ATLAS Express

Center for Advancing Transportation Leadership and Safety

July, 2015 Volume 2, Issue 2

UMTRI University of Michigan Transportation Research Institute

Texas A&M Transportation Institute

VOLUME 2, ISSUE 2
JULY 2015

ATLAS Express

Center for Advancing Transportation Leadership and Safety

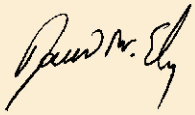
FROM THE DIRECTOR

While the ATLAS Center has been busy sponsoring research projects and conducting the Traffic Safety Conference, we are also very proud of our efforts to provide students with opportunities to learn about transportation safety. Our Summer Internship is well underway with six students from four universities spending the summer at Texas A&M University participating in a variety of research projects. We had numerous students presenting posters at the Traffic Safety Conference in Corpus Christi, and we congratulate Mr. Nathan Schulz for having his poster judged as the top poster at the conference. This issue of ATLAS Express discusses these and our many other activities.

Technologies continue to be developed to improve transportation, and the ATLAS Center faculty and staff recognize that these technologies need to be thoroughly researched. Technologies need to be well-designed and tested under conditions of actual use. This issue of the ATLAS Express highlights several projects related to the development and testing of technology to improve traffic safety and mobility. Dr. Lisa J. Molnar and I are editing a special issue on advanced technologies for older drivers for the journal *Accident Analysis & Prevention*. I invite you to learn more about these activities by also looking at our website: ATLAS-Center.org.

If you have questions or feedback about the ATLAS Center, or you wish to contribute financially to our activities, please contact me at: ATLAS-Center@umich.edu.

My Best Regards,



David W. Eby, PhD
Director, ATLAS Center

The purpose of the ATLAS Express is to inform faculty, students, sponsors, and other transportation stakeholders about the ongoing activities of the Center

Lost in Translation No More: Paul A. Green's Efforts Pay Off

Transportation is a multidisciplinary field. Engineers and researchers from vastly different backgrounds conduct research and share information to advance the state of knowledge of the safety and performance aspects of transportation systems. However, engineers and researchers across disciplines do not always speak the same language when it comes to defining and operationalizing important safety-related performance measures or statistics. For example, "distance headway" between leading and following vehicles is used and reported differently by different disciplines. For at least 75 years, civil engineers used this term to mean the distance between the same point on the lead and following vehicles (e.g., the front axle or front bumper). In contrast, human factors experts, interested in crash avoidance, are concerned about the distance between lead and following vehicles (distance gap), which they mistakenly refer to as headway. Mechanical engineers developing simulations of vehicle dynamics use the center of gravity as their reference point, so to them headway is the separation of the centers of gravity of successive vehicles. Finally, computer graphics programmers examining collision detection in simulators are interested in the spatial centers between objects (which they call headway). Although the definitions make sense within each discipline, they do not measure the same dimension and their values are quite different, several feet in the headway example. Guessing which of these substantially different definitions is intended from context is not good practice.

University of Michigan Transportation Research Institute (UMTRI) Research Professor Dr. Paul A. Green was concerned about the variety of definitions for the same term and the lack of precision in their use. A few years ago, under his guidance, master's student Mark Savino reviewed more than 100 human factors journal articles and reports concerning driving as his thesis work. Mr. Savino found that measures and statistics could have anywhere from 2 to 13 names for them and definitions were rare, and when provided, were vague or conflicting, as in the headway example above. That thesis took three years to complete.

In response to this problem, a Society of Automotive Engineers (SAE) subcommittee was formed to develop a Recommended Practice to provide standard names and definitions for driving performance measures and statistics. Dr. Green is that Practice's sponsor. Following completion of Mr. Savino's thesis, Dr. Green has spent the last five years developing, with the help of other experts, a Recommended Practice to precisely define driving measures and statistics. He's been able to devote a significant amount of time to this effort, in part because of funding support for other areas of his research from the ATLAS Center and a previous U-M University Transportation Center. The result of his work is the SAE Recommended Practice J2944, Operational Definitions of Driving Performance Measures and Statistics, a 171-page, all-inclusive set of definitions for more than 50 commonly-used driving measures and statistics, such as lane departure, roadway departure, time to collision, time to line crossing, and time gap. The document is supported by more than 300 references. The standard was designed so engineers and researchers will have all the information they need to find and cite a particular definition quickly and easily. "A typical [recommended practice] document would just say here's the definition with one sentence and a note or two of explanation. In SAE J2944 we provide a definition, if not several alternatives, references to the documents from which those definitions were obtained, guidance is using the term, and a figure/table showing typical data for context. This document literally defines the field. We were unhappy with the quality of the science of driving, so we undertook this enormous effort to help solve the problem."

The eventual goal is that journals and conference proceedings will require compliance with this Recommended Practice. Dr. Green is hopeful this will get researchers onboard and on a path to clearer, more useful driving studies. SAE Recommended Practice J2944, Operational Definitions of Driving Performance Measures and Statistics has recently been published. For a copy, go to: http://standards.sae.org/j2944_201506/. For more information, contact Dr. Green at pagreen@umich.edu. In Dr. Green's words, "if you are studying or developing systems for how people or automation drive, you should have a copy."

Meet the ATLAS Center Team

Jessica Franklin

Jessica has worked for the Texas A&M Transportation Institute (TTI) for over 25 years. During this time she has held numerous staff positions, most recently being promoted to Administrative Coordinator. In this capacity, she assists the Associate Director in managing the daily operations of the Freight Shuttle program by directing and supervising all administrative and fiscal matters. She is instrumental in preparing budgets, proposals, and payroll. She maintains monthly financial records and serves as the liaison between office staff and the Administrative and Fiscal Services areas of TTI.

From 1993 to 2013, she served as the program chair for the biennial National Highway-Rail Grade Crossing Safety Training Conference. She established and worked with a committee of industry professionals to develop the program, as well as coordinated and hosted the event. In 2008, she began assisting in coordination and hosting the annual Traffic Safety Conference, held by TTI's Center for Transportation Safety and co-sponsored by the ATLAS Center for the last two years. For both events, her responsibilities include overseeing the selection and contracting with a host hotel, maintaining and expanding a database of potential attendees, coordinating development of website information and registration material, contacting potential speakers and session moderators, working with speakers to obtain copies of their information and presentations that will be used during the events, as well as working with conference hotel for room set-ups, conference receptions and meal functions, and moderating sessions during the conference if needed.

Jessica is a native of Louisiana, but spent most of her young life in various countries around the world, finally settling in Texas in 1980. She has two daughters and in her spare time, enjoys spending time with family, kayaking, listening to music and cooking.

Laura Higgins

Laura Higgins is an Associate Research Scientist in the Texas A&M Transportation Institute's Center for Transportation Safety, and helps coordinate the activities of the students participating in ATLAS Center Summer Research Internship Program. Her research has focused on a variety of topics in driver perception and comprehension of information, including a study for the Texas Department of Transportation (TxDOT) on drivers' comprehension of and compliance with roadway flood warning signs; a study for the Wisconsin Department of Transportation examining the decision and route selection processes of drivers faced with lane closures, and a current project sponsored by the National Cooperative Highway Research Program (NCHRP), developing guidelines for emergency exit signs and markings for highway tunnels.

Laura has experience in developing and conducting surveys, focus groups, and interviews of drivers and transit riders, as well as conducting closed-course and on-road driving studies.

Her non-work time is spent singing in her church's sanctuary choir, spoiling her nieces and nephew, sewing, reading (particularly sci-fi and fantasy), and attending every comic-book-based movie that hits theaters.

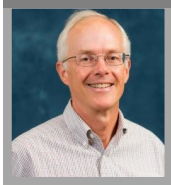
Announcement—Call for Papers

Journal of Accident Analysis & Prevention (AAP) Special Issue

Center Director David W. Eby and Associate Director Lisa J. Molnar are serving as guest editors for an AAP special issue titled "Implications of Advanced Vehicle Technologies for Older Drivers." This is a call for papers for that issue. Papers of particular interest are those regarding older drivers (drivers age 65 and older) and the following types of technologies: connected vehicle (vehicle to vehicle and vehicle to infrastructure) technologies; automated/autonomous vehicle technologies; and active safety technologies. The scope of this issue is to: find out how older drivers use advanced vehicle technologies; assess the benefits of these technologies in terms of safety, mobility, comfort and other outcomes; and to find out older drivers' perceptions about these technologies with regard to expectations, trust, acceptance, and performance. Papers are to be submitted by **November 1, 2015**. For more information visit: **http://www.journals.elsevier.com/accident-analysis-and-prevention/call-for-papers/implications-of-advanced-vehicle-technologies-for-older/**

Research News

Researcher Feature



Meet Dan Blower, Associate Research Scientist in UMTRI's Vehicle Safety Analysis Group, and the star of our latest Researcher Feature video. Dan's primary area of research is traffic crash causation, and he is currently a researcher on the ATLAS Center Research Excellence Program project "Project Investigation of the Correlation between Roadside Safety Hardware and Vehicle Safety Standards Evaluation Criteria" and the Cooperative Research Program project "Identifying the Potential of Improved Heavy Truck Crashworthiness to Reduce Death, Injury, and Societal Costs of Heavy Truck Crashes." See video: *http://www.atlas-center.org/research/researcher-features/dan-blower/*.

2016 Request for Proposals

The 2016 ATLAS Center at UMTRI Research Excellence Program Request for Proposals for projects related to Integrated Solutions for Transportation Safety was issued to University of Michigan (U-M) faculty on April 3rd. Proposals were due May 15th. Eight proposals were received on a variety of topics including pile-driving, distracted driving, occupant protection, drowsy driving, young drivers, and older heavy-vehicle drivers. These proposals will be reviewed by invited experts outside of the U-M. Nine other projects are currently being conducted at UMTRI and TTI from previous Research Excellence Program awards. Learn more at http://www.atlas-center.org/research/

Research Excellence Program

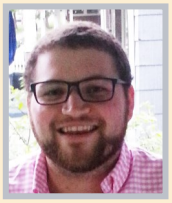
A final report, one-page brief, and web briefing video for "Predicting Driver Distraction Using Computed Occlusion Task Times: Estimation of Task Element Times and Distribution" are available in the Technology Transfer & Research sections of our website. The project investigated how long it takes drivers to perform tasks on modern navigation, entertainment, & driver-information systems. Learn more at www.atlas-center.org/technology-transfer/.

Educational News

The 2015 Summer Internship Program kicked off on June 1st with students from four universities selected to participant in the 10 week program at Texas A&M University (TAMU). All of the students were matched with an appropriate researcher mentor at TTI and Texas A&M to guide them as they work on transportation safety themed projects.

Stay updated on the interns' local activities and research work at www.atlas-center.org/educationworkforce-development/2015-summer-intern-program/whats-happening-with-the-2015-interns/.

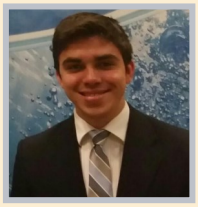
Summer Internship Program



Garrett Ackner, biomedical engineering major at U-M, is working with TTI Associate Research Scientist Chiara Silvestri Dobrovolny on a project that aims to prevent crashes between emergency and civilian vehicles.

Lolivone de la Rosa-León, environmental engineering student at Polytechnic University of Puerto Rico, is working with TTI Senior Research Engineer/Program Manager Jerry Ullman to determine the safety benefits of work zone queue warning systems such as rumble strips, smart work zone and intelligent transportation systems.

Marci Early, civil engineering major at the University of Arkansas, Fayetteville, is working with TTI Program Manager and Research Engineer Karen Dixon on the driver perceptions of right-of-way at two-way stop controlled intersections.



George Gillette is a civil engineering student at TAMU. This summer, George is working with TTI Senior Research Engineer Kay Fitzpatrick on a study addressing distracted pedestrians.

Marielle Saunders is a history major and sustainability minor at U-M. This summer, Marielle is working with two mentors: TTI's Associate Research Engineer Joan Hudson and TAMU Associate Professor Chanam Lee. Marielle will research pedestrian and bicycle safety with Joan, and will investigate the relationships between health, safety, the built environment, and active living with Chanam.

Zach Snyder is a mechanical engineering student at U-M. Zach is working with TTI Program Manager/Senior Research Scientist Michael Manser on an older driver support system to assist the growing population of those 65 and older.

Educational News (cont'd)

ATLAS Center Symposium Program Series

In May, **Dr. Michael Manser**, Senior Research Scientist and Human Factors Program Manager in the Center for Transportation Safety (CTS) at TTI, was hosted by Dr. David W. Eby for an UMTRI visit to meet with researchers. Michael gave a symposium talk in conjunction with the ATLAS Center sponsored UMTRI 50th Anniversary Automated Vehicle Seminar Series. He discussed TTI's current efforts and directions within the automated and connected vehicles domain with emphasis on human technology interaction. Watch a video of the presentation here: http://www.atlas-center.org/educationworkforce-development/atlas-symposium-series-program/michael-manser/

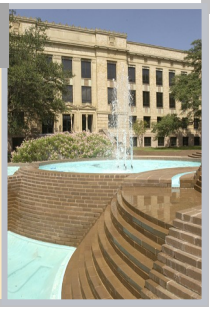
SAVE THE DATE for our next symposium visitor, **Dr. Sue Chrysler**, Senior Research Scientist from TTI who will be hosted by UMTRI's Paul Green from September 28-30, 2015.

Advancement Via Individual Determination (AVID) Program

On May 1,
25 sixth grade AVID students and two teachers from Cypress Grove Intermediate School in College Station, Texas visited TTI. On May 8, 39 sixth grade AVID students and six teachers from Oakwood Intermediate School in College Station, Texas, visited TTI.

During each visit, the students learned about the transportation industry and careers in engineering, and participated in various hands-on transportation themed activities related to: traffic control devices, transportation and the environment, bicycle safety, and distracted driving. The students used hand-held microscopes to examine various pavement markings, sign sheetings, and raised reflective pavement markings (RRPMs); touched and attempted to identify materials used to prevent erosion; learned about the planning and design of bicyclist and pedestrian facilities; and 'drove' the Texas A&M AgriLife Extension Service distracted driving simulator, among other activities. The ATLAS Center funded the materials needed for activities as well as TTI's Melisa Finley's efforts to develop the agenda, coordinate activities, and host the program events.

Student Research Participation



Six students from TTI and three students from U-M are participating in ATLAS Center research Projects. Collectively these students represent a broad range of academic departments including Biostatistics, Civil Engineering, Mechanical Engineering, Public Health, and Structural Engineering.

Educational News (cont'd)

Up-and-Comer
Trebecca McDonald

Trebecca McDonald graduated with a Civil Engineering Bachelor's Degree from the University of Michigan in May 2015, and has begun an exciting new career at HNTB in Detroit, MI as a Transportation Engineer. AT HNTB, Trebecca will be working on the I-94 reconstruction project, primarily in property acquisition, helping the Michigan Department of Transportation (MDOT) acquire land needed for the project. Trebecca previously held a co-op position at MDOT for the summer of 2014, where she had the opportunity to learn the basics of Microstation (similar to AutoCAD) in order to create two design concepts for a future commuter lot in Northfield, MI. She also was responsible for the revision and packaging of a scoping document containing work valued over $16 million. Recently, Trebecca participated in an ATLAS Center sponsored student poster session at the 2015 Traffic Safety Conference, where she presented results of studying pedestrian and driver behavior on Plymouth Road in Ann Arbor, MI.

"I appreciated the opportunity provided by The ATLAS Center and UMTRI to present my team's work on studying pedestrian and driver behavior on a high volume road with traffic beacons installed. Not only was I able to express my passion about maintaining traffic while keeping people safe, I was able to network with many professionals having everything from administrator to vendor roles in transportation who share the same interest. From the poster sessions to the seminars, I developed a growing appreciation for the complexity of road and highway safety, and look forward to increasing safety awareness in my own career." ~ Trebecca McDonald, Student Poster Presenter, TTI Traffic Safety Conference

Technology Transfer

Web Briefings

As part of this program, a short, concise video is produced for each ATLAS Center project. These brief summary videos include a description by the principal investigator of what was done on the project, study findings, and the application of those findings for transportation safety. As mentioned earlier in this issue, the video for the project "Predicting Driver Distraction Using Computed Occlusion Task Times: Estimation of Task Element Time and Distributions" is available on our website at www.atlas-center.org/technology-transfer/web-briefings/. Check back for more web briefings as ATLAS Center projects are completed.

Research Briefs

The ATLAS Center posts quick and convenient one-page briefings of all of our final projects on our website. The briefing for "Predicting Driver Distraction Using Computed Occlusion Task Times: Estimation of Task Element Time and Distributions" can be found at www.atlas-center.org/technology-transfer/research-briefs/. Check back as projects are completed.

Technology Transfer (cont'd)

Knowledge Translation Program

After recently meeting with staff from the U-M Office of Technology Transfer, we are in the process of working on a creative resource to aid our principal investigators in successfully navigating the process required for technology transfer, product development, & technology commercialization.

Publications

ATLAS Center staff are working on a project sponsored by the AAA Foundation for Traffic Safety (AAAFTS). They recently completed a publication for the project that is slated for release by AAAFTS in December, 2015. The citation for the report is:

Eby, D.W., Molnar, L.J., Zhang, L., St. Louis, R.M., Zanier, N., & Kostyniuk, L.P. (2015). *Keeping Older Adults Driving Safely: A Research Synthesis of Advanced In-Vehicle Technologies*. Washington, DC: AAA Foundation for Traffic Safety.

Please visit our website for more publications at www.atlas-center.org/technology-transfer/reports/

Website & Facebook

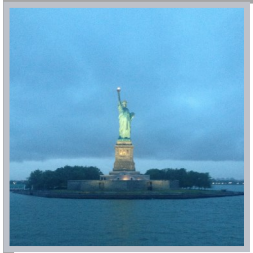
Our website and Facebook are the best places to check back for news on our research, education and technology transfer programs and activities. The ATLAS Center staff frequently adds pictures, videos and the latest news. See more about the Traffic Safety Conference, current and upcoming research projects, and more at **ATLAS-Center.org**

or **www.facebook.com/ATLASCenter**

Newsletter

This is the sixth issue of *The ATLAS Express,* our Center newsletter. We encourage you to go back and read about our past work and activities in previous issues at www.atlas-center.org/technology-transfer/newsletters/

Events



Center Director David W. Eby and Project Coordinator Beth Jakubowski attended the CUTC Annual Summer Meeting at Rutgers University in New Brunswick, New Jersey from June 1-3, 2015. UTC Updates, successful UTC Grantee Activities, national center presentations, and UTC Administrative Managers Sessions were the highlights of the meeting. The boat excursion on the Hudson River was a great chance to network among other UTC directors, administrators, and USDOT grant managers.

Council of University Transportation Centers

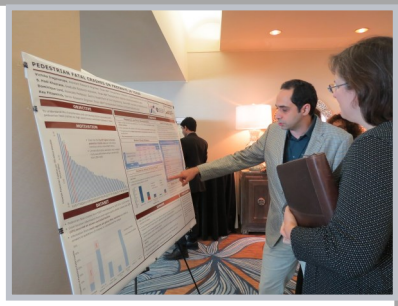
Events (cont'd)

ATLAS Center staff David W. Eby, Lisa J. Molnar, Robert Wunderlich, Melissa Tooley, Lidia Kostyniuk, Renée St. Louis, Nicole Zanier, Liang Zhang, Beth Jakubowski, Barb Lorenz, and Laura Higgins attended TTI's annual Traffic Safety Conference, co-sponsored by ATLAS Center, from June 8-10 in Corpus Christi, Texas.

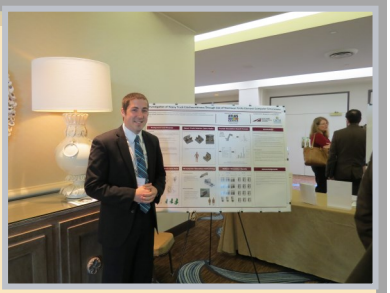
David W. Eby, Lisa J. Molnar, Robert Wunderlich, Lidia Kostyniuk, Daniel Blower, Renée St. Louis and Nicole Zanier gave presentations in the Driver Behavior and Attitudes, Protecting our Vulnerable Users, Transit Travel Training, Strategies to Improve Truck Safety, and Improving Safety through Enforcement sessions. Melissa Tooley led the Linking Crash and Trauma Data to Improve Safety session.

A session dedicated to ATLAS Center research featured TTI Associate Research Scientist Chiara Silvestri Dobrovolny, TTI Associate Research Scientist; Melisa Finley, TTI Research Engineer; Daniel Blower, UMTRI Associate Research Scientist; and Lisa Buckley, UMTRI Assistant Research Scientist. Please visit www.atlas-center.org/technology-transfer/sample-page/past-events/video-highlights-2015-safety-conference/ to videos of these presentations.

A student poster session gave students the opportunity to present their work and interact with transportation safety professionals. The ATLAS Center directly sponsored the 10 student poster participants (eight from TAMU and two from the University of Michigan). All students were scored on poster quality, importance of the work, and presentation by four secret judges. To see the list of students and poster titles, go to:www.atlas-center.org



2015 ATLAS Center Student of the Year, **Nathan Schulz**, Student Technician, TTI Roadside Safety and Physical Security Division, and ATLAS research undergraduate student, was announced the poster session winner by Robert Wunderlich.



Congratulations, Nathan…again!

Events (cont'd)

UMTRI's 50 Anniversary Seminar Series

The ATLAS Center sponsored Virginia Tech Transportation Institute Research Scientist Dr. Gregory Fitch, and Professor Nadine Sarter of the U-M Center for Ergonomics, Industrial and Operations Engineering, to present their research. Greg presented research on driver distraction, driver performance with collision avoidance systems, and operator interaction with automated vehicles. Nadine's talk was titled "Human-Automation Interaction: Lessons Learned across Domains," discussing lessons learned from aviation that are relevant for ground vehicles.

Activities

The ATLAS Center continues to support Education Coordinator and Certified Child Passenger Safety Technician Renée St. Louis's efforts to deliver individualized hands-on instruction to community members participating in monthly child safety seat inspection stations, expectant parent classes held at local businesses, and other community safety events.

Michigan Safety Conference

On April 15, David W. Eby attended the 2015 Michigan Safety Conference, held in Lansing, Michigan, and gave a presentation titled "Older Drivers: An Overview."

On April 22, Lidia Kostyniuk served as a judge at the U-M Undergraduate Research Opportunity program (UROP) Spring Research Conference.

On June 29, Lisa J. Molnar presented "Research Initiatives on Connected/ Automated Vehicle Technology" as part of a panel at the Mid-Year Meeting of the TRB Committee on the Safe Mobility of Older Persons ANB60), in Woods Hole, MA.

On June 6, ATLAS Center staff members Renée St. Louis and Nicole Zanier attended the 2015 Michigan Truck Driving Championship in Lansing, Michigan. Renée and Nicole served as judges for the competition, which brought in 5-axle, 3-axle, tankers, straight truck and flatbed truck drivers from companies all over Michigan. Nicole and Renée also had the opportunity to 'drive' the Michigan Center for Truck Safety mobile truck driving simulator.

If you would like to unsubscribe to this newsletter or contact the ATLAS Center, please email us at **ATLAS-Center@umich.edu** or call **(734) 764-4778.**

ATLAS CENTER

Advancing Transportation Leadership & Safety

The ATLAS Center is a collaboration between the University of Michigan Transportation Research Institute (UMTRI) and the Texas A&M Transportation Institute (TTI)

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Enjoy the Summer Season!

David, Lisa, Robert, Melissa, Lidia, Renée, Nicole, Barb, and Beth

Front Cover Photo: Corpus Christi Harbor —Nicole Zanier
Inside Photos: TTI Personnel—TAMU Media; U-M Faculty—U-M Media; TTI/TAMU Buildings—TAMU Media; Interns at Safety Conference—Beth Jakubowski; Michael Manser—UMTRI Marketing; AVID Photos—TAMU Media; ; U-M Student Photos—U-M Media; CUTC-Statue of Liberty—Beth Jakubowski; Safety Conference Photos—Nicole Zanier; Nadine Sarter & Greg Fitch—UMTRI Marketing; MI Truck Driving Championship—Larry Archer & Nicole Zanier;
Back Cover Photo: Michigan Sleeping Bear Dunes National Lakeshore—Sue Finley