

Danielle Meyers
Coordinator I

Bill Gilpin
TN Vans
Nashville Office

Visit tnvans.utk.edu
The Airport Ground Transportation Association is a trade association for ground transportation operators, airport authorities, and industry suppliers dedicated to the continuous improvement of airport ground transportation services for the traveling public.

By the Numbers

AGTA began in 1946 with 21 members
Today AGTA has 119 ground transportation operator companies, vendors, and airport authorities across the United States and Canada
15 member board of directors
Holds two conferences per year

Since September 2022, the University of Tennessee Center for Transportation Research has provided administrative services to the Airport Ground Transportation Association. This partnership has expanded to include Supply Chain Management faculty from the Haslam College of Business, where executive services are also now part of the association and university’s agreement. The collaborative efforts between these two UT departments will ensure AGTA thrives through a robust expansion of airport ground transportation research previously unavailable to the association. As this is a new endeavor, the UT-AGTA team is excited to effectively develop a plan that involves UT students, staff, and faculty with the goal of growing this association and ensuring current industry concerns are met with contemporary improvement methods.

Misty Richards, AGTA Administrator and Grant Coordinator for the Center for Transportation Research at the University of Tennessee-Knoxville.
With motor vehicle crashes being the leading cause of death for children under 13, the Center for Transportation Research considers its role with child passenger safety a vital component to our services to the state of Tennessee and its travelers. Therefore, the Center for Transportation Research, in conjunction with the Tennessee Highway Safety Office, provides training to highway safety professionals on best practices, new methods, emerging issues, legislation, law enforcement, and more.

Through car seat check events across the state, the Center for Transportation Research coordinates with state and local agencies to provide car seats for distribution at events. Car seats are provided to caregivers who have expired car seats, recalled seats, or no seat at all to ensure that each child leaves the check event safely restrained. The personnel staffing each car seat check event is a nationally certified safety technician who has completed the required training program provided by the Center for Transportation Research staff.

**2023 by the numbers**

Provided seats to 50 agencies including police departments, fire departments, the Tennessee Highway Patrol and the Department of Child Services

Distributed 644 Safety Seats
CTR Community Support

Two Bikes Charity Soirees

Each year members of the CTR staff support Two Bikes through the annual summer fundraiser at the Mill and Mine. The funds raised goes to support the work of Two Bikes and their mission to foster opportunity, sustainability, and community through bicycles.

National Night Out Events

Night Out events happen nationwide every fall. They are community building campaigns hosted by police departments that promote neighborhood camaraderie to make neighborhoods safer. CTR bringing the #GetConvinced program to these is our way of making the communities safer.
University of Tennessee President Randy Boyd talks with Butch Eley, Deputy Governor and Commission of Transportation for Tennessee about the future of smart mobility.

Faculty and staff from University of Tennessee Knoxville and University of Tennessee Chattanooga come together with UT President Randy Boyd during the 2023 Smart Mobility Conference in Nashville.
Transportation Research Board Meeting

Leaders at the University of Tennessee Knoxville, University of Tennessee Chattanooga, and The University of Tennessee System greeted visitors during “Tennessee Night” at the 2023 TRB Meeting in Washington D.C.

CTR was well represented at the 101st annual Washington DC TRB meeting in January 2023
The Tennessee Traffic Cones (Team UTK), represented by Meredith King, Grace Whitehouse, and Saurav Parajuli, won the 2023 TSITE Traffic Bowl competition held on February 15, 2023, at the University of Tennessee, Chattanooga. This competition tested the students’ knowledge of ITE, transportation planning, and engineering topics. These students emerged victorious over teams representing the University of Memphis and the University of Tennessee Chattanooga.

“We would like to express our appreciation to DeAnna and the Center for Transportation Research for the invaluable contribution in providing us with transportation services. Thank you so much.”

- Saurav Parajuli
Tennessee Traffic Cones Team Member
Impact Through Training and Education

Education and training are huge components of the work of CTR. In addition to faculty working with undergraduate and graduate students, professional Engineers lead classes throughout the state to make our streets and roadways safer and more efficient places to drive.

2022 was a record year for one of these programs; the Tennessee Transportation Assistance Program conducted 101 workshops across 26 training areas. Students logged 19,790 hours of training in areas such as rail safety, traffic signal installation and maintenance, and event safety training.

CTR continues to be one of the leading training centers for rail safety with the expertise of trainers such as Dr. David Clarke, a leading academic expert in rail and rail safety.

The work of CTR to train those around the state of Tennessee to install and maintain traffic equipment is not seen by most drivers as they commute to work. Still, when one of these systems, such as a traffic light, is not operating correctly, the effect can be costly and even fatal.

The Tennessee Model Users Groups is another program that moves behind the scenes daily. Still, this group looks ahead and conducts long-range forecasting to anticipate future transportation needs and mitigate potential challenges.

Each of these programs brings together competent and caring staff members who want to keep our roadways safe and traffic systems operating smoothly whether it is an ordinary driving day or a big event occurring in our community. The following pages peel back the curtain and provide insight into the work going on to keep traffic flowing as smoothly and safely as possible.
Tennessee Transportation Assistance Program

TTAP is part of a nationwide Local Technical Assistance Program (LTAP) financed jointly by the Federal Highway Administration (FHWA), the Tennessee Department of Transportation (TDOT), and the University of Tennessee.

TTAP moves innovative transportation technologies and practices into the hands of the men and women who maintain Tennessee’s local roads and bridges.

Types of Trainings Conducted

- Roadway Drainage Maintenance: The Key to Long Lasting Roadways - Online Workshop
- TATE Certification
- Traffic Signal Academy
- Rail Safety
- Special Event Traffic Training

2022 TDOT Grant Awards
Technical Assistance to Agencies

| New Tazewell | Multimodal Access Grant | $1,187,500 |
| Gainesboro | Multimodal Access Grant | $616,034 |
| Spring City | Multimodal Access Grant | $734,665 |
| Etowah | Traffic Signal Modernization Program | $170,000 |

Total Awards to Date $2,708,199

75% of TTAP training participants are from local agencies.
The Numbers

101 Workshops were conducted on 36 different training areas.

Workshops were held in 24 different cities and 17 were conducted online.

3,591 students were trained and 695 hours of instruction occurred.

TTAP provided grant application assistance to 16 Tennessee cities and counties in 2023.

To date, four of these communities have been awarded more than $2.7 million dollars for local transportation projects through TTAP.

TTAP Staff

Matt Cate, P.E.
TTAP Director

Dr. Airton Kohls
TTAP Training Coordinator

Spence Meyers
Technical Assistance Specialist

Frank Brewer
TTAP Work Zone Instructor

Jenny Jones
Editor, Road Talk
Dr. David B. Clarke is one of the premier academic experts on rail transportation. His 42-year career includes extensive experience with railroad education, research, and engineering. He has taught in the center’s railroad continuing education program since 1992, with courses in various railway engineering topics taught throughout the United States and internationally. Dr Clarke brings experience gained through more than 25 years as a consulting engineer to his classes. He is a life member of the American Railway Engineering and Maintenance of Way Association. (AREMA)
We all feel the impact of traffic signals when we drive to work or do our errands, and we likely take these safety devices for granted unless they are malfunctioning in some way. The Traffic Signal Academy is a six-day comprehensive training program that enhances the toolbox of traffic signal practitioners in Tennessee and around the country, with more than 1,800 participants since its inception in 2012.

Traffic signal operations play an important role in the safe and efficient movement of people, goods, and vehicles through our roadway systems. Listed as a training source in the Federal Highway Administration (FHWA) Arterial Management Program, the Academy continues to provide the tools necessary for transportation agencies to design, operate and maintain traffic signal systems.

“I had an opportunity to learn more about the work I do in a much simpler way. The videos and visuals were very helpful, and the Manuals received contained important information for future references and guidance.”

- Mike Towles
TDOT Design Division, ITS

Dr. Airton Kohls
Research Associate III, CTR
The University of Tennessee Center for Transportation Research has people working in multiple office locations, focusing on improving lives through transportation safety and innovation. CTR is a hub of research and programs spread across Tennessee. These research endeavors and programs are funded through grants with the knowledge that the money invested makes a difference in improving the lives of those living and working in our state.

Funding for the work of CTR derives from federal, state, and industrial resources who believe in saving lives through education, technology, and fiscally astute management of the dollars invested. The following pages tell the story of CTR and its partner organizations, The Tennessee Department of Transportation, the Tennessee Highway Safety Office, and the faculty, staff, and students who conduct transportation research.

Between 2019 and 2023, $44,222,483 has been invested in the work of CTR, its research, and its programs.

Programs such as Teen Safety have provided technology to allow students to safely experience the simulated perils of driving under the influence of alcohol and riding in a car during a collision. These funds have paid instructors to teach classes on rail safety, traffic light repair, and properly marking a street for maximum safety during a community event.

Research has been funded to move transportation from electric bikes to mass transit buses. Innovations have been made in alternate fuels and roadway materials.

The funding listed on the following pages is more than just numbers; these dollar amounts represent lives saved now and in the future through the work of CTR and its partners.
Funding by Source

Financial Review 2019-2023

- THSO: 44%
- TDOT: 36%
- Federal: 19%
- Other: 1%

Funding CTR’s research and other activities

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</tr>
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<tr>
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<tr>
<td>09/18/18</td>
<td>Transportation Energy Evolution Modeling (TEEM)</td>
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<tr>
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<td>Estimating the Joint Demands for Railroad and Barge Movements of Farm Products</td>
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<td>Exploring the Effects of Increased Truck Sizes or Weights on Rail-Served Agricultural Product Markets</td>
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<tr>
<td>07/17/18</td>
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<td>08/10/18</td>
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<td>09/26/18</td>
<td>Coal Transportation in Appalachia and a Related Proposal</td>
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<td>Implementation Toolkit and Model Delivery Plan</td>
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## Funding Sources and Expenditures
### Fiscal Year 2023

#### Funding Sources

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<tr>
<th>Funding Sources</th>
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<tbody>
<tr>
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<tr>
<td>University Research Incentive Funding (RIF) for Center Operations/Research Support</td>
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#### Expenditures

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<th>Research</th>
<th>University Misc</th>
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<td>216,606</td>
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### Total Program Expenditures

- **Center Operations**: 76%
- **Center RIF**: 6%
- **Training Support**: 12%
- **Training Research**: 4%
- **University Misc**: 2%
<table>
<thead>
<tr>
<th>Date of Award</th>
<th>Project Title</th>
<th>PI</th>
<th>Agency</th>
<th>Award Amount</th>
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<tr>
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<td>Evaluating the Impacts of 1-24 Smart Corridor Strategies</td>
<td>Lee Han</td>
<td>TDOT</td>
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<td>TDOT</td>
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<td>07/31/24</td>
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## THSO Awards 2019-2023

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<tr>
<th>Date of Award Notice</th>
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<th>Total Award</th>
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<th>End Date</th>
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### Totals by Year

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<td>2019</td>
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## Researcher Award Amounts

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<td>Deanna Flinchum</td>
<td>$6,000,000</td>
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<tr>
<td>Matthew Cate</td>
<td>$2,362,000</td>
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<tr>
<td>David B. Clarke</td>
<td>$1,606,888</td>
</tr>
<tr>
<td>Asad Khattak</td>
<td>$831,009</td>
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<td>Lee Han</td>
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<td>Baoshan Huang</td>
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<tr>
<td>John Ma</td>
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<tr>
<td>Candace Brakewood</td>
<td>$204,023</td>
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<td>John Schwartz</td>
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<tr>
<td>Qiang He</td>
<td>$200,000</td>
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<td>Mark Burton</td>
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<td>Andrew Yu</td>
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<td>Jonathan Overly</td>
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<td>Airton Kohls</td>
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<td>David Clarke/Robert Gibson</td>
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<td>David Clarke/Janet Hopson</td>
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<td>Kevin Heaslip</td>
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<td><strong>Total</strong></td>
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</table>
Impact Through Collaboration

CTR staff and collaborative partnerships throughout the state of Tennessee work together to achieve the mission and mandate we were given in 1972.

**Our Mission**

- Harness the full resources of the University of Tennessee in the conduct of transportation research.
- Develop and educate the transportation workforce.
- Assist and advise operators and users of the transportation system.

**CTR Partners**

- [Tennessee Department of Transportation](https://www.tdot.state.tn.us/)
- [Highway Safety Office](https://thso.tn.gov/)
- [Tennessee Model User Group](https://tnmug.net/)
CTR Leadership

Leads the Center for Transportation Research.

Kevin holds a PhD, Civil and Environmental Engineering, University of Massachusetts Amherst
MS, Civil and Environmental Engineering, Virginia Tech
BS, Civil and Environmental Engineering, Virginia Tech.

Dr Kevin Heaslip
Director and Professor

Dr Jerry Everett
Associate Director
Leads the Teen safety program as well as overseeing the CTR Interns and working with the CTR staff members located at the Tennessee Department of Transportation.
Jerry Holds a Ph.D., MS and a BS in Civil Engineering from the University of Tennessee, Knoxville.

DeAnna Flinchum
Chief of Staff
Leads the hiring efforts of CTR, and oversees the TN Vans nonprofit transportation program.
Deanna holds a BS in Supply Chain Management and an MS in Civil Engineering from the University of Tennessee.

Matt Cate
Director of TTAP
Leads the Tennessee Transportation Assistance program and serves as a liaison with the THSO.
Matt holds a BS and MS in Civil Engineering from the University of Tennessee.

Carol Hatmaker
Business Manager
Leads the accounting efforts of CTR.
Carol holds a bachelors degree in Business Administration from Auburn University with an emphasis in Accounting.

Michelle McGuffin
Director of Communications
Leads the communication of CTR and its programs.
Michelle is currently a doctoral candidate at University of the Cumberlands and holds a MA in Strategic Communications from Regent University, and a BA in Marketing from McKendree University.
The THSO and UT CTR partnership has been instrumental in promoting highway safety in Tennessee and is a testament to the power of collaboration. It is a partnership at its absolute best.

Where the Partnership Began
The Center for Transportation Research (CTR) at the University of Tennessee was awarded the first Program Administration grant by the Governor's Highway Safety Office (GHSO) in 2000. The grant provided seven full-time staff members to work within the GHSO, which then resided as a division of the Tennessee Department of Transportation (TDOT). Due to significant increases in funding and programs from the National Highway Traffic Safety Administration, the GHSO needed additional staffing but could not secure state funding for the expansion.

Law Enforcement Liaison Program
The LEL program originally began in 1998 as a response to the NHTSA’s goal of establishing a communication link between state highway safety offices and local law enforcement. The grant started with the Tennessee Association of Chiefs of Police, later moved to local agencies, and then to East Tennessee State University before finally being awarded to the UT CTR in 2005.

The partnership between GHSO and UT CTR has continued to thrive. The GHSO moved from the TDOT to the Tennessee Department of Safety and Homeland Security (TDOSHS) by executive order in April 2016 and officially changed its name to the Tennessee Highway Safety Office (THSO). THSO approved extending the partnership in October 2017 by offering five-year contracts for the Program Administration and LEL grant programs. These contracts have been renewed for another five years in October 2022.

Seventeen 25 THSO staff members are funded through contracts between the THSO and the CTR, with nine staff members working on the Program Administration grant and eight on the LEL grant.

Tennessee Highway Safety Office
THSO allocates over 350 grants each federal fiscal year to support its mission and vision. These grants provide agencies with the resources, personnel, and tools to foster safe driving practices on our roadways. The THSO’s LEL program has two full-time personnel who maintain a comprehensive statewide training program.

The Program trains law enforcement personnel and other individuals in highway safety in areas such as:
- Child Passenger Safety
- Standard Field Sobriety Testing
- Drug Recognition Expert
- This program trains over 1,200 individuals each year

Annual Tennessee Lifesavers Conference
The conference brings together professionals from a wide range of fields in highway safety, including law enforcement, highway engineers, and advocacy groups. The conference educates attendees on emerging trends and the best practices in highway safety. The conference features multiple pre-conference classes, where participants can receive continuing education units. The Director’s Awards Luncheon is a conference highlight where outstanding individuals are recognized for contributing to highway safety.

The Law Enforcement Challenge showcases the law enforcement agencies in Tennessee doing amazing things to help the citizens be safer on the roadways. The conference attracts between 500 to 600 attendees, and the staffing provided on both UT CTR contracts assists in all administrative, logistical, and implementation aspects of the conference.
“I would like to thank the Center for Transportation Research for the partnership with the Tennessee Highway Safety Office, a division of the Tennessee Department of Safety and Homeland Security, in providing a tremendous service to the citizens of Tennessee. The CTR is very much involved in saving lives across our roadways. The oversight of traffic safety grants and our Law Enforcement Liaison program, play a key role in reducing fatalities and serious injuries. Congratulations on 50 years of serving Tennesseans.”

Melissa Smith
Claims Analyst, THSO

Katie Roark
Claims Analyst, THSO

Kevin Hager
Operations Administrator, THSO

Sheri Murphy
Administrative Assistant, THSO

John Mayes
Statewide DRE and ARIDE Coordinator, THSO

Aaron Loden
Cumberland TN Law Enforcement Liaison, THSO

Michael Presson
West TN Law Enforcement Liaison, THSO

Jason Ivey
Deputy Director, THSO
CTR/THSO Partnership

Joel Brisson
Middle Tennessee Law Enforcement Liaison, THSO

Lori Bullard
Law Enforcement Liaison Program Administrator, THSO

Shandi Smith
Program Manager, THSO

Roxanne Stec
Program Manager, THSO

Beth Vernon
Program Manager, THSO

W. G. “Buck” Campbell
LEL Statewide Training Coordinator, THSO

Rhiannon Chambers
Program Manager, THSO

Steve Dillard
Senior Law Enforcement Liaison, THSO

Armando Fontes
East Region Law Enforcement Liaison, THSO
The Tennessee Drug Recognition Expert Program

Teaches officers how to identify drug impairment other than alcohol. The oversight falls under the auspices of the Highway Safety Office. The DRE Coordinator manages the training, development, and continuing education of the certified DREs.

Kudos to the Rutherford County Sheriff's Office for New Local Program

This office allows the DRE students to complete the required evaluations for the class in the county jail. Previously, the DRE evaluations were conducted in Jacksonville, Florida. The venue change allows DRE candidates to complete evaluations on local people using drugs that may be trending in Tennessee. It provides “real” exposure to the drugs prevalent in the state and drugs often encountered by law enforcement.

Collaborating to offer the country's first ADAPT course.

Collaborators:
- Tennessee Bureau of Investigation (TBI)
- Middle Tennessee State University’s (MTSU) Forensic Science Laboratory
- AAA

The ADAPT (Advanced Drug-Impairment Assessment through Physiology and Toxicology) course was designed to further the knowledge of law enforcement Drug Recognition Experts (DREs) regarding the effects of legal and illegal substances on the human body and driver impairment after consumption.

About the Program
- DREs who completed the course became better equipped to serve as expert court witnesses by offering stronger testimonies during the prosecution of impaired drivers.
- The class of 94 students consisted of representatives from 16 municipal law enforcement agencies, six county agencies, and the Tennessee Highway Patrol (THP).
- Presenters included the Tennessee District Attorneys General Conference, Tennessee Traffic Safety Resource Prosecutors, the TBI, and the THSO.
- Class topics included Anatomy and Physiology of the Brain, CNS Stimulants and Depressants, Pharmacology and Effects of THC in Marijuana, Hallucinogens and Dissociative Drugs, Esoteric Drugs and Emerging Drug Trends, Oral Fluid Testing, and Working with DREs in Court.
- Tennessee’s DRE Program is one of the best in the Country and has reached milestones that other states have not.
- It continues to be a model for other states to use while developing and establishing their DRE program.
CTR Team

Debbie Bower
Accounting Specialist II, CTR

Sandra Chandler
Administrative Specialist I, CTR

Linda Capps
Administrative Assistant, CTR

Victoria Coy
Accounting Specialist I, CTR

Jia (Lisa) Li
IT Analyst II, CTR

Mareike Ortmann
Research Associate II

Judy Carver
Accounting Assistant III, CTR

Robert Gibson
IT Administrator, CTR

Dr. Larry G. Bray
Research Professor
Marissa Maurer
CTR Intern focusing on the #GetConvinced Teen Highway Safety program. She is achieved her Master of Science in Marketing this spring. Marissa assists with refinement of program activities and planning teen outreach activities at local community events and East Tennessee high schools, as well as with marketing and social media for CTR and #GetConvinced.

Sophia Jodoin
Senior at the University of Tennessee, Knoxville, studying Sustainability and Geography. She is assisting in TEAM-TN research to provide a more equitable mobility ecosystem in the state of Tennessee through an NSF-funded grant. She is working to provide a social science background to the equity side of the TEAM-TN Engine initiative.

Ashkan Neshagaran
Graduate Research Assistant responsible for supporting various research projects and assisting in the collection, analysis, and documentation of research data both independently and collaboratively within a multidisciplinary team. Other responsibilities include preparing research reports, presentations, and assisting with grant applications.

Sarah LaFetra
Survey Design Intern for TN Vans. She will assist in developing a client survey to gauge interest in alternatively fueled vehicles.

Grady Owen
Grady is assisting Dr. Jerry Everett as they perform a transportation skills gap analysis and inventory for CR2C2. Additionally, he will assist with analyzing the results of the inventory to determine missing components in the existing training/education offerings. He is a masters student studying Civil and Environmental Engineering.

Sydney Smith
Video Production Intern for #GetConvinced. She is a senior majoring in cinema studies and minoring in sociology. She currently directs the production of videos for use by teachers interested in utilizing our hands-on safe driving activities for teenagers.

Changwha Oh
Provides GIS, data analysis and modeling support for the Tennessee Model User Group (TNMUG). He assists Dr. Jerry Everett in performing GIS analysis for traffic counts, special generators and other transportation related data. Additionally, Changwha provides research and analysis support in the development of TnTown, a standardized travel demand model for small MPOs in Tennessee. He also participates in TNMUG meetings, training sessions and other TNMUG events.
The Visiting Scholar Program at CTR began with a relationship with Beijing Jiaotong University in Beijing, China (a predominately transportation focused university). The first scholar in this program came from Shanghai in 2010 from the Shanghai Jiaotong University. Over the past thirteen years the number of scholars has increased to total of 42 visiting scholars. Most of these scholars were professors at their university or Institution before arriving here. A few scholars were Ph.D. candidates and worked on their dissertations while they were here. The scholars traditionally stay for one year on a J-1 Visa. The majority of our scholars have come from China but we also have had one visitor from Japan and one from South Korea.

The interaction with the visiting scholars helps them improve their English skills, learn about American/Southern Culture, and study our transportation systems and literature. The staff at CTR benefit from this association by learning about Asian Culture from the scholars. Some University professors and staff spend time outside of business hours with the scholars. It is a great educational experience for everyone. Many scholars hope to visit the United States in the future.

Donghyung Yook is a Research Fellow at the Korea Research Institute for Human Settlements. His research is in transportation planning, spanning projects on Public Private Partnerships in Korea, disaster response routing, and public transit modeling.

Dr. Yook earned a Ph.D. in Transportation Engineering from Utah State University, a master’s degrees in Transportation Engineering from the University of Virginia and the University of Seoul, and a Bachelors in Transportation Engineering from the University of Seoul. In 2022-2023 he contributed to the work of CTR and lived in Knoxville with his wife Jihui and their daughter Haewon (Jessica) Yook.

Universities/Institutes of our Visiting Scholars
- Central Southern University of Forestry and Technology in Changsha, China
- Shanghai Jiaotong University in Shanghai, China
- Shandong Jiaotong University in Jinan, China
- Hebei University of Technology in Tianjin, China
- School of Traffic and Transportation Engineering, Changsha University in Changsha, China
- Qingdao University of Technology in Qingdao, China
- School of Materials Science and Engineering, Chang’an University, Xian, China
- Dalian Maritime University in Dalian, China
- Beijing Jiaotong University in Beijing, China
- ERINA-Economic Research Institute for Northeast Asia in Niigata, Japan
- Korea Research Institute for Human Settlements in Sejong-si, South Korea