

UMTRI

# RESEARCH REVIEW

• UNIVERSITY OF MICHIGAN TRANSPORTATION RESEARCH INSTITUTE • OCTOBER–DECEMBER 2011 • VOLUME 42, NUMBER 4 •



*on page 1:*

## Driving Forces

Fewer young, but more elderly,  
have driver's licenses

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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

# Driving Forces

*Fewer young, but more elderly, have driver's licenses*

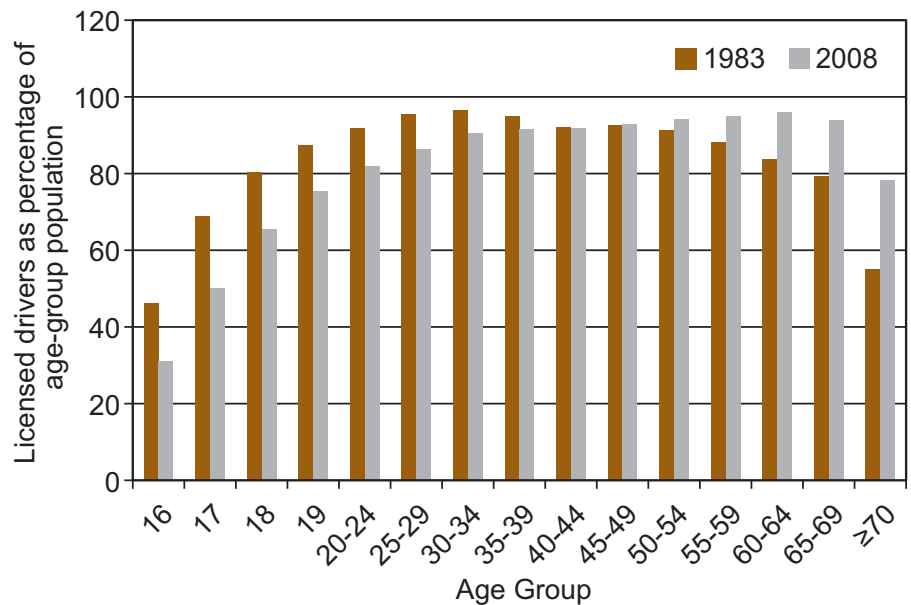
The convenience of electronic communication may be partly to blame. Or the high cost of buying and maintaining a vehicle. Whatever the reason, UMTRI research has recently shown that fewer young people today are getting driver's licenses than their counterparts in the early 1980s.

In a new study in the journal *Traffic Injury Prevention*, UMTRI research professor Michael Sivak and colleague Brandon Schoettle examined changes in the United States from 1983 to 2008 in the percentage of persons with driver's licenses as a function of age.

They found that a third of all licensed drivers in the United States in 1983 were under age thirty. Today, only about 22 percent of drivers are twentysomethings or teenagers. Further, more than half of all drivers in 1983 were under age forty, but today that number has fallen to less than 40 percent.

"It is possible that the availability of virtual contact through electronic means reduces the need for actual contact among young people," said Sivak. "Furthermore, some young people feel that driving interferes with texting and other electronic communication."

"Also of importance," Sivak added, "is the fact that younger people are moving in increasing numbers to large cities with reasonable public transportation, such as New York and San Francisco. Finally, younger people are on the forefront of concern for the environment."



SIVAK AND SCHOETTLE (2011), BASED ON DATA PUBLISHED IN *TRAFFIC INJURY PREVENTION*, VOL. 12, PP. 588-592.

Sivak and Schoettle found that young people not only account for a lower percentage of today's total licensed drivers, but that young drivers comprise a smaller portion of their age group, relative to the same figures from 1983. (See graph above.)

About 87 percent of nineteen-year-olds in 1983 had their licenses, but twenty-five years later, that percentage had dropped to about 75 percent. Other teen driving groups have also declined: eighteen-year-olds fell from 80 percent in 1983 to 65 percent in 2008, seventeen-year-olds decreased from 69 percent to 50 percent, and sixteen-year-olds slipped from 46 percent to 31 percent.

Drivers in their twenties and thirties also saw their ranks fall as a percentage of their age group population—down nearly 10 percentage points for twentysomethings and down about 5 percentage points for the thir-

tysomethings.

Research professor Ray Bingham, who heads UMTRI's Young Driver Behavior and Injury Prevention Group, says that he hasn't noticed a change in the importance of driving to teens, but cost can be a significant obstacle.

"What I have heard a lot is that the cost of getting licensed, purchasing, insuring, maintaining and fueling a car has become an impediment to use of a car. Prices have increased a fair bit since the mid 1980s for all facets of car ownership and operation," said Bingham. "Cost pushes people to seek out transportation alternatives."

## Older People Still Driving

On the other hand, licensed drivers among older age groups (those over forty) have increased their numbers, as both a percentage of their population and as a percentage of total licensed drivers.

*continued...*

*Continued from page 1*

Sivak and Schoettle found that in 2008, those seventy and older comprised the largest group of drivers on the road—more than 10 percent—slightly higher than those in their forties or fifties. Furthermore, licensed drivers as a percentage of their age group population have risen for all groups over age forty-five since 1983. (See graph on page 1.) In 1983, between 84 percent and 88 percent of people in their late fifties and early sixties had a driver's license. Now those percentages are in the 95-percent range. The change is even more pronounced for seniors. Today, about 94 percent of those age sixty-five to sixty-nine and 78 percent of those seventy and older have their licenses, up from 79 percent and 55 percent, respectively, in 1983.

The aging of the U.S. population is partly at work, says UMTRI research scientist David W. Eby, head of the Michigan Center for Advancing Safe Transportation throughout the Lifespan (M-CASTL). The decline in infant mortality, increasing lifespans, and baby boomers aging into older adulthood are three significant factors. The first baby boomers turned sixty-five this year, and all baby boomers will be sixty-five or older in the next twenty years.

Eby confirms that older adults of today are more likely to hold a driver's license than the older adult of a decade ago. According to Eby, this trend is largely due to older women being more likely to obtain and hold a driver's license in old age. Older women's

rates of licensure are approaching that of older men. However, Eby points out, having a license does not necessarily mean that a person is driving. Maintaining safe mobility for older adults will continue to be a challenging societal issue for the next several decades.

“The solutions to this challenge will require a multidisciplinary, system-wide approach that includes improvements in vehicle and roadway design; licensing and enforcement policy; community mobility options; education and awareness; and care giving practices,” said Eby.

### **Future of Transportation**

A combination of factors is at work, agrees Sue Zielinski, director of Sustainable Mobility and Accessibility Research and Transformation (SMART), who added that the evolution of who is and who isn't obtaining and holding a driver's license is an indi-

cator, not a cause of how society and transportation are changing.

Mounting evidence points to the evolution of more sophisticated, multimode transportation systems, said Zielinski. These systems can include personal cars but also take advantage of emerging technological and social innovations that help create transportation portfolios that are connected, sustainable, and appealing.

In light of rapid urbanization and complex demographic, economic, and cultural shifts, licensing trends are an important indicator that transportation systems of the future will need to evolve to meet the diverse needs and preferences of a broad range of people, from young to old. **RR**



COURTESY OF M-CASTL

# Improving Commercial Vehicle Safety

*UMTRI evaluation finds that CSA substantially improves FMCSA enforcement and compliance model*

The U.S. Department of Transportation's Federal Motor Carrier Safety Administration (FMCSA) released UMTRI's independent evaluation of the Compliance, Safety, Accountability (CSA) program's Operational Model Test (Op-Model Test) on August 31, 2011.

The findings confirm that CSA substantially improves FMCSA's enforcement and compliance model. UMTRI's Vehicle Safety Analytics Group conducted the independent evaluation, which was led by UMTRI assistant research scientist Paul E. Green. Evaluation results confirm that the CSA model enables FMCSA and its state partners to contact more commercial motor carriers earlier to correct safety problems and ensure compliance with safety regulations in order to reduce crashes, injuries, and fatalities related to commercial motor vehicles.

Launched in 2008, the CSA Op-Model Test divided motor carriers from four test states (Colorado, Georgia, Missouri, and New Jersey) between test and control groups. UMTRI evaluated the effectiveness of the new Safety Measurement System (SMS) and CSA interventions, and compared the cost and efficiency of the CSA compliance-and-enforcement model with the cost and efficiency of the previous model. They found effectiveness and efficiency gains that fully support the ongoing national implementation of CSA. FMCSA added additional states, Delaware, Kansas, Maryland, Minnesota, and Montana, to the test to demonstrate full implementation challenges and to provide a validation dataset for evaluation purposes.

The following are among the evaluation highlights:

- CSA's SMS better identifies motor carriers for safety interventions than the previous SafeStat system.
- CSA interventions are effective in improving motor carriers' safety behavior.

- CSA interventions use enforcement resources efficiently.
- CSA reaches more carriers to improve safety compliance.

To read the full FMCSA summary and access the UMTRI report, go to <http://csa.fmcsa.dot.gov/about/umtri.aspx> 

## What is CSA?

Compliance, Safety, Accountability (CSA) is a Federal Motor Carrier Safety Administration (FMCSA) initiative to improve large-truck and bus safety and ultimately reduce crashes, injuries, and fatalities that are related to commercial motor vehicles. It introduces a new enforcement and compliance model that allows FMCSA and its state partners to contact a larger number of carriers earlier in order to address safety problems before crashes occur.

Source: <http://csa.fmcsa.dot.gov/about/>

## SMART Research Update

*The University of Michigan's Sustainable Mobility and Accessibility Research and Transformation (SMART) project is a cross-university initiative of the U-M Transportation Research Institute and Taubman College of Architecture and Urban Planning.*

### **From Detroit to Beijing**

SMART received a \$250,000 grant from Alcoa Foundation in 2011 to develop and apply practical solutions to the challenges of sustainable transportation in the Detroit and Beijing regions over the next two years. SMART is now part of Alcoa Foundation's \$4 million Advancing Sustainability Research: Innovative Partnerships for Actionable Solutions initiative, which funds ten global sustainability research projects in Australia, Brazil, Canada, China, Russia and the United States.

The project will marry knowledge and action on sustainable transportation and related sustainable economic development in two cities that are vastly different and yet face challenges and opportunities that might offer wider lessons for advancing sustainable transportation in other regions and communities around the world.

"Sustainable transportation is especially important today because accelerated urbanization, population growth and globalization pose a range of challenges including environmental ones," says Susan Zielinski, director of SMART. "These issues make it critical to develop smart and practical transportation solutions that will sustain our cities, our environment, and our economies now and in the future."

SMART takes a systems approach to urban mobility and accessibility. It uses a public-private innovation approach to engage businesses, governments, nongovernmental organizations and academia in mapping and piloting integrated transportation solutions customized to each region. It also identifies and catalyzes related quality-of-life benefits and economic opportunities.

"The SMART program builds on a long-standing relationship between Alcoa and the University of Michigan," says Tim Myers, presi-

dent of Alcoa Wheel & Transportation Products. "Our organizations share a strong commitment to sustainability and this SMART research program will lay a foundation for the future of knowledge and action around sustainable transportation."

### **Catalyzing the New Mobility in Cities**

With support from the Rockefeller Foundation, SMART has begun work on a new project to catalyze New Mobility in cities. The purpose of the initiative is to identify existing and emerging New Mobility business models and innovative transportation approaches, with an emphasis on those that benefit the urban poor. Researchers will also work to identify and convene the social entrepreneurs and key stakeholders to advance these new models and explore possible paths for scaling up these models.

The project is in three parts:

1. Report on the Global New-Mobility Industry, which will focus on current status as well as opportunities to support the urban poor worldwide, with some emphasis on India, South Africa, Brazil, and the Philippines.
2. New-Mobility Entrepreneurs Prize and Listing (the "Mobi" awards), a new program to recognize innovative entrepreneurs in the New Mobility industry; and
3. New-Mobility Implementation in Manila Philippines.

SMART's vision of the project is to provide a springboard for research and action on New Mobility Business models geared to the urban poor as well as more widely.

This work aims first to raise awareness and then to catalyze opportunities in areas formerly untapped. SMART researchers anticipate that the dialogue, research, and on-the-ground solution building over the course of this one-year initiative will lay the foundation for a wider community of entrepreneurs, businesses, and urban leaders dedicated to understanding, action, and policy related to new business models and innovative transport approaches.

This project has arisen in the context of challenging global events including rapid urbanization, shifting demographics, increasing climate-change threat, and global economic restructuring. At the same time, new information technologies and

cultural trends toward open-source, IT-enhanced multimodal portfolios, and door-to-door systems have affected traditional business methods.

The SMART project is particularly timely, says Zielinski, because while a plethora of innovations has arisen worldwide in response to these trends, significant gaps remain, which are amplified for the vulnerable and urban poor. To understand these conditions and contexts, SMART will bring together its Living Lab partners as well as selected research collaborators in the coming year to answer key questions and catalyze actions to address these issues.

### **Consumer Uptake of Seamless Multi-Modal Mobility**

The Michigan Memorial Phoenix Energy Institute (MMPEI) PISSET (Partnerships for Sustainable Energy Technologies) grant will support a new SMART postdoctoral fellow in 2012 to conduct research on the project “Consumer Uptake of Seamless Multi-Modal Mobility.” The project, led by Richard Gonzalez of the University of Michigan Institute for Social Research and psychology department, and David Chock, former lead climate scientist at Ford Motor Company and now a visiting scholar at UMTRI, focuses on new decision models related to multimodal, multiservice travel, and the energy and sustainability implications of those choices.

This approach moves from comparing single modes to understanding how behavior changes when a mix of connected modes and services are provided as a mobility portfolio. There is some evidence that better information increases uptake of particular modes but less on what happens when a more integrated sophisticated system is provided to allow people to choose the appropriate mode for the purpose as they go through their day.

The goal of the two-year study is to understand how providing integrated, multimodal transportation and related real-time information and payment systems to support seamless door-to-door mobility impacts consumers’ mode choice and affects sustainability.

As mobile internet systems become available, it is now possible to establish a real-time information and forecast system that enhances physical

connectivity among transportation modes and services. Real-time information supports travelers in making informed decisions, which in turn enables the establishment of the next-generation (New Mobility) grid.

New behavior-based mode-choice models are being developed that incorporate revealed- and stated-preference information applied to specific regions, to be followed by a forecast of subsequent impacts on greenhouse-gas emissions. The regions of interest in this study include major cities in the U.S. and China. The initial test survey has been focused on a selected population in Ann Arbor, and discussions are underway with collaborators in Brazil and Portugal.

More recently, Gonzalez and Chock have received a Graham Institute Planning Grant to work with partners in Los Angeles, Pasadena, San Francisco, and Portland (many of whom are SMART Living Lab collaborators) to develop an integrated assessment (IA) focused on national, state, and local policy implications of this work.

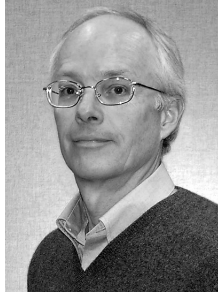
### **Ongoing SMART Research**

SMART connects with and catalyzes a range of research across the university and with other universities in the United States and globally. Watch future issues of the *UMTRI Research Review* for news and updates, including some exciting work on accessibility, see <http://terpconnect.umd.edu/~cliu8/> led by Jonathan Levine and Joe Grengs of the Taubman College of Architecture and Urban Planning.

For more information on SMART research and initiatives, contact Sue Zielinski at [susanz@umich.edu](mailto:susanz@umich.edu) or see [www.um-smart.org/blog](http://www.um-smart.org/blog)

RR

## Blower Appointed to Michigan Truck Safety Commission



Michigan Governor Rick Snyder appointed Daniel Blower, UMTRI associate research scientist, to the Michigan Truck Safety Commission. He will represent Michigan's four-year colleges and universities.

The commission develops and administers programs addressing commercial truck-driver education. Others appointed to the commission are Dave Goller, Ken Houck, Chuck Moser, and Walter G. Heinritzi (reappointed).

"Each of these individuals brings unique backgrounds and skills to the board and I am confident they will help ensure that Michigan's truck drivers are properly educated and trained for safe travels," Snyder said in a news release.

Blower is an associate research scientist in UMTRI's Vehicle Safety Analysis Group. He began at UMTRI over twenty-five years ago, working on the Trucks Involved in Fatal Accidents project. Medium and heavy trucks have been a primary research emphasis, but he has also directed projects on traffic-safety issues related to light vehicles.

Blower's current primary area of interest is traffic crash causation. His past projects include investigating the crash experience of younger truck drivers, researching the role of passenger car drivers and truck drivers in truck-car fatal crashes, developing an event tree for heavy-truck accidents, determining events leading to sport-utility rollover, developing statistical models relating vehicle configuration and operating environment to the probability of accident involvement, and relating truck design attributes (such as rollover threshold) to involvement in related accident types. He is also a member of the Society of Automotive Engineers.

On the commission, Blower will represent Michigan's four-year colleges and universities and replaces Jacqueline A. El-Sayed. He will serve a two-year term expiring August 4, 2013. **RR**

## Ritter Joins UMTRI as Administrative Specialist



Jane Ritter joined UMTRI in June 2011 as an administrative specialist. She provides administrative support for UMTRI director Peter Sweatman, oversees faculty recruitment and promotions, and coordinates the UMTRI Executive Committee, Advisory Committee, and External Advisory Board.

Jane has worked at the University of Michigan since January 1998. She began in the Department of Psychiatry as secretary to the director of adult outpatient psychiatry and the department administrator. She moved to the Office of the Vice President for Research (OVPR) in October 1998, supporting the Associate Vice Presidents for Research in Natural Sciences and Health Sciences. In this role, Ritter provided staff support for the director search that brought Peter Sweatman to UMTRI in 2004.

Ritter earned her BBA in 2000 and MS in Organizational Development in 2002, both from Eastern Michigan University's College of Business. In 2004, she received the OVPR Exceptional Service Award.

"I'm delighted to be working at UMTRI," says Ritter. In the coming year, she is looking forward to planning and organizing a special speaker series at UMTRI. She will also be participating in a special winter 2012 session of the University of Michigan's Center for the Education of Women's Leadership Series. **RR**



## Vivoda Named 2011 M-CASTL Student of the Year



M-CASTL is pleased to announce that Jonathon Vivoda has been named the 2011 M-CASTL Student of the Year. As winner of the award, Vivoda will receive \$1,000 and the cost of attendance at the Transportation

Research Board (TRB) annual meeting in Washington, D.C. At TRB, he will attend the Council of University Transportation Centers awards banquet and will receive a certificate from the U.S. Department of Transportation.

Jonathon Vivoda is currently enrolled in the Health Behavior and Health Education (HBHE) department's PhD program at the University of Michigan School of Public Health. Vivoda worked at UMTRI between 1998 and 2011, and for M-CASTL since its inception. While working for the center, Vivoda served as the program coordinator, and had primary responsibility for M-CASTL's educational mission, as well as contributing to the technology-transfer and research missions of the center.

Vivoda holds a master of public health degree in HBHE, and a bachelor degree in psychology, both from the University of Michigan. His research interests include age-related driving issues, motor-vehicle-occupant restraint-system use, driver distraction, the effects of ITS technology on driver behavior, and understanding motor-vehicle crash trends.

He is an expert in organizing and managing field data collection for occupant-protection-use surveys, and has developed methods of using hand-held electronic devices for the collection of many types of field data. He has also developed procedures for observing seat-belt use by motorists traveling at night, utilizing specialized night-vision equipment. Vivoda is currently serving as a graduate student instructor for a course entitled "Research Methods in Psychology." **RR**

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](mailto:umtridocs@umich.edu) to inquire about the availability of other publications listed here.

## Journal Articles

Ehsani, J.P.; Bingham, C.R.; Shope, J.T. 2011. "Driving Exposure by Driver Age in Michigan." *Journal of Safety Research*, vol. 42, no. 3, pp. 193-197, DOI: 10.1016/j.jsr.2011.04.002.

Hu, J.; Klinich, K. D.; Reed, M.P.; Kokkolaras, M.; Rupp, J.D. 2011. "Development and Validation of a Modified Hybrid-III Six-Year-Old Dummy Model for Simulating Submarining in Motor-Vehicle Crashes." *Medical Engineering & Physics*, published online September 19, 2011, DOI: 10.1016/j.medengphy.2011.08.013.

Li, Z. Hu, J.; Reed, M.P.; Rupp, J.D.; Hoff, C.N.; Zhang, J.; Cheng, B. 2011. "Development, Validation and Application of a Parametric Pediatric Head Finite Element Model for Impact Simulations." *Annals of Biomedical Engineering*, vol. 39, no. 12, pp. 2984-2997, DOI: 10.1007/s10439-011-0409-z.

Sivak, M.; Schoettle, B. 2011. "An Analysis of U.S. Road Fatalities per Population: Changes by Age from 1958 to 2008." *Traffic Injury Prevention*, vol. 12, no. 5, pp. 438-42, DOI: 10.1080/15389588.2011.588980.

Sullivan, J.M.; Flannagan, M.J. 2011. "Vehicle Kinematics in Turns and the Role of Cornering Lamps in Driver Vision." *Leukos*, vol. 7, no. 4, pp. 263-271.

## Technical Reports

Matteson, A.; Jarossi, L.; Woodrooffe, J. 2011. Buses Involved iGreen, P.E.; Blower, D. F. 2011. Evaluation of the CSA 2010 Operational Model Test. Report no. UMTRI-2011-8. <http://hdl.handle.net/2027.42/86185>

The research documented in this report was sponsored by the Federal Motor Carrier Safety Administration.

Green, P.E.; Matteson, A. 2011. Evaluation of 2009 Oregon Crash Data Reported to the MCMIS Crash File. Report no. UMTRI-2011-44.

<http://hdl.handle.net/2027.42/89597>

The research documented in this report was sponsored by the Federal Motor Carrier Safety Administration.

Sivak, M.; Schoettle, B. 2011. Recent Changes in the Age Composition of Drivers in 15 Countries. Report no. UMTRI-2011-43.

<http://hdl.handle.net/2027.42/86680>

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

Sivak, M.; Schoettle, B. 2011. Recent Major Improvements in Road Safety in the U.S.: Changes in the Frequency of Crashes or the Severity of the Outcome of Crashes? Report no. UMTRI-2011-46.

<http://hdl.handle.net/2027.42/88160>

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

# CONFERENCES & EVENTS

## February

New Partners for Smart Growth  
February 2-4; San Diego, California  
[www.newpartners.org](http://www.newpartners.org)

National Biodiesel Conference and Expo  
February 5-8; Orlando, Florida  
[www.biodieselconference.org](http://www.biodieselconference.org)

National Conference of Regions  
February 12-14; Washington, D.C.  
[www.narc.org](http://www.narc.org)

ATSSA Convention and Traffic Expo  
February 12-16; Tampa, Florida  
<http://expo.atssa.com/>

Marketing New Powertrain Technologies:  
Strategies in Transition  
February 15; Rochester, Michigan  
[www.umtri.umich.edu/divisionPage.php?pageID=250](http://www.umtri.umich.edu/divisionPage.php?pageID=250)

ATA Technology and Maintenance Council  
Annual Meeting  
February 20-23; Tampa, Florida  
[www.truckline.com](http://www.truckline.com)

SAE Hybrid Vehicle Technologies Symposium  
February 21-22, San Diego, California  
[www.sae.org/events/training/symposia/hybrid](http://www.sae.org/events/training/symposia/hybrid)

## March

Transportation & Infrastructure Convention  
March 7-9, Washington, D.C.  
[www.transportationsummit.com](http://www.transportationsummit.com)

Fare Collection and Workshop and TransITech  
Conference  
March 20-22; Fort Worth, Texas  
[www.apta.com](http://www.apta.com)

## April

Transportation Safety Conference  
April 17-18; Topeka, Kansas  
[www.continuinged.ku.edu/programs/transportation/](http://www.continuinged.ku.edu/programs/transportation/)

SAE 2012 World Congress  
April 24-26; Detroit, Michigan  
[www.sae.org/congress](http://www.sae.org/congress)

Design-Build in Transportation  
April 25-27; Phoenix, Arizona  
[www.dbtranspo.com/](http://www.dbtranspo.com/)

## May

WTS Annual Conference  
May 9-11; Denver, Colorado  
[www.wtsinternational.org/](http://www.wtsinternational.org/)

## June

Lifesavers: National Conference on Highway  
Safety Priorities  
June 14-16; Orlando, Florida  
[www.lifesaversconference.org](http://www.lifesaversconference.org)  
**RR**

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