

## Semi Annual Report for University Transportation Centers

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Development & Education Center (STRIDE)

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Signature of Submitting Official: \_\_\_\_\_

Lily Elefteriadou, Ph.D.

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## ACCOMPLISHMENTS

### *What are the major 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. To do this, 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?*

- In Year 1, STRIDE funded 10 research projects. Five of those projects have either been completed or nearly completed. Project G (*Transit in the Era of Shared Mobility*) and Project I (*Freeway Management for Optimal Reliability*) have been completed. Final reports are expected for Project B (*Technology Influence on Travel Demand and Behaviors*), and Project F (Integrated Implementation of Innovative Intersection Designs). Project C (*Performance Measurement and Management Using Connected and Automated Vehicle Data*) is under peer review.
- In Year 2, STRIDE funded 17 projects. One project has been completed (Project B2 - *Evaluation of Work Zone Mobility by Utilizing Naturalistic Driving Study Data*) and three projects are in the draft/final report and peer-review stage (Project A2 - *Changing Access to Public Transportation and the Potential for Increased Travel*; Project C2 - *Urban Freight and Planning*; and Project O2 - *Macroscopic Fundamental Diagram Approach to Traffic Flow with Autonomous /Connected Vehicles*).
- In Year 3 STRIDE funded 11 projects which focus on Big Data/Analytics; Autonomous/Connected Vehicles; Detours, Planned Events and Incidents; and Shared Mobility.
- A list of all STRIDE projects are posted on the STRIDE website at <https://stride.ce.ufl.edu/research-2/active-research-projects/>; they are also included at the end of this report. We have created specific pages for individual STRIDE funded projects, which include the required Project Information sheets, links to final reports, links to webinars, products, news, webinar links and any other information that relates specifically to the project. We continue to monitor all STRIDE final reports, and we are reviewing them for 508 compliance requirements for accessibility.
- Several webinars have been offered to disseminate our research findings. We offer approximately 1-2 webinars each month. A list of webinars offered this reporting period is provided on Page 14. Our webinars are recorded, and a list of those are provided at <https://stride.ce.ufl.edu/technology-transfer/workshops-webinars-conferences/>. The STRIDE Center's webinar series continues to have solid attendance with an average of 24 live participants and an average of 37 YouTube views of recordings.
- One hundred seven students (undergrad and graduate) and post-docs have been supported in the last year by either STRIDE funding or matching cost-share projects.
- The STRIDE Center's fall 2019 newsletter was released on December 19, 2020, and featured spotlights on research projects, researchers, students, project-related webinars, K-12 activities and student and faculty accomplishments. To view the newsletter, visit: <https://conta.cc/2M8LJ30>.
- STRIDE hosted three Distinguished Speaker seminars during the performance period:
  - Dr. Nicholas Evans, Assistant Professor, Department of Philosophy, University of Massachusetts Lowell, presentation title *Modeling Ethical Algorithms in Autonomous Vehicles Using Crash Data*, February 20, 2020 (co-hosted with the Department of Philosophy at UF).
  - Dr. Jose Holquin-Veras, Professor and Director of the Center of Excellence for Sustainable Urban Freight Systems, Rensselaer Polytechnic Institute, presentation title *Freight Demand Modeling: Overview of Two Decades of Research*, November 14, 2019.

- Dr. Pat Mokhtarian, Susan G. and Christopher D. Pappas Professor. Georgia Institute of Technology, *Pursuing the Impossible Dream: Incorporating Attitudes into Regional Transportation Model*, February 11, 2020.
- Work related to Project N2 *Data Fusion for Signalized Arterial Performance Measurement*, led by Thomas Chase of NCSU, was entered into TRB's Traffic Signal Systems Committee Challenge. The NCSU team created an Automated Traffic Signal Performance Measure (ATSPM) and developed two algorithms that could provide better estimates of the measure. The team led by Shoaib Samandar, a graduate student at NCSU, was selected among the final three teams and was invited to present at the traffic signal mid-year meeting in Falmouth, Mass in August 2019.
- The STRIDE Center showcased I-STREET at the USDOT's exhibits booth during the Consumer Electronics Show in Las Vegas, Nevada on January 9, 2020. I-STREET is a real-world testbed in Gainesville, Florida, developed in collaboration with the Florida Department of Transportation (FDOT) and the City of Gainesville. The testbed is used to develop, deploy, and evaluate advanced transportation technologies including connected and autonomous vehicles, smart devices, and sensors, which can improve mobility and safety.
- The STRIDE Center held a student poster showcase and competition in January 2020 during the 99<sup>th</sup> Annual Meeting of the Transportation Research Board. A total of 23 STRIDE-related research posters were showcased during the event. Page 3 lists the winners of the competition.
- The STRIDE Center's External Advisory Board (EAB) and Internal Steering Committee (ISC) members met on January 15, 2020, during the 99<sup>th</sup> Annual Meeting of the Transportation Research Board in Washington, D.C. The main purpose of the meeting was to discuss and identify strategies for the Center's Year 4 projects and to align them with the needs of the state DOTs in the Southeastern region.
- STRIDE Center partners met again on March 27, 2020, with members of the External Advisory Board (comprised of state DOT representatives) via Zoom to continue discussions related to the Year 4 projects.
- On April 24, 2020, members of the STRIDE Center's External Advisory Board and partners met via Zoom to present draft scopes of work for Year 4 projects, and seek feedback from our stakeholders.
- The STRIDE Center (represented by Ms. Ines Aviles Spadoni) served as a member of the planning committee for the 7<sup>th</sup> Annual UTC Conference for the Southeastern Region. The STRIDE Center is also one of the co-sponsors of this event. The conference was set to take place March 26<sup>th</sup> and 27<sup>th</sup> 2020, but it was postponed to Fall 2020 due to the COVID-19 pandemic. The planning committee will meet in July 2020 to resume planning for a new date. The STRIDE Center organized and held the first conference in the series in fall 2013. Since then, several UTCs in the region have hosted this conference. The conference is open and invites participation from non-UTC designated universities, as well as from the private and public sectors.
- The STRIDE Center co-sponsored the Florida-Puerto Rico District ITE 3<sup>rd</sup> Annual ITE Student Leadership Summit. The event was held in Miami, Florida February 7-9, 2020 and hosted by the FIU ITE Student Chapter. More than 80 students and 40 professionals from across Florida attended this event. For more information, visit: <https://lctr.eng.fiu.edu/news/2.htm>.
- We are continuing to work with Dr. Mohammed Hadi of FIU to determine a date to host a training workshop for an FDOT-funded project titled *Estimation of System Performance and Technology Impacts to Support Future Year Planning (BDY29-977-39)*. After discussions with Dr. Hadi, it was determined that due to the COVID-19 health crisis, this workshop may be postponed to Spring 2021. This is a project which was funded by FDOT as cost share for the STRIDE Center.
- Work is in progress related to the creation of an I-STREET training program. Trainings will include lessons learned on the implementation of advanced technologies studied and tested in the I-STREET research projects.

#### List of Awards and Recognitions

- Dr. Kari Watkins, Georgia Tech, received a Student Recognition of Excellence in Teaching: Class of 1934 Award for 2019.
- Dr. Dimitra Michalaka, The Citadel, was elected to serve as South Carolina Section Representative to Southern District 5, Institute of Transportation, Executive Committee, Board of Directors.
- Sahila Sarjana, UAB, received the 1st place award at the STRIDE Student Poster Competition at the 99th Annual Meeting of the TRB in Washington, DC for the poster titled “Examining the Impact of Transportation Network Companies (TNCs’) Presence on Travel Preferences and Patterns of Birmingham Transportation Users”. Other winners included Tausif Ullah Chy, UAB, 2nd place, poster titled Examining Temporary Lane Closures Placement Impacts on Freeway Construction Zones Operations”; and Rebecca Kiriazes, UAB, 3rd place, poster titled “The Impact of Smartphone Applications on Trip Routing”.
- Rebecca Kiriazes was awarded the STRIDE Student of the Year. The award was presented at the CUTC Awards Banquet during the 2020 Transportation Research Board Annual Meeting, Washington, DC on January 12, 2020. She was also awarded \$1,000 from the STRIDE Center.
- Gokmen Pacal, graduate student at UAB, was awarded a 2019 Gulf Region Intelligent Transportation Systems (GRITS) Scholarship on November 12, 2019 and a scholarship from the Academic Small Business Alliance on Sept. 9, 2019.
- Cadet Joseph Martinez, Citadel, was the recipient of Gilbert H. Rowe Transportation Engineering Scholarship, S.C Institute of Transportation Engineers.
- Cadet Robert Davidson, Citadel, was the recipient of Harry McCullough Mims Scholarship for exceptional aptitude and outstanding student achievement in transportation engineering.
- Cadet Steven Pollard, Citadel, was the recipient of Harry McCullough Mims Scholarship for exceptional aptitude and outstanding student achievement in transportation engineering.
- Mahmoud Arafat, Ph.D. candidate at FIU, won the 2020 Lifesavers Traffic Safety Scholars (TSS), National Highway Transportation Safety Administration. In 2019, he won the first place in the Florida Automated Vehicle Summit (FAV 2019) Student's Poster Competition.

#### K-12 Outreach Activities

- STRIDE K-12 outreach programs have reached over 5,100 students to date.
- Final reports have been completed for University of Alabama at Birmingham, The Citadel, Jackson State University, and North Carolina State University. Final reports will be made available soon on the STRIDE website.
- Evaluation results from the Jackson State University’s Mississippi Summer Transportation Institute (MSTI) were featured in the following article: Yan, J., Wen, K. and Li, L., 2020. Effects of Summer Transportation Institute on Minority High School Students’ Perception of STEM Learning. *Journal of STEM Education: Innovations & Research*, 20(2).
- The University of Alabama at Birmingham’s Chapter of the Society of Women Engineers received the UAB Outstanding Community Service Program for their Girls in Engineering Day program.
- STRIDE organized a panel of 5 experts for session “Creating Successful K-12 Transportation Outreach Programs” at the 2020 7<sup>th</sup> Annual UTC Conference for the Southeastern Region at Florida Atlantic University on March 26, 2020. The conference was cancelled due to COVID-19 and will be rescheduled for the fall. Invited panelists include: Adrianna Clark, MIBA, US. Department of Transportation; David Garber, PhD, PE, Florida International University; Maranda McBride, PhD, North Carolina Agricultural and Technical State University; Dimitra Michalaka, PhD, The Citadel; and Virginia Sisiopiku, PhD, University of Alabama at Birmingham (UAB).
- STRIDE assisted with the implementation of the first Women in Transportation Initiative (WITI) internship program, a flagship program of the U.S. Department of Transportation Office of Small Business, at the University of Florida. The program focused on the asphalt industry and was organized by the Women of Asphalt (WofA). The eight-week internship was incorporated into a 3-credit semester-long course for undergraduate and graduate students and included field trips and guest speakers related to the asphalt industry.

- STRIDE assisted with the creation of a script for a short video highlighting the Real-time Intersection Optimizer (RIO) project, funded by the National Science Foundation (NSF) at UF. The video is designed to be accessible to K-12 audiences and the general public.

*K-12 STEM: School-based Programs*

- UF provided an introduction to transportation engineering and a hands-on STEM engineering design activity to 417 4th grade students as part of the Career Day program in public schools.
- UF launched a Future City Middle School Club at Howard Bishop Middle School (Gainesville, FL) and provided ongoing mentorship in engineering design, transportation infrastructure and urban planning. Six students participated in a weekly club meeting and won 2<sup>nd</sup> place in the regional competition in January 2020.
- The Citadel hosted a model bridge building competition for 25 middle school students at the East Cooper Montessori Charter School.
- Two Citadel faculty met with 5 elementary school aged homeschooled children and their parents, to discuss the FIRST Lego League club's project on alternative transportation options to solve traffic congestion to Folly Beach during summer months. Students presented their plan at the FIRST Lego League competition in Summerville, Nov. 23, 2019.

*K-12 STEM: Campus Programs*

- Seventeen students continued their education on autonomous systems through monthly meetings on the UAB campus. Students were scheduled to continue with design of hardware, 3-D printing, DC motor, steering, brake lights, headlights, and ultrasound sensors modules. The UAB research faculty are currently evaluating how to best move forward given the constraints of the COVID 19 pandemic.
- Fifty-three student volunteers from across the UAB School of Engineering hosted the Spring 2020 Kids in Engineering DAY on Feb 15<sup>th</sup> and 22<sup>nd</sup> 2020 for 89 middle school students from around the greater Birmingham, AL, area. With a theme of "Engineering Island", participants got hands-on experience in STEM activities learning "survival skills" across the engineering disciplines of Biomedical, Civil, Electrical, Materials, and Mechanical.
- The UF STRIDE Center collaborated with the UF student chapter of the Institute of Transportation Engineers (ITE) and Women in Transportation Seminar (WTS) to provide a transportation themed trivia activity at the annual UF Engineering Fair (E-Fair) during National Engineers Week on February 18, 2020. Over 200 elementary students tested their knowledge of transportation infrastructure, modes, safety, famous historical vehicles, and fictional vehicles from popular movies and cartoons.
- The Citadel's civil engineering student volunteers and faculty hosted a bridge and transportation competition event with 200 bridge participants as part of the annual "Storm The Citadel" event. Students constructed bridges using popsicle sticks which were judged by aesthetics and loads. Engineering students discussed the bridge designs with K-12 teams during load testing.
- The Citadel's (pre-knob) high school recruitment program invites prospective students to spend a night on campus and shadow a civil or construction engineering freshman. Participants learn about transportation engineering, highway design, research projects, and typically attend a transportation engineering course.

*K-12 STEM: Girls in Engineering*

- Student volunteers in the UAB School of Engineering led the 2019 Girls in Science and Engineering Day (GSED) event on Saturday, October 26. Eighty middle school girls participated in nine workshops that involved problem-solving activities, games, and design challenges that empowered them to consider careers in STEM. 48.9% of girls indicated they would consider a career in science and engineering and 86.7% indicated they would recommend a future GSED event to a friend.
- The Citadel Civil, Environmental and Construction Engineering, School of Engineering (SOE), and Society of Women (SWE) student chapter organized "Introduce a Girl to Engineering Day," a three-hour outreach event for middle-school girls to learn about engineering through high-energy, hands-on learning activities. 36 Girl Scouts participated in the event along with 26 engineering students and professional volunteers. Educational activities included constructing a castle, building a crane, designing and building a road, and programming an ozobot to navigate the road.
- On March 11, 2020, 150 middle school girls from the Sarasota and Orlando areas visited the UF campus for a day-long Girls Engaged in Engineering event. Girls listened to a keynote address, participated in two hands-on engineering activities, toured engineering labs on campus with the Engineering Ambassadors,

and had lunch with UF engineering students. STRIDE provided a hands-on activity in bridge building and a presentation on research at UF's Smart Infrastructure Management Laboratory. The STRIDE Center was a key organizer of the event along with the Society of Women Engineers (SWE), Women in Transportation Seminar (WTS), and Florida Engineering Experiment Station (FLEXStation).

#### *K-12 STEM: Summer Programs*

- Summer camp programs were being planned for 2020 at JSU, UAB, The Citadel, Georgia Tech, TTU, and UF. With the COVID-19 pandemic, these programs have been cancelled. Efforts to move some programs online are being discussed.

#### *K-12 STEM: Community Events*

- The Citadel participated in the 10th Annual Charleston Science, Technology, Engineering & Math (STEM) Festival, held Mar. 9, 2020, providing activities in bridge design, fabrication and testing using K'nex rods and connectors educational building sets. During the 5-hour event approximately 200 students participated in our program and were introduced to foundational principles of civil engineering.
- Plans to participate in the annual UF Health Bicycle Rodeo were canceled due to COVID-19.

#### *Community College Outreach*

- Dr. Nithin Agarwal, Director of the University of Florida Transportation Institute (UFTI) Technology Transfer (T2) Center and graduate faculty in the Civil and Coastal Engineering department met with students in the Gator Engineering at Santa Fe program at Santa Fe College in Gainesville, FL on February 25, 2020 to talk about career opportunities in the transportation sector and coursework and programs at the University of Florida. The Gator Engineering at Santa Fe program is a collaboration between the University of Florida, the Herbert Wertheim College of Engineering, and Santa Fe College where students begin their coursework at Santa Fe and then matriculate to UF to complete a B.S. engineering degree.

#### *How have the results been disseminated?*

- The STRIDE Center continues to encourage and monitor interactions between project PIs (and their teams) and stakeholders. We track these interactions via progress reports, email communication, and through the Technology Transfer reports due at the completion of each project (in addition to the final/technical report). STRIDE is continuously encouraging researchers to work closely with stakeholders to obtain feedback on their research scope and methodology and to assist with the dissemination of their research findings.
- STRIDE has created project-specific pages on its website, which package all the activities related to a specific project such as final reports, webinars, workshops, publications, and more. For an example of such a page visit <https://stride.ce.ufl.edu/project-i/>.
- The STRIDE Center is creating "Project Briefs" for all projects. The Briefs will be 1 to 2 pages in length and will contain quickly digestible information related to the project in non-technical language.
- The STRIDE Center uses Facebook, Twitter 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 at <https://stride.ce.ufl.edu/research-2/final-reports/>.

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

- Continue to plan training related to FDOT (cost share) project *Estimation of System Performance and Technology Impacts to Support Future Year Planning* (BDY29-977-39), led by Dr. Mohammed Hadi of FIU.
- Host Dr. Srinivas Peeta of GaTech for a STRIDE Distinguished Lecturer seminar. This seminar was scheduled to take place in April 2019, but due to COVID-19, this seminar was postponed.
- Publish the STRIDE Center's Spring 2020 newsletter by mid-May 2020.
- Continue to coordinate activities with the STRIDE Internal Steering Committee via Zoom.
- Continue to host webinars related to on-going or completed STRIDE projects. A schedule of the upcoming webinars is provided at <https://stride.ce.ufl.edu/technology-transfer/workshops-webinars-conferences/>.
- Continue to attend the planning meetings for the 7<sup>th</sup> Annual UTC Conference for the Southeastern Region.

- STRIDE will continue to monitor research projects through progress reports on a quarterly basis. Each report is reviewed to ensure adequate progress is made, to collect metrics, and for invoicing purposes.
- STRIDE will continue to provide guidance and monitor the K-12 projects at The Citadel, Georgia Tech, Jackson State University, North Carolina State University, Tennessee Tech, University of Alabama at Birmingham, and at the University of Florida.
- STRIDE expects that the bicycle and pedestrian clearinghouse database site will be completed soon. The bike/pedestrian clearing house will serve as a resource for the State of South Carolina’s transportation agencies and engineering organizations.

## PARTICIPANTS & COLLABORATING ORGANIZATIONS

Below is a list of the key organizations that the STRIDE Center and its consortium members have collaborated with in the past 6 months. Most state DOTs provide cost-share, while other entities provide a variety of contributions (in-kind, facilities, collaborative research, personnel exchanges, etc.)

Name of Organization	Location	Type of Contribution(s)
Alachua Health Education Center	Gainesville, FL	Recruitment and dissemination
Center for Independent Living	Gainesville, FL	Provide mobility options to individuals throughout the lifespan with or without impaired mobility
City of Gainesville	Gainesville, FL	Providing AV shuttle; Access to data streams from the City’s fiber network.
City of Hoover	Hoover City, Alabama	Data share and possible implementation of study finding
Florida Department of Transportation (FDOT)	Tallahassee, FL	Collaborative research, matching funds/cost share; possible implementer
Florida International University	Miami	collaborative research
HealthStreet	Gainesville, FL	Recruitment
Oak Hammock – Institute of Learning in Retirement	Gainesville, FL	Recruitment
TOMNET University Transportation Center	Atlanta, GA	in-kind contribution of survey data
Transdev	Paris, France	Providing safety operator/engineer and route mapping for the AV shuttle
University of Alabama at Birmingham (UAB)	Birmingham, AL	Institutional In-Kind match
UF Clinical Translational Science Institute (CTSI)	Gainesville, FL	Recruitment
UF Computer and Information Science Engineering	Gainesville, FL	Collaborative research
UF Institute of Aging	Gainesville, FL	Recruitment
University of Alabama	Tuscaloosa	Data share and collaboration on the implementation of the study finding
University of Florida	Gainesville	collaborative research
University of Minnesota	Minneapolis, MN	Collaborative research
Voyage	Lady Lake, Florida	Collaborative research

Alabama Department of Transportation (ALDOT)	Montgomery, AL	Cost share
Arcadis	New York City, NY	Dissemination
Beep	Lake Nona, FL	Collaborative research
Clemson University	Charleston, SC	Feedback on course curriculum and suggestions for collaborations across institutions
College of Charleston	Charleston, SC	Feedback on course curriculum and suggested for community collaborators; collaboration to construct database, engage MAAS providers
Durham, NC Public Schools	Durham, NC	Anonymous school bus route data
Edulog (Education Logistics, Inc.)		Data
Gainesville Regional Transit System (RTS)	Gainesville, FL	Personnel exchange, data
Georgia Department of Transportation (GDOT)	Atlanta, GA	Personal exchanges, data from GDOT to study driver behavior and traffic information, data on speed and volume for validating outputs
Georgia Institute of Technology	Atlanta, GA	Collaborative research; collaboration to construct database, engage MAAS providers
Gotcha Mobility	Charleston, SC	Micro mobility provider with 50 MAAS systems across U.S.
Institute for Transportation Research and Education (ITRE)	Raleigh, NC	Data
Rotary Club	Gainesville, FL	Recruitment
Texas A&M Transportation Institute	College Station, TX	Collaborative research
University of Iowa	Iowa City, IA	Collaborative research
University of Kansas	Lawrence, KS	Collaborative research
Virginia Tech Transportation Institute	Blacksburg, VA	Data collection and provider

## OUTPUTS

The STRIDE Center uses the following metrics to assess the OUTPUTS related to its technology transfer program. Thirty-two products and eight technical reports have been completed so far. The table below summarizes those outputs. <b>METRIC</b>	Year 1 Projects Target/Completed	Year 2 Projects Target/Completed	Year 3 Projects Target/Completed	<b>TOTAL COMPLETED (All Projects)</b>
<b>Product(s):</b> Number of new or improved tools, technologies, products, methods, practices, and processes to reduce congestion	9 / 14*	18 / 18*	11 / 0	<b>32*</b> <b>Products</b>
<b>Technical Report:</b> Number of client-based technical reports published about approaches to congestion mitigation	9 / 5*	18 / 3*	11 / 0	<b>8*</b> <b>Technical Reports</b>

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

### Products

This table summarizes the 7 products completed during the reporting period (Oct 1-March 31). All products are from Year 2 projects. The total number of products completed to date is 32.

Project#	Product
A2	<b>Methodology</b> - In many areas, increasing real-estate values have caused the economic displacement of low-income populations to suburban areas. While this is happening in the Raleigh-Durham-Chapel Hill region of North Carolina, efforts have also been made to expand and improve the transit system. Dr. Eleni Bardaka's team at NCSU developed a methodology to assess whether these two simultaneous changes were making it easier or harder for low-income residents to access public transportation. Researchers found that although accessibility to transit increased over time, accessibility to qualified jobs by transit decreased. Researchers shared their findings with GoTriangle, the regional transit agency, in order to help plan for future transit improvements.
A2	<b>Model</b> - Ridership on public transportation has been on a steady decline resulting in fewer dollars to invest back into transit improvements. In the past, transit agencies have had limited tools to determine how best to improve service in a cost-effective way. Dr. Kari Watkins' team at Georgia Tech developed a model to more accurately analyze ridership over time and space. Applying the model in four different metropolitan areas – Portland, OR; Miami, FL; Atlanta, GA; and Minneapolis/St.Paul, MN – researchers were able to identify specific corridors that would benefit from service changes. The Metropolitan Atlanta Rapid Transit Authority (MARTA) is currently using the results within their research and service planning units. The model will help transit agencies understand the causes of ridership decline and identify strategies to reverse the trend.
A2	<b>Geospatial Model</b> - Transportation Network Companies (TNCs), such as Uber and Lyft, are adding to the field of transportation options, but little is known about how they may impact public transit and specialized transportation services or if they can meet the needs of the transportation disadvantaged. By interviewing transit and social service agencies in Florida, Drs. Ruth Steiner and Ilir Bejleri's team at UF established requirements and challenges associated with partnerships with TNCs. A geospatial model was developed to identify specific service gaps facing the transportation disadvantaged and opportunities for how improved TNC partnerships could potentially fill these gaps in metro Orlando.

	Researchers discussed preliminary results with the staff of LYNX and modified the model to address based upon the discussion.
A2	<b>Typology</b> - Transportation to medical services is a critical need for many, particularly those with acute medical needs. Technological advances and shared mobility are reshaping paratransit and dial-a-ride services in the U.S. Ridesourcing options are appearing in electronic medical record workflows of clinicians and they are becoming a part of the choice set for patients through formal partnerships with care providers, insurance companies, and transit agencies. Dr. Noreen McDonald and doctoral student Mary Wolfe at UNC -Chapel Hill conducted a national review of these emerging services and developed a typology of innovations including three strategies in which medical transportation could be provided by TNCs. The typology has been shared with practitioners nationwide. New mobility solutions promise cost saving potential for insurers and more reliable access for patients. It is unclear whether these services could be financially viable in low-density, non-urban areas.
B2	<b>Preliminary Headway Table for Traffic Simulation Software</b> – Naturalistic Driving Study (NDS) work zone data was reused to develop new (or update existing) capacity and traffic flow models for work zones. As the NDS data offer a unique opportunity to different drivers negotiating freeway work zones areas, this research can improve the existing work zone capacity analysis methods by developing models to measure the speed-flow-density relationship at specific work zone configurations. DOTs and transportation agencies will have a better understanding of work zone traffic flow distribution to better plan construction with the least traffic impact.
D2	<b>Smart Driver Course</b> - Dr. Classen was a subject matter expert to develop the AARP Smart Driver Course Research and Guidebook. Older drivers that successfully complete this course receive a reduced rate for their drivers insurance.
D2	<b>Book Chapter</b> - Classen, S., & Alvarez, L. Driver Capabilities in the Resumption of Control (Chapter 10). (2019). In Donald L. Fisher, William J. Horrey, Michael A. Regan, & John D. Lee (Eds.), Handbook of Human Factors and Automated, Connected and Intelligent Vehicles. In press.

#### Technical Reports

- Project B - *Technology Influence on Travel Demand and Behaviors*, peer review completed, final report in preparation, PI: Dr. Virginia Sisiopiku
- Project C - *Performance Measurement and Management using Connected and Automated Vehicle Data*, draft final under peer review, PI: Dr. Mohammed Hadi
- Project F - *Integrated Implementation of Innovative Intersection Designs*; peer review completed, final review in preparation, PI: Dr. Nagui Roupail
- Project I - *Freeway Management for Optimal Reliability*, 2020, report completed, PI: Dr. Yafeng Yin
- Project A2 - *Changing Access to Public Transportation and the Potential for Increased Travel*, final report in preparation, PI: Dr. Kari Watkins
- Project B2 - *Evaluation of Work Zone Mobility by Utilizing Naturalistic Driving Study Data*, report completed, PI: Dr. Huaguo Zhou
- Project O2 - *Macroscopic Fundamental Diagram Approach to Traffic Flow with Autonomous /Connected Vehicles*, draft final under peer review, PI: Dr. Robert Whalin

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

#	Description	Date	Type
A	Kiriazes, R., Watkins, K., Guin, A., Hunter, M. "Impact of Smartphone Applications on Trip Routing", Presented at the Transportation Research Board's 99th Annual Meeting, Washington, D.C., 2020	January 2020	Presentation
A	Paper: 20-05194 – "The Impact of Smartphone Applications on Trip Routing" (TRB)	January 2020	Poster, TRB

B, I2	Guo, G., Khalil, J.M., Yan, D., and Sisiopiku V. (2019). "Realistic Transport Simulation: Tackling the Small Data Challenge with Open Data", Proceedings of International Workshop on Big Data Tools, Methods, and Use Cases for Innovative Scientific Discovery, 2019 IEEE International Conference on Big Data, Los Angeles, CA.	2019	Proceedings
C	Azizi, L. and M Hadi. "Freeway's Traffic Flow State Identification with Consideration of Disturbances by Individual's Vehicle: A Hybrid Scheme of Gaussian Mixture Model and K-Means Clustering". Presented at the 2020 TRB annual meeting.	January 2020	Presentation
C	Azizi, L. and M Hadi. "Real-Time Prediction of Traffic State on Freeways Based on Trajectory Data: A Machine Learning Approach". Presented at the 2020 TRB annual meeting.	January 2020	Presentation
C	Azizi, L. and M Hadi. "Estimation of Freeway Traffic Safety Utilizing Disturbance Metrics Based on Trajectory Data". Presented at the 2020 TRB annual meeting.	January 2020	Presentation
H	Dimitra Michalaka, 3rd annual C2M2 Conference, presentation on The Citadel and transportation engineering activities at the CEE department, Clemson University, SC	10/8/2019	Conference Presentation
I	Jeremy Addison, Seyed Behzad Aghdashi, Nagui Roupail, "Evaluating the Impact of Incidents on Freeway Facilities and Updating the Incident Capacity Adjustments for HCM," Transportation Research Record (currently under final review for publication).		Paper
J	Jehn, N.L., and R.E. Turochy. "Calibration of VISSIM Models for Rural Freeway Lane Closures: Novel Approach to the Modification of Key Parameters", was published in Transportation Research Record: Journal of the Transportation Research Board, 2019.		Publication
A2	"The Mystery of the Missing Bus Riders", NYT Article: <a href="https://www.nytimes.com/interactive/2020/03/13/upshot/mystery-of-missing-bus-riders.html">https://www.nytimes.com/interactive/2020/03/13/upshot/mystery-of-missing-bus-riders.html</a>	March 2020	Publication, NYT
A2	Wolfe, M., McDonald, N., Holmes, M. "Transportation Barriers to Healthcare in the U.S" In press to American Jour Public Health	March 2020	In Press
A2	Han, M., Steiner, R. L., Bejleri, I, Bai, X., & Noh, S. "Improving Transportation Accessibility for the Transportation Disadvantaged: Collaborations between Transit Agencies and TNCs". Presented at the Annual Conference of the Association of Collegiate Schools of Planning, Greenville, SC.	10/24/2019	Conference presentation
B2	"The Impact of Driver Characteristics on Headway Selection and Free-Flow Speed at Work Zones by Utilizing Naturalistic Driving Study Data" poster presented at the Transportation Research Board 99 <sup>th</sup> Annual Meeting in Washington DC.	1/13/2020	Poster
D2	Mason, J., Classen, S., Wersal, J., & Sisiopiku, V. "Establishing Face and Content Validity of a Survey to Assess Users' Perceptions of Automated Vehicles". Presentation at the TRB, Washington D.C., January, 2020. Dr. Mason presented the research team's initial validation for the survey created for and utilized in this study. This was presented at the TRB, January 2020.	1/14/2020	Presentation

D2	Classen, S., Mason, J., Wersal, J., & Sisiopiku, V. "Older drivers' perceptions of autonomous vehicles". AND30 (Simulation and Measurement of Vehicle and Operator Performance) at Transportation Research Board (TRB), Washington D.C., January, 2020. Dr. Classen presented the interim-findings from the research team in January 2020, to the AND30 Committee (Simulation and Measurement of Vehicle and Operator Performance) at Transportation Research Board (TRB).	1/13/2020	Presentation
D2	Mason, J., Classen, S., Wersal, J., & Sisiopiku, V. "Establishing face and content validity of a survey to assess users' perceptions of automated vehicles". Poster to be presented at the Florida Occupational Therapy Association, Orlando, FL, November, 2019.	11/16/2019	Poster
D2	Classen, S., Mason, J., Wersal, J., & Sisiopiku, V. "Autonomous Vehicle Technology: Experiences and Preferences of Older Drivers in the Southeast". Presentation for Gulf Region Intelligent Transportation Society (GRITS), Natchez, MS, November, 2019.	11/4/2019	Conference Presentation
D2	Classen, S., Mason, J., Wersal, J., & Sisiopiku, V. "Older drivers' experiences with autonomous vehicle technology". Presentation for Annual Conference of the Road Safety & Simulation (RSS), Iowa City, IA, October, 2019.	10/15/2019	Conference Presentation
E2	Steiner, R. and Alakshendra, A. Presented the paper "Millennials, GenX, and Shared Mobility Services: A Tale of Two States: North Carolina and Florida" at the Association of Collegiate Schools of Planning conference, Greenville, South Carolina.	10/24/2019	Conference Presentation
F2	Jiahua Qiu, Wang Peng, Lili Du presented a poster "Supply Market Analysis for Integration of Ridesharing and Public Transit" during the STRIDE student poster showcase/competition.	1/13/2020	Poster
F2	Jiahua Qiu, Wang Peng, Lili Du presented a poster "Supply Market Analysis for Integration of Ridesharing and Public Transit" at the University Florida Warren B. Nelms First Annual IoT Conference held December 3-4, 2019.	December 3-4, 2019	Poster
J2	Hector Mata presented a poster titled "Development of a Real-Time Databased Decision System for Arterial Management" during the STRIDE student poster showcase/competition.	1/13/2020	Poster
J2	Hector Mata, A poster "Machine Learning Approach for Real-Time Traffic State Identification on Arterials Using Probe Vehicle Data." Was presented at the 2019 FAV Summit in Miami, FL.	11/21/2019	Poster
K2	The project team presented a poster summarizing the findings in this project at TRB annual meeting 2020. "Modeling framework for capacity analysis of freeway segments: Application to ramp weaves", D. Xu, N. Roupail, B. Aghdashi, I. Ahmed and L. Elefteriadou, poster TRB 2020, (#20-04063)	1/15/2020	Poster
K2	Overview of the project presented to the German Federal Highway Research Institute (BAST); Title: "Assessing and Addressing Deficiencies in the HCM Weaving Segment Analysis"	3/2/2020	Presentation
K2	"Assessing and Addressing Deficiencies in the HCM Weaving Segment Analysis", Lily Elefteriadou, University of Florida, German Federal Highway Research Institute, March 3, 2020	March 2020	Presentation

K2	"Modeling Framework for Capacity Analysis of Freeway Segments: Application to Ramp Weaves", Dezhong Xu, Nagui M. Roupail, Behzad Aghdashi, Ishtiaq Ahmed, Lily Elefteriadou, Transportation Research Record, Transportation Research Board, January 15, 2020, <a href="https://doi.org/10.1177/0361198119900157">https://doi.org/10.1177/0361198119900157</a>	1/15/2020	Paper
L2	Dimitra Michalaka, "Assessing potential of bike share networks and active transportation to improve urban mobility, physical activity and public health," 3 <sup>rd</sup> Annual C2M2 Conference, Clemson, SC	10/3/2019	
L2, F3	Dimitra Michalaka, "Assessing potential of bike share networks and active transportation to improve urban mobility, physical activity and public health outcomes in SC," ASCE Eastern Branch Meeting	1/10/2020	
M2	Mosammat Tahnin Tariq, Aidin Massahi, Rajib Chandra Saha, Mohammed Hadi, "Combining Machine Learning and Fuzzy Rule-based System in Automating Signal Timing Expert's decisions," Transportation Research Record, 2020.	3/1/2020	Conference Presentation and Paper
M2	STRIDE Student Poster Showcase/Competition at UFTI Reception, January 13, 2020, "Combining Machine Learning and Fuzzy Rule-Based System in Automating Signal Timing Expert's Decisions during Non-Recurrent Congestion"	1/13/2020	Poster
M2	Mosammat Tahnin Tariq "Utilization of Connected Vehicle Data to Improve Traffic Signal Control Strategies", 2019 FAV Summit, Nov 2019	11/2019	Presentation
O2	Guojing Hu, Weike Lu, Feng Wang and Robert Whalin, "Macroscopic Fundamental Diagram Based Discrete Transportation Network Design," Journal of Advanced Transportation, January 2020, <a href="https://doi.org/10.1155/2020/4951953">https://doi.org/10.1155/2020/4951953</a>	1/20/2020	Publication
O2	Hao Huang, Jiannan Mao, Weike Lu, Guojing Hu, Lan Liu, "A Hybrid CEEMDAN-GRU Model for Short-Term Metro Passenger Flow Prediction", Transportation Research Board (TRB) 99th Annual Meeting, January 13, 2020.	1/13/2020	Presentation
O2	Guojing Hu, Jackson State University, presented the poster "A Cooperative Bypassing Algorithm for Connected and Autonomous Vehicles in the Mixed Traffic" at the University of Florida Transportation Institute's (UFTI) reception at TRB in Washington, DC.	1/13/2020	Poster
O2	Weike Lu, Jun Liu, Jiannan Mao, Guojing Hu, Chuqiao Gao, Lan Liu, "A Macroscopic Fundamental Diagram Approach to Evaluating Performance of Regional Traffic Controls", presentation at the Transportation Research Board (TRB) 99th Annual Meeting, January 13, 2020. Paper in press for publication in TRR in 3/27/2020.	1/13/2020	Presentation
P2	"Machine Learning Approach for Real-Time Traffic State Identification on Arterials Using Probe Vehicle Data", M. Hadi, M. Hector, 2019 Florida Automated Vehicle Summit, Miami, FL.	11/1/2019	Poster
Q2	Powerpoint presentation about Curbside Management created and presented in undergraduate Multimodal Transportation course [September 2019]; shorter version created and presented in Engineering Communications course [November 2019]	September 2019	Presentation
B3	Zhao, X., Liu, X., Yan, X.* (2020). "Modeling demand for ridesourcing services in the City of Chicago: A direct demand machine learning approach". Proceedings of Transportation Research Board 99th Annual Meeting, Washington, DC.	January 2020	Paper

B3	Xu, Y., Yan, X., Liu, X., Zhao, X.* (2020) "Applying Interpretable Machine Learning to Identify Key Factors Associated with Ride-Splitting Adoption Rate and to Model Their Nonlinear Relationships". Transportation Research Board 99th Annual Meeting, Washington, DC.	January 2020	Presentation
B3	Yan, X., Liu, X., Zhao, X. (2020). "Using machine learning for direct demand modeling of ridesourcing services in Chicago". Journal of Transport Geography, 83, 102661.	February 2020	Publication
B3	Zhao, X., Yan, X., Yu, A., Van Hentenryck, P. (2020)." Prediction and behavioral analysis of travel mode choice: A comparison of machine learning and logit models". Travel Behaviour and Society, 20, 22-35.	February 2020	Publication
C3	Liu, C., Bardaka, E. Suburbanization of poverty and changes in transit accessibility over time. 2020 TRB Annual Meeting, Paper Presentation	January 2020	Paper Presentation
C3	Wolfe, M.K., McDonald, N.C., and Holmes, G.M. "Transportation Barriers to Health Care in the U.S.", 2020 TRB Annual Meeting, Poster Presentation	January 2020	Poster
F3	Morgan Hughey, "Quantifying physical activity levels and patterns for the Charleston, SC bike share system in 2018," Active Living Conference 2020, Orlando, FL	2/3/2020	Presentation

## OUTCOMES

The STRIDE Center uses the metrics shown in the table below to assess the OUTCOMES related to its technology transfer program. A total of twenty-seven trainings serving 1,065 professionals have been held for STRIDE projects to date. During this reporting period, eight trainings serving 208 professionals have been completed related to Year 1 projects and 5 trainings serving 437 professionals have been completed related to Year 2 projects.

METRIC	Year 1 Projects Target/ Completed	Year 2 Projects Target/ Completed	Year 3 Projects Target/ Completed	TOTAL COMPLETED (All Projects)
<b>Body of Knowledge:</b> Number of technology transfer trainings for transportation professionals on a new or improved congestion mitigation approach (workshops, webinars)	9 / 14*	18 / 13*	11 / 0	<b>27*</b> <b>Trainings</b>
<b>Professionals Trained:</b> Number of transportation professionals participating in technology transfer trainings to improve their understanding and awareness of new or improved congestion mitigation approaches	90 / 514*	180 / 551*	11 / 0	<b>1,065*</b> <b>Professionals trained</b>

\* Totals include this and all prior reporting periods.

### Trainings & Professionals Trained

A total of thirteen trainings (related to both Year 1 and Year 2 projects) engaged 642 professionals during the reporting period, as summarized in the table below. There were an additional 190 views of YouTube recordings of STRIDE webinars.

Project #	Training	Date	# Trained	YouTube Views
A	STRIDE Webinar - "Impact of Smartphone Applications on Trip Routing and Congestion Management" Dr. Angshuman Guin, Georgia Institute of Technology & Mohammed Hadi, FIU	1/29/2020	32	44
A	The results of the project were presented at a professional conference, the ITS Georgia Annual meeting on October 7 in Athens Georgia. The presentation was very well accepted by the Georgia Department of Transportation Representatives and the consultant community and piqued considerable interest in the results. (Meeting website: <a href="http://www.itsga.org/event/2019-annual-meeting-and-exposition/">http://www.itsga.org/event/2019-annual-meeting-and-exposition/</a> )	10/7/2019		
B	Technical Presentation – Mrs. Sultana presented a paper titled “Simulation Options for Modeling Shared Mobility” at the 2019 AlaSim M&S Conference , Huntsville, AL October 24, 2019	10/24/2019	15	
B	STRIDE webinar - "Do Southeastern Millennials Uber? Initial findings from North Carolina" Allie Thomas, PhD, UNC Chapel Hill	2/12/2020	7	35
E	UNC facilitated a webinar sponsored by TRB ADD30 Travel and Land Development; presentations included 1) “Evaluating On-Site Vehicle Parking and TDM Programming in DDOT’s Development Review Process” Aaron Zimmerman, Sr. Transportation Planner, District Department of Transportation 2) “MAPC’s Perfect Fit Parking Initiative: Improving the Way Planners Assess Residential Parking Demand” Tim Reardon and Kasia Hart, Metropolitan Area Planning Council Webinar recording: <a href="https://zoom.us/recording/share/nDorfNZDLFma2vvNlydmqUhfT8k8NdmGT7U_y-CQae6wlumekTziMw">https://zoom.us/recording/share/nDorfNZDLFma2vvNlydmqUhfT8k8NdmGT7U_y-CQae6wlumekTziMw</a>	11/6/2019	42	
F	STRIDE webinar - “Evaluation of Pedestrian and Bicycle Options at Continuous Flow Intersections” Chris Cunningham, PE, MSCE, Director, Highway Systems (ITRE) and Ishtiak Ahmed, NCSU	10/23/2019	55	50
I	STRIDE webinar - "Freeway Facility Reliability: Improved Modeling of Incident Impacts" Nagui Roupail, PhD and Behzad Aghdashi, PhD, NC State University	11/13/2019	14	17
J	Rod Turochy, PhD, Auburn University, presented "An Overview of Work Zone Crash Severity Trends and Work Zone Planning to Minimize Secondary Crashes" as a part of the Transportation Speaker Series at Georgia Tech's Georgia Transportation Institute.	9/13/2018	40	
A2	On October 17, 2019, a lunch-learn was held at MARTA for employees from multiple units at MARTA.	10/17/2019	30	
A2	Eno Center for Transportation Webinar: "Analyzing Bus Ridership Decline" Simon Berrebi, PhD, Postdoctoral Fellow at the Georgia Institute of Technology and Alice Grossman, PhD, Senior Policy Analyst, Eno Center for Transportation	11/7/2019	370	

A2	STRIDE webinar - "Modeling Bus Ridership Trends on a Hyper-Local Level Between 2012 and 2018" Dr. Simon Berrebi, Georgia Tech	4/1/2020	17	12
B2	STRIDE webinar - "The Impact of Driver Characteristics on Headway Selection and Free-Flow Speed at Work Zones by Utilizing Naturalistic Driving Study Data" Huaguo Hugo Zhou, PhD and Dan Zu, Auburn University	10/2/2019	16	32
D2	2 lectures were presented and 4 Driving Rehabilitation Therapy students graduated from the Driving Rehabilitation Therapy Certificate Program.		4	

## IMPACTS

The STRIDE Center uses the list of metrics shown in the table below to assess the IMPACTS related to its technology transfer program. Seventy-one meetings with stakeholders have been completed and 5 products have been adopted or implemented to date.

METRIC	Year 1 Projects Target/ Completed	Year 2 Projects Target/ Completed	Year 3 Projects Target/ Completed	TOTAL COMPLETED (All Projects)
<b>Stakeholders:</b> Number of stakeholders (agencies, businesses, etc.) you meet with to encourage adoption or implementation of congestion mitigation approaches	9 / 8*	18 / 55*	11 / 8*	<b>71*</b> <b>Stakeholders</b>
<b>Adoption/Implementation:</b> Number of incidences that congestion mitigation outputs of research have been implemented or adopted (ex. decision making, practices, methods, analytical tool, data/database, software, policy change, behavior analysis, commercialization)	2 / 2*	2 / 3*	11 / 0	<b>5*</b> <b>Products Adopted/ Implemented</b>

\* Totals include this and all prior reporting periods.

### Stakeholder Meetings

Researchers held 33 meetings with stakeholders during the reporting period.

Project	Stakeholder	Date	Description
A	Georgia Department of Transportation Representatives	10/7/2019	The results of the project were presented at a professional conference, the ITS Georgia Annual meeting on October 7 in Athens Georgia. The presentation was very well accepted by the Georgia Department of Transportation Representatives and the consultant community and piqued considerable interest in the results.
F	Transportation Research Board	1/13/2020	The project team presented the findings from this project in the 99th Annual Meeting of Transportation Research Board.
A2	Rob Goodwin, Director of Research MARTA; multiple members of his team	10/8/2019	A meeting took place to present the final results of the frequency and demographic analysis on MARTA ridership change.
A2	King County Metro (7 people from Service Dept, Speed and Reliability)	10/17/2019	30-minute presentation organized by the Service Development unit

B2	Larry Shannon, roadway geometrics specialist, Michael Baker International	1/13/2020	Presented the poster "The Impact of Driver Characteristics on Headway Selection and Free-Flow Speed at Work Zones by Utilizing Naturalistic Driving Study Data" at the Transportation Research Board 99th Annual Meeting in Washington DC.
B2	John Michael Walker, state safety operations engineer, ALDOT	9/25/2019	Presented "Application of Naturalistic Driving Study Data to Study Work Zone Mobility" at Alabama Roadway Safety Conference.
B2	Dr. Jiaqi Ma, director of Advanced Transportation Collaborative, University of Cincinnati		Discussed the potential use of the results of this study for simulation modeling, as the current headway table is outdated. The meeting took place at the Automated Vehicle Symposium in Orlando, FL.
D2	Malisa McCreedy, Director of Mobility, City of Gainesville	11/21/2019	Justin and Malisa met to discuss the shuttle and waiver. The continued support of the City of Gainesville has been very much appreciated.
D2	Jesus Gomez, Transit Director, City of Gainesville	12/20/19-1/06/2019	We have continued to speak with Neal Hemenover and Jesus Gomez to determine the status of the NHTSA waiver and next steps for testing participants. The waiver was approved on December 20th, 2019. We are currently discussing when the shuttle will begin operating in downtown Gainesville.
D2	City of Gainesville, FDOT, STRIDE, EasyMile, Transdev	2/3/2020	AV Shuttle Inaugural Ride: The stakeholders and collaborators participated in the official kickoff of the shuttle in downtown Gainesville. This was covered by the news media and publicized to the public.
D2	City of Gainesville, FDOT, STRIDE	2/3/2020	Interim findings were presented at the UF Innovation HUB
D2	Arcadis	2/17/2020	During the meeting, interim findings were disseminated and discussed. Additionally, we discussed our approach to develop the study protocol and develop a collaborative team of stakeholders.
D2	Oak Hammock CEO, Gainesville, FL	1/16/20-4/15/2020	Dr. Classen is meeting monthly with the CEO of Oak Hammock to update him on the study as well as answer any questions that he may have. A Town hall meeting was scheduled—and cancelled twice (AS waiver issues, COVID-19 issues) , but will be held in future to make known the findings of the study to the residents of Oak Hammock.
F2	Mr. Jesus Gomez and Ms. McCreedy at Gainesville RTS	10/3/2019	Gainesville RTS recently launched a new App. Transloc (a micro-transit on demand), which aims to give riders flexible option. Our approach will help RTS to improve ridership and microbus service level by providing the following capabilities.
F2	Dr. Jie Bian, Principal Planner, Miami-Dade County Department of Transportation and Public Works	10/8/2019	<ul style="list-style-type: none"> <li>• Miami-Dade County Department of Transportation and Public Works are also following the impacts of TNCs on public transportation demand.</li> <li>• The research may inform them market areas where transit and TNCs may be complimentary of each other, and what transit services are most likely to be complimented by TNCs, and what services are most likely to be challenged/replaced by TNCs.</li> <li>• The research findings may help the MD County identify designated TNC pick-up/drop-off areas.</li> </ul>

F2	FDOT - many program managers and specialists	12/18/2019	The statistical approaches help discover the temporal-spatial service gaps for the public transit service, where are currently dominated by ridesharing modes. The machine learning approaches help find the potential first/last mile service gaps. These research findings will help public transit operator to decide the location of new transit stops or set up optimal microbus service.
G2	Andrew Heath, P.E., State Traffic Engineer, GDOT	11/11/2019	Engaged Georgia Department of Transportation (GDOT) by discussing with Andrew Heath on getting the data from GDOT to study driver behavior and traffic information in work zone.
G2	Robert Baker Jr. TMC Traffic Ops Manager, GDOT	1/28/2020	Robert showed Georgia Tech research team through the GDOT's Traffic Management Center and gave hands on demo on Navigator site containing the live streams of widely available GDOT's traffic cameras and other traffic data sensors, Robert helped identify sites for the project's case study
G2	1) Dr. Rod Turochy, Auburn University 2) Veronica Ramirez Alabama Transportation Assistance Program	2/5/2020	Discussed the outcomes of the study conducted by Georgia Tech on work zone driver behavior and merge locations, discussed impacts of external factors such as queue and gap on merge location distribution, discussed the simulation inputs needed and time line for the next task in the project.
G2		3/10-11/2020	Dr. Tsai served on the national expert panel of workzones for AV/CV to help guide the national research study on preparing workzones for AV/CV on March 10-11, 2020 in DC.
I2	James Fowler, Director, Department of Traffic Engineering, City of Birmingham	7/30/2019	Communicated with Mr. James Fowler, Director of the Department of Traffic Engineering of the City of Birmingham via email. Presented the project objectives and progress and requested collaboration between UAB and the City on this and related follow up STRIDE research initiatives.
J2 & M2	Dan Smith and Nicole Forest (FDOT), Giri Jeedigunta (AECOM), Aidin Massahi (Eland engineering)	January 2020	Discuss the potential for applying the product from this project. M2 - The research team is working with FDOT District 4 and their consultant to implement the operator decision automation in a tool for use at the FDOT District 4 TMC, as part of a participation in a National Operation Center of Excellence Competition. This will allow a real-world evaluation of the tool in addition to the simulation-based evaluation currently being conducted.
K2	TRB Committee on Highway Capacity and Quality of Service	1/13/2020	We presented the findings of the project as well as an overview of project activities to the TRB committee on Highway Capacity and Quality of Service in the TRB's annual meeting in January 2020.
Q2	John Sadlo, Director, Site Services, Coke	2/15/2019	Met with Coke to discuss project. Unfortunately, we were not able to make the case well enough to Coke for them to be willing to share their data to try a simulation of the ridesharing. However, we were able to convince them to do an employee survey.
B3	Jesus Gomez, Transit Director, City of Gainesville	11/18/2019	X. Zhao met with the Transit Director of RTS and discussed our STRIDE project and the potential to integrate micro-mobility with public transit to facilitate first/last-mile problem.
B3	Darryll Dockstader, FDOT	12/18/2019	X. Zhao met with program managers of FDOT and discussed our STRIDE project to seek their input.

D3	Zeke Willis, City of Birmingham DOT	2/2/2020	Met with Zeke Willis from the City of Birmingham Department of Transportation to discuss the project objectives and scope and discuss ways the City can contribute. He agreed to provide data the City and suggested other lines of analysis.
D3	Becky White (VP), Jeff Stephenson, Charles Cochran	2/18/2020	Met with Sain Associates staff to discuss the objectives and scope of the project and solicit their input. Sain Associates was heavily involved in the original detour planning and implementation. We discussed available data and participation. The PI said he would approach the Regional Planning Commission of Greater Birmingham for additional marching funds to allow Sain Associates to participate more actively in the project.
D3	Brett J. Sellers, ALDOT TSMO	3/4/2020	Met with Brett Sellers, ALDOT TSMO section, to discuss the project objectives and scope and obtain information on available data. We discussed outcomes ALDOT would like to see result from the study, the format and content of the motorist survey, and data ALDOT is able to provide. Brett was able to provide several reports and data sets ALDOT has compiled on the interstate project.
D3	Scott Tillman, Mike Kazyroski, Harry He – RPC-GB	3/30/2020	Met with Regional Planning Commission to discuss scope of the project and solicit their input for data analysis. The RPC-GB is very interested in the project findings and views it as a good “lessons learned” effort. We discussed involving Sain Associates in the project and they agreed that would be beneficial. Scott Tillman offered to provide CMAQ funding to bring Sain Associates in as a study partner.
E3	Mathew Palmer, Director, Strategic Planning Initiatives, Durham Public Schools	ongoing	The project team has had ongoing communications, in person, on phone, and by email, with Durham Public Schools, primarily with their strategic planning office but also with their school bus routing team. The stakeholders were excited by the possibility of reducing the impact of congestion upon their school buses, by improving routing and other means, once the study is complete.
E3	Education Logistics, Inc. (Edulog) - Andy Leibenguth, Senior Consultant	ongoing	Ongoing conversations with Senior Consultants from Edulog about applicability of data within their software to help answer the research question. Previous discussions focused on easily obtainable data from within Edulog as to minimize the amount of additional work required by local school systems. Edulog also sees value in using Bus Route Information (Stop Locations, Stop Times, Path of Travel and Total Passenger Counts) to help study the cost of congestion. After narrowing down a list of applicable Florida counties, Edulog put the PIs in contact with contacts in several Florida school systems.

*Product Adoption*

Two products (1 each from Year 1 and 2) have been adopted and are being implemented. Additional product adoptions are expected from Year 1 and Year 2 projects as they come to completion.

- Survey to assess users’ perceptions of AV technologies - The FDOT, Office of Safety, has funded a new project, using the survey developed with this STRIDE funding—to enhance the survey (Phase 1) and extend it to adults (i.e., 50+ years old) (Phase 2) who are using a variety of autonomous mobility services, including: ride hailing services, ride sharing services, taxis, shuttles and busses. (Project D2)
- User questionnaire surveys on transportation user behaviors – The Birmingham Survey was adopted by the research team in STRIDE I2 to be used for the survey of travelers in the South Beach region. The surveys are available for others to review, use, and adapt to their own needs. Copies of the surveys may be found in the Final Report. (Project B)

## 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 – *The COVID 19 pandemic has caused the cancellation or postponement of several events and activities. The STRIDE consortium is exploring various options for delivering our K-12 programs over the summer. All project meetings and university courses are expected to continue uninterrupted. However, the reduced traffic and social distancing rules may result in delays in data collection.*
- Changes that have a significant impact on expenditures - *Nothing to report.*
- Significant changes in use or care of human subjects, vertebrate animals and/or biohazards - *Nothing to report.*
- Change of primary performance site location from that originally proposed - *Nothing to report.*

## SPECIAL REPORTING REQUIREMENTS

- *No special reporting requirements*

## STRIDE Year 1 List of Projects

(For the complete list, visit: <https://stride.ce.ufl.edu/stride-research/active-research-projects/>)

## STRIDE Year 2 List of Projects

(For the complete list, visit: <https://stride.ce.ufl.edu/stride-research/active-research-projects/>)

## STRIDE Year 3 List of Projects

(These are the STRIDE Center's most recently funded projects, which began late Fall 2019 to early Spring 2020.)

### **Emerging Mobility Services for the Transportation Disadvantaged**

Lead PI: Dr. Eleni Bardaka, North Carolina State University

Team: Dr. Noreen McDonald, University of North Carolina at Chapel Hill; Dr. Ruth Steiner, University of Florida; Dr. Xia Jin, Florida International University; Dr. Jeffrey LaMondia, Auburn University

### **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**

Lead PI: Dr. Sherrilene Classen, University of Florida

Team: Dr. Virginia Sisiopiku, University of Alabama at Birmingham and Dr. Jason Mason, University of Florida

### **Evaluation of Transportation Network Infrastructure, Safety, and Travel Route Characteristics of Bike Share, Electric-Powered Pedal-Assist Bike Share, and Electric Scooter System Operation**

Lead PI: Dr. Jeff Davis, The Citadel

Team: Dr. Dimitra Michalaka, The Citadel; Dr. Kweku Brown, The Citadel; Dr. Kari Watkins, GaTech;

### **Utilization of Connectivity and Automation in Support of Transportation Agencies' Decision Making**

Lead PI: Dr. Mohammed Hadi, Florida International University

Team: Nagui Roupail, Ph.D., North Carolina State University; Lily Elefteriadou, Ph.D., University of Florida; Virginia Sisiopiku, Ph.D., University of Alabama at Birmingham; Angshuman Guin, Ph.D., GaTech

### **Identifying and Mitigating Congestion Onset**

Lead PI: George List, Ph.D., North Carolina State University

Team: Billy Williams, Ph.D. North Carolina State University; Michael Hunter, Ph.D., GaTech; Mohammed Hadi, Ph.D., Florida International University

### **Locating and Costing Congestion for School Buses and Public Transportation**

Lead PI: Kai Mondast, MRP, Director Public Transportation Group, North Carolina State University

Team: Ruth Steiner, Ph.D., University of Florida

### **Smartphone-Based Incentive Framework for Dynamic Network-Level Traffic Congestion Management**

Lead PI: Srinivas Peeta, Ph.D., GaTech

Team: Lili Du, Ph.D., University of Florida

**Developing a Methodology to Evaluate Detours for Major Construction Projects in the Era of Real-Time Route Guidance**

Lead PI: Andrew Sullivan, Ph.D., University of Alabama at Birmingham

Team: Virginia Sisiopiku, Ph.D., University of Alabama at Birmingham; Rod Turochy, Ph.D., Auburn University

**Traffic Congestion Identification and Prediction based on Image Processing and Deep Learning Methods**

Lead PI: Robert Whalin, Ph.D., Jackson State University

**Micro-Mobility as a Solution to Reduce Urban Traffic Congestion**

Lead PI: Xilei Zhao, Ph.D., University of Florida

Team: Virginia Sisiopiku, Ph.D., University of Alabama at Birmingham; Ruth Steiner, Ph.D., University of Florida

**Evaluation of Work Zone Mobility by Utilizing Naturalistic Driving Study Data, Phase II**

Lead PI: Huaguo Hugo Zhou, Ph.D., Auburn University

Team: Rod Turochy, Ph.D., Auburn University

## New Cost Share Projects for this Reporting Period

**Guidelines for Implementation of Right Turn Flashing Yellow Arrows and Leading Pedestrian Intervals (2018-21)**

PI: Chris Cunningham, North Carolina State University

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