#### Semi-Annual Report for University Transportation Centers

U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology (OST-R) Federal Grant No. 69A3551747104

Project Title: Southeastern Transportation, Research, Innovation, Development & Education Center (STRIDE)

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Recipient Organization: U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology (OST-R) (Dawn Tucker-Thomas, M.S., J.D., UTC Grant Manager) 1200 New Jersey Ave, S.E. Washington, DC 20590

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Stapenda

Signature of Submitting Official:

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### NOTE OF IMPORTANCE

A no-cost extension was granted to the STRIDE Center during the performance period through September 30, 2024.

# ACCOMPLISHMENTS

#### What are the primary goals of the program?

- To develop novel strategies for reducing congestion in the southeast and nationally by considering new technologies in vehicles, telecommunications, shared autonomy in transportation, driver/traveler behavior, and financial constraints. We focus on five research thrusts: Technology, Management, Data, Design, and Users.
- To implement the research products developed from these strategies and to make them available to the practitioner community. The STRIDE Center continues to work closely with state DOTs in the region and other stakeholders via the Center's technology transfer, education, and workforce development activities to disseminate the results of our work and facilitate implementation.

#### What was accomplished under these goals?

- STRIDE Workforce Development Summit The University of Florida Transportation Institute's Technology Transfer (T2) Center, in partnership with The Citadel and Tennessee Technical University, organized a multi-day event in May 2023. The event featured insightful sessions focused on various aspects of traffic signal technology and was an integral part of the Workforce Development Summit. See the following link for the details: <u>https://techtransfer.ce.ufl.edu/training/stride-workforce-development-summit/</u>.
- YEAR 1 Projects: Completed.
- **YEAR 2 Projects:** Sixteen of 17 projects are now completed. The final reports, including the technology transfer reports (TTR), the project briefs (PB), and the webinars, have been posted to the STRIDE Center's <u>project webpage</u>. We will disseminate the results of these projects via Constant Contact send them to TRB for inclusion in their e-newsletter. All except two completed projects have an associated TTR, and we are developing the <u>PBs</u>. Webinars related to these projects have been recorded (see <u>recorded webinars</u> <u>page</u>). The PIs have uploaded the data for these projects into the <u>Zenodo repository</u>. The 16 completed projects for Year 2 are:
  - > Project A2 Changing Access to Public Transportation & the Potential for Increased Travel
  - > Project B2 Evaluation of Work Zone Mobility by Utilizing Naturalistic Driving Study Data
  - Project C2 Urban Freight & Planning
  - Project D2 UF & UAB's Phase I Demonstration Study: Older Driver Experiences with Autonomous Vehicle Technology
  - Project E2 Establishing A Dual Generational Modality Dataset: Comparing the ride-sharing adoption trends and perspectives of consumers from two generational cohorts, Millennials and Gen X'ers
  - Project F2 Discovering Potential Market for the Integration of Public Transportation & Emerging Shared-Mobility Services
  - Project G2 Quantitatively Evaluate Work Zone Driver Behavior Using 2D Imaging, 3D LiDAR, and Artificial Intelligence in Support of Congestion Mitigation Model Calibration and Validation (recently completed)
  - > Project H2- Fly-By Image Processing for Real-Time Congestion Mitigation
  - Project 12 Mitigating Network Congestion by Integrating Transportation Network Companies and Urban Transit
  - > Project J2 Real-Time Based Decision Support System for Arterial Traffic Management

- Project K2 Assessing and Addressing Deficiencies in the HCM Weaving Segment Analyses (this report has been sent to the TRB Newsletter and accepted for publication)
- Project L2 Understanding Relationships Between the Built Environment, Physical Activity, Public Health, Urban Mobility, and Traffic Congestion: Graduate Curriculum Development
- Project M2 Comparing and Combining Existing and Emerging Data Collection and Modeling Strategies in Support of Signal Control Optimization and Management
- > Project N2 Data Fusion for Signalized Arterial Performance Measurement
- Project O2 Macroscopic Fundamental Diagram Approach to Traffic Flow with Autonomous /Connected Vehicles.
- Project Q2 -Enabling the Shared Transportation Revolution

Year 2 has one remaining project that has yet to be completed:

Project P2 – Development of Guidance for Scheduling of Freeway Work Zones to Minimize Congestion Impacts

We anticipate receiving a draft final report with the peer review process by the end of 2023 and a finalized report by April 2024.

- **YEAR 3 Projects:** There are 11 projects, and all but one has been completed. The completed projects are:
  - Project A3 UF & UAB's Phase 2 Demonstration Study: Developing a Model to Support Transportation System Decisions considering the Experiences of Drivers of all Age Groups with Autonomous Vehicle Technology
  - > Project B3 Micro-Mobility as a Solution to Reduce Urban Traffic Congestion
  - > Project C3 Emerging Micromobility Services for the Transportation Disadvantaged
  - Project D3 Evaluating Detours for a Major Construction Project in the Era of Real-Time Route Guidance
  - > Project E3 Locating and Costing Congestion for School Buses and Public Transportation
  - Project G3 Utilization of Connectivity and Automation in Support of Transportation Agencies' Decision Making
  - > Project H3 Smartphone-Based Incentive Framework for Dynamic Network-Level Traffic
  - Congestion Management
  - > Project 13 Evaluation of Work Zone Mobility by Utilizing Naturalistic Driving Study Data, Phase II
  - > Project J3 Identifying and Mitigating Congestion Onset
  - Project K3 Traffic Congestion Identification and Prediction based on Image Processing and Deep Learning Methods

The ongoing project is:

Project F3 - Traffic Congestion Identification and Prediction based on Image Processing and Deep Learning Methods

The PI working on the draft final report. We anticipate that this project will be wrapped up by April 2024.

A list of Year 3 projects is available at <u>https://stride.ce.ufl.edu/stride-research/active-research-projects/.</u> Once completed, final reports (including the TTRs, the PBs, and the webinars) will be posted to the STRIDE Center's project webpage. The results will be disseminated via Constant Contact, and final reports will be sent to TRB for inclusion in their e-newsletter. All completed projects will have a TTR, <u>PB</u>, and a recorded <u>webinar</u>. The PIs will upload their data into the <u>Zenodo repository</u>. • **YEAR 4 Projects:** Four of the six projects of Year 4 have been completed. Two projects are ongoing (one is in the peer review process):

Completed projects:

- Project A4 Addressing Unpredictable Sources of Congestion
- Project C4 Framework for the Development of a Diverse Transportation Workforce in the Southeast Region
- > Project D4 Mobility-on-Demand Transit for Smart, Sustainable Cities
- > Project F4 Automatic Safety Diagnosis in Connected Vehicle Environment

Two ongoing projects:

- Project B4 Integrated Corridor Management: Cooperative Signal Control with Freeway Operations and Ramp Metering (In peer review)
- > Project E4 Innovative Intersection and Interchange Designs and Their Use Across the Southeast

A list of Year 4 projects is available at <u>https://stride.ce.ufl.edu/stride-research/active-research-projects/</u>. Once completed, final reports (including the TTRs, the PBs, and the webinars) will be posted to the STRIDE Center's project webpage. The results will be disseminated via Constant Contact, and final reports will be sent to TRB for inclusion in their e-newsletter. All completed projects will have a TTR, <u>PB</u>, and a recorded <u>webinar</u>. The PIs will upload their data into the <u>Zenodo repository</u>.

• **YEAR 5 Projects:** There are a total of nine projects. Three are ongoing, five have been completed, and one project is in the peer review process:

Completed projects:

- Project A5 Barriers and Facilitators of People with Disabilities in Accepting and Adopting Autonomous Shared Mobility Services
- > Project D5 Overcoming Barriers to Freight & Logistics Firm Collaboration with Urban Planning
- Project E5 Transportation Workforce Development for State DOTs to Address Equity, Diversity, and Inclusion in the Southeast Region
- Project J5 Assessing and Addressing Deficiencies in the HCM Weaving Segment Analyses (Phase 2 of Project D)
- Project K5 A Better Understanding of Shopping Travel in the U.S.

Ongoing projects:

- Project F5 Transportation Workforce Development Related to Traffic Signal Systems Phase II (in peer review)
- Project G5 Engineering Careers from a Unique Summer Bridge Program
- > Project H5 (supplement to J3, Phase 2) Identifying and Mitigating Congestion Onset (Phase II)
- Project I5 Evaluation of Advanced Vehicle & Communication Technologies through Traffic Microsimulation; Project J5 – Assessing and Addressing Deficiencies in the HCM Weaving Segment Analyses/Phase II

All Year 5 projects are posted at <u>https://stride.ce.ufl.edu/stride-research/active-research-projects/</u>. Once completed, the final reports (including the TTRs, the PBs, and the webinars) will be posted to the STRIDE Center's project webpage. The results will be disseminated via Constant Contact, and final reports will be sent to TRB for inclusion in their e-newsletter. All completed projects will have a TTR, <u>PB</u>, and a recorded <u>webinar</u>. The PIs will upload their data into the <u>Zenodo repository</u>.

• **YEAR 6 Projects:** Two of the 15 total projects in Year 6 have been completed. Nine are in the peer review process, and four are ongoing:

Completed Projects:

- *K6 A Curriculum for Transportation Equity (COMPLETED)*
- L6 Locating and Costing Congestion for School Buses and Public Transportation, Phase II (COMPLETED)

Ongoing Projects:

- A6 Public Microtransit Pilots: System Assessment and Equity Considerations Based on the NC Experience (ongoing)
- B6 Optimal Charging Station Planning to Adapt Mass Adoption of Electric Vehicles under Both Normal and Evacuation Scenarios (ongoing)
- D6 Centralized Clearinghouse for Transportation Workforce Development Resources for the Southeastern Region (peer review)
- > E6 State DOT Policies Affecting Adaptive Street Use (peer review)
- > F6 Simulating a Shift to E-Delivery: Impacts on VMT (peer review)
- G6 Phase 2: Evaluating Signal Timing Planning Options in Terms of Coordination between Successive Signals at Continuous Flow Intersections (peer review)
- H6 Utilization of Connectivity and Automation in Support of Transportation Agencies' Decision-Making – Phase 2 (ongoing)
- > 16 Macroscopic Fundamental Diagram Estimation using Loop-Detector Data (peer review)
- > J6 Implementation Project: Planning for Urban Freight (peer review)
- M6 Analysis of Impacts of Pavement Quality Deterioration on Recurring Traffic Congestion (peer review)
- O6 Real-time Safety Diagnosis System for Connected Vehicles Using Parallel Computing (peer review)
- > P6 Equitable Artificial Intelligence in Transportation (peer review)
- > R6 WKF STRIDE K-12 Curriculum: Exploring Innovations in Transportation (ongoing)

All Year 6 projects will be completed by Spring 2024.

- STRIDE Ongoing and Completed Projects: A list of all STRIDE projects (ongoing and completed) can be found on the STRIDE website at <a href="https://stride.ce.ufl.edu/research-2/active-research-projects/">https://stride.ce.ufl.edu/research-2/active-research-projects/;</a> they are also included at the end of this report. We have created project-specific web pages for each STRIDE-funded project to provide the required Project Information sheets, links to final reports, and links to recorded webinars, products, related news, and any other information related to the project.
- **Students Supported by STRIDE:** Thirty-four master's students and 39 Ph.D. students were supported by STRIDE during the reporting period. The grant also supported six undergraduate students.
- I-STRIDE Fall 2022 Newsletter: The STRIDE Center's Spring 2023 newsletter was released on June 13, 2023. Contents included a story on the visit to SunTrax during Plugfest 2023, where STRIDE-affiliated researchers tested an algorithm that reduces vehicles' time at traffic signals and improves pedestrian safety, a story on the Center's Student of the Year, an activities booklet related to transportation engineering design for 5<sup>th</sup> to 12<sup>th</sup> graders, and more. The complete newsletter can be viewed at <a href="https://conta.cc/43zfbF3">https://conta.cc/43zfbF3</a>.
- STRIDE Training for Implementation of Advanced Technologies through I-STREET: STRIDE is planning an I-STREET-related training program funded by FDOT through a matching project, including lessons learned

on implementing advanced technologies. The program will provide course offerings on autonomous and connected vehicles, data analytics, and sensors for transportation applications. The planning of this initiative is funded by FDOT under a match project. FDOT is reviewing the plan developed for further action.

- Work in Progress for STRIDE Spring 2023 Newsletter: The next STRIDE newsletter (fall 2023) is scheduled to be released in early December 2023.
- Research Project Briefs (no change): STRIDE continues to produce 2-page Project Briefs for each completed project, summarizing the project products and findings. STRIDE also continues to create final report "packages," which contain the final report, the project brief, the technology transfer report, and links to associated webinars. This final report package is sent via Constant Contact to transportation professionals, students, alumni, and other stakeholders. For a complete list of the Project Briefs, visit <a href="https://stride.ce.ufl.edu/technology-transfer/products/">https://stride.ce.ufl.edu/technology-transfer/products/</a>.
- **STRIDE Webinars:** During this performance period, 15 webinars related to STRIDE projects were held from October 5, 2022, to March 8, 2023. To view upcoming and the list of archived webinars, including their recordings, visit <a href="https://stride.ce.ufl.edu/technology-transfer/workshops-webinars-conferences/">https://stride.ce.ufl.edu/technology-transfer/workshops-webinars-conferences/</a>.

#### List of Awards and Recognitions

• Southern District Institute of Transportation Engineers (SDITE) Excellence in Transportation Engineering Education Award, Dr. Dimitra Michalaka, The Citadel

#### K-12 Outreach / Workforce Development Activities

STRIDE (at UF) was awarded a grant from the CUTC New Initiative Projects, where a new undergraduate course on Careers in Transportation was developed. Ines Aviles-Spadoni gave a presentation related to this course to attendees at the 2023 CUTC Summer Meeting at Florida International University in Miami. As additional background information, this course was piloted in Fall 2022, where 37 speakers presented their profession and career path to undergraduate students, graduate students, and transportation professionals seeking to explore career alternatives within transportation were welcomed to attend. Students were required to complete an elevator pitch, a personal Odyssey Plan, an informational interview, and a Professional Profile project to develop their skills. Weekly assignments included readings, videos, podcasts, and activities related to transportation issues. The final report for the project can be found at <a href="https://stride.ce.ufl.edu/wp-">https://stride.ce.ufl.edu/wp-</a>

content/uploads/sites/153/2023/04/CUTC-Final-Report-Careers-in-Transportation-April-2023.pdf.

Ines Aviles-Spadoni has been invited to present about this course via a webinar hosted by the Institute of Transportation Engineers (ITE) Education Council on Thursday, November 30, 2023.

#### How have the results been disseminated?

# (Note: The information contained in this section mostly remains the same. However, some information in the bulleted list has been updated.)

- The STRIDE Center continues to send final reports to TRB for inclusion in their weekly E-Newsletter to disseminate research results and products to the transportation community.
- Product Briefs are created, which summarize the research and any associated products. They are incorporated into a Constant Contact email for broader dissemination.
- The Product Briefs are created to promote the various products developed from STRIDE-funded projects and can be found at <a href="https://stride.ce.ufl.edu/technology-transfer/products/">https://stride.ce.ufl.edu/technology-transfer/products/</a>.
- Thirty-seven briefs have been completed to date. That's six more than the previous performance period. All briefs are available on the STRIDE website on the <u>Products page</u> (<u>https://stride.ce.ufl.edu/technology-transfer/products/</u>).
- The STRIDE Center uses Facebook, Twitter, LinkedIn, and Constant Contact to disseminate the results of research, to raise awareness about ongoing research projects, to promote opportunities for students

(conferences, symposia, poster sessions), to advertise upcoming webinars and distinguished speakers, and to provide information on the various K-12 outreach activities taking place at the Center.

- Final reports are posted on the STRIDE website and each project-specific page. Visit the Research Project page at <a href="https://stride.ce.ufl.edu/stride-research/final-reports/">https://stride.ce.ufl.edu/stride-research/final-reports/</a>. (Note: Both active and completed projects are posted on this page.)
- Project PIs publish the results of their research in refereed journal publications and regularly present research in progress at technical conferences.
- STRIDE organizes webinars for each research project, which are recorded and available through our <u>YouTube channel</u>. The complete list of webinars is found at <u>https://stride.ce.ufl.edu/technology-transfer/workshops-webinars-conferences/</u>.
- Project PIs regularly present their research to various stakeholders. The STRIDE Center tracks interactions between project PIs (and their teams) and stakeholders via progress reports, email communication, and through the Technology Transfer reports due after each project (in addition to the final/technical report). STRIDE continuously encourages researchers to work closely with stakeholders to obtain feedback on their research scope and methodology and assist with disseminating their research findings.
- STRIDE continues to update the project-specific pages on its website. The project-specific pages provide a comprehensive list of all activities and products related to each STRIDE-funded project. These include the following: final reports, webinars, workshops, technology transfer reports, project briefs, presentations, and publications. For an example of such a page, visit the Research Projects page at <a href="https://stride.ce.ufl.edu/stride-research/active-research-projects/">https://stride.ce.ufl.edu/stride-research/active-research-projects/</a>. (Note: Both active and completed projects are posted on this page.)

#### What do you plan to do during the next reporting period to accomplish the goals and objectives?

The STRIDE Center received a no-cost extension to September 30, 2024. Our focus during the next reporting period is to complete the remaining projects in Years 2, 3, 4, and 5. We expect Year 6 projects to be completed by early spring 2024. We are working to ensure proper steps are taken to close out the STRIDE grant.

- **Year 2 Projects:** Work with PI to finalize Project P2 (Turochy, *Development of Guidance for Scheduling of Freeway Work Zones to Minimize Congestion and Safety Impacts*).
- Year 3 Projects: We expect a draft final report for Project F3 by the end of October 2023. The draft final will have to be peer-reviewed. We hope this project will be wrapped up by March 2023 (Davis, Evaluation of Transportation Network Infrastructure, Safety, and Travel Route Characteristics of Bike Share, Electric-Powered Pedal-Assist Bike Share, and Electric Scooter System Operation).
- Year 4 Projects: Projects B4 (Hajbabaie Integrated Corridor Management: Cooperative Signal Control with Freeway Operations and Ramp Metering) is currently being peer-reviewed, and E4 (Guin Innovative intersection and interchange designs and their use across the Southeast) is still in progress. We anticipate both projects to be completed by early Spring 2024.
- Year 5 Projects: Project F5 is under peer review, and projects G5, H5 (Phase 2 of Project J3), and I5 are ongoing, and we anticipate a draft final by December 2023. We anticipate closing out these projects by early Spring 2024. We will monitor these projects closely to ensure they meet their deadline.
- Year 6 Projects: Projects D6, E6, F6, G6, I6, J6, M6, O6, and P6 are currently in the peer review process. We expect that these will be completed by December 2023. Projects A6, B6, H6, and R6 (WKF) are ongoing. We expect to have a draft final report by November 2023, but the reality is that these projects will most likely be completed and closed out by Spring 2024. We will monitor these projects to make sure they are completed on time.
- We will publish the STRIDE Center's Fall 2023 newsletter by early December 2023.
- We will continue coordinating all consortium activities with the STRIDE Internal Steering Committee via monthly Zoom meetings.
- We will continue to monitor research projects through progress reports every quarter. Each piece is reviewed to ensure adequate progress is made, to collect metrics, and for invoicing purposes.

- We will continue to develop 2-page Project/Product Briefs as projects are completed.
- We will continue to send finalized reports to TRB for inclusion in their newsletter and on various other social media platforms (LinkedIn, Twitter, FB) associated with the STRIDE Center and the University of Florida Transportation Institute.
- We will continue to host webinars related to ongoing or completed STRIDE projects. A schedule of the upcoming webinars is provided at <a href="https://stride.ce.ufl.edu/technology-transfer/workshops-webinars-conferences/">https://stride.ce.ufl.edu/technology-transfer/workshops-webinars-conferences/</a>.

# OUTPUTS

The STRIDE Center uses the following metrics to assess the OUTPUTS related to its technology transfer program. Eighty-nine products and forty-eight technical reports have been completed so far. The table below summarizes those outputs. Researchers have <u>exceeded the product targets</u> in Years 1, 2, 3, and 4 thus far.

METRIC	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL		
	Target / Completed								
Product(s): Number of new or improved tools, technologies, products, methods, practices, and processes to reduce congestion	9 / <b>20</b> *	18 / <b>36</b> *	11 / 22*	6 / <b>8</b> *	9 / 3*	15 / <b>0</b> *	89* Products (no change from the last performance period)		
Technical Report: Number of client- based technical reports published about approaches to congestion mitigation	10 / <b>10</b> *	17 / <b>17</b> *	11 / <b>10*</b>	6 / <b>4</b> *	9 / 5*	15 / <b>2</b> *	48* Technical Reports		

\* Totals are calculated from this reporting period and all prior reporting periods.

#### Products

No new products were reported during this performance period. To date, the total number of products completed to date is 72. The STRIDE Center expects to report additional products during the next reporting period.

#### Completed Technical Reports

Forty-seven projects out of a total of 68 have been completed. Of the remaining 21 projects, 11 are in peer review, and ten are active. The following projects are completed (all active and completed projects can be found on the STRIDE website at <a href="https://stride.ce.ufl.edu/stride-research/active-research-projects/">https://stride.ce.ufl.edu/stride-research/active-research-projects/</a>):

- 1. Project A-Impact of Smartphone Applications on Trip Routing & Congestion Management
- 2. Project B -Technology Influence on Travel Demand & Behaviors
- 3. Project C-Performance Measurement & Management Using Connected & Automated Vehicle Data
- 4. Project D-Evaluation of Advanced Vehicle and Communication Technologies through Traffic Microsimulation
- 5. Project The Challenges of Predicting Travel Behavior on Estimating Trip Generation: Local Traffic Impact Assessment in Four Southeastern and Mid-Atlantic States
- 6. Project F-Integrated Implementation of Innovative Intersection Designs
- 7. Project G-Transit in the Era of Shared Mobility
- 8. Project H Strategies for Mitigating Congestion in Small Urban & Rural Areas

- 9. Project I-Freeway Management for Optimal Reliability
- 10. Project J- Improving Work Zone Mobility through Planning, Design, and Operations
- 11. Project A2-Changing Access to Public Transportation & the Potential for Increased Travel
- 12. Project B2-Evaluation of Work Zone Mobility by Utilizing Naturalistic Driving Study Data
- 13. Project C2-Urban Freight & Planning
- 14. Project D2-UF & UAB's Phase I Demonstration Study: Older Driver Experiences with Autonomous Vehicle Technology
- 15. Project E2 Establishing a Dual Generational Modality Dataset: Comparing the Riding-Sharing Adoption Trends & Perspectives of Consumers from Two Generational Cohorts, Millennials & Gen X'ers
- 16. Project F2-Discovering Potential Market for the Integration of Public Transportation & Emerging Shared-Mobility Services
- 17. Project G2 Quantitatively Evaluate Work Zone Driver Behavior using 2D Imaging, 3D Lidar, & Artificial Intelligence in Support of Congestion Mitigation Model Calibration & Validation
- 18. Project H2-Fly-By Image Processing for Real-Time Congestion Mitigation
- 19. Project I2 Mitigating Network Congestion by Integrating Transportation Network Companies and Urban Transit
- 20. Project J2 Real-Time Data-Based Decision Support System for Arterial Traffic Management
- 21. Project K2-Assessing and Addressing Deficiencies in the HCM Weaving Segment Analyses
- 22. Project L2 Understanding Relationships Between the Built Environment, Physical Activity, Public Health, Urban Mobility, and Traffic Congestion: Graduate Curriculum Development
- 23. Project M2-Comparing and Combining Existing and Emerging Data Collection and Modeling Strategies in Support of Signal Control Optimization and Management
- 24. Project N2 Data Fusion for Signalized Arterial Performance Measurement
- 25. Project O2- Macroscopic Fundamental Diagram Approach to Traffic Flow with Autonomous/Connected Vehicles
- 26. Project Q2 Enabling the Shared Transportation Revolution
- 27. Project A3 UF & UAB's Phase 2 Demonstration Study: Developing a Model to Support Transportation System Decisions considering the Experiences of Drivers of all Age Groups with Autonomous Vehicle Technology
- 28. Project B3 Micro-Mobility as a Solution to Reduce Urban Traffic Congestion
- 29. Project C3 Emerging Mobility Services for the Transportation Disadvantaged
- 30. Project D3 Evaluating Detours for a Major Construction Project in the Era of Real-Time Route Guidance
- 31. Project E3 Locating and Costing Congestion for School Buses and Public Transportation
- Project G3 Utilization of Connected and Automated Vehicles in Support of Transportation Agencies' Decision Making
- 33. Project H3 Smartphone-Based Incentive Framework for Dynamic Network-Level Traffic Congestion Management
- 34. Project I3 Evaluation of Work Zone Mobility by Utilizing Naturalistic Driving Study Data, Phase II
- 35. Project J3 Identifying and Mitigating Congestion Onset
- 36. Project K3 Traffic Congestion Identification and Prediction based on Image Processing and Deep Learning Methods
- 37. Project A4 Addressing Unpredictable Sources of Congestion
- 38. Project C4 Transportation Workforce Development for State DOTs to Address Congestion for the Southeast Region
- 39. Project D4 Mobility-on-Demand Transit for Smart, Sustainable Cities
- 40. Project F4 Automatic Safety Diagnosis in Connected Vehicle Environment
- 41. Project A5 Barriers and Facilitators of People with Disabilities in Accepting and Adopting Autonomous Shared Mobility Services

- 42. Project D5 Overcoming Barriers to Freight and Logistics Firm Collaboration with Urban Planning
- 43. Project E5 A Framework to Promote Diversity and Inclusion in Workforce Development in Southeast States
- 44. Project J5 Assessing and Addressing Deficiencies in the HCM Weaving Segment Analyses Project J5 (Phase II of Project K2)
- 45. Project K5 A Better Understanding of Shopping Travel in the U.S.
- 46. Project K6 A Curriculum for Transportation Equity
- 47. Project L6 Locating and Costing Congestion for School Buses and Public Transportation, Phase II

#### Publications, Conference Papers, Posters& Presentations

The following publications, conference papers, posters, and presentations were completed during the reporting period.

Project #	Description	Date	Туре
115 (12	Dracanted research at the Annual Masting of the North Carolina		
	Section of the Institute of Transportation Engineers (ITE)	11/0/2022	procontation
Phase 2)	Section of the institute of Transportation Engineers (TE)	11/8/2023	presentation
	Mobile Battery Swapping Service: Leveraging MPC and Deep		
	Reinforcement Learning: Transportation Research Board Appual		
B6	Meeting 2024 (Accepted)	10/2023	naper
	Presented at the Department of Energy's National Renewable		hah e.
	Energy Laboratory on Charging on-Demand Innovations		
B6	Leveraging Optimization and Machine Learning	9/26/2023	presentation
	Meeting with transportation specialists at Saudi Aramco Group		
B6	on Emerging Mobile Chargin as a Service (CaaS)	3/22/2023	presentation/meeting

# OUTCOMES

The STRIDE Center uses the metrics in the table below to assess the OUTCOMES related to its technology transfer program. One hundred and ten trainings serving 5,477 professionals have been held for STRIDE projects. Researchers have <u>exceeded or met the targets</u> for the number of training and the number of professionals trained for Year 1, Year 2, Year 3, Year 4, and Year 5 projects thus far.

METRIC	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6*	Other	TOTAL	
	Target / Completed								
Body of	9 / <b>25*</b>	18 / <b>34</b> *	11 / <b>25</b> *	6 / <b>7</b> *	9 / <b>15*</b>	15/4*	n/a	110*	
Knowledge:								Training	
Training for									
professionals									
Professionals	90 /	180 /	110 /	60/ <b>233*</b>	90 / <b>676*</b>	150/140*	n/a	5477*	
Trained	1336*	1970*	1122*					Professionals	
								trained	

\* Totals include this and all prior reporting periods.

#### Training & Professionals Trained

Ten trainings engaged 668 professionals during the reporting period, as shown in the table below. There were 226 views of YouTube recordings of STRIDE product videos and webinars.

Project #	Training	Date	# Trained	YouTube Views
Р6	STRIDE Webinar: Artificial Intelligence (AI) Applications in Transportation: Key Concepts, Use Cases, & Workforce Development Issues	9/5/2023	102	Video to be edited and uploaded
06	STRIDE Webinar: Real-time Safety Diagnosis System for Connected Vehicles with Parallel Computing Architecture	9/13/2023	8	Video to be edited and uploaded
L6	STRIDE Webinar: Locating and Costing Congestion for School Buses and Public Transportation Phase II	8/29/2023	12	12
15	STRIDE Webinar: Evaluation of Advanced Vehicle and Communication Technologies through Traffic Microsimulation	7/26/2023	56	11
F6	STRIDE Webinar: Travel Implications of a Shift to E-Delivery	7/20/2023	18	16
F5	STRIDE Workforce Development Summit (see <u>https://techtransfer.ce.ufl.edu/training/stride-workforce-</u> <u>development-summit/</u> ) 48	5/19 to May 22, 2022	329	N/A
A5	STRIDE Webinar: Barriers & Facilitators of People with Disabilities in Accepting Autonomous Shared Mobility Services	5/3/2023	39	48
E4	STRIDE Webinar: Innovative Intersection and Interchange Designs and Their Use Across the Southeast	4/26/2023	55	96
H5 (J3, Phase 2)	STRIDE Webinar: Addressing Unpredictable Sources of Congestion on Freeways	4/19/2023	22	20
P2	STRIDE Webinar: Modeling of Freeway Work Zones to Support Project Management	4/5/2023	27	23

### IMPACTS

The STRIDE Center uses the metrics listed in the table below to assess the IMPACTS related to its technology transfer program. Over 192 meetings with stakeholders have been conducted since the beginning of the grant.

Some researchers meet with stakeholders on a weekly or biweekly basis. Twenty-three products have been adopted or implemented to date. Researchers have <u>exceeded the target</u> number of stakeholders for Year 1, Year 2, Year 3, Year 4, and Year 5 thus far.

METRIC	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
	Total / Completed						
<b>Stakeholders:</b> Number of stakeholders (agencies, businesses, etc.) you meet with to encourage the adoption or implementation of congestion mitigation approaches	9 / <b>13</b> *	18 / <b>80*</b>	11 / <b>54</b> *	6 / <b>24</b> *	9 / <b>18</b> *	15 / <b>11</b>	200* Stakeholder Meetings
Adoption/Implementation: Number of incidences in congestion mitigation outputs of research that have been implemented or adopted (ex. decision making, practices, methods, analytical tool, data/database, software, policy change, behavior analysis, commercialization)	2 / <b>2</b> *	2 / 12*	2 / 2*	2/4*	2 / <b>3</b> *	2 / <b>0</b> *	23* Products Adopted/ Implemented (no change from the last performance period)

\* Totals include this and all prior reporting periods.

#### Stakeholder Meetings

Researchers working on Project (B6 - Optimal Charging Station Planning to Adapt Mass Adoption of Electric Vehicles under Both Normal and Evacuation Scenarios) met with a stakeholder.

Project #	Stakeholder(s)	Date	Description
B6	DOE- National Renewable Energy Laboratory	9/26/2023	Meeting and presentations

#### **Product Adoption**

There were no product adoptions during the reporting period. Twenty-three products have been adopted or implemented (see Impacts section).

# CHANGES/PROBLEMS

- Changes in approach and reasons for change NOTHING TO REPORT
- Actual or anticipated problems or delays and action or plans to resolve them Although the COVID-19 pandemic caused the cancellation or postponement of several events and activities, the recent relaxation of pandemic rules has allowed our researchers to carry out their normal research activities during these past six months.
- Changes that have a significant impact on expenditures NOTHING TO REPORT
- Significant changes in the use or care of human subjects, vertebrate animals, and/or biohazards **NOTHING TO REPORT**

• Change of primary performance site location from that proposed initially - NOTHING TO REPORT

# SPECIAL REPORTING REQUIREMENTS

• NONE

## STRIDE Year 1, Year 2, Year 3, Year 4, Year 5, and Year 6 List of Projects

The complete list of projects can be found at: <u>https://stride.ce.ufl.edu/stride-research/active-research-projects/</u>)

# **Cost Share Projects**

There are three new cost-share projects at the University of Florida (see below) and three additional cost-share projects to report from the STRIDE consortium members.

*Explore the Use of Tele-operated/Autonomous Vehicle (AV) to Assist Road Ranger Service Patrol (RRSP) in Responding to Incidents*, BED31-977(Florida Department of Transportation), PI: Dr. Nithin Agarwal, University of Florida

Scan and Review of Autonomous Shuttle Operations and Other Personal Transportation Options Affecting Autonomous Transit Viability, BED31-977-22 (Florida Department of Transportation), PI: Dr. Lily Elefteriadou, University of Florida

*Evaluation of Gainesville Pedestrian-Bicyclists Connected Vehicle Pilot*, BED31-977-23 (Florida Department of Transportation), PI: Dr. Lily Elefteriadou, University of Florida

#### NCDOT Multimodal Connected Vehicle Project Support

RP2022-27, North Carolina Department of Transportation, PI Chris Cunningham, North Carolina State University/ITRE

Application of Artificial Intelligence Technologies in FDOT Safety and Transportation System Management and Operational (TSM&O) Programs, BED 25-977-13, PI: Dr. Mohammed Hadi, Florida International University

*Infrastructure Enablers for Reliable Cooperative Driving Automation (CDA) Phase I: Existing Infrastructure Evaluation*, BED 25-977-09, PI: Dr. Mohammed Hadi, Florida International University