

research review

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Mcity Grand Opening

U-M opens Mcity test environment for connected and driverless vehicles



Research and testing is now underway at the University of Michigan's 32-acre Mcity, the world's first controlled environment specifically

designed to test the potential of connected- and automated-vehicle technologies that will lead the way to mass-market driverless cars. Mcity, which officially opened on July 20, simulates urban and suburban roadways to provide a real-world environment for safe, repeatable testing of new technologies before they are tried out on public roads. It is operated by U-M's Mobility Transformation Center (MTC).

"We believe that this transformation to connected and automated mobility will be a game changer for safety, for efficiency, for energy, and for accessibility," said Peter Sweatman, director of the MTC. "Our cities will be much better to live in, our suburbs will be much better to live in. These technologies truly open the door to 21st century mobility."

Mcity was designed and developed by U-M's interdisciplinary MTC, in partnership with the Michigan Department of Transportation (MDOT).

Photo credit: University of Michigan

"MTC and Mcity highlight the interdisciplinary strengths of U-M," said U-M President Mark Schlissel. "The initiative also demonstrates the great potential in working with partners outside the university to address compelling issues of broad impact."

The facility also underscores Michigan's emergence as a leader in advanced mobility, building on the state's position as the global center of automotive research and development for more than a century. Today, Michigan is home to 375 automotive research centers, and has the highest concentration of industrial and mechanical engineers in the country.

"We've been a world leader in innovation, especially in terms of mobility," said Michigan Governor Rick Snyder. "We put the world on wheels. We transformed how the world moved. Michigan is uniquely positioned to continue to be a leader in mobility, and the University of Michigan's new Mcity will play a critical role in that future."

(Continued on page 2)



Mcity Grand Opening (Continued from page 1)

Mcity is a 32-acre simulated urban and suburban environment, which includes a network of roads with intersections, traffic signs and signals, streetlights, building facades, sidewalks, and construction obstacles. It is designed to support rigorous, repeatable testing of new technologies before they are tried out on public streets and highways.

“There are many challenges ahead as automated vehicles are increasingly deployed on real roadways,” Sweatman said. “Mcity is a safe, controlled, and realistic environment where we are going to figure out how the incredible potential of connected and automated vehicles can be realized quickly, efficiently, and safely.”

In particular, Mcity allows researchers to simulate the environments where connected and automated vehicles will be most challenged. Even seemingly minor details that a vehicle might encounter in urban and suburban settings have been incorporated into Mcity, such as road signs defaced by graffiti and faded lane markings.

The types of technologies that will be tested at the facility include connected technologies—vehicles talking to other vehicles or to the infrastructure, commonly known as V2V or V2I—and various levels of automation all the way up to fully autonomous, or driverless, vehicles.



MTC is a public-private partnership among industry, government and academia. The center was established to lay the foundation for a commercially viable ecosystem of connected and automated mobility that will revolutionize the movement of people and goods worldwide. A key MTC goal is to put a shared network of connected, automated (including driverless) vehicles on the road in Ann Arbor by 2021.

In addition to Mcity, MTC has three on-roadway connected- and automated-vehicle deployments underway. With the help of UMTRI and the Michigan Economic Development Corporation, MTC is building on a nearly 3,000-vehicle connected technology project launched three years ago by the U-M Transportation Research Institute to create a major deployment of 9,000 connected

CONNECTED TECHNOLOGY: A History of UMTRI Milestones



1987

Michigan program in Intelligent Vehicle Highway Systems (IVHS) founded. IVHS refers to the range of advanced electronics systems that impact highway transportation.

Some early goals were to optimize speed and efficiency of traffic flow and employ smart sensors and control systems to help drivers avoid collisions.

1992

Robert D. Ervin, head of UMTRI's Engineering Research Division, and codirector of the Michigan IVHS program, gives a presentation at the World Trade Center on the U-M IVHS program, one of the leading IVHS programs in the United States.

2001

Road departure crash warning (RDCW) field operational test begins. Conducted by UMTRI and partners as part of the Intelligent Vehicle Initiative, the RDCW project succeeded in field-testing an advanced set of crash-warning systems in vehicles. The project collected data from seventy-eight drivers, who traveled a total of 83,000 miles, and confirmed the technology's potential for reducing the number of road-departure crashes in the U.S.

2006

UMTRI is awarded funding by USDOT to continue development and evaluation of integrated vehicle-based safety systems (IVBSS). The program developed integrated, advanced technologies and warning systems to help drivers avoid crashes. The systems employed a variety of sensors, including radar, image processing, and global positioning data to determine the relationship between an equipped vehicle and the roadway environment.

2011

UMTRI is chosen by USDOT to conduct the largest-ever road test of connected-vehicle crash-avoidance technology, known as Safety Pilot Model Deployment (SPMD). Under the leadership of UMTRI director Peter Sweatman and led by program manager Jim Sayer, the project team begins work to coordinate and execute the multiyear project, which involves equipping nearly 3,000 cars, trucks, and buses with wireless communication devices to gather extensive data on system operability and effectiveness at reducing crashes.

vehicles operating across the greater Ann Arbor area. MTC is also partnering with industry and the Michigan Department of Transportation to put 20,000 connected vehicles on the road in Southeast Michigan. The third piece of the plan calls for deploying a 2,000-vehicle mobility service of connected and automated vehicles in Ann Arbor.

“This unique combination of a purpose-built test environment and real-world deployments sets U-M apart from other organizations and institutions doing similar work,” said Jim Sayer, director for deployment for MTC.

MTC’s industry and government partners reflect the diversity of perspectives required to meet the challenges ahead. In the private sector, MTC partners include automakers and top-tier auto suppliers, but also traffic-signal and traffic-sensing companies, insurance providers, telecommunications, big data, IT and more. On the public side, MTC is working with federal, state, and city governments.

“Mcity represents an important partnership between government at all levels, private industry and academia,” said Kirk Steudle, director of the Michigan Department of Transportation. “State of Michigan officials are thrilled to be part of this vital collaborative, which will ensure that Michigan continues to be the world’s auto leader.”

Speakers at the grand opening ceremony, held inside Mcity, included Schlissel, Sweatman, and Steudle, along with U-M Board of Regents Chair Shauna Ryder Diggs, U.S. Representative Debbie Dingell, U.S. Senator Debbie Stabenow, U.S. Senator Gary Peters, and Ann Arbor Mayor Christopher Taylor.

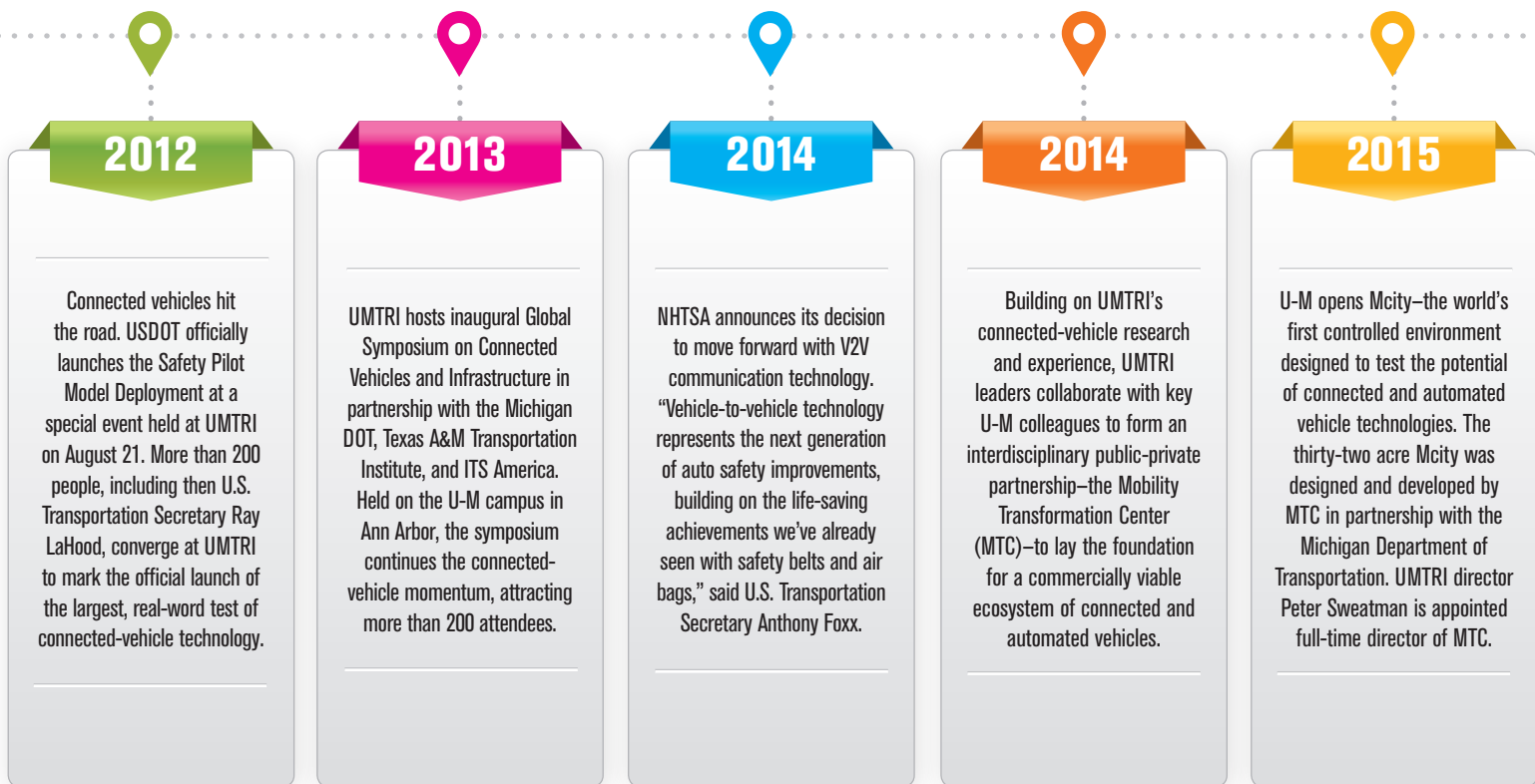
MTC is looking beyond technology to make next-generation mobility a reality. The center brings together faculty and students from across U-M to explore the web of engineering, business, law, urban planning, policy, and social challenges that must be addressed.

MTC was launched in 2013 and Mcity construction began last year. About \$10 million has been invested in the test facility, with funding coming from U-M and MDOT. Mcity will be available for use by any organization, but priority will be given to MTC partners and U-M faculty and students.

MTC is working closely with fifteen Leadership Circle member companies, each investing \$1 million over three years, and engaging in thought leadership. Thirty-three affiliate members are also contributing, and investing \$150,000 over three years. Current Leadership Circle companies are Delphi Automotive PLC; DENSO Corporation; Econolite Group, Inc.; Ford Motor Co.; General Motors Co.; Honda Motor Co., Ltd.; Iteris, Inc.; Navistar, Inc.; Nissan Motor Co., Ltd.; Qualcomm Technologies, Inc.; Robert Bosch, LLC; State Farm Mutual Automobile Insurance Company; Toyota Motor Corp.; Verizon Communications, Inc.; and Xerox Corp.

Source: Michigan News. <http://ns.umich.edu/new/multimedia/videos/23020-u-m-opens-mcity-test-environment-for-connected-and-driverless-vehicles>.

For more information, visit the Mobility Transformation Center website, www.mtc.umich.edu.



UMTRI Leadership Changes

Sweatman to lead MTC; Flannagan appointed UMTRI interim director



Peter Sweatman, director of UMTRI for eleven years, has been appointed full-time director of the

Mobility Transformation Center (MTC), effective September 1, 2015. As part of this transition, UMTRI associate research scientist Carol Flannagan has been appointed interim director of UMTRI.



Sweatman, an international authority on transportation research and development with a specialty in heavy-vehicle-infrastructure interaction, came to UMTRI as director in 2004. He has become widely recognized as a leader in intelligent vehicle systems (ITS), working closely with government and industry in this emerging field. In 2010, he was appointed to the U.S. Department of Transportation's ITS Advisory Committee, and he currently serves on the ITS America Board of Directors. He played a key role in bringing the landmark Connected Vehicle Safety Pilot Model Deployment to UMTRI. This \$31 million program was funded by U.S. DOT to test the viability of connected technology by equipping nearly 3,000 private vehicles in Ann Arbor—along with selected intersections, curves, and freeway sites—with devices that collect data that can be used to alert drivers to potentially dangerous situations.

“Peter has demonstrated exceptional leadership in overseeing UMTRI and in guiding the development of the MTC,” said S. Jack Hu, U-M interim vice president for research. “His stature in the field of connected and automated vehicles; his strong relationships with government and industry; and his vision for a safer, greener future for mobility will serve the university well as we take the MTC to the next level.”

A national search is under way to find a permanent director for UMTRI, and Hu said he expects the process to be complete by the end of the current calendar year.

During this transition, Carol Flannagan has been appointed UMTRI interim director. Flannagan is an associate research scientist in UMTRI's Biosciences Group and codirector of UMTRI's Center for the Management of Information for Safe and Sustainable Transportation (CMISST).



She joined UMTRI in 1991 after completing her Ph.D. in mathematical and experimental psychology at U-M. Her research interests include ergonomics in automotive design and crash-database analysis. She has performed extensive analyses of various crash databases to identify injury patterns and trends and to identify predictors of injuries in different types of crashes. In addition, she often provides statistical advice to other UMTRI groups.

“With her strong research background, and her clear grasp of the mission of UMTRI and its unique position among U-M interdisciplinary units, I believe that Carol is the right person to guide us through the period of transition as we search for a new director.”

“With her strong research background, and her clear grasp of the mission of UMTRI and its unique position among U-M interdisciplinary units, I believe that Carol is the right person to guide us through the period of transition as we search for a new director. I look forward to working with her in the coming months,” said Hu.

Peter has demonstrated exceptional leadership in overseeing UMTRI and in guiding the development of the MTC. . . His stature in the field of connected and automated vehicles; his strong relationships with government and industry; and his vision for a safer, greener future for mobility will serve the university well as we take the MTC to the next level.

— S. Jack Hu, U-M interim vice president for research

U-M and Kohl's Launch Campaign to Reduce Distracted Driving among Teens



It's a contract full of such vows as "I will find sunglasses before driving," "I will wait until stopped to search for music" and "I will rely on passengers to make calls or text for me," signed by teens before hitting the road as new drivers.

The teen-parent driving agreement is just one of the many free online tools offered to young drivers, parents, families, schools and communities through the new Kohl's Drive Smart initiative launched this summer.

A \$299,497 grant from Kohl's Department Stores is made possible through the Kohl's Cares cause merchandise program. Through this initiative, Kohl's sells \$5 books and plush toys, where 100 percent of net profit benefits children's health and education programs nationwide, including hospital partnerships like this one. The grant has allowed the pediatric-trauma program at University of Michigan's C.S. Mott Children's Hospital to develop a novel, evidence-based program designed to reduce distracted teen driving. The program was developed in conjunction with the U-M Injury Center and researchers in UMTRI's Young Driver Behavior and Injury Prevention Group.

The effort comes as traffic accidents continue to be the leading cause of death for American teens, with research pointing to distracted driving as a common culprit.

"Teen drivers and their passengers are at particular risk of injury from car accidents and we see every day how even the most simple, seemingly innocuous distractions can result in tragedy," says Peter Ehrlich, M.D., director of the Pediatric Trauma Center at U-M's C.S. Mott Children's Hospital and the principal investigator of the grant.

"Our goal is to increase awareness of the dangers and reality of distracted driving and to empower both teens and their parents with strategies to make impactful changes in driving habits. We are thankful for this generous gift from Kohl's that will support our efforts to educate drivers and make our roads safer."

Kohl's Drive Smart's website (kohlsdrivesmart.org) includes an interactive teen-driving simulation that asks teens what they would do in common scenarios such as hearing a ping on their phones alerting them of a message or if friends are laughing and ask the driver to turn around to see something. An online driving toolkit also offers the parent-teen agreement and safe driving tips for drivers, passengers and families.

The campaign will also roll out digital and mobile advertising targeting teens and parents, which shows the effects of distracted driving on teen drivers while sharing statistics about distracted driving, crash rates and parent role modeling. At least one local driver's education program in Saline, Michigan, has already used parts of the Kohl's Drive Smart initiative for its teen students.

Much of the initiative targets not just teens but parents, who researchers believe play an important role in teens' driving habits.



The parent-teen agreement holds parents accountable too, asking them to check boxes promising to limit distractions and to "be a good role model," "provide a safe ride home (no questions at that time)," and "apply rules fairly and consistently."

"We know that it is not only important for parents to regularly talk to their kids about distracted driving but to be a good role model for what safe driving looks like," Ehrlich says. "Parents who occasionally eat fast food in the car or take a quick phone call should remember that their kids are watching. Young people who perceive that their parents drive while distracted tend to do the same."

Research shows that the majority of drivers do at least one distracted-driving behavior every time they drive—including 87 percent of adults and 92 percent of teens. Teens are four times more likely to crash or nearly crash when distracted, and adults are twice as likely.

The online toolkit includes tips on preventing and minimizing distractions for both drivers and their passengers. Tips for passengers include offering to navigate, securing pets and taking care of children so the driver can focus on the road. Parents may also use the website information for conversation starters with both their teen driver and also with their 12-14 year olds to encourage them to be calm, quiet, and helpful passengers.

Kohl's Drive Smart's multiformat campaign will target parents and teens via mobile marketing banner ads, digital billboards, streaming audio, social media, and geofencing. Brochures and reminder sheets will also be distributed at driver's education graduations, community events, county fairs and by health providers.

Credit: University of Michigan Health System, <http://www.uofmhealth.org/news/archive/201508/kohlsdrivesmart>

Read more about tips to prevent distracted driving on the C.S. Mott Children's Hospital blog: <http://uofmhealthblogs.org/childrens/voices-from-mott/tips-to-prevent-distracted-driving/24187/>



UMTRI research drives publication of SAE standard



SAE International has published SAE Recommended Practice J2944, *Operational Definitions of Driving Performance Measures and*

Statistics. UMTRI research professor Paul Green is lead author of this standard.



SAE J2944 is a foundational document providing driving performance operational definitions for on-road vehicles operated by a driver, automatically driven (self-driving), or operated by shared control. It is based on other foundational documents such as the AASHTO “Green Book,” the *Highway Capacity Manual*, and the *Manual of Uniform Traffic Control Devices*, and is supplemented with more than 300 references.

“This recommended practice was written to advance global mobility, which is SAE International’s core mission,” said Green. “Progress in science and engineering depends upon having a common language for exchanging ideas, be it the metric system, or this recommended practice.”

The measures and statistics defined in this document are used to describe the lateral and longitudinal control of road vehicles as part of safety and/or usability evaluations of (1) driver distraction caused by in-vehicle information systems (e.g., navigation systems, in-vehicle cell phones), (2) driver awareness and assistance systems (e.g., adaptive cruise control, lane keeping assistance, collision warning, crash avoidance braking), (3) fitness to drive/licensing, (4) drug and medication use by drivers, (5) autonomous driving, and (6) for other purposes. These measures and statistics appear in technical standards, journal articles, proceedings papers, technical reports, and presentations.

J2944 defines more than eighty terms related to driving, such as *lane departure*, *gap* and *headway*. The definitions enable researchers and OEMs to avoid misleading, inconsistent, or confusing use.

“To encourage use, we not only provided the definitions, but also guidance in their use, key studies that have used them, and representative data,” Green said. “Although use of this recommended practice will be required in many contexts, our goal was to make this document so useful and easy to use that people would want to use it anyway.”

New rating system developed for LATCH hardware in vehicles



The Insurance Institute for Highway Safety (IIHS) has launched a new rating system for LATCH usability. The new rating system for LATCH usability is based on IIHS-sponsored research conducted at UMTRI over the last four years led

by associate research scientist Kathleen Klinich and senior research associate Miriam Manary.

LATCH stands for lower anchors and tethers for children and consists of dedicated hardware in the vehicle and on the child restraint. By offering a method to install child restraints without using the vehicle seat belt, the system was intended to make it easier to install a child seat properly. This is true in many vehicles, but in other vehicles LATCH is difficult to use even if it meets federal requirements. It is particularly important to make the tether anchor easy to find and use because using a tether offers an additional safety benefit by reducing head movement of forward-facing children in a crash.

The Institute’s new LATCH ratings will serve as a resource for families looking for a vehicle that makes it easier to install their child restraints using the LATCH system. In addition, the information provided by the IIHS highlights vehicles that provide more LATCH anchors than are required by Federal Motor Vehicle Safety Standard 225.



Photo credit: UMTRI

“The diagrams provided by the IIHS quickly show how many seating positions have lower anchors and tethers, how hard they are to use, and whether there are options for using LATCH in center seating positions,” says Klinich.

IIHS news release: www.iihs.org/iihs/news/desktopnews/iihs-launches-ease-of-use-ratings-of-latch-hardware-in-vehicles

UMTRI report: *Factors affecting tether use and misuse*, <http://hdl.handle.net/2027.42/106031>

UMTRI report: *LATCH usability in vehicles*, <http://hdl.handle.net/2027.42/90856>

Nielsen joins UMTRI as business administrator



Holly Nielsen joined UMTRI on September 16 as UMTRI's business administrator, replacing Cathy Seay-Ostrowski, who had been in the position since 2005.



In her new role at UMTRI, Nielsen will be responsible for developing and administering the financial, business information, human-resource, and facilities functions of UMTRI. She will report to the UMTRI director and will maintain a close working relationship with administrators in the U-M Office of Research as well as other U-M schools and colleges.

Nielsen earned a BA from U-M, majoring in economics and German. Her studies included a semester abroad at the University of Heidelberg in Germany. She also earned an MBA from the U-M Ross School of Business.

Prior to joining UMTRI, she was the executive director for Application and Information Services (AIS) for U-M's Information and Technology Services since October 2011. In this position she was responsible for the university's enterprise applications, which support U-M's core activities and provide information to inform strategic, tactical, and operational decision making across the university.

Before being an executive director, Nielsen served ITS as the director of AIS Enabling Technologies and Services from June 2010 to October 2011. In that role, she led strategic planning for business intelligence, mobile applications, portals, and performance support. Her work in the areas of business intelligence and mobile-application development has been recognized in national and local media.

Between 1998 and 2010, Nielsen served as assistant director, first for Student Administration, and then for Business Intelligence. In these leadership roles, she built the university's business-intelligence environment and developed the strategy for the Next Generation Data Warehouse.

When Holly began her career at U-M in 1986, she was a computer consultant at the U-M Ross School of Business Administration. Between 1988 and 1998, she moved to positions of increasing responsibility. She was coordinator of Office Information Systems for the Office of the President, Academic Affairs, and the Office of Budget and Planning; senior data analyst for University Information Systems; coordinator of Management Information Systems in the College of Literature, Science, and the Arts; and subproject manager for M-Pathways Student Administration.

UMTRI researchers receive best paper award



Several members of the UMTRI Biosciences Group received a Best Paper Award at the Ground Vehicle Systems Engineering and Technology Symposium (GVSETS), held August 4-6 in Novi, Michigan. The paper was awarded one of two best papers out of fifty-three accepted at the symposium.

The title of the paper is "Effects of Occupant Size, Military Gear, Seatbelt Type, and Advanced Seatbelt Features on Occupant Kinematics in Tactical Vehicles during Frontal Crashes."

The paper's authors are Jingwen Hu (UMTRI), Rebekah Gruber, Lauren Wood (UMTRI), Nichole Orton (UMTRI), Cong Chen, Jonathan Rupp (UMTRI), Matthew Reed (UMTRI), and Risa Scherer.

GVSETS and the Advanced Planning Briefings for Industry (APBI) comprise the National Defense Industrial Association (NDIA) Michigan Chapter's key industry-government-academia event.

GVSETS brings together leaders from the Army and Marine Corps, as well as industry and academia leaders.



Matthew Reed and Jingwen Hu

Recent UMTRI Publications



Most UMTRI reports are available in full text online. See the website address at the end of the citation. Please contact the UMTRI Library at 734-764-2171 or umtridocs@umich.edu to inquire about the availability of other publications listed here.

Conference Papers

▶ Reed, M.P.; Park, B.K.; Kim, K.H.; Jones, M.L.H. 2015. "Statistical Prediction of Body Landmark Locations on Surface Scans." *Proceedings of the 19th Triennial Congress of the International Ergonomics Association*, August 9-14, 2015, Melbourne, Australia. http://ergonomics.uq.edu.au/iea/proceedings/Index_files/papers/1781.pdf

Journal Articles

▶ Jermakiana, J.S.; Klinich, K.D.; Orton, N.R.; Flannagan, C.A.C.; Manary, M.A.; Malik, L.A.; Narayanaswamy, P. 2014. "Factors Affecting Tether Use and Correct Use in Child Restraint Installations." *Journal of Safety Research*, vol. 51, December 2014, pp. 99-108. DOI:10.1016/j.jsr.2014.09.011

▶ McDonald, C.C.; Goodwin, A.H.; Pradhan, A.; Romoser, M.R.; Williams, A. 2015. "A Review of Hazard Anticipation Training Programs for Young Drivers." *Journal of Adolescent Health*, vol. 57, no. 1, pp. S15-S23. DOI:10.1016/j.jadohealth.2015.02.013

▶ Ouimet, M.C.; Pradhan, A.K.; Brooks-Russell, A.; Ehsani, J.P.; Berbiche, D.; Simons-Morton, B.G. 2015. "Young Drivers and Their Passengers: A Systematic Review of Epidemiological Studies on Crash Risk." *Journal of Adolescent Health*, vol. 57, no. 1, pp. S24-S35. DOI:10.1016/j.jadohealth.2015.03.010

▶ Park, B.K.; Reed, M.P. 2015. "Parametric Body Shape Model of Standing Children Aged 3-11 Years." *Ergonomics*, published online May 1, 2015. DOI:10.1080/00140139.2015.1033480

▶ Park, J.; Ebert, S.M.; Reed, M.P.; Hallman, J.J. 2015. "A Statistical Model Including Age to Predict Passenger Postures in the Rear Seats of Automobiles." *Ergonomics*, published online September 2, 2015. DOI:10.1080/00140139.2015.1088076

Technical Reports

▶ Flannagan, C.A.C.; Green, P.E.; Klinich, K.D.; Manary, M.A.; Bálant, A.; Sanders, U; Sui, B.; Sandqvist, P.; Selpi; Howard, C. 2014. *Mutual Recognition Methodology Development*. Report no. UMTRI-2014-32. <http://hdl.handle.net/2027.42/111736>

The research documented in this report was sponsored by the Alliance of Automobile Manufacturers.

▶ Reed, Matthew P.; Ebert, Sheila M. 2014. *Evaluation of the Seat Index Point Tool for Military Seats*. Report no. UMTRI-2014-33. <http://hdl.handle.net/2027.42/111823>

The research documented in this report was sponsored by the U.S. Army Tank Automotive Research, Development and Engineering Center.

▶ Sivak, M. 2015. *Has Motorization in the U.S. Peaked? Part 7: Update through 2013*. Report no. UMTRI-2015-10. <http://hdl.handle.net/2027.42/110979>

The research documented in this report was sponsored by UMTRI's Sustainable Worldwide Transportation program.

▶ Sivak, M.; Schoettle, B. 2015. *Motion Sickness in Self-Driving Vehicles*. Report no. UMTRI-2015-12. <http://hdl.handle.net/2027.42/111747>

The research documented in this report was sponsored by UMTRI's Sustainable Worldwide Transportation program.

▶ Sivak, M.; Schoettle, B. 2015. *Road Safety with Self-Driving Vehicles: General Limitations and Road Sharing with Conventional Vehicles*. Report no. UMTRI-2015-2. <http://hdl.handle.net/2027.42/111735>

The research documented in this report was sponsored by UMTRI's Sustainable Worldwide Transportation program.





UMTRI In The News

► **See the digital soldiers who ‘crash test’ army vehicles**

<http://www.bbc.com/future/story/20150907-see-the-digital-soldiers-crash-testing-army-vehicles>

► **Gas mileage of vehicles on the road: Little progress since early ‘90s**

<http://ns.umich.edu/new/releases/23068-gas-mileage-of-vehicles-on-the-road-little-progress-since-early-90s>

► **Robot, you can drive my car: Majority prefer driverless technology**

<http://ns.umich.edu/new/releases/23023-robot-you-can-drive-my-car-majority-prefer-driverless-technology>

► **Driving while fatigued can be less deadly thanks to technology**

<http://wwlp.com/2015/08/18/driving-while-fatigued-can-be-less-deadly-thanks-to-technology/>

► **The road less traveled: Americans cutting down on daily trips**

<http://ns.umich.edu/new/releases/23090-the-road-less-traveled-americans-cutting-down-on-daily-trips>



Upcoming Events

22nd ITS World Congress

October 5-9; Bordeaux, France
<http://itsworldcongress.com>

UMTRI Research Symposium

October 15; Ann Arbor, Michigan
<http://bit.ly/1F0MvYF>

Human Factors and Ergonomics Society

October 26-30; Los Angeles, California
<http://www.hfes.org>

9th UTC Spotlight Conference: Connected and Automated Vehicles

November 4-5; Washington, D.C.
www.trb.org/calendar

59th Stapp Car Crash Conference

November 9-11; New Orleans, Louisiana
www.stapp.org

Inside China: Understanding the Current and Future Chinese Automotive Industry

November 11; Ann Arbor, Michigan
umtri.umich.edu/our-results/projects/focus-future-conferences

Disrupting Mobility: A Global Summit Investigating Sustainable Futures

November 11-13; Cambridge, Massachusetts
www.disrupting-mobility.org/



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UMTRI's Strategic Intent

To be the leader in transportation systems research integrating vehicles, people, and infrastructure to achieve a highway transportation system where:

- ▶ Fatalities and injuries are eliminated
- ▶ People and goods flow efficiently
- ▶ Reliance on nonrenewable energy is reduced

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