University of Minnesota

CENTER FOR TRANSPORTATION STUDIES

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CTS Catalyst

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Accelerating the pace of transportation innovation

New Roadway Safety Institute focuses on user-centered safety solutions for multiple modes

The new Roadway Safety Institute, a $10.4 million regional University Transportation Center (UTC) established in late 2013, will conduct a range of research, education, and technology transfer initiatives related to transportation safety. Led by the University of Minnesota, the two-year consortium will develop and implement user-centered safety solutions across multiple modes.

The Institute will be a focal point for safety-related work in the region, which includes Minnesota, Illinois, Indiana, Michigan, Ohio, and Wisconsin. Other consortium members are the

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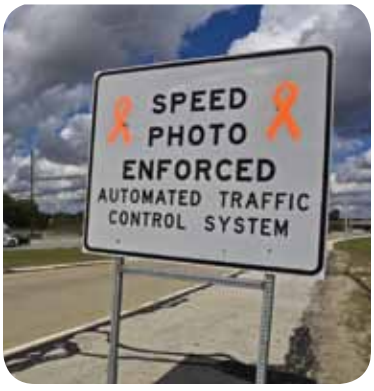

Automated speed enforcement study provides guidance for Minnesota

The discussion and debate about automated speed enforcement in many states—including Minnesota—is both complex and puzzling. On one hand, studies have shown that automated speed enforcement (ASE) increases roadway safety when deployed in certain settings, and public opinion polls show Minnesotans overwhelmingly support ASE in certain locations.

On the other hand, only 14 states and Washington, D.C., employ ASE; Minnesota is one of the 36 states that do not use automated speed enforcement. The perceived lack of public support is often cited as the primary reason ASE isn't used in more states.

***Speed enforcement** continued on page 7*

CrashHelp system performs successfully in rural Minnesota pilot

Access to emergency medical services (EMS) following a serious crash is a long-standing rural safety problem in the United States. Since EMS service is based on population density, rural areas are often underserved, resulting in higher fatality rates per rural mile traveled.

In an effort to improve the effectiveness of EMS response and care coordination in these rural areas, researchers at the University of Minnesota and Claremont Graduate University have conducted a pilot study of the CrashHelp system in central Minnesota. The study, completed in partnership with the Central Minnesota Regional Trauma Advisory Committee, was funded by the Minnesota Departments of Transportation and Health as part of the Minnesota Toward Zero Deaths program.

CrashHelp is a smartphone-based system that allows emergency responders to collect multimedia data about crash victims on-scene and send it directly into emergency rooms. The information gives hospitals advance notification of crash severity and helps them best prepare for a patient's arrival. Claremont professor Tom Horan led the development of the CrashHelp system and the Minnesota pilot study.

Between July 2012 and June 2013, CrashHelp was implemented and tested at Cuyuna Regional Medical Center in Crosby, Tri-County Hospital in Wadena, and the ambulance providers that serve these facilities.

During the pilot, more than 20 paramedics used CrashHelp to report on nearly 400 incidents, with overall positive results. Findings indicated that the system helped improve EMS data collection, communication between EMS personnel and the hospitals' emergency departments, and decision making by hospital personnel.

Illustration by J. David Thorpe

CrashHelp allows emergency responders to collect on-scene patient data with a smartphone.

For emergency room staff, the information collected using CrashHelp was especially valuable for preregistering patients and assembling medical teams prior to a patient's arrival—both of which allowed patients to get treated more quickly.

In one case, an emergency room physician contacted a surgeon solely based on an image transmitted using CrashHelp, rather than having to wait and assess the patient in person.

"The physician, on seeing the image [of a deep tissue laceration], actually went ahead—before the patient even arrived—and contacted a surgeon and said 'I anticipate that we'll need your involvement based on what I'm seeing here,'" a charge nurse explained. "It expedited getting the surgeon here."

The pilot study also revealed that deeper integration of CrashHelp with existing trauma workflows, EMS policies and procedures, and existing electronic patient care report and health record systems would be essential for the sustained use and value of the system.

In addition to integrating CrashHelp into these systems, future work could include determining the clinical value of information for care decisions and quantifying the effect of CrashHelp on patients' survivability.

IN 2012,

70%

OF ALL FATAL CRASHES IN MINNESOTA

occurred on

RURAL ROADS.

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The grass is greener thanks to online turfgrass pathology course

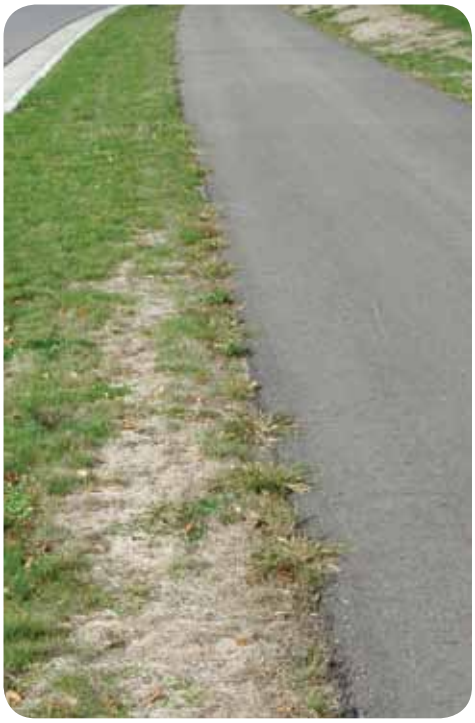
Whether on a roadside, rest area, park, or lawn, turfgrass diseases can significantly damage turf in the Midwest. As governmental agencies continue to regulate inputs on turfgrass, it is important for managers to know how to meet new turfgrass management challenges—especially concerning diseases.

An online course from the University of Minnesota's College of Continuing Education gives turfgrass managers the expertise necessary for controlling diseases in this challenging environment. The curriculum was created under the guidance of Associate Professor Eric Watkins of the Department of Horticultural Science. He also serves as the course's content advisor. (See sidebar below about his research.)

The course prepares students to diagnose Upper Midwest turfgrass diseases and then determine control measures using both cultural and chemical methods. It is presented in Moodle, an e-learning platform that uses a number of interactive instructional tools. Cost is $75, and 12 professional development hours (PDHs) may be earned.

New this spring, the course counts as one elective credit in the Minnesota Local Technical Assistance Program (LTAP) Roads Scholar program. (Minnesota LTAP is a program within CTS.) Aimed at maintenance personnel, the Roads Scholar Program combines a range of training options into a structured curriculum. Graduates earn a valuable professional development credential.

Learn more at **mnltap.umn.edu/training**.



Typical roadside damage to turfgrass can be caused by salt, heat, and drought.

Research continues into salt-tolerant turfgrass

A research team led by Eric Watkins is in the final year of an LRRB-funded project to identify salt-tolerant turfgrass mixes for use along roadsides. The team has already identified hardier grasses and grass mixes than those commonly in use, and MnDOT has installed sod grown from the new mixes along some roadsides (see the March 2013 *Catalyst* for details). The researchers are currently creating best management practices for installing and establishing salt-tolerant grasses on roadsides.

NEW RESEARCH REPORTS

Recently published reports on transportation-related research at the University of Minnesota explore the following topics:

AN ADVANCED LED WARNING SYSTEM
(MnDOT 2014-10)

HELPING THE VISUALLY IMPAIRED NAVIGATE WORK ZONES
(MnDOT 2014-12)

QUANTIFYING MOISTURE EFFECTS WITH UNSATURATED MECHANICS
(MnDOT 2014-13)

Research reports are available at **cts.umn.edu/Publications/ResearchReports**.

CTS research conference: from extreme weather to socio-demographics to transitways

Flooding, drought, the polar vortex: extreme weather events have huge impacts on the transportation system. One of the highlights of the 25th Annual CTS Transportation Research Conference will be a luncheon presentation about extreme weather and strategies for building resilience into the transportation system.

Other highlights include an opening plenary session about socio-demographics and the future of transportation, and a two-session track about the impacts of transitway expansion.

The conference takes place May 21 and 22 at the Saint Paul RiverCentre. The conference brochure and registration information are available online at **http://z.umn.edu/kme**.

Opening session: The End of Car Culture? Socio-Demographic Trends and Travel Demand

In the next 30 to 40 years, the transportation industry will face many new and emerging trends that will dramatically reshape priorities and needs. To help practitioners face these changes and effectively shape the future, a National Cooperative Highway Research Program study is investigating these trends and their implications for the transportation system.

One such trend—changing socio-demographic factors—is expected to considerably affect travel demand. Although America has long been one of the world's prime car cultures, that status might be shifting because of new population and demographic trends. The graying and browning of

Help wanted: employers for internship program

The Department of Civil, Environmental, and Geo- Engineering (name change effective July 1, 2014) has launched a new internship opportunity for its upper-division students. Through the Internship Opportunities Program (IOP), the department helps locate temporary and part-time employment for undergraduate students to work with a professional engineer in private industry or in a government agency in the Twin Cities area.

IOP is a noncredit program designed to give students relevant practice in an engineering setting. The program involves a paid assignment suggested to be 8 to 10 hours per week over a 12- to 14-week period during the fall or spring semester.

Tiffany Ralston, IOP program coordinator, explains: "IOP is focused on the initial internship, giving students needed experience. In addition, it gives companies a means to evaluate future employees and promote the profession."

The department is seeking to recruit enough organizations to offer a total of 80 internships each academic year.

Contact **tralston@umn.edu** for further details about IOP.

America, slow household growth, and a hyperlinked younger generation are all playing a role in the need for vehicles.

In the conference opening session on May 21, John Njord, former CEO of the Utah Department of Transportation and now with Tom Warne and Associates, will discuss key socio-demographic trends, their potential impacts on future travel demand, and their implications for state DOTs and MPOs. He will also provide an overview of a customizable tool that can help planners and policymakers explore the interaction of demographic trends and travel demand in their regions.

Following his presentation, a panel of experts will share their perspectives on these socio-demographic trends and their implications for transportation professionals.

Luncheon: Extreme Weather—Trends, Projections, and Thoughts for Building Resilience

Over the last decade, a number of major weather events have resulted in significant costs, many of which stemmed from disruption or damage to transportation networks. In some cases (although not necessarily all), trends in the frequency or intensity of these events can be linked to longer-term changes in the climate. In all cases, the events demonstrate the vulnerabilities that are associated with our transportation infrastructure and services.

At the conference luncheon on May 21, Joe Casola, staff scientist and program director for science and impacts at the Center for Climate and Energy Solutions (C2ES), will discuss strategies for building resilience and offer real-world examples from transportation managers and planners to illustrate some of the emerging best practices in resilience planning.

Featured workshop: Transforming Communities Through Transitways

This half-day track on May 22 will include two sessions:

- From Research to Practice—Transitway Impacts on the Twin Cities Region
- Policy Implications of Transforming Communities

The sessions will showcase findings from the Transitway Impacts Research Program, highlight how practitioners are using these findings, and engage participants in a dynamic conversation about policy implications and next steps.

Students network with transportation professionals at Career Expo

Around 100 students interested in transportation-related careers gathered at Coffman Memorial Union on February 18 to meet with representatives from nearly 30 transportation organizations at the 2014 Transportation Career Expo.

The event began with three roundtable discussion periods in which students discussed a range of transportation topics with industry professionals, exchanged resumes and business cards, and made valuable connections.

Laura Eash, a program coordinator at the Minnesota Transportation Alliance, also exhibited with her agency. Eash told students that networking is vital in securing jobs, and personally meeting industry professionals goes a long way.

"You can throw your resumes at as many companies as you want, but you're probably not going to stand out unless you know someone at the organization," Eash said. "Meet professionals and make personal connections. Even if you can't get a job right away, it's important to maintain good relationships."

After the roundtable discussions, attendees mingled with exhibitors to pick up educational materials and applications and to learn more about available job and internship opportunities.

Attendee Autumn McDowell, a senior majoring in urban studies at the University of Minnesota, said she is interested in a future career in transportation planning.

"Here you get to see people who work at the companies face-to-face," McDowell said. "It's nice to be able to present yourself to them."

The annual event was sponsored by CTS and its Education and Outreach Council, WTS Minnesota, the Minnesota Local Road Research Board, Minnesota LTAP, and the Council of Supply Chain Management Professionals.

***Institute** from page 1*

University of Akron, University of Illinois at Urbana-Champaign, Southern Illinois University Edwardsville, and Western Michigan University.

Max Donath, professor of mechanical engineering at the U of M, serves as the new Institute's director. He shares his vision for the Institute below.

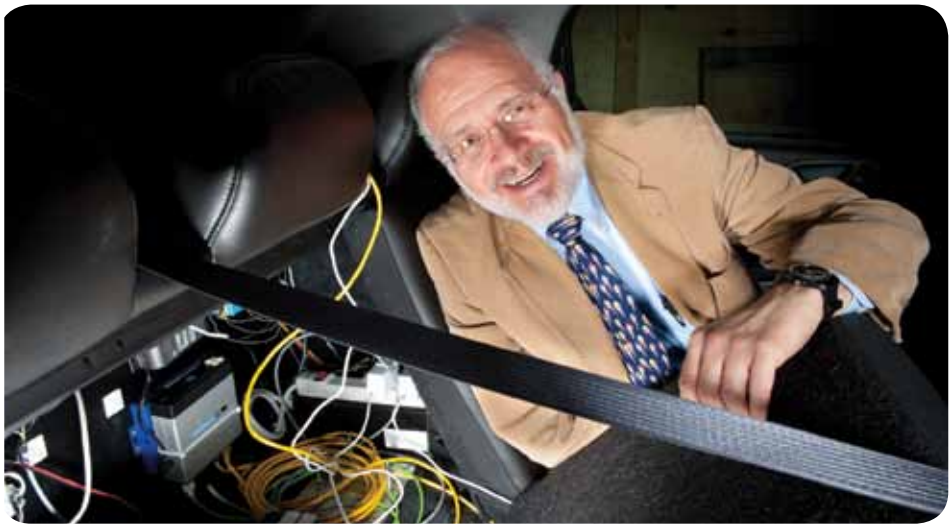


Photo: U of M College of Science and Engineering

Max Donath is the director of the Roadway Safety Institute.

What topics will the Institute's research investigate?

The people using our region's roadways aren't as safe as they should be. It's a tragedy that more than 4,800 people died on Region 5 roads in 2012, while thousands more suffered life-changing injuries. The Institute's research will work to prevent the crashes that lead to these fatalities and injuries.

Specifically, we will focus on two key areas: high-risk road users and traffic safety system approaches. Within these areas, our projects will address issues related to rail-grade crossings, roadway departures, vehicle automation technologies, signalized intersections, wrong-way crashes, automated speed enforcement, bicyclists, pedestrians, commercial truck drivers, and impaired drivers. Although this is a broad range of topics, we hope to bring added attention to areas that have either not received much attention in the past or have significant unsolved issues.

How will the Institute's work address regional safety priorities?

Most of our research topics resulted from conversations with state safety engineers in Region 5 departments of transportation. Their input, as well as insight gained from reviewing the state strategic highway safety plans, helped us determine priorities.

Although some issues were uniquely identified by individual states, they are all relevant across our region as well as nationally. For example, safety at rail-grade crossings was a priority for Illinois, but this is becoming a more significant issue across our region and the United States, especially with the increased transportation of crude oil by rail.

What educational initiatives will be conducted?

We'll focus on educating the public and attracting more professionals to the safety workforce. We want to communicate with students and get them excited about the things that are happening in this field and about the opportunities available to them.

One effort we're planning is a safety-related museum exhibit that can help explain concepts and technologies to a younger audience. We'll also work to connect students to employers and offer continuing education to professionals in the safety field.

What makes the Institute unique?

One distinctive thing we'll be working on is transportation safety in American Indian lands, where there is an unusually high number of motor vehicle crash fatalities. Half of the states in our region contain tribal lands, and our research will work to better understand why this is happening and to develop more effective solutions. To my knowledge, no other UTCs are working on this issue.

Working with American Indian communities, we plan to gather information from a variety of stakeholders and use it to develop a more comprehensive foundation for understanding safety risks and deploying countermeasures. Secondly, we would like to work with tribal transportation leaders to support the implementation and evaluation of management and policy options that could help improve safety.

How will members' expertise help the Institute accomplish its goals?

It is important for us to address significant traffic safety issues. We want the work we do to make a difference to the people using our roadways. I want to make sure we're putting something out there that practitioners can use to make that happen.

In order to do that within our two-year timeframe, we'll be drawing on the safety-related expertise of all our members. Each member has unique capabilities that help contribute to the overall strength of our team and our ability to address regional issues. We'll take advantage of this extensive expertise to expand our reach and work on yet-unsolved safety problems.

To learn more about the

ROADWAY SAFETY INSTITUTE,

or to subscribe to the Institute's forthcoming

ELECTRONIC NEWSLETTER,

please visit the Institute website at **roadwaysafety.umn.edu**.

***Speed enforcement** from page 1*

There is public support for using ASE to reduce speeds in Minnesota school zones and work zones.

Prompted by the gap in Minnesota between state policy and the safety benefits and strong support for ASE, researchers at the Humphrey School of Public Affairs designed a study to investigate scenarios for an ASE pilot program in Minnesota.

"Our aim was to develop a blueprint that would inform policymakers about the potential for an ASE pilot project in work zones and school zones," says lead researcher Frank Douma, associate director of the State and Local Policy Program at the Humphrey School. "We chose work and school zones due to the strong public support for ASE in these locations and the experiences in other states showing that ASE is an effective tool for reducing speed in these locations."

First, the research team documented the legal and political environment surrounding ASE in Minnesota and analyzed available data for speed-related crashes in Minnesota school and work zones. Next, the researchers investigated and cataloged the possible solutions to a number of considerations and questions involved in developing an ASE pilot project. These questions include:

- Who is responsible for the violation—the vehicle owner or the driver?
- Should penalties be civil or criminal?
- To what extent should automated warnings be used?
- How is evidence of an ASE violation authenticated in court hearings?
- What should law enforcement's role be in operating the program?
- How should ASE fine revenue be allocated?
- What should the goals of an ASE pilot project be?
- How should the success of an ASE pilot project be measured?
- What should the penalties be for non-payment of ASE fines?
- What role should private contractors play in the ASE ticketing process?

Finally, researchers set out to develop a "blueprint" of preferred scenarios for ASE in Minnesota—and came face-to-face with several obstacles. "While making choices about some of the design elements for an ASE pilot project was relatively straightforward, we found that many decisions require weighing multiple and interdependent considerations that create difficult political and policy tradeoffs," Douma says. Tradeoffs generally fall along three dimensions: politics or public acceptance, operational challenges and cost issues, and effectiveness. "Even in an environment with apparent strong public support for ASE, and with strong evidence from other states that ASE improves roadway safety, we determined that these tradeoffs create substantial operational and political challenges to an ASE pilot program in Minnesota at this time."

Despite these obstacles, policy experts say an ASE program in Minnesota is possible. "We've seen other states overcome similar challenges," Douma says. "To move an ASE program forward, we'll need consensus among government stakeholders that ASE is a worthwhile tool, and agreement as to what an ASE program should look like operationally. In addition, we'll need policymakers to champion ASE as a valuable roadway safety tool in order to provide the political and policy momentum needed to work through these challenges."

READ CATALYST ONLINE

for links to research reports and other resources.

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