



Public-private consortium developing technologies for preventing drunk driving

Despite targeted enforcement and driver-education campaigns, alcohol-related crashes continue to claim thousands of lives every year. But new technologies currently under development promise a revolutionary approach to preventing drunk driving.



Susan Ferguson

Addressing the 2011 CTS Winter Luncheon on February 15, highway safety researcher **Susan A. Ferguson** described how a system to unobtrusively measure a driver's blood-alcohol content (BAC) is being developed by a government-industry partnership.

Ferguson is the president of Ferguson International LLC, a consulting firm focused on highway safety issues, and a former senior vice president for research at the Insurance

Institute of Highway Safety. **Max Donath**, director of the Intelligent Transportation Systems (ITS) Institute at CTS, welcomed Ferguson and praised her seminal research on crash avoidance and safety technologies including air bags and in-vehicle safety alert systems. The winter luncheon is sponsored each year by the ITS Institute.

"The fact of the matter is, there are many people out there drinking and driving and who are involved in fatal crashes who have never been caught," said Ferguson. According to conservative estimates, even someone who drives drunk 50 times may only be caught once, she explained, and other studies estimate that the likelihood of being caught is even lower.

Ferguson described how a consortium of manufacturers and government agencies came

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U of M technology helps buses bypass congestion

On 271 miles of Twin Cities-area roadways, bus drivers are allowed to operate their vehicles on shoulder lanes to avoid rush-hour traffic congestion. A driver-assist system (DAS) developed at the Intelligent Transportation Systems (ITS) Institute is helping drivers safely navigate these bus-only shoulder lanes, even in adverse conditions. The system uses a combination of differential GPS, vehicle-mounted laser sensors, and visual and tactile alerts to monitor a bus's position on the roadway and quickly deliver critical information to the driver.

With funding from the U.S. Department of Transportation's Urban Partnership Agreement and match from the State of Minnesota, the ITS Institute's Intelligent Vehicles Laboratory (IV Lab) and HumanFIRST Program have collaborated with the Minnesota Valley Transit Authority (MVTA) and Schmitt and Sons Transportation to equip 10 MVTA buses with the navigational system. IV Lab director **Craig Shankwitz**, HumanFIRST director

Mike Manser, and MVTA transit planning manager **Mike Abegg** have led the project, with significant contributions from IV Lab and HumanFIRST research staff.

DAS technology was installed in the MVTA buses in March 2010, and use of the buses was progressively increased through January 2011 as drivers were assigned and trained, Abegg says. The buses provide service on part of the Cedar Avenue bus rapid transit (BRT) corridor, which offers express commuter service on bus-only shoulders between downtown Minneapolis and Apple Valley. The 22-mile transitway, scheduled to begin full operation in 2012, is part of an effort to improve traffic flow on I-35W between downtown Minneapolis and the city's southern suburbs.



Craig Shankwitz



Mike Manser

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Research conference topics announced

Speakers and topics have been announced for the 22nd Annual CTS Transportation Research Conference. The event takes place May 24 and 25 at a new location: the Crowne Plaza Hotel in St. Paul.

The opening session will feature a keynote presentation by **Adrian Moore**, vice president of research at Reason



Adrian Moore

Foundation, titled "P3s—Public Private Partnerships? Or Peripatetic Pain in the Pants?"

As state governments struggle to meet growing transportation infrastructure needs, leveraging existing resources through the use of public-private partnerships (P3s or PPPs) has become increasingly attractive. Moore will discuss the role P3s might play in Minnesota's transportation future. He will review trends in transportation P3s and what drives them, examine the pros and cons of P3s, describe

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Please note: This year's research conference is at a new location: the Crowne Plaza Hotel in St. Paul.

Research conference luncheon: urban development and mobility

What's the real reason Americans spend so much time in traffic? In *Driven Apart*, a recent report prepared for CEOs for Cities and funded by the Rockefeller



Joe Cortright

Foundation, **Joe Cortright** offers a new view of the relationship between transportation performance and urban development patterns.

Cortright, economist with Impresa in Portland, Oregon, and senior adviser to CEOs for Cities, will share highlights from the report—*Driven Apart: How Sprawl is Lengthening Our Commutes and Why Misleading Mobility Measures*

are Making Things Worse—at the CTS Research Conference luncheon May 24.

The report provides an alternative to the 25-year-old industry standard created for the Texas Transportation Institute's *Urban Mobility Report*, an annual summary of traffic congestion in the 439 U.S. urban areas. According to Cortright, the solution to congestion has much more to do with how we build our cities than how we build our roads. The report says compact cities are the real answer to reducing traffic delays and lays out an alternative set of accessibility-based measures of urban transportation performance that provide a better guide to policymakers. **CTS**

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current innovations and evolutions in P3s, and discuss how P3s are being used and what crucial elements help them succeed.

Moore's remarks will set the stage for a panel discussion with State Sen. **Scott Dibble**; **Brad Larsen**, director of traditional and innovative finance with the Minnesota Department of Transportation; **Jay Lindgren**, a partner in Dorsey & Whitney LLP and a legal expert in innovative finance and regulatory strategies for urban redevelopment and public infrastructure projects; and **Lee Munnich**, director of the State and Local Policy Program at the Humphrey School of Public Affairs. **CTS**

Conference registration and further details

The program and registration information have been mailed and are also posted at www.cts.umn.edu/Events/ResearchConf. For more information, contact the College of Continuing Education at 612-624-3708, cceconf5@umn.edu.

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together in early 2008 to explore the potential benefits of in-vehicle alcohol-detection technology as well as the implementation challenges and policy issues associated with introducing such a system. The effort was kicked off by a blue-ribbon panel of regulators, safety researchers, and industry representatives that spent a year identifying promising technologies and ultimately awarded contracts to two companies to develop their approaches to the challenge.

The research enjoys widespread support within the automotive industry, Ferguson said, with Honda, Hyundai, and Volvo recently joining the roster of major car makers participating in the consortium. In addition to the U.S. government, the consortium also includes Transport Canada, the Swedish national road administration, and the Japanese government.

Ferguson stressed that the technologies are not intended as mandatory equipment on private vehicles, and her organization is not pursuing any legislative agenda involving mandatory alcohol detection. Instead, she believes the future of driver alcohol-detection technology is tied to voluntary acceptance by drivers and to

demand for the systems as a safety feature. Eventually, she said, engagement with the auto insurance industry could lead to incentives for vehicles equipped with alcohol-detection systems.

Among the most significant technical hurdles to be overcome, she said, is the need for the detection system to be as unobtrusive as possible. Current alcohol-detection systems, which are mandated for certain offenders, require drivers to blow into a tube before starting their vehicles; it is unlikely that the general public—many of whom never drink and drive, or who abstain from drinking altogether—would embrace such a design.

Accordingly, the technologies now being studied do not require drivers to do anything they would not normally do when starting their vehicles. The consortium is investigating two approaches—one based on atmospheric sensors that measure alcohol in the driver's breath, and a second that uses touch-based sensors to detect and measure alcohol in the bloodstream through the skin.

To be effective, the detector system must not only be unobtrusive but fast, accurate, and precise as well, Ferguson

continued. It must measure BAC within five seconds and be resistant to both false positive readings and potential tampering.

Turning from technical issues to policy challenges, Ferguson said a recent survey indicated that about two-thirds of Americans would support an effective in-vehicle alcohol-detection system.

The consortium's goal is to make the alcohol-detection system acceptable and even desirable to the car-buying public, Ferguson continued. Policy research and technology research are being carried out in parallel, she said, to identify attitudes and barriers to implementation.

As part of that effort, a series of exploratory focus groups in different cities are now under way. Other planned efforts include periodic national surveys and discussions with stakeholder groups involved in transportation safety.

Despite the promise of the technology, the consortium's efforts face opposition from certain segments of the alcoholic beverage industry, Ferguson said. **CTS**

University finalizes commercialization agreement for ‘SAFL Baffle’

The University of Minnesota finalized an agreement with a Minneapolis startup company to commercialize a device that will improve sediment control for urban storm-water runoff. The device was developed at the St. Anthony Falls Laboratory (SAFL), a research unit within the College of Science and Engineering, with funding from the Minnesota Department of Transportation.



John Gulliver

Nicknamed the “SAFL Baffle,” the device is a cost-effective method for preventing harmful sediments in storm-water from reaching Minnesota lakes and streams.

“Urban runoff hits the road, goes into the storm sewers, and ends up in receiving water bodies like lakes and rivers,” said **John Gulliver**, a civil engineering (CE) professor and co-inventor of the SAFL Baffle. “Cities are required to treat urban

runoff and are trying to figure out how to deal with this.”

Co-inventors were CE adjunct professor **Omid Mohseni** and graduate student **Adam Howard**.

The SAFL Baffle is installed in a sump—a vertical cylinder that connects two or more sewer pipes. The baffle slows down water rushing into the sump and prevents it from picking up sediments that have settled there during low-flow periods.

“Existing sumps are catching sediments for small storms, but if a big storm comes along, it will wash all those sediments back out,” Gulliver said. “So we devised a simple technique to keep the sediments in the sump during high-flow events. Its main purpose is to prevent the sediment from being scoured out when you have high flow.”

Devices currently on the market remove floating trash, oil, grease, and heavy metals as well as sediment. These additional features are often unnecessary, because a separate device can be installed at the

street level to remove trash. A combination of a trash-removal device and the SAFL Baffle will do the same job as devices currently on the market at a fraction of the price.

“The current devices that are on the market have a lot of features that are generally not needed,” said **A.J. Schwidder**, CEO of Upstream Technologies, the startup company. With the SAFL Baffle, customers only pay “for what they need,” says Schwidder, a Carlson School of Management MBA student.

Several Minnesota cities are installing the baffle this spring.

“One of the attractive things about the SAFL Baffle is that there are real customers who want to purchase it now,” said **Dale Nugent**, marketing manager for the University’s Office for Technology Commercialization. “It’s affordable and meets a pressing need for sediment control.” **CTS**

(Reprinted with permission from the Department of Civil Engineering website.)

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Shoulder operation allows buses to provide faster, more reliable service to passengers, but maneuvering 9.5-foot-wide buses in 10-foot-wide shoulders is often challenging for drivers. Heavy traffic and poor weather conditions can make a driver’s task even more difficult in an environment where there is no margin for error.

Based on technology under development at the IV Lab since 1999, the DAS uses GPS satellite positioning technology and an on-board map database of the bus route to continuously position the bus with respect to the lane with centimeter-level accuracy. A head-up display (HUD) mounted between the driver’s face and the windshield shows the location of lane boundaries, helping drivers remain safely on the shoulder even when roads are snow-covered or visibility is low. Information about other vehicles or objects on the roadway, detected by laser sensors mounted on the front and sides of the bus, is also displayed on the HUD to help drivers avoid potential collisions.

If the DAS detects the bus beginning to drift from its lane, the white or yellow

lane boundary on the HUD will turn red. If the bus touches the lane boundary, the driver’s seat vibrates on the corresponding side of the vehicle. Although the drivers remain in control of the buses at all times, if both warnings are ignored, the driver feels a “suggestive torque” on the steering wheel, which indicates to the driver the direction the bus needs to go to remain safely on the shoulder.

Currently, the DAS-equipped MVTA buses operate both on and off the “mapped” Cedar Avenue BRT corridor—areas where the route has been mapped for the on-board bus database. The buses will remain in service for at least six to nine years, Abegg estimates, and the DAS is considered a permanent installation.

The MVTA hopes to expand mapped areas to other shoulders and equip more buses with DAS technology in the future, Abegg says, but the current installation will be evaluated before significant additional investments are made. As the cost of adding mapped lane miles to the existing database is relatively low, however, Abegg anticipates the addition of more

Cedar Avenue and I-35W shoulders to the system in 2011.

For more information on DAS technology and its BRT applications, visit www.its.umn.edu/Research/FeaturedStudies/brt.

The DAS was featured recently in the Minneapolis *StarTribune*; the *Minnesota Daily* (the University’s Twin Cities campus newspaper); and the *UTC Spotlight*, a monthly report of the University Transportation Centers Program, administered by the U.S. Department of Transportation’s Research and Innovative Technology Administration. **CTS**



Mike Abegg (seated) and Craig Shankwitz in Bus 2.0

CTS completes communications assessment, plans next steps

In recent years CTS has expanded communications activities and products for itself and the programs it manages. At the same time, new tools and technologies have transformed the field of communications. To fulfill the outreach component of its mission, it is critical for CTS to maximize the effectiveness of its communications resources and stay on the cutting edge of communications technologies.

To gauge this effectiveness, CTS conducted a strategic assessment of its communications in 2010. Information was gathered from a range of stakeholders through electronic surveys, focus groups, and one-on-one interviews. Top competitive programs within the University and several transportation centers outside Minnesota were also reviewed.

The resulting assessment found an overall positive perception of CTS

communications. Highest praise came from the practitioners who find the research and information to be integral resources they frequently reference. Feedback called for continued delivery of research results, but with greater focus on implementation and impacts to the end user. Feedback also indicated a preference for electronic channels, except for annual reports.

The areas of improvement noted were relatively consistent. The major area called for a unified “brand identity” that encompasses the “sub-brands” (programs housed within CTS) into an overarching brand, thus eliminating brand confusion and possible oversaturation of content.

The second area of improvement is to develop more graphically appealing communications, in particular the CTS website.

The outcome of the strategic assessment

was a communications plan that defines CTS’s overarching communications goals and outlines strategic and tactical components to execute them. Work is under way to develop overarching branding, redesign the website, and determine the mix, content, and frequency of print and e-mail publications. Plans are to complete the work this fall.

CTS thanks all of those who participated in last year’s assessment and looks forward to the changes ahead. **CTS**

New research reports available

The enclosed insert lists research reports written by University researchers and published by CTS, Mn/DOT, the Minnesota Local Road Research Board, and other sponsors from November 2010 through February 2011. **CTS**

Upcoming events *To see other events or publicize yours, visit www.cts.umn.edu/Events.*

Apr. 12–13	Minnesota Spring Maintenance Training Expo, St. Cloud, Minn. See www.mnltap.umn.edu/Events/SpringMaintenanceExpo .	July 28–30	World Symposium on Transport and Land Use Research, Whistler, British Columbia. See www.wstlur.org .
Apr. 17–21	National Association of County Engineers Annual Conference, Minneapolis. See www.countyengineers.org .	Aug. 16	Transportation Engineering and Road Research Alliance (TERRA) Innovation Series event, Albertville, Minn. See www.terreroadalliance.org .
Apr. 27–29	Minnesota Alcohol Traffic Safety Association Conference, St. Cloud, Minn. See www.matsa.us .	Oct. 6–7	AirTAP Fall Forum, Breezy Point, Minn. See www.airtap.umn.edu .
May 18–20	3rd International Conference on Roundabouts, Carmel, Ind. See www.trb.org/Main/Blurbs/3rd_International_Conference_on_Roundabouts_163897.aspx .	Nov. 16–17	Minnesota Toward Zero Deaths (TZD) Annual Conference, Duluth, Minn. See www.minnesotatzd.org .
May 24–25	22nd Annual CTS Transportation Research Conference, Crowne Plaza, St. Paul. See www.cts.umn.edu/Events/ResearchConf .		
June 13–14	Symposium on Mileage-Based User Fees, Breckenridge, Colo. See http://utcm.tamu.edu .		
July 24–27	10th International Low-Volume Roads Conference, Lake Buena Vista, Fla. See www.trb.org/LowVolumeRoadsConference/LVR10.aspx .		

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