



UTC Spotlight

University Transportation Centers Program

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Researcher's Life-Long Interest in Transportation and Safety Research Piques President's Interest

Did you ever hope to meet the President of the United States and share your research? Taylor Lochrane, Ph.D., had just that opportunity in July 2014, when he gave President Barack Obama a tour of the Turner-Fairbank Highway Research Center (TFHRC) in McLean, Virginia. Lochrane showed President Obama a vehicle he had customized with sensors designed to enhance traveler safety and mobility. Lochrane also demonstrated the Federal Highway Administration's (FHWA's) research on Speed Harmonization, an application designed to



Taylor Lochrane, Ph.D., speaks with President Obama about the the connected automation technologies built into FHWA's research vehicle fleet.

reduce congestion using vehicle-to-infrastructure (V2I) communications. This application uses traffic sensors to collect real-time traffic information, which is sent to a traffic management center (TMC). The TMC implements speed harmonization by calculating the optimal set speed, which is then sent to the connected vehicles to control traffic flow, improve safety, and reduce congestion. The President was very interested in this area of research.

As a graduate of the University of Central Florida's transportation program in Civil, Environmental, and Construction Engineering, Lochrane benefitted from working under the supervision of his adviser, Professor Haitham Al-Deek, an active faculty member conducting research for the Southeastern Transportation Center

(STC). Al-Deek was awarded an Opportunity & Exploratory Grant by the STC to evaluate wrong way driving incidents and potential countermeasures on Florida's Turnpike Enterprise roadway system.

Connected vehicle research is a hot topic in traffic safety. With this technology, vehicles will be able to "communicate" with each other using in-vehicle or aftermarket devices that share important safety information. Connected vehicles have the potential to "communicate" with traffic signals, work zones, toll booths, school zones, mobile devices (e.g., smart phones), and more, providing both pedestrians and drivers with an awareness of hazards all around them. Onboard sensors will alert drivers to possible crash situations, such as cars in the driver's blind side. Infrastructure communications will provide both drivers and pedestrians, especially those with disabilities, with information regarding traffic signal changes. Connected vehicles and connected infrastructure will result in increased safety and mobility on the road for drivers, roadside workers, and pedestrians alike. This is just some of the work Lochrane and his colleagues are pursuing.

Growing up, Lochrane was always interested in transportation. As an undergraduate he knew he wanted to work in the transportation industry, but he was unsure where to focus. Lochrane's transportation engineering professor at the University of Central Florida (UCF), Professor Haitham Al-Deek, invited Lochrane to join his research team as an undergraduate research assistant, giving him the chance to see if transportation engineering research captured his interest. After attending the annual Transportation Research Board (TRB) meeting in Washington, DC, Lochrane soon realized his research focus would be on traffic operations and decided to conduct graduate research work at UCF with Professor Al-Deek as supervisor.



President Obama is given a tour of the Saxton Transportation Operations Laboratory by Taylor Lochrane, Ph.D., while at the Turner-Fairbank Highway Research Center.

Lochrane received his B.S., M.S., and Ph.D. in Civil Engineering from UCF. While there he ran for student body Vice President and was elected as the first Ph.D. Engineering student for that office. He encouraged student ridesharing with *Zimride*. He also helped design *KnightLYNX*, an evening bus service for students. Lochrane is proud of his time as student body Vice President and his time spent improving student transportation at UCF.

Lochrane's hard work, research, and knowledge gained him selection to FHWA's Summer Transportation Internship Program for Diverse Groups (STIPDG) in 2010. This internship opened his eyes to civil service, and he began to look for other opportunities to work with

FHWA. He came across a program called the Student Career Experience Program (SCEP) (now referred to as the Pathways program), which had a job opening at TFHRC. He applied and was accepted to start in February 2011 as a student trainee in the Office of Operations Research and Development at TFHRC, which allowed him to continue his dissertation research at UCF. He later accepted a full time position as a Research Civil Engineer in 2012 at the same location in the Saxton Transportation Operations Laboratory, which focuses on connected vehicle technologies and services.

Lochrane has worked on many projects with real-life applications. One of his projects looked at the impact electronic signs had on drivers during times of congestion. He also worked on UTC-related research with Professor Al-Deek to understand driver behavior in freeway work zones. The research focused on improving traffic simulation models to better predict the impact a work zone has on mobility. He manages several projects in the area of connected vehicles (vehicle-to-vehicle and vehicle-to-infrastructure) as well as connected automation applications, such as Cooperative Adaptive Cruise Control. He currently works with a team to promote and develop research to relieve traffic congestion and improve mobility. Lochrane will continue to take his knowledge and experience to new research heights in transportation operations.

About This Project

The Southeastern Transportation Center is a consortium of nine universities in U.S. Department of Transportation Region IV: the University of Tennessee, as lead institution; University of Kentucky; the University of South Florida; the University of Central Florida; the University of Alabama; the University of Alabama Birmingham; the University of North Carolina Chapel Hill; North Carolina A&T State University; and Clemson University.

STC funds large-scale, multiuniversity transportation safety research initiatives as well as Opportunity & Exploratory Grants in the Southeast. STC sponsors outstanding individuals to pursue graduate and undergraduate degrees in transportation-related disciplines. To date, the STC has provided educational funding to over 1,800 students in the region.

This newsletter highlights some recent accomplishments and products from one University Transportation Center (UTC). The views presented are those of the authors and not necessarily the views of the Office of the Assistant Secretary for Research and Technology or the U.S. Department of Transportation, which administers the UTC program.

