To reduce congestion and improve safety, the Minnesota Department of Transportation (MnDOT) has deployed active traffic management (ATM) technology on two freeways in the Twin Cities. The ATM system incorporates intelligent lane control signals (ILCS) placed over selected lanes at half-mile increments to warn motorists of incidents or hazards ahead.

Using this existing ATM infrastructure, U of M researchers have developed and field-tested two new warning systems aimed to reduce rear-end crashes on Minnesota freeways.

Components of an Attractive Minnesota Freight Market

Performance of the freight system in Minnesota profoundly affects economic competitiveness. But perspectives vary on what constitutes and contributes to an attractive, competitive freight environment. Differences among various interests—carriers, retailers, consumers, and government—give rise to a certain competitive tension underlying critical decision making and investment involving freight.

To make sense of it all, the Minnesota Freight Advisory Committee (MFAC) in June published Components of an Attractive Minnesota Freight Market. The white paper, which identifies key aspects of an attractive freight market in Minnesota, is the first in a planned MFAC series about freight transportation issues important to Minnesota’s economy.
In November, CTS will conclude our 30th anniversary celebration at the annual Transportation Research Conference. The one-day event will celebrate CTS’s first 30 years and explore what comes next by presenting new learning, emerging ideas, and the latest innovations in transportation.

The conference will be held November 2 at the Commons Hotel on the U of M east bank campus. The opening plenary and luncheon presentations are described below, and registration information is available at cts.umn.edu/events.

Opening Session: How We Pay for Transportation Infrastructure—What’s the Value Proposition?
The public generally support investing in transportation infrastructure, yet they fiercely oppose increases in user fees or taxes to support this investment. The opaqueness of transportation revenue mechanisms like the gas tax makes it difficult for the public to easily discern how much they pay for infrastructure and what value they derive from it.

Joung Lee, policy director at the American Association of State Highway and Transportation Officials, will examine the latest direction in infrastructure funding at the federal level. He will also offer examples of innovation happening in states all around the country and discuss policy and political considerations when it comes to transportation revenue and financing tools.

Following Lee’s presentation, a panel of Minnesota leaders and experts will share perspectives on transportation infrastructure funding. Panelists will include Tracy Hatch, Minnesota Department of Transportation deputy commissioner; Jim McDonough, Ramsey County commissioner; and Jerry Zhao, associate professor at the Humphrey School of Public Affairs.

Luncheon: Transportation Policy Innovation—LA Metro’s Experience
In August 2015, the Los Angeles County Metropolitan Transportation Authority (LA Metro) embarked on an ambitious experiment: Could a new department with an extraordinary name bring about dramatic changes in transportation policy and innovation for a large government agency in a short period of time?

LA Metro’s chief innovation officer Joshua Schank will describe the creation of the Office of Extraordinary Innovation (OEI), designed to manage public-private-partnerships (P3) and strategic planning for the agency. For P3s, this included overseeing a new unsolicited proposal process designed to encourage private-sector ideas for delivering Metro projects and services. OEI was also charged with developing the Metro Strategic Plan, which would clearly define the mission, vision, and goals for the agency and create a culture of innovation.

Schank’s presentation will look back on the successes and failures of the first two years of this experiment in innovation at LA Metro and explore the path forward. This will include a discussion of the challenges faced—including fierce resistance to innovative approaches and intense demands on OEI to deliver quickly—as well as the new ideas brought to the agency.
A new report by a team of researchers at the U of M’s Resilient Communities Project (RCP) provides insights into barriers stakeholders face to building healthier, more equitable developments in first-ring suburbs of Minneapolis and Saint Paul. The report also suggests steps that could positively influence development decisions moving forward.

The Healthy and Equitable Development Project, funded by Blue Cross and Blue Shield of Minnesota’s Center for Prevention, was developed for over a year and focused on 18 developments within four cities: New Hope, St. Louis Park, Hopkins, and Richfield. It reflects the thoughts of community members, elected officials, city staff, and developers on the problems and opportunities around affordable living and active transportation.

“One of the goals of RCP is to advance local sustainability on the ground by helping communities move from ideas to implementation,” RCP director Mike Greco says. “The Healthy and Equitable Development Project is a great example of that.”

The highlighted challenges and barriers that first-ring suburbs face include:

- Community opposition to active transportation infrastructure and new developments, including market-rate and affordable housing
- Meeting the needs and desires of residents who are currently car-dependent while working towards becoming more walkable and bikeable
- Retrofitting streets with sidewalks—and deciding who will pay for and maintain them

Although many of these problems may seem intractable, there are ways to move forward. As a result of this report, cities, developers, and other stakeholders will seek to use suggestions and case studies from other communities to overcome current obstacles in building healthier, more equitable development in the suburbs by focusing on three core areas: community engagement, active living, and equity and affordable housing.

Sample recommendations from the report include:

- **Community engagement**: Build authentic, long-term relationships with community members rather than transactional relationships. Engage the community early in the development process rather than after all decisions have been made.
Hands-on lessons, field trips, and other activities introduced a diverse group of elementary and middle school students to transportation topics in programs held throughout the summer.

In June, the Roadway Safety Institute (RSI) participated in the White Earth Indian Reservation Summer Academy of Math and Science for the third consecutive year. The two-week day camp teaches students in grades 4 to 8 about math, science, and engineering using American Indian culture and interactive lessons. It is offered in partnership by the White Earth Nation and the University of Minnesota Extension.

This year’s RSI session included a lesson on how plants used in roadside vegetation can improve the environment, help pollinators, and control snow. Another lesson, co-taught by Minnesota Toward Zero Deaths East Central and West Central regional coordinator Tom Nixon, focused on safety and distraction.

In another effort, CTS hosted a session for eighth- and ninth-grade girls as part of the Eureka! Program, a partnership between the U’s College of Science and Engineering and YWCA Minneapolis. The program helps girls interested in STEM explore career possibilities and prepare for next steps in their post-secondary education. In the CTS session, the girls learned about traffic management and tested their traffic control skills with CTS’s online game Gridlock Buster.

In July, 31 middle schoolers participated in CTS’s third National Summer Transportation Institute (NSTI), a two-week program featuring classroom activities, lab sessions, and field trips around the Twin Cities. New activities this year included tours of the Mississippi Watershed Management Organization and Hennepin County Public Works, a session with the Learning Jet at the St. Paul Downtown Airport, a bike and pedestrian infrastructure tour on the U of M campus, and the chance to take a spin in MnDOT’s snowplow driving simulator.

NSTI is part of a national program designed to attract a diverse range of students to education and career opportunities in transportation. It was sponsored by CTS with funding from the Federal Highway Administration administered by MnDOT.
New scholarship honors CTS founding director

The children of Richard P. Braun have established a scholarship to honor his memory and legacy. Braun, the founding director of CTS, died April 11 at the age of 91.

Braun was a University of Minnesota alumnus (‘48 and ‘55) and a long-time public servant. He served as commissioner of the Minnesota Department of Transportation under both GOP and DFL governors.

The Braun family shares their motivation for the endowment: “One of the defining characteristics of our dad was his interest in the future. He was innately curious about things, and quite determined to imagine different and better solutions to challenges—whether this was his infinite number of uses for masking tape or his interest in intelligent vehicles. He felt strongly about encouraging research, specifically around how to stretch the limits and redefine transportation.”

The family also discusses Braun’s legacy: “The importance of public service and education were two of our dad’s core beliefs, and he was a walking example of these at a national and state level. We have heard from so many people that Richard inspired them in their careers and their lives. We know his hope was that the scholarship would serve as a catalyst for undergraduate students to reflect on how they, too, might use their education to contribute to serving the public.”

The Richard P. Braun Transportation Scholarship will be awarded annually to a University of Minnesota undergraduate student who is pursuing a degree in a transportation-related field of study. To honor Braun’s vision for the center and acknowledge the transdisciplinary nature of the transportation field, eligible students may come from a variety of disciplines including engineering, planning, urban studies, geography, design, environmental sciences, social sciences, economics, and logistics/supply chain.

The merit-based scholarship will be awarded to a junior or senior with a GPA of 3.0 or higher. Preference will be given to students who have demonstrated both leadership and technical skills.

“CTS values and appreciates this generous endowment honoring Dick’s contributions to CTS and to transportation research and education,” says Laurie McGinnis, CTS director. “The endowment supports our commitment to undergraduate education and enhances our existing scholarship portfolio.”

The U of M Foundation welcomes additional contributions to the endowed scholarship. Memorial donations may be sent to: U of MN Foundation, Braun CTS Scholarship, P.O. Box 860266, Minneapolis, MN 55486-0266.

CTS is administering the scholarship. Application instructions and further details will be available this fall at cts.umn.edu.

Development from page 3

- **Active living**: Use demonstrations and temporary installations to help community members understand how biking and walking infrastructure will work, and gather a broader array of perspectives beyond just those of adjacent property owners. Work toward equity in pedestrian and bike infrastructure by creating holistic plans for bike/walk networks throughout the community, rather than only building such infrastructure when new development occurs.

- **Equity and affordable housing**: Humanize affordable housing residents and correct misperceptions to reduce fear of the unknown among neighbors. Anticipate the conversion of informal affordable housing to market-rate housing, especially in areas well-served by transit.

“This report offers a refresh to suburban communities looking for ways to build on their assets and strengths,” says Gretchen Nicholls, a program officer at the Twin Cities Local Initiatives Support Corporation who was interviewed for the project. “It is especially timely as cities undertake their comprehensive plan updates, reassessing priorities and goals—and offers great ideas to help raise the bar for inner ring suburban communities.”

Links to the full report and other materials are available on our website.

(Adapted with permission from an article published May 22, 2017, on the University of Minnesota website.)
“We need to take a hard look at some of the key components that truly make up the freight industry and how this ties into overall transportation infrastructure and competitiveness of markets,” says MFAC chair Bill Goins. “This paper highlights the unique perspectives, issues, and needs of all freight market contributors—air, pipeline, producers, rail, trucking, and water.”

MFAC turned to the University of Minnesota for expertise to sort out the important issues of the Minnesota freight market and its diverse and complex stakeholders. Humphrey School researcher Matt Schmit authored the paper with guidance from an MFAC subcommittee that included MFAC members and staff from MnDOT and CTS.

“Freight plays such an incredible role in our economy. If we’re able to foster a dialogue where more people understand what’s important—what matters most—the better off we’re going to be,” Schmit says. “We wanted to make this accessible to policymakers and other constituencies, including the public.”

Schmit’s findings are based on a thorough literature review of the topic and interviews with approximately 30 key stakeholders in Minnesota’s freight industry, including producers that grow, manufacture, and ship product; carriers in trucking, rail, air, and water-based transportation modes; third-party logistics firms that track and contract shipping routes to the nearest nanosecond; and regulators and planners at various levels of government.

Based on conversations with various interests, key components of an attractive Minnesota freight market include:

- Increasingly efficient supply-chain management
- Stronger balance between inbound and outbound freight movement
- Additional options for shippers, including improved access to rail and, to a lesser extent, water modes through new or improved intermodal terminals
- Sufficient investment in transportation infrastructure and congestion mitigation
- Improved career pathways and geographically balanced labor supply
- Consistent regulation and policies that promote technology adoption, public-private partnerships, and private investment
- Consistent regulation and policies that promote technology adoption, public-private partnerships, and private investment

Finally, according to Schmit, external factors—such as shifting port activity due to the widening of the Panama Canal, impacts from global climate change, and rapid technological advances in vehicle automation, including the potential for self-driving trucks—present a mix of challenges and opportunities as freight shippers and carriers respond to changing realities and pressures in a highly competitive freight market.

The white paper, intended as a foundation for subsequent papers focused on critical Minnesota freight issues, represents a new era for MFAC and freight in Minnesota. In 2016, MFAC introduced strategic organizational changes in conjunction with the development of the Minnesota Statewide Freight System Plan. The goal is to increase awareness of freight issues locally and nationally, facilitate quick response to freight questions and issues from the Minnesota Legislature and other organizations, and provide a focal point for freight expertise in Minnesota.

Components of an Attractive Minnesota Freight Market is available for download along with other publications and materials about freight in Minnesota at dot.state.mn.us/ofrw/mfac.

TRUCKING accounts for more than 60 PERCENT of freight mode share by weight and value.
prototypes for queue warning systems in a new MnDOT-funded project. The warning systems specifically focus on preventing rear-end collisions—the most frequent type of crash on freeways.

“Rear-end freeway crashes are a serious safety and mobility problem,” says John Hourdos, director of the Minnesota Traffic Observatory at the University of Minnesota. In 2014, these crashes accounted for 38 deaths and more than 5,000 injuries in Minnesota alone. “Research has shown that these dangerous crashes tend to occur during traffic slowdowns and at end-of-queue locations, so warning a driver to these conditions in advance allows them to be more alert and possibly avoid crashes.”

The new prototypes aim to reduce rear-end crashes by addressing stop-and-go traffic and end-of-queue situations as well as shockwaves, a crash-facilitating condition in which a sudden change in traffic movement causes a cascade of braking. The long-range goal of the project is to develop a unified queue warning system that can be deployed at other locations in Minnesota’s freeway network.

Development of the two prototype warning systems began in 2014, and they were subsequently deployed on two high-traffic freeways in the Twin Cities: I-35W and I-94.

“These two locations have significantly different traffic conditions,” Hourdos says. “On I-35W, congestion creates expanding queues, while on I-94 crashes are most likely to occur due to shockwaves that often develop quickly.”

To capture traffic data, researchers merged live video from existing camera detector stations with data from in-pavement loop detectors. With this data, researchers developed two algorithms that were used to create a rear-end collision warning system. The system can prompt the ILCS units to display warning messages for drivers, such as Prepare to Stop, Slow Traffic Ahead, and Traffic Ahead 10 MPH. In the future, the algorithms could be used to develop a rear-end collision warning system that could be installed at other freeway locations where similar queuing conditions exist.

Results of the study show that warning messages delivered by the two prototype systems can be effective at alerting drivers to queuing conditions, with the ultimate benefit of reducing rear-end collisions. At the I-94 test site, the system substantially reduced crashes and near-crashes: crashes decreased by 22 percent and near-crashes dropped by 54 percent. At the I-35W location, messages delivered by the warning system reduced speed variances by helping drivers maintain a steady speed and curbing stop-and-go traffic.

“The big lesson learned was that the detection method had to function quickly and display a message that was timely and accurate. This gains the trust and confidence of the motoring public,” says Brian Kary, MnDOT freeway operations engineer.

Going forward, the researchers would like to pursue a longer trial period of the queue warning systems. “Testing over a period of two or three years could help us ensure this cost-effective system can deliver sustainable benefits,” Hourdos says.
AUGUST 2017

New warning systems aim to reduce rear-end crashes on freeways.

Infrastructure funding and **POLICY INNOVATION** featured at **RESEARCH CONFERENCE.**

Overcoming barriers to **HEALTHY, EQUITABLE DEVELOPMENT** in Twin Cities suburbs.

**MFAC WHITE PAPER** provides overview of **Minnesota FREIGHT MARKET.**