Semi-Annual Progress Report for

University Transportation Centers

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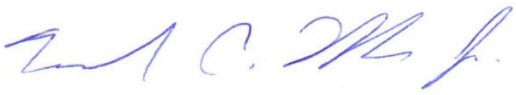

1. Accomplishments

1.1 What are the major goals of the program?

Our New England University Transportation Center (NEUTC) mission is to advance transportation safety through transformational research, education, and technology transfer. Our focus is upon translating research into implementation as we work to save lives today, while delivering research that transforms safety in the presence of evolving technology and opportunity. The passage of the Infrastructure Investment and Jobs Act (IIJA) and the development of the National Roadway Safety Strategy (NRSS), coupled with a more mainstream introduction of safety culture (e.g., Safe System) provide a foundation for improved safety across the surface transportation system. The time to make a generational impact in transportation safety is now.

NEUTC promises to advance transportation expertise and technology throughout the transportation discipline and contribute towards workforce development through the delivery of a robust research, education, and technology transfer agenda in support of IIJA statutory research priority of *Promoting Safety* along with the US DOT Strategic Plan Goals of *Transformational Research*. NEUTC brings together research and education leaders with a proven track record of delivering cutting-edge research to address key challenges in transportation safety. NEUTC will support the US DOT's mission, "To deliver the world's leading transportation system, serving the American people and economy through the safe, and efficient movement of people and goods.".

1.1.1 Research

Traditional safety challenges—such as the safety of vulnerable users, driver behavior, infrastructure assessment, and rural safety—are both complicated and potentially improved by the emergence of advanced technologies including automated vehicles, smart infrastructure, and human-machine interactions (HMIs), as well as the varying needs across different regions and communities served by our transportation systems. This has created broad needs for educational and research breakthroughs and innovation across the safety spectrum. NEUTC's research addresses critical safety challenges and advances several of US DOT's Strategic Plan KPIs through the application of transformative technologies. To achieve impactful research and effective safety measures, focus is required on specific topic areas that either: a) provide the greatest potential for safety related improvements, and/or b) require additional attention due to the significance of crash-related outcomes. Our mission to advance safety through transformative research will cover four thematic priority areas:

1) Embedding Community Engagement within Transportation Safety
2) Developing Smart Infrastructure and Connected Systems
3) Improving Safety for all Modes and Populations
4) Promoting Automated Vehicle Safety

These topic areas address integral components of the transportation system, contributing to a safe transportation system for all.

1.1.2 Leadership Development

The members of our consortium are leaders within the transportation profession, and we are excited about the opportunity to expand our leadership role as we work to advance transportation safety in a transformative fashion. Developing the next generation of leaders in transportation is a core function of NEUTC. As leaders we expect NEUTC to be at the forefront in advancing US DOT's KPIs. Our plan is to mix

new ideas with established best practices, such as an annual multi-day symposium that will bring faculty, students, stakeholders, vendors, and practitioners together to discuss innovations in safety research. These symposia will include activities to support collaboration, foster networking, and develop leadership skills for both researchers and students. An added focus will be placed upon increasing participation from government and industry by ensuring invitations are extended to all collaborators on all NEUTC projects. Given our prioritization on leadership, we will continuously seek opportunities for our consortium members.

1.1.3 Education and Workforce Development

The education and workforce development components will address K-12, university, and continuing education students. We are excited about the wide range of education activities within NEUTC which will expand our transportation knowledge base and broaden participation in transportation. Some of the specifical education and workforce development goals include the creation or expansion of the following activities:

The Safety Toolbox Curriculum: This initiative aims to develop and deliver educational materials focused on basic transportation safety concepts. The Safety Toolbox will feature a regional agenda including webinars, workshops, and outreach programs, targeting high school to undergraduate students and transportation professionals. It will also engage researchers, policymakers, and system operators.

Community College Pipeline: In collaboration with community college partners BHCC and HCC, this program will offer strategic educational activities such as the development of an introductory transportation course with transfer credit potential, a research and mentoring program (RAMP), visiting research and internship opportunities, and programming to address "the hidden curriculum" to help eliminate barriers to student success.

Expand Bridging Expectations & High School Course: This initiative builds upon a successful two-day pilot program designed to introduce high school students to careers and topics in transportation. The next phase involves developing a full-year elective course in collaboration with Springfield Public Schools. The course will cover fundamental transportation concepts, real-world applications, and career pathways, with the goal of offering dual enrollment credit through a partnering community college. As the curriculum is finalized and piloted, NEUTC plans to expand the program to additional schools across the consortium.

Hack-a-thons & Capstones: This effort includes hosting hack-a-thon style events where student teams from various academic backgrounds collaborate to solve transportation safety challenges—such as using data from smart infrastructure to improve decision-making. It also supports student involvement in capstone projects that align with their academic programs, providing hands-on experience in applying research concepts to real-world transportation issues.

Develop College Curriculum: NEUTC members aim to expand the presence of transportation safety topics in college curricula and enhance their quality. This includes creating case studies and curriculum modules for engineering courses—especially at the first-year level—to encourage interest in transportation fields. Additional plans involve incorporating subject matter expertise into existing courses, developing a general education module on the broader impacts of traffic safety, and supporting the creation of new courses and certificate programs.

Outreach to K-12: The consortium members will continue supporting K-12 STEM and career exploration activities, such as tours, internships, and presentations, along with sharing successful outreach practices across New England. Additionally, student contributions will be recognized through awards and features at annual symposia and on the NEUTC website.

1.1.4 Technology Transfer

One of the primary functions of the UTC program is to directly translate research into practice, policy, or novel advancements of the state-of-the-practice. Technology transfer and collaboration is well-documented historical strength across the entire NEUTC team. We are particularly excited about the seven-part technology transfer plan that we have developed to complement our research and education activities. Our consortium members are actively engaged in innovative technology transfer that is blend of both traditional (e.g., LTAP workshops, industry engagement, conference participation, etc.) and less traditional (e.g., DECIDE©, NSF I-Corp, public information videos, etc.) methods. Our focus in technology transfer will be translating research and best practices into implementation, especially in our rural and/or underserved communities across New England. Each member of our consortium will contribute towards- and participate within- our technology transfer and collaboration activities.

1.2 What was accomplished under these goals?

1.2.1 Research

The New England University Transportation Center (NEUTC) is midway through a productive second year in our consortium, dedicated to advancing transportation safety and efficiency through impactful research and community engagement. During this reporting period we awarded Year 2 projects to expand our efforts in research, technology transfer, and education. Additionally, early in the next reporting period we will launch our Year 3 RFP to begin allocating Year 3 funds.

Funded Projects

During this period, the NEUTC successfully managed an extensive portfolio of projects, comprising:

Year one projects: 19 research projects, 2 projects focused on Technology Transfer, 1 project dedicated to Outreach and Education. Of these projects, three have been completed with final reports submitted, which can be viewed on our website.

Year two projects: From 35 submitted proposals, 5 phase two projects and 14 new research projects were initiated.

Peer Reviewed Journal Publications/Conference Papers

The center continues to contribute to transportation scholarship through several accepted and published works, highlighting advances in safety, accessibility, crash behavior analysis, and intelligent vehicle systems.

Transportation Research Record:

- Patterson, D., **Ai, C., Christofa, E.**, Remache-Patino, B., Indrakanti, S., Kostopoulou, E., & Leao, G. (2025). *Enhancing Disaster Response Planning: A Framework for Bicycle and Pedestrian Transportation.*

International Journal of Sustainable Transportation:

- Jiang, G., **Gao, S., & Christofa, E.** (2025). *Outdoor information panels to convey real-time travel information for transit ridership recovery*, 1–15.

Transportation Research Part F: Psychology and Behaviour:

- Pipkorn, L., Noonan, T. Z., Mehler, B., **Reimer, B.**, & Gershon, P. (2025). Changes in glance and hands-on-wheel behaviors when engaging with non-driving-related tasks while using Tesla Autopilot. *Transportation Research Part F: Traffic Psychology and Behaviour, 109*, 232–241.

ASCE International Conference on Transportation and Development (2025):

- Luo, J., **Gonzales, E.J., & Christofa, E.** (2025). *Measuring Walk Accessibility and Equality by National Walkability Index*, presented June 8–11, Glendale, Arizona.

IEEE International Conference on Robotics and Automation (ICRA) 2025:

- Zhang, Z., Ahmad, H.M.S., Sabouni, E., Sun, Y., Huang, F., Li, W., & **Miao, F**. (2024). *Safety Guaranteed Robust Multi-Agent Reinforcement Learning with Hierarchical Control for Connected and Automated Vehicles*.

Association for the Advancement of Artificial Intelligence (AAAI) 2025:

- Huang, H., He, S., & **Miao, F.** (2024). *CUQDS: Conformal Uncertainty Quantification under Distribution Shift for Trajectory Prediction*.

These publications underscore NEUTC's commitment to advancing transportation safety, through impactful, peer-reviewed research. In addition to these publications and conference papers, there are numerous papers that have both been submitted or are currently under review as a result of NEUTC research.

Research-Related Engagements

The center continues to engage with the public and industry through presentations, media coverage, and expert commentary on critical transportation topics:

Davis Chacón-Hurtado presented *"Exploring the Relationship Between the Built Environment, Crime, and Bus Ridership: A Case Study in Hartford, Connecticut"* at the 71st North American Meetings of the Regional Science Association International in New Orleans, Louisiana (November 14–16, 2024). He also co-authored a student-led research project on pedestrian and cyclist safety in Hartford, featured at the University of Connecticut's *Frontiers in Undergraduate Research*.

Bryan Reimer continues to work closely with a broad range of industry stakeholders, including Agero, Allstate, Audi, BMW, Google, Honda, Toyota, State Farm, and others. He has also been prominently featured in several media outlets:

- Quoted in *Pittsburgh Post-Gazette*, *CNBC*, *The Ojo-Yoshida Report*, *Auto Connected Car*, *Information Week*, and *Tech Probe*, addressing automation, driver assistance technologies, and safety.
- Participated in a podcast episode titled *"GM Rips Away the Cruise 'Band-Aid'"* hosted by *The Ojo-Yoshida Report*.

Fei Miao gave an invited seminar at Johns Hopkins University and was featured in the *JHU Newsletter* for her research on multi-agent learning systems for safe and efficient autonomous vehicles:

Michael Plotnikov's research on bus seat belt systems received public attention in *The Boston Globe* article *"The seat belts you probably didn't even know you had"* (Feb. 2024). His work was also featured in a UMass-produced video titled *"Buckle Up for Safety"*, which explains current challenges and outlines potential solutions.

These activities demonstrate the center's continued commitment to engaging with transportation professionals, public audiences, and the media to share knowledge and improve safety across the system.

External Grants

NEUTC consortium members have secured external funding to advance research across several transportation topics, including safety systems, driver training, and data-informed planning:

- **National Science Foundation**: REU Site – RIDE, supporting undergraduate research in areas related to driving behavior and system design. (Co-PI: Eleni Christofa)
- **National Cooperative Highway Research Program (NCHRP 17-106)**: Study on the effects of centerline and shoulder rumble strips on bicyclist safety along high-speed two-lane highways. (Co-PIs: Michael Knodler, Francis Tainter & Eleni Christofa)
- **BasiGo, Inc.**: Project supporting air quality monitoring and driver training to assist the implementation of electric bus service in Rwanda. (Co-PI: Eleni Christofa)
- **Massachusetts Department of Transportation**:
    - *"Measuring Access to Improve Public Health – Phase II"*, a study co-led by Eric Gonzales and Eleni Christofa, includes a research assistant from UMass Amherst.
    - Ongoing research support for multiple studies related to intersection design, bus stop placement, and roadway regulations.

Invited Research Presentations

NEUTC faculty, researchers, and students have continued to share their work at national and regional events, contributing to the advancement of transportation research and safety practices:

Eleni Christofa delivered multiple invited presentations in Spring 2025, including:

- *Exploring Bike Lane Safety Using Trajectory Data* at Swissnex, Cambridge, MA (March 26, 2025)
- *Safe and Accessible Transportation Systems* at the University of Connecticut Transportation and

Urban Engineering Seminar Series, Storrs, CT (March 31, 2025)

Jimi Oke co-authored the poster presentation *A Spatial Typology Analysis of Crash Characteristics across 2480 Census Tracts* with Mohammed Abdalazeem at the TRB Annual Meeting, January 2025.

Shannon Roberts's project team member Meng Wang presented to the MIT Advanced Vehicle Technology Consortium (November 21, 2024), sharing early findings with automotive industry representatives.

Davis Chacón-Hurtado gave a presentation titled *Accessibility to Jobs as a Human Right: Exploring the role of worker income and workplace characteristics on the journey to work* at the UMass Transportation Seminar Series (October 2024).

Bryan Reimer gave several invited talks and presentations over the past six months:

- *Insuring the Future: The Rewards and Risks of Assisted and Automated Driving*, Allstate Research Webinar (November 7, 2024)
- *Insights and Innovations from 25 Years of Field and Naturalistic Data Logging*, The Eye, the Brain, and the Auto (November 18, 2024)
- Multiple presentations at the TRB Annual Meeting (January 2025), including analyses on over-the-air updates, automated lane changes, driver-pedestrian interactions, and takeover events
- *Bad Behaviors: Autonomous Driving Distraction & Safety*, The Detroit Auto Show (January 15, 2025)
- *Data-Driven Insights on Driver Behavior in the Age of Automation*, Tu Delft Automated Driving and Simulation Lab Webinar (February 27, 2025)
- *Distractions You Can't See: Insights on Mental Health and Driving Outcomes*, Lifesavers National Conference on Highway Safety Priorities (March 9–11, 2025)

Fei Miao delivered seminars at Johns Hopkins University, MIT, and Yale, presenting her work on intelligent systems and vehicle automation.

Michael Plotnikov presented findings on bus safety and restraint systems at several professional venues including:

- The 2024 Commercial Vehicle Safety Summit
- Meetings hosted by the American Bus Association and United Motorcoach Association
- UMass Amherst Transportation Seminar
- Upcoming 2025 MassDOT Innovation Conference

1.2.2 Leadership Development

The New England University Transportation Center (NEUTC) has demonstrated robust leadership in the transportation field, highlighted by a series of invited presentations, prestigious awards, and significant editorial responsibilities held by its faculty and students. This active involvement not only promotes

NEUTC's visibility in the academic and professional communities but also enhances its impact on transportation policies and practices.

Invited Presentations and Workshops

NEUTC researchers participated in a wide range of invited talks and workshops, sharing their latest work with academic institutions, industry professionals, and public sector audiences:

- **Simos Gerasimidis**:
  - *Meta-material Design by Architecture, Deteriorated Bridges, and Stability of Thin Shells* at the Chair of Metal Structures, TUM Munich (2024)
  - *Form Finding: Designing with Nature's Principles* presented at a Summer School in Lake Como, Italy, focusing on future directions in structural design (2024)
- **Jimi Oke**:
  - Co-presented *Energy Forecasting and Scenario Planning for Decision-Making in Urban Rail Transit Systems* with Z. Han, E. Christofa, and E. Gonzales at the TRB Annual Meeting (2025)
- **Shannon Roberts**:
  - Guest lecture: *Automation*, for the Human Factors Engineering course, Stevens Institute of Technology (October 21, 2024)
  - Seminar: *Driving Automation: Investigating and Improving How Drivers Learn and Interact with Vehicle Automation*, Stevens Institute of Technology, Department of Systems and Enterprises Seminar Series (October 21, 2024)
  - Talk: *Can Car Conversations Save Us? Human Passengers vs. Conversational AI*, Google Lunch & Learn (Online), December 4, 2024
- **Fei Miao**:
  - Presented seminars at MIT (Data Science Seminar), Johns Hopkins University (Computer Science Seminar), and Yale University on recent advances in intelligent transportation and control systems
- **Michael Plotnikov**:
  - Presented *Innovative Approaches to Increase Seatbelt Use on Motorcoaches to Save Lives and Reduce Injury Severity* at the Winter 2025 Seminar Series, sponsored by the UMass Transportation Program, UMass ITE Student Chapter, and UMass WTS Student Chapter

Professional and Paper Awards

- **Eleni Christofa**:
  - *Public Engagement Program Fellow*, UMass Amherst
  - *Runner-up Poster Winner*, College of Engineering Research Symposium (with E. Kostopoulou)
  - Mentored Y.-M. Yang, who was named a *Traffic Safety Scholar* for the 2025 Lifesavers Conference and received a *Graduate School Fieldwork Grant*
  - Mentored E. Kostopoulou, recipient of the *2025 WTS-Rhode Island Local Graduate Scholarship*

- **Fei Miao**:
    - *Best Paper Award*, IJCAI 2024 AI4TS Workshop
    - Mentor to UConn student recipient of a *Pre-Doctoral Award*
- **Simos Gerasimidis**:
    - *Editor's Choice Paper*, Communications Engineering Journal (2024) for *Structural integrity of aging steel bridges by 3D laser scanning and convolutional neural networks*
- **Eric Jackson**:
    - Mentored Oluwaseun Olufowobi, named a *2025 Lifesavers Traffic Safety Scholar* and one of 29 students selected nationally to attend the Lifesavers Conference
- **Jimi Oke**:
    - *ASCE Outstanding Reviewer Award* (2023, awarded in 2024)
    - *2024 Armstrong Fund for Science* recipient
    - Mentored M. Abdalazeem and Z. Han, recipients of *CEE Travel Awards*
- **Eric Gonzales**:
    - Co-authored a *Finalist Entry* in the TRB Transit Data Challenge with M. Azhdari for the tool *Fare Payment Compliance Monitoring and Lost Revenue Estimation using Automatically Collected Data*
- **Nicholas Kirsch**:
    - Mentored Shuva Paul, who was named the NEUTC UNH Site *Student of the Year*
- **Bryan Reimer**:
    - Honored with a *Bartimaeus Award* by the Detroit Institute of Ophthalmology for contributions to the understanding of vision and driver behavior
- **Michael Knodler**:
    - Mentored Tolu Oke who was named NEUTC Student of the Year
    - Mentored Tolu Oke, Nicole Aredes and Peter Swenson who were named *2025 Lifesavers Traffic Safety Scholars* and 3 of 29 students selected nationally to attend the Lifesavers Conference
    - Mentored Angelina Caggiano who was selected as a Dwight D. Eisenhower Fellow and a WTS Scholarship recipient
    - Mentored Pravar Parashar and Angelina Caggiano who were selected as First Year Teaching Fellows for introductory courses, titled "Exploring Automobile Engineering Fundamentals" and "Transportation Innovation and Smart Cities", respectively.

<u>Journal Editorships and Grant Review Panels</u>

NEUTC researchers continue to contribute their expertise through service on journal editorial boards and national review panels:

- **Jimi Oke**: Panelist for the NSF Civil Infrastructure Systems – Engineering Research Initiation program (December 2024)
- **Monika Filipovska**: Served on a National Science Foundation review panel for the Cyber-Physical Systems program

- **Fei Miao**: Participated in multiple NSF review panels; Associate Editor for the *IEEE Open Journal of Control Systems* and proceedings of the *Conference on Decision and Control (CDC)* and *American Control Conference (ACC)*
- **Jinbo Bi**: Served on review panels for NSF and NIH (BDMA); Editor for two academic journals in the areas of machine learning and artificial intelligence
- **Simos Gerasimidis**: Editorial Board member for the *ASCE Journal of Structural Engineering*
- **Egemen Okte**: Associate Editor of the *International Journal of Pavement Engineering*
- **Eleni Christofa**:
    - Editorial Board member, *ASCE Journal of Transportation Engineering Part A: Systems*
    - Handling Editor, *Transportation Research Record*
- **Eric Gonzales**: Collaborated with E. Christofa in editorial duties for *Transportation Research Record* and *ASCE Journal of Transportation Engineering Part A: Systems*
- **Anuj K. Pradhan**: Handling Editor, *Transportation Research Record*
- **John Ivan**: Associate Editor, *Accident Analysis and Prevention*
- **Song Gao**: Editorial Board member, *Transportation Research Part B*
- **Fatemeh Fakhrmoosavi**: Guest Editor, *Transportation Research Part D: Transport and Environment*
- **William Lyons**:
    - Editorial Board member, *Civil Engineering Practice* (Boston Society of Civil Engineers)
    - Referee for the *International Journal of Sustainable Development*
- **Nicholas Lownes**: Editor of a special issue in *Applied Sciences* on *Intelligent Transportation Systems for Sustainable Mobility*

Leadership in Professional Organizations

NEUTC faculty and researchers continue to take on leadership roles within major transportation and engineering organizations, contributing to the direction and advancement of the field:

- **Egemen Okte**: Member of the *ASCE Transportation & Development Institute Artificial Intelligence Committee*, which organizes workshops aligned with NEUTC research themes
- **Eleni Christofa**: Secretary of the *TRB Committee on Transportation and Health (AME70)*
- **Jimi Oke**: Member of the *TRB Committee on Critical Infrastructure Protection* and the *TRB Committee on Transportation Energy*
- **Michael Knodler**
    - Executive Committee Member (current Secretary) of the Council of University Transportation Center
    - Director at large for the American Road Builders Association (ARTBA)
    - Director, ATRA Research & Education Division
    - Member, AAA FTS Safe Mobility Conference Planning Committee – Co Chair of Technical Presentation Committee
- **Eric Gonzales**:
    - Member of the *TRB AP020 Committee on Emerging and Innovative Public Transport and Technologies*

    - Member of the *TRB AHB45 Committee on Traffic Flow Theory and Characteristics*
- **Shannon Roberts**: At-Large Member of the *Executive Council for the Human Factors and Ergonomics Society*
- **Nicholas Kirsch**: Vice President of Finance for the *IEEE Vehicular Technology Society*
- **Davis Chacón-Hurtado**: Member of the *Technical Program Committee* for the *IEEE International Symposium on Ethics in Engineering, Science, and Technology (ETHICS) 2025*
- **Francis Tainter***:*
    - *Communications Coordinator of the TRB ACH50 Committee on Road User Measurement and Evaluation*
    - *Executive Board Member, Southeastern New England ITE Chapter*
- **Fatemeh Fakhrmoosavi**: Member of the *TRB Committee on Freight Transportation Planning and Logistics (AT015)*
- **Fei Miao**:
    - Member of the *IEEE Control Systems Society Smart City Technical Board*
    - Organizer for the *IEEE CPSWeek* and active in the *IEEE Control Systems Society*
- **Nicholas Lownes**: Cluster Chair for *Auction Theory* at the *INFORMS Annual Meeting*, organizing the *Robert Day INFORMS session*

<u>Student Leadership Activities</u>

NEUTC continues to foster student engagement and leadership through hands-on research, presentations, and outreach events hosted across consortium institutions:

- **University of New Hampshire**: Under the guidance of Nicholas Kirsch, four students participated in NEUTC-supported research activities.
- **University of Connecticut**:
    - Davis Chacón-Hurtado supported two graduate and two undergraduate civil engineering students in research roles
    - Nicholas Lownes organized multiple outreach and seminar events including:
        - *UConn SoCEE Freshman Connect Event* (3 students)
        - *UConn College of Engineering Open House* (2 students)
        - *UConn Transportation and Urban Engineering Seminar Series*, attended by approximately 50 students
- **UMass Amherst**:
    - Michael Plotnikov presented during the Winter 2025 Seminar Series, attended by approximately 20 students and hosted in collaboration with the UMass ITE and WTS student chapters
- **Norwich University:** William Lyons supported two students in NEUTC research activities and led outreach to over 250 participants as part of the *First Lego League*
- **Fei Miao** (UConn): Engaged two students in NEUTC-related research and mentoring activities

1.2.3 Education and Workforce Development

We have made significant strides in education and workforce development, with a focus on integrating advanced educational programs and providing students with meaningful opportunities to develop academic and professional skills in transportation-related fields.

Hack-a-thon and Capstone Participants

NEUTC supported student engagement through structured, project-based learning experiences during this reporting period:

- **Norwich University**: 12 students participated in a Criminal Justice Capstone focused on transportation-related topics
- **University of Connecticut**: 16 students took part in senior design projects related to transportation systems and safety

These initiatives provided students with practical experience and applied problem-solving opportunities within the transportation domain.

NEUTC Peer Mentors and Mentees

During this reporting period, NEUTC supported a growing network of mentorship relationships between faculty, graduate students, and undergraduates engaged in transportation research:

- **Nicholas Kirsch** supported six students through mentoring activities related to NEUTC projects
- **Davis Chacón-Hurtado** mentored three students, including Devin Rhoads, Sophiya Shrestha, and an additional mentee
- **Isabelle Coppa Wandenkolk** mentored Declan Daley, an undergraduate student majoring in mathematics, economics, and computer science at UMass Amherst

These mentoring relationships provide students with hands-on experience, guidance, and professional development opportunities in the field of transportation.

Summer/Winter NEUTC Research Fellows

There were no NEUTC-supported summer or winter research fellows during this reporting period. However, planning is underway for the next cycle of the RIDE REU program at UMass Amherst. The upcoming cohort will once again be supported by the National Science Foundation, with additional contributions from NEUTC. This year's program will include participation from students at Holyoke Community College, expanding the reach of research and mentoring opportunities within the region.

Students Supported by NEUTC Projects

NEUTC has provided direct support to a total of **33 Ph.D. students**, **18 undergraduate students**, and **1 master's student** during this reporting period. These students have contributed to a wide range of transportation research projects, including infrastructure safety, crash prediction, public transit analysis, and emerging vehicle technologies. In addition, over **300 K-12 students** were engaged through outreach

activities such as the First Lego League and STEM-focused academies. This ongoing student involvement reflects NEUTC's strong commitment to developing the next generation of transportation researchers and professionals through experiential learning and faculty mentorship.

New Courses and Modules

NEUTC consortium members continued to integrate research findings into curriculum development, expanding educational offerings in transportation and related disciplines:

- **Egemen Okte**: A module on distress detection methods is under development for *CEE 515: Pavement Design* and is planned for launch in Spring 2026
- **Nicholas Kirsch**: Data fusion techniques from NEUTC research are being incorporated into a graduate-level course on *Estimation and Detection*
- **Krista Reichert**:
    - Launched a new *Certificate Program in Geographic Information Systems* (26 credits), including new courses in *Advanced GIS*, *Remote Sensing*, and a *GIS Capstone*
    - Enhanced curriculum modules in *Intermediate Algebra*, *College Algebra*, *Statistics*, and *Introduction to Engineering*
- **Davis Chacón-Hurtado**: Developed a case study option focusing on built infrastructure and crime for final project submissions in *ENG-HRTS 2300: Engineering for Human Rights* (Spring 2025)
- **Fei Miao**:
    - Integrated NEUTC-related content into *Introduction to Machine Learning* and *Embedded and Networked Systems* at UConn's School of Computing
- **William Lyons**: Developed and delivered instructional modules and courses including:
    - *Transportation for Public Finance*
    - *Designing a Transportation-Focused Capstone Course for Criminal Justice & Criminology Majors*

These curricular enhancements expand transportation education across engineering, computer science, and social science disciplines, connecting students to emerging topics and technical methods in the field.

K-12 Student Engagement

- **World is our Classroom**: Hosted about 120 students from the Springfield-area public high schools over the course of eight days at UMass' Aviation Research and Training facility adjacent to the Westover Air Reserve Base. These visits provided insights into aviation careers, airport management, and air traffic control. The day concluded with a visit to Union Station in Springfield where the students were exposed to career options within public transportation.
- **UMass** hosted a class of 8th graders from Mohawk Trail Regional School in Shelburne Falls. The students were given an introduction to transportation engineering and participated in an activity where they had to design their own roads using StreetMix. They concluded their day with some fun, visiting the award-winning UMass dining halls and ice skating at the Mullins Center.
- **Cole Fitzpatrick** presented to the 1st grade class at Fort River Elementary School in Amherst, MA. He introduced the students to engineering and taught them what civil engineers do. They covered a

wide range of topics such as “where does the water go when it rains?” and “why do we need speed limits?”

- **Holyoke Community College** hosted approximately 100 students during STEM week from several schools from both Holyoke and Springfield.

1.2.4 Technology Transfer

We are continually engaging in technology transfer activities, ensuring that the research findings and innovations are communicated effectively to stakeholders within the industry, government, and the general public. This engagement enhances the application of research outputs in practical settings and contributes to broader societal impacts.

NEUTC-Related Events and Attendance

NEUTC consortium members participated in and hosted several events during the reporting period, engaging students, researchers, and professional audiences:

- **Cyber-Informed Engineering Workshop**: NEUTC co-hosted a successful workshop alongside Norwich University’s CGRS, NUARI, and UMass’s University Transportation Center, drawing over 40 attendees. The event focused on cybersecurity threats to transportation infrastructure—such as bridges, tolls, and traffic systems—and introduced the principles of Cyber-Informed Engineering (CIE) as a proactive approach to mitigating risk and strengthening public safety.
- **Connecting Communities Workshop**: NEUTC hosted a two-day workshop centered on integrating community input into transportation research outreach. With participation from researchers, planners, and MassDOT representatives, the event emphasized the development of community-centered engagement strategies using real-world projects and included sessions on planning, outreach methods, and interactive discussion.
- **2024 Northeast Commercial Vehicle Safety Summit**: Led by UMassSafe with support from the Federal Motor Carrier Safety Administration, the summit focused on preventing commercial vehicle crashes through partnerships between universities and law enforcement. Held November 13–14 in Springfield, MA, the event featured active participation from NEUTC researchers who helped coordinate and run sessions aimed at enhancing safety, compliance, and collaboration across sectors.
- **NEUTC Webinar Series:** Two webinars were delivered during this reporting period. The first highlighted the first NEUTC-funded completed research project entitled “The Context of Crash Occurrence A Complexity-Infused Approach” and the second provided an overview of all the recently funded Year 2 NEUTC projects. These webinars cumulatively had over 100 attendees and resulted in great engagement and discussion. Multiple webinars are already scheduled during the next reporting period.
- **Krista Reichert** coordinated multiple outreach and career development events through the BHCC STEM Summer Academy:
    - 11 students visited NEUTC labs at UMass Amherst to engage with faculty and student researchers
    - A career poster session featuring speakers from the Massachusetts Bay Transportation

Authority drew 192 student attendees
    - Career workshops and a guest speaker event drew 35 and 20 student attendees, respectively

These events reflect NEUTC's ongoing commitment to sharing research, facilitating professional development, and connecting the academic community with transportation practitioners.

LTAP Engagements

From October 1, 2024, to March 31, 2025, we delivered 136 LTAP and 93 MassDOT safety-focused trainings, with 60% of LTAP and 82% of MassDOT sessions centered on safety. High-demand courses included "Fall Protection and Ladders," "Trenching and Excavation Safety," "Chainsaw Training," and "Flagger/First Aid Certification." New topics like "Truck Maintenance Essentials" and "Creating Accessible Communities" addressed evolving workforce needs. Trainings were offered in-person, virtually, and online to ensure broad access.

The UConn T2 Center remained active, delivering in-person workshops like Traffic Signal Inspector Training and Complete Streets planning, launching the 10th CT Transportation Leadership Program, and hosting a FHWA Proven Safety Countermeasures workshop. Virtual sessions and the CT Crossroads newsletter further supported ongoing professional development across Connecticut.

Media Requests

In addition to research-related engagements, the Connecticut Transportation Institute (CTI) at UConn and other NEUTC researchers have remained active in the media, contributing to public discussions on roadway safety, crash trends, and technology applications in transportation. During this reporting period, CTI contributed to more than 35 media stories across major news outlets.

Highlighted coverage includes:

- **NBC CT**: *Reckless on Our Roads* series, including segments on stop sign violations and pedestrian safety improvements
- **Hartford Courant** and **CT Insider**: Reports on rising traffic fatalities in Connecticut and the state's ongoing efforts to address them
- **WTNH News 8**: Coverage of CTI's use of vehicle black box data to support crash investigations
- **American Council of Engineering Companies (ACEC)**: *Engineering Influence* podcast featuring CTI's partnership with CTDOT on workforce initiatives
- **CBS News:** Prof. Francis Tainter provided a demonstration of UMass' Air Traffic Control (ATC) simulator and discussed how it can be used to train the next generation of air traffic controllers.

Additional media mentions include interviews, editorial commentary, and online coverage of speed camera programs, lane visibility initiatives, and pedestrian safety plans throughout the region.

Separately, **Shannon Roberts** was featured in *WalletHub*, *WWLP Mass Appeal*, and *Toyota Newsroom* articles related to teen driver safety and risk awareness. **Fei Miao**'s research on autonomous vehicle learning systems was highlighted in the *JHU Newsletter*.

Industry and Governmental Stakeholders Requests for Technical Assistance

NEUTC researchers received multiple requests for technical input and consultation from both public agencies and private organizations during this reporting period:

- **Eric Gonzales** provided input to South County Connector, a microtransit operator, on planning flex-route service options
- **Nicholas Kirsch** engaged with agencies such as the Federal Highway Administration (FHWA) and state departments of transportation in follow-up discussions related to ongoing research and technology applications
- **Bryan Reimer** was appointed to the *Task Force on Human Factors in Aviation Safety Aviation Rulemaking Committee (HF Task Force ARC)*, contributing transportation safety expertise to federal aviation rulemaking efforts
- **William Lyons** contributed to discussions on Cyber-Informed Engineering (CIE) and cybersecurity in transportation systems with MassDOT
- **Michael Plotnikov** and his research team held multiple meetings with members of the Massachusetts legislature to address challenges related to seat belt use in motorcoach transportation. These efforts have supported the development of a proposed amendment to the Massachusetts seatbelt law that would include motorcoaches under its scope

Social Media Engagements

- NEUTC researchers actively utilize platforms like LinkedIn to share insights, research findings, and discuss current trends in transportation, helping to keep the professional community informed and engaged. In addition, NEUTC has created its own **LinkedIn page**, which is steadily growing, currently with **140 followers** (up from 63 at the time of the last report). This platform serves as a hub for updates on research, events, and professional development opportunities, further expanding NEUTC's reach within the transportation community.
- NEUTC also launched a **YouTube channel** during this reporting period. This channel will serve as a repository to post recorded webinars.

Practitioner Attendance at Events

NEUTC-hosted and affiliated events during this reporting period drew strong participation from transportation practitioners, including representatives from state departments of transportation, municipal agencies, consulting firms, and industry partners. Notable examples include:

- The **Cyber-Informed Engineering Workshop**, co-hosted with Norwich University, welcomed over 40 attendees, including municipal and state transportation officials
- The **Connecting Communities Workshop** brought together researchers and practitioners for two days of focused engagement on public outreach strategies
- The **Northeast Commercial Vehicle Safety Summit**, led by UMassSafe with NEUTC support, convened participants from universities, enforcement agencies, and federal partners to discuss crash prevention
- **Michael Plotnikov** presented research at the *Commercial Vehicle Operations Conference* and

industry association meetings, reaching over 100 stakeholders from government, academia, and private transportation companies

- Events such as the *MassDOT Innovation Conference*, *VTRANS Symposium*, and seminars hosted at UMass, UConn, and BHCC included attendance by engineering professionals, state agency representatives, and local public works staff
- **UConn's T2 Center** delivered more than a dozen workshops and webinars attended by municipal and state personnel through its LTAP program

DOT Requests for Presentations or Proposals

MassDOT has requested research on several NEUTC topics including "Categorization of Vulnerable Road Users", "Effective Safety Messaging across Different Cultures", "Motorcycle Crashes in Left Turn Across Path Scenarios" and "Traffic Citation Values: An Analysis of Current Rates & Public Perception." Similarly, The "Community-Centered Traffic Safety" project will address traffic safety through a tailored approach, developing strategies such as evaluating citation structures, creating culturally relevant safety messages, and crowdsourcing community-specific concerns. Together, these initiatives involve interdisciplinary collaboration and emphasize transportation solutions across Massachusetts.

In advance of the forthcoming Year 3 Request for Proposals, NEUTC hosted a Research Needs session with our Advisory Board, which includes each of the six New England DOTs. The Advisory Board Members provided a myriad of research ideas that were directly added into the RFP to make certain these DOT priority areas are reflected with the proposals submitted and projects funded.

1.3 How have the results been disseminated?

As the NEUTC research, technology transfer and education projects progress, we anticipate increased opportunities to disseminate the results of our activities.

1.4 What do you plan to do during the next reporting period to accomplish the goals?

During the next reporting period we have planned several NEUTC activities that will directly support goal accomplishment

NEUTC will continue the expansion of our website, social media platforms, and webinar series to help with the dissemination of NEUTC news and activities.

Norwich University will host the **NEUTC Leadership Summit and 2nd Annual NEUTC Research Symposium** on May 19–20, 2025. The Leadership Summit will include interactive sessions, peer-based challenges, and team-building activities to strengthen leadership capabilities among students and early-career researchers. The NEUTC Research Symposium will feature a keynote panel, research workshops, poster sessions, and presentations highlighting current work from across the consortium.

NEUTC will also host a professional development short course titled **"Saved by a Traffic Engineer: Advancing Multimodal Safety through Research and Practical Use of the MUTCD and Other Design Guidance."** The session will provide an overview of recent updates to the MUTCD, incorporate guidance from AASHTO, NACTO, and ITE, and explore traffic signal timing strategies to improve safety across all modes.

2 Participants and Collaborating Organizations

2.1 What organizations have been involved as partners?

Partner organizations within the current reporting period include the New England Department of Transportation. Most notably has been the continued integration of MassDOT and CTDOT to align priority projects with NEUTC activities. Additionally, NEUTC has actively partnered with MassDOT in the planning/hosting of the MassDOT Innovation Conference for which registered attendance of over 1600 participants from the public and private sectors, industry and academia.

World is our Classroom – a 501C3 has partnered with NEUTC to expand their Bridging Expectations program to include K-12 outreach related to transportation for public school students. We are now partnering with WioC and the Springfield Public Schools to plan for a high school level transportation elective course.

2.2 Have other collaborators or contacts been involved?

We have engaged with other collaborators both within the UTC Program and outside of the UTC Program.

3 Outputs

3.1 Publications/presentations/conference papers

Since its launch, the New England University Transportation Center (NEUTC) has seen a steady increase in research activity, resulting in a growing number of peer-reviewed publications, invited presentations, and conference contributions. During this reporting period, NEUTC researchers published papers in leading journals such as the *International Journal of Sustainable Transportation*, *Transportation Research Record*, and *Transportation Research Part F*. Faculty and students also presented at major national and international venues, including the TRB Annual Meeting, MassDOT Innovation Conference, and academic seminars hosted by institutions such as MIT, Yale, and Johns Hopkins.

3.2 Policy papers

None yet to report.

3.3 Website and other engagements

The NEUTC website, launched in mid-January 2024, has served as a key platform for sharing news, event updates, and information on ongoing research projects. During this reporting period, the site recorded 2,330 visits from 2,018 unique users. In addition to the homepage, the most frequently viewed section was the “Projects” page—demonstrating strong interest in the research being conducted across the consortium and the site’s effectiveness in showcasing current initiatives.

In addition to our website, we have bolstered our LinkedIn presence, increasing the page to 140 followers. During this reporting period the page has attracted 158 visitors from 84 unique users.

3.4 New methodologies, technologies or techniques

None yet to report.

3.5 Inventions, patents, and/or licenses

None yet to report.

3.6 Other Products
None yet to report.

4 Outcomes

As NEUTC-supported research projects mature, several have begun to yield meaningful outcomes that contribute to transportation safety, planning, and technology development.

- **Truck Permitting and Infrastructure Resilience**: UMass researchers, in collaboration with MassDOT, are advancing a data-driven framework to manage increasing truck loads while mitigating damage to roadways and bridges. This work will inform future permitting practices and infrastructure design standards.
- **Crash Typology and Targeted Interventions**: A spatial crash typology developed using over 220,000 crash records from three states is enabling researchers to identify distinct crash patterns and propose location-specific mitigation strategies. A journal manuscript based on this work is under review.
- **Microtransit and Safety**: NEUTC-supported analysis of rural microtransit services in Massachusetts has quantified safety benefits such as reduced pedestrian exposure to high-speed roadways without sidewalks. These findings support evidence-based evaluations of emerging transit models.
- **Crash Forensics and Vehicle Data**: UConn researchers have demonstrated the value of electronic crash data from vehicle systems in supporting law enforcement investigations and enhancing understanding of driver behavior pre- and post-crash.
- **Trust and Human-Machine Interfaces in AVs**: UMass research is exploring the use of interface design and behavioral modeling to foster passenger trust in Level 4 automated vehicles, with early findings presented at HFES conferences.
- **Behavior and Network Analysis from Crash Reports**: Using 60,000 FARS crash reports, researchers have developed a behavior typology from narrative analysis, which can help classify crashes even when descriptive data is absent—improving targeting of interventions.
- **Technology Integration and AI in CAV Safety**: UConn-led projects have made significant advances in explainable AI, trajectory prediction, and reinforcement learning frameworks for connected and automated vehicle (CAV) coordination. Early results have been presented at top conferences, including ICRA 2025.

Collectively, these outcomes reflect NEUTC's growing research footprint and its contributions toward safer, more efficient, and technologically robust transportation systems.

5 Impacts

5.2 Impact on the effectiveness of the transportation system
NEUTC's focus on understanding human interactions within a complex and dynamic transportation landscape is aimed at improving both safety and operational efficiency. Our research supports safer

travel, better integration of multiple transportation modes, and strategies to reduce congestion—contributing to more reliable and effective transportation systems.

5.3 Impact on the adoption of new practices, or instances where research outcomes have led to the initiation of a start-up company

Nothing to report.

5.4 What is the impact on the body of scientific knowledge?

Highlighted in Section 1.2.1

5.5 What is the impact on transportation workforce development?

Highlighted in Section 1.2.3

6 Changes/problems

As we approach the midpoint of year two for NEUTC we are happy to report no specific changes needed or problems encountered.

6.1 Changes in approach and reasons for change

NEUTC is making all efforts to ensure that all activities, including research projects, workshops and educational activities are compliant with the recent series of Executive Orders related to transportation.

An additional change is that the Site Director from the University of Maine has left the region and is now a faculty member at Oklahoma University. We are actively working to address next steps on the path forward.

6.2 Actual or anticipated problems or delays and actions or plans to resolve them

None to report

6.3 Changes that have a significant impact on expenditures

None to report

6.4 Significant changes in use or care of human subjects, vertebrate animals, and/or biohazards

None to report

6.5 Change of primary performance site location from that originally proposed

None to report.

7 Special Reporting Requirements

N/A