FY12 at a Glance

- 4,600+ participants in technical assistance and continuing education workshops and events in 10 Minnesota counties
- 2 startup companies launched
- 29 master's and doctoral degrees awarded
- 42 research funding sources
- 23,000+ recipients of CTS-produced newsletters and publications
- 3,300+ participants at CTS-sponsored and -hosted events
- 69 faculty and staff with research projects from 19 departments
CTS is all about transportation innovation.

• Generating it.
• Facilitating it.
• Sharing it.
• Celebrating it.

This annual report tells the story of CTS transportation innovation in FY12. You will find both the quantitative and qualitative accounts of CTS—the statistics and the stories. Because both matter. Both tell the story of who we are, and where we are headed.

The annual report also illuminates the value CTS and the U of M bring to Minnesota and the world beyond:

• Stories of discoveries shining light on transportation challenges.
• Stories of bright students and graduates fueling our workforce.
• Stories of researchers and practitioners collaborating to solve real-world problems.

And this annual report is an example of CTS’s strategic journey in 2012, a year in which we revamped our graphic identity and launched our signature publication Catalyst to better capture the innovative spirit and energy of our organization.

As always, our success depends on the support of our partners, sponsors, and committee members, and we thank you for your commitment. With your guidance, we are confident CTS will continue to shine bright.

Sincerely,

Laurie McGinnis
Director
Safe Teen Car technology targets risky driving behavior

Motor vehicle crashes are the leading cause of death for U.S. teens. Teens are more likely to engage in risky driving behaviors than older drivers, and they’re less likely to wear their seat belts.

To reduce teen driver crashes, U of M researchers and Maryland-based research organization Westat have developed a vehicle-based technology solution: the Safe Teen Car (STC). The team, which included researchers Mike Manser, Chris Edwards, Janet Creaser, Alec Gorjestani, Arvind Menon, and Craig Shankwitz, has completed testing of its prototype driver support system. The project was sponsored by the National Highway Traffic Safety Administration.

The STC system is intended as a potential built-in option in new autos. It utilizes the advanced computer intelligence of today’s vehicles to provide beginning drivers with information tailored to their needs and behaviors. It monitors speed, excessive maneuvers (such as hard acceleration or sharp turns), cell phone use, seat belt use, and passenger presence, then provides real-time feedback to the driver when it detects a crash risk factor.

In a functional road test, the majority of teens said the system improved their safety, and most parents said they would recommend the system to other parents and teens.

“The STC project was an attempt to determine how the manufacturer could build [a system] given the chance,” Manser says. The project resulted in recommendations and final specifications for a safe teen vehicle.
THE VALUE OF A YOUNG LIFE: PRICELESS
Because too many new teen drivers die senselessly, CTS researchers are developing in-vehicle technologies to help them learn better and faster.

One system—an aftermarket option—uses a smartphone mounted on the dashboard to give real-time feedback to teens and report unsafe behavior to parents.

“We know from research that immediate feedback can be very powerful for producing behavioral changes,” says Mike Manser, director of the U’s HumanFIRST Program.

U of M research has also been incorporated into a smartphone app and an online education game about the dangers of distracted driving.

CTS studies teen driving habits—and brings innovative tools to the marketplace to change the unsafe ones.
We found that integrating transit planning with land use and economic development maximizes the return on transitway investment,” Fan says. Locating future development inside the I-494/I-694 loop will create additional accessibility to regional jobs beyond current projections; locating development along transitways provides even greater benefits.

Additionally, the researchers found that locating new jobs near transitways increases accessibility more than locating new housing near transitways, with the greatest accessibility benefits realized by balancing both. Research sponsors were the McKnight Foundation, the Surdna Foundation, and the Jay and Rose Phillips Family Foundation of Minnesota.

“This research confirms the value of a multimodal transportation system in maximizing access to jobs,” says Tim Henkel, assistant commissioner with the Minnesota Department of Transportation. “It further demonstrates the benefit of locating jobs and transitways in close proximity to improve the economic competitiveness of a region.”

Maximizing the benefits of transitway investments

The Minneapolis–St. Paul metropolitan region is in the midst of a transit renaissance. In the past decade, light rail, commuter rail, and bus rapid transit services have improved transit links between the central cities and suburbs. To accommodate projected population and employment growth, a network of 14 transitways is planned for 2030. How can the region ensure the greatest return on this investment, improve job accessibility, and strengthen the region’s economic future? University of Minnesota researchers led by Yingling Fan, an assistant professor in the Humphrey School of Public Affairs, set out to find the answer.

To determine how well transitways connect workers to job opportunities—and employers to the labor force—researchers first identified where the region’s greatest opportunities exist. They then determined how the planned transitway investments could yield maximum accessibility benefits and economic growth. To do so, they developed and analyzed alternative land-development strategies and identified the most promising development solutions.
Smartphone research aims to help visually impaired pedestrians

Crossing a street isn’t risk-free for any pedestrian, but it’s especially challenging for the blind or visually impaired. Chen-Fu Liao, senior systems engineer in the U’s Minnesota Traffic Observatory, led a research team that developed a prototype Mobile Accessible Pedestrian Signal (MAPS) system using a smartphone, GPS, and other technologies to help people with limited or no eyesight cross signalized intersections safely.

The U’s system goes above and beyond existing crosswalk aids. While standing at an intersection, the user can point a smartphone in the direction he or she wants to cross and call up information about the intersection and the signal phase by tapping the unit’s touchscreen once. Tapping twice confirms the desired crossing direction and sends a request for a crossing signal to the traffic signal controller. The user gets feedback from the text-to-speech interface.

Because it’s an app, it’s easy and inexpensive for users. And MAPS puts the assistive technology directly in the hand of the user, avoiding many of the drawbacks associated with conventional infrastructure-based systems while offering greater flexibility and ease of use. The research was funded by the Intelligent Transportation Systems Institute, and a prototype has been field-tested at several intersections.

The researchers interviewed 10 blind and low-vision people to better understand what types of information they use at intersection crossings and to identify what could help them. “I think the whole system and the whole concept is so beautiful,” says Ken Rodgers, president of the American Council for the Blind of Minnesota. “It just works well.”

MORE MOBILITY AND SAFETY FOR VISUALLY IMPAIRED PEDESTRIANS

Because visually impaired pedestrians and vehicles can be a lethal mix, CTS research is developing a smartphone app to receive traffic-signal-based warnings.

“Sure, a smartphone can help you locate a shop in seconds or play games,” says Chen-Fu Liao, the lead researcher. “But we created an app that delivers traffic signal and safety information in real time to the visually impaired. With our app, it’s not just a smartphone, or a fun phone, it’s a life-saving phone.”

CTS turns emerging technologies into real-world products—and improves people’s lives.
Driver-assist technology improves bus driver performance
A driver-assist system (DAS) developed by the Intelligent Transportation Systems (ITS) Institute is improving bus operations and reducing driver stress on bus-only shoulders in the Twin Cities, according to an evaluation published by the Federal Transit Administration (FTA). The DAS has been in use on 10 Minnesota Valley Transit Authority (MVTA) buses operating in the Cedar Avenue bus rapid transit corridor since 2010 and is the first deployed system of its kind.

The DAS uses high-accuracy GPS and vehicle-mounted sensors to monitor a bus’s position on the roadway. It provides feedback to the driver through a head-up display (HUD), vibrating seat, and actuated steering if it detects the bus drifting out of the bus-only shoulder lane.

The FTA evaluation measured the performance of the DAS in six areas, including efficiency/productivity, rider satisfaction, and driver satisfaction. Overall results indicate that drivers stayed in the shoulder lanes 10 percent longer and drove 3 miles per hour faster while the DAS was active, indicating an increase in driver confidence. Results from passengers were also positive: more than 95 percent were satisfied with travel time reliability.

The installation of the system was funded by the FTA through the U.S. Department of Transportation’s Urban Partnership Agreement with match from the Twin Cities Metropolitan Council. The ITS Institute’s Intelligent Vehicles Laboratory and HumanFIRST Program collaborated with the MVTA and Schmitty and Sons Transportation on the installation.

“I’m pleased that the evaluation documented a measurable improvement in driver performance,” says MVTA transit planning manager Mike Abegg, a leader of the Cedar Avenue project. “The fact that bus operators had a positive reaction overall is also encouraging for the adoption not only of this specific technology, but the wide spectrum of connected-vehicle technologies that are on the near horizon.”
Bicycle, pedestrian traffic counts support better decision making

Research on bicycle and pedestrian traffic in the City of Minneapolis is helping policymakers and planners make better decisions about when and where to invest in nonmotorized transportation infrastructure.

Led by Greg Lindsey, a professor at the Humphrey School of Public Affairs, a team of researchers used infrared counters to collect data on the use of Minneapolis trails by cyclists and pedestrians. The team also analyzed field traffic counts taken by the Minneapolis Department of Public Works and Bike Walk Twin Cities and used the counts to develop models for estimating nonmotorized traffic on Minneapolis streets, sidewalks, and trails. The project was funded by the Intelligent Transportation Systems Institute.

Lindsey says these models will provide transportation planners with the tools to make more informed investment choices. The study’s findings have already been used by the Volpe National Transportation Systems Center and Bike Walk Twin Cities in a report to Congress.

The data and models are also being used in collaboration with the Minneapolis Parks and Recreation Board (MPRB) to calculate total trail user-miles traveled on all MPRB trails. The estimates could be used to support planning, engineering, maintenance, and funding decisions.

“This could provide decision makers with a better understanding of the use of the entire system,” Lindsey says. “It would be helpful for both management decisions and applications for financial support for trail development.”
Transportation and quality of life: a citizen perspective

Quality of life is a commonly used term, but what does it mean to the average Minnesota citizen? What factors do Minnesotans identify as important to their quality of life, and how does transportation fit in? The Minnesota Department of Transportation (MnDOT) partnered with researchers from the University of Minnesota’s Tourism Center in an effort to find out.

In a statewide study, researchers used focus groups and surveys to identify the major categories that contribute to quality of life in Minnesota, including transportation. The research team was led by Ingrid Schneider, Tourism Center director. Karla Rains, director of customer relations at MnDOT, provided transportation-related guidance.

The study identified 11 main categories that Minnesotans find important for their quality of life. Although transportation was ranked ninth overall, participants said it was often a factor in their experience of other categories. “Transportation is described as the piece that makes everything else on the list happen,” Rains says. “It gets [citizens] to work, health care appointments, and recreation opportunities.”

Using the results of the study, MnDOT has begun implementing a planning process that uses transportation as a gathering point to address the multiple needs of a community. “We’ve already begun holding consumer-centric planning meetings with stakeholders and other state agencies at the corridor-planning level,” Rains says.

MnDOT is also using the quality-of-life study results to review and revise its current performance measures, which will be used to guide future planning and investment decisions. “Our goal is to ensure we’re measuring ourselves against those services that predict satisfaction and contribute to quality of life for Minnesotans,” Rains says.
Salt-tolerant turfgrass for roadsides: good for environment, good for local budgets

Researchers in the Department of Horticultural Science are working to identify salt-tolerant turfgrass mixes for Minnesota roadsides.

“What we see happening on these roadsides that don’t have salt-tolerant grasses is [that] public agencies are continually spending money to redo their initial project,” says Eric Watkins, the lead researcher. “That’s where there could not only be some environmental benefits, but also quite a bit of money to be saved by some of these municipalities and local governments.”

The Minnesota Department of Transportation (MnDOT) and Minnesota Local Road Research Board (LRRB) turned to Watkins for alternatives.

Under a four-year LRRB grant, the research team, including graduate research assistant Joshua Friell, has been testing hundreds of grasses and mixtures of grasses at an indoor facility and on roadside plots provided by MnDOT. The researchers have already discovered better grasses than those currently in use. The best grasses are those that can survive heavy salt exposure, cold winter conditions, and hot and humid summer weather.

“We’re already getting results that are being utilized by sod growers,” Watkins says. And Dwayne Stenlund of MnDOT’s Office of Environmental Services says MnDOT expects to use a new mix to stabilize difficult soils during the 2013 construction season.
Living snowfence calculator helps MnDOT save money and lives

As part of a study of living snow fences, U of M researchers created a benefit-and-cost-analysis tool that enables the Minnesota Department of Transportation (MnDOT) to further its living snow fence program. The study predicts that MnDOT could see net economic returns of more than $1.3 million per year by expanding the use of living snow fences to guard roads from drifting or blowing snow.

Living snow fences are plantings of trees, shrubs, grasses, or crops used as windbreaks to manage high winds and drifting snow before it reaches roads. Clearer roads mean lower maintenance costs for local agencies and safer conditions for motorists.

The tool evaluates the costs of living snow fences to landowners and helps calculate the global and site-specific economic, transportation, and environmental benefits. Gary Wyatt, an agroforestry professor with the University of Minnesota Extension in Mankato, led the study.

“There are about 4,000 problem sites across the state, and we don’t have the resources to address all of them,” says Dan Gullickson, MnDOT’s Living Snow Fence program coordinator. The tool helps MnDOT determine operating costs and prioritize highways that warrant treatment. Living snow fence contracts with landowners are currently in place at only 2.3 percent of those sites.

“On average about eight people die on Minnesota roads per year because of blowing and drifting snow,” Gullickson said. “This tool helps us support the Toward Zero Deaths initiative by making highways safer for the traveling public.”
Heavy farm equipment on pavements: research informs permitting policies

Over the past few decades, farm equipment has become larger and heavier. In a recent study, researchers from the U of M and Iowa State University evaluated the effects of this heavy agricultural equipment on paved roadways.

Civil engineering researchers led by Lev Khazanovich studied pavement structural response, such as stresses and strains, under heavy farm equipment and a typical five-axle semi-trailer truck on two asphalt roadway sections and two concrete pavement sections. They found that the heavy farm vehicles caused high pavement stresses and more damage to the roadway than the standard semi. The researchers also confirmed that the weight per axle is more important than the gross vehicle weight.

“These are valuable results, and should be valuable in years to come,” says Gary Danielson, public works director of Kandiyohi County and a member of the technical advisory committee for this project. “For my county, the study will help us in determining our permitting policies for heavy vehicles,” he says. “The study provides clear evidence that extra axles do make a difference...We thought this was true over the years, but the study confirms that. We’re now more open to heavy permitted vehicles than we used to be, on more roads in the county.”

The project included funding and other contributions from MnDOT, Iowa DOT, Illinois DOT, Wisconsin DOT, the Minnesota Local Road Research Board, and the Professional Nutrient Applicators Association of Wisconsin.
Because effective congestion relief requires accurate traffic information, CTS researchers invented and commercialized the SMART Signal system to gather data from arterial streets.

According to Steven Misgen, metro traffic engineer at the Minnesota Department of Transportation, the system has benefits for the traveling public. These include reduced congestion and improved travel time throughout a given corridor. “As a result, they’ll have a better quality of life, [spending] less time sitting in congested intersections,” Misgen says.

CTS analyzes congestion problems—and invents the technologies to fuel gridlock-busting solutions.

New startup companies arise from transportation research

Discoveries by University of Minnesota researchers were used to launch a record 12 startup companies in fiscal 2012. Two of the 12 startups were transportation-related: SMART Signal Technologies Inc. and Drive Power LLC.

The SMART Signal (Systematic Monitoring of Arterial Road Traffic Signals) system reduces congestion on roads controlled by traffic lights. It automatically collects and processes data from traffic signal controllers at multiple intersections and then creates performance measures, including information on the times and locations where congestion occurs on a given roadway. Traffic engineers can use these measures to determine whether signals are properly timed and to monitor the overall performance of the system. Civil engineering associate professor Henry Liu led the research team that developed SMART Signal, which has been deployed at more than 30 intersections in Minnesota and six intersections in Pasadena, California. Funding and in-kind support for the SMART Signal system have been provided by the Minnesota Department of Transportation (MnDOT), the ITS Institute, the Minnesota Local Road Research Board, Hennepin County, and the National Cooperative Highway Research Program.

Drive Power LLC makes web- and smartphone-based products that leverage emerging measurement technologies and predictive analytics to help people make more informed driving decisions. For example, a mobile app—DriveScribe—blocks calls, e-mails, and text messages while the vehicle is in operation and provides real-time coaching to novice drivers. The app was developed by U of M mechanical engineering department researchers led by Alec Gorjestani, who also serves as Drive Power’s vice president for technology. The research behind DriveScribe was funded by MnDOT and the ITS Institute.
Educating the workforce

Students gain experience through new internship program

Thanks to a new internship program, four undergraduates got a taste of real-world operations and gained insight for their future career paths.

The eight-week Summer Transportation Internship Program, held in the summer of 2012, provided an opportunity for students to gain professional experience and skills that will complement their academic pursuits. It was developed in partnership by CTS, the Intelligent Transportation Systems (ITS) Institute, Howard University, and the Minnesota Department of Transportation (MnDOT). Through the program, the students gained practical knowledge about MnDOT, learned about its operations, and worked on transportation-focused projects.

“The internship involved a lot of learning experience and exposure to the real-world environment,” says Sam Lamichhane, one of the interns.

“I have learned that on-the-job learning, with college education as a background, is the way to success.”

Another of the interns, Chelsey Palmateer, says she thoroughly enjoyed the opportunity that the internship provided. “Basically, I learned a lot about the vast amount of work and planning that goes into maintaining and improving the transportation network,” she says. “I gained insight into the workings of MnDOT, and now I know where I want to end up when I graduate.”

Palmateer’s supervisor/mentor echoes the positive experience. “This was a great two-way opportunity,” says Brian Isaacson. “We got the energy and insights of a talented young engineer, and she got some great exposure to planning and programming for a variety of highway and transit efforts.”
CTS Career Expo offers job-hunting tips, networking opportunities

More than 100 students seeking transportation-related career opportunities attended the 2012 Transportation Career Expo. Students in many disciplines—from planning to engineering to supply chain management—were among the attendees.

The campus event featured a panel discussion with transportation industry experts providing career-planning advice. Speakers shared personal experiences from their transportation-related fields, stressed the importance of internships in college, and offered tips for putting together successful resumes.

“I think internships are incredibly important,” said Rebecca Reiff, deployment team leader for General Mills. She added that the skills and leadership qualities developed during internships are very valuable. “It’s something that every single employer is going to be looking for,” she said.

Following a Q&A session, 28 exhibitors from public, private, and professional organizations offered networking and employment opportunities.

The annual expo was sponsored by the CTS Education and Outreach Council, the Women’s Transportation Seminar, the Minnesota Local Road Research Board, the Minnesota Local Technical Assistance Program, the Intelligent Transportation Systems Institute, and the Council of Supply Chain Management Professionals.

The U of M graduating class of 2010 will add $8.9 billion in future increased earnings for Minnesota.
Honoring student achievement
At its annual award ceremony, CTS honored students demonstrating outstanding academic achievement.

Matthew J. Huber Award (given to students in engineering, science, and technology fields)
- David Bennett, master’s and doctoral candidate, Department of Mechanical Engineering. Advisor: Professor David Kittelson
- Augusto Cannone Falchetto, doctoral candidate, Department of Civil Engineering. Advisors: Associate Professor Mihai Marasteanu and Assistant Professor Jia-Liang Le

John S. Adams Award (given to students in policy and planning fields)
- Qian Chen, dual master’s candidate, Humphrey School of Public Affairs and Department of Statistics. Advisor: Assistant Professor Yingling Fan
- David Smith, doctoral candidate, Department of Applied Economics. Advisor: Professor Frances Homans

AWARD WINNER IN THE WORKFORCE
Lei Zhang received a Huber Award in 2003. During graduate school Zhang interned with the Minnesota Department of Transportation as an engineer at the traffic management center. After graduating, he worked for two years as an assistant professor in civil and construction engineering at Oregon State University; he is currently in his fourth year as an assistant professor in the Department of Civil and Environmental Engineering at the University of Maryland.

Zhang says that the projects he completed as a graduate research assistant were incredibly valuable to him. “Research is the bridge between public policy, human behavior, policy relevance, and the social side of transportation,” he says. “Being able to link the coursework to my research projects made the research experience real to me...The experience I got from the University of Minnesota directly correlates to what I do now.”

CTS attracts and honors brilliant minds—the workforce and leadership of the future.
Exhibits introduce K–12 students to transportation

CTS staffed exhibits and participated in several events to introduce K–12 students to transportation and transportation-related fields of study.

• University of Minnesota Urban Research and Outreach-Engagement Center (UROC) Community Day. UROC is home to 10 University programs committed to research and problem-solving in engaged partnership with individuals and organizations in Northside communities in Minneapolis.

• United Negro College Fund (UNCF) Empower Me Tour. The tour is a traveling career- and college-readiness road show created by UNCF in partnership with Wells Fargo. More than a thousand Minnesota students (mostly high school age) plus their parents participated.

• Fourth Annual Teen Safe Driving Summit. About 160 teenagers, school advisers, law enforcement officers, and others attended the daylong event, which was sponsored by the Metro Area Safe Communities Coalition.

• College of Science and Engineering (CSE) Student Organization Fair. The fair was hosted by the Society of Hispanic Professional Engineers University of Minnesota student chapter with support from CSE.

• CSE Exploring Careers in Engineering and Physical Science Summer Camp. CTS promoted transportation-related degrees and careers to about 50 high school students during the annual day camp, which is designed to introduce students to careers in science, engineering, and math.
Online gravel road training: students from Alaska to Botswana

The Minnesota Local Technical Assistance Program (LTAP), a program of CTS, launched its first online distance-learning course: Gravel Road Maintenance and Design.

The course provides a high-quality training option at a low cost. It is designed for supervisors, operators, and township officials responsible for maintaining gravel roads, as well as anyone interested in gravel road maintenance. Students can access the training anytime, anywhere. All that’s needed is access to a web-enabled computer and an e-mail address. The course was developed in partnership with Minnesota’s Local Road Research Board.

Graduates earn credit in Minnesota LTAP’s Roads Scholar Program, a structured curriculum of training options. Grads can also earn a continuing education unit and professional development hours.

The online course is a hit with students from Alaska to Botswana. Fourteen students have already completed the course and 20 are currently enrolled, half from outside Minnesota. “Thank you for the opportunity to participate in an online course like this,” said Jim Gilles of the Kanabec County Highway Department, one of the graduates. “I would like to see more classes incorporated into [online training], as it is harder to get away from the job to attend classes.”

Guidebook helps airport managers prepare for emergencies

CTS annual research conference shares cutting-edge findings

Policymakers and practitioners listened to cutting-edge research findings at the 23rd Annual CTS Transportation Research Conference, held in May 2012 in St. Paul.

The two-day conference opened with the first public presentation of research findings from Assistant Professor Yingling Fan’s study of transitway investments (see page 4). Following her presentation, a panel of experts discussed the implications of the research for the region and beyond.


One of the conference’s concurrent sessions focused on the future of transportation funding. Lee Munnich of the Humphrey School of Public Affairs shared highlights from a policy task force commissioned by the Minnesota Department of Transportation to examine the feasibility of a mileage-based user fee (MBUF) system in Minnesota. The Humphrey School helped facilitate the process and provided technical advice to the task force. The session also included a panel of task force members who offered thoughts on MBUF in Minnesota.

**REINVENTING TRANSPORTATION FINANCING**

Because higher fuel efficiency means lower gas-tax revenues, the U of M is working to develop and understand alternative funding options, such as technology to charge user fees based on distance traveled.

“We need a fair and flexible transportation funding system, and the current gas tax fails on both fronts,” says Bernie Lieder, chair of a state MBUF task force and former chair of the Minnesota House Transportation Finance and Policy Division.

CTS studies policy questions—and listens to public concerns, creates new understanding, and helps solve public problems.
CTS luncheons bring forward thinking to Minnesota

CTS luncheons continued to bring speakers to Minnesota to share the latest trends and issues in transportation. This year’s topics looked at the future of sustainable cities and urban mobility.

Reviving the streetcar and the urban form it generated—the “flat city”—is the most affordable way to meet sustainability goals, according to Patrick Condon, the fall luncheon speaker. Condon, a professor and senior researcher with the Design Centre for Sustainability at the University of British Columbia, hypothesized that a “flat” city with streetcars on a grid is more sustainable than a “pointy” city with high densities and transit nodes. “Most of our thinking has been to make cities pointier, bigger, put more jobs there, put more transit there,” he said. “That’s maybe a fool’s errand…It goes against the grain of the existing city. It may in fact go against the grain of the cultural expectations of Americans and Canadians.”

A new kind of automobile—the automated “cybercar”—could be the answer to urban mobility challenges, said Michel Parent at the winter luncheon. Parent is scientific advisor to IMARA (Computer Science, Mathematics and Control for the Automated Road), a project team from INRIA, the French National Institute for Research in Computer Science and Control. He said that cybercar networks—made up of small, automated, public vehicles segregated from other traffic—would operate similar to today’s bike- or car-sharing systems. His team at INRIA has been developing components of automated systems for about 20 years, including a prototype cybercar. “It’s a new form of automobile—the car of the future for urban transportation.”
Research Partnership Award: advanced LED warning signs

Each year CTS honors researchers and practitioners who join forces to implement research innovation. Partners in the year’s winning project—“Advanced LED Warning Signs”—worked to improve the safety of rural blind intersections by developing a low-cost, easy-to-install advance warning sign system that can be implemented on existing static signs.

The Advanced Light-Emitting Diode Warning System uses solar energy to power wireless technology for vehicle detection. The system shows promise in changing driver behavior by increasing wait times and reducing speeds. It was installed in St. Louis County just north of Duluth, and positive benefits have been recorded. The two-year project was funded by the Minnesota Local Road Research Board; MnDOT’s Research Services Section ran the project’s technical advisory panel.

The work included a survey of nearby residents and discussion of the psychology of drivers crossing such intersections. The researchers are now in the second phase of the project. “We hope it will provide real, practical solutions using off-the-shelf products that can be implemented in any rural intersections that have blind spots,” says Professor Taek Kwon of the University of Minnesota Duluth (UMD) Department of Electrical Engineering, the lead researcher.

In addition to Kwon and his research students, project partners were:
- MnDOT: Rob Ege, Alan Rindels, Mike Weiss
- St. Louis County: Brian Boder, Victor Lund

Presentation to state legislators

CTS gave a presentation to the Minnesota Legislature’s I-90 Coalition and MnDOT officials in the summer of 2012 in Rochester. CTS was invited to give the presentation by U of M president Eric Kaler and U of M Rochester chancellor Stephen Lehmkuhle. CTS director Laurie McGinnis gave an overview of CTS and its programs, and Max Donath, director of the Intelligent Transportation Systems Institute, discussed research to make rural roads safer with driver-centered systems.

International exchanges

Kathleen Harder, director of the Center for Design in Health, delivered lectures and led research seminars at Jilin University College of Traffic in Changchun, China. She also delivered a seminar to the senior administrators of the Yunan Provincial Police and another to graduate students in the Department of Traffic Engineering at Kunming University of Science and Technology. The topic was information design in complex systems, specifically as it pertains to designing safer roadway infrastructure and changeable message signs.

Carissa Schively Slotterback, associate professor and director of the Urban and Regional Planning Program in the Humphrey School of Public Affairs, participated in the George C. Marshall Visit to Austria.
Program. Established in 1961, the program brings to Austria every year a group of 10 mid-career decision makers from government, academia, and industry associations to learn about Austrian innovations in industry and technology.

Research papers by several U of M transportation researchers were accepted for the 2012 Transport Research Arena Conference, a top research event in Europe. Two of the researchers—Zhirong Zhao and Adeel Lari of the Humphrey School—attended the conference in Greece with travel funds from CTS. Topics included value capture for transportation finance and telework/workforce flexibility.

Freight and Logistics Symposium: The Impacts of Economic Change

During the 15th Annual Freight and Logistics Symposium on December 2, representatives from the business, academic, and public sectors gathered to discuss the effects of economic change on freight and logistics providers.

Christopher Caplice, executive director of the Center for Transportation and Logistics at the Massachusetts Institute of Technology, discussed his work on the Future Freight Flows project. The project uses scenario planning to overcome the challenges associated with long-term planning of complex projects involving many stakeholders.

The symposium also included two panels: one on technology and post-recession capacity and implications for Minnesota, and another on the intersection of transportation and economic development.

The event was sponsored by CTS in cooperation with MnDOT, the Minnesota Freight Advisory Committee, the Council of Supply Chain Management Professionals–Twin Cities Roundtable, the Metropolitan Council, and the Transportation Club.
Distinguished Service Awards
At its annual award ceremony, CTS honors distinguished leaders who exemplify the service that brings transportation innovation to life.

Richard P. Braun Distinguished Service Award: Robert Johns, director, U.S. Department of Transportation John A. Volpe National Transportation Systems Center, and director of CTS from 2001 to 2009

Ray L. Lappegaard Distinguished Service Award: Charles Zelle, president and CEO of Jefferson Lines, chair of the Minneapolis Regional Chamber of Commerce, and co-chair of the Transportation Task Force of the Itasca Project

William K. Smith Distinguished Service Award: Meg Schmidt Duncan, senior manager of carrier relations, Koch Logistics, and president of the Council of Supply Chain Management Twin Cities Roundtable from 2008 to 2011

Distinguished Public Leadership Award: James Hovland, mayor of Edina and member of the I-494 Corridor Commission and the Transportation Advisory Board to the Met Council

More than 575 volunteers serve on CTS councils and program committees.
Faculty and Staff

CTS Faculty and Research Scholars

Aerospace Engineering and Mechanics
Demoz Gebre-Egziabher, Associate Professor

Applied Economics
Jerry Fruin, Associate Professor
Gerard McCullough, Associate Professor

Bioproducts and Biosystems Engineering
Bruce Wilson, Professor

Carlson School of Management
Karen Donohue, Associate Professor, Operations and Management Sciences
Alfred Marcus, Professor

Civil Engineering
Gary Davis, Professor
Catherine French, Professor
John Gulliver, Professor
Bojan Guzina, Shimizu Professor
John Hurdos, Director, Minnesota Traffic Observatory
Michael Iacono, Research Fellow
Lev Khazanovich, Associate Professor
Joseph Labuz, Professor
David Levinson, Braun/CTS Chair in Transportation Engineering
Chen-Fu Liao, Educational Systems Manager, Minnesota Traffic Observatory
Henry Liu, Associate Professor
Mihai Marasteanu, Associate Professor
Julian Marshall, Assistant Professor
Panos Michalopoulous, Professor
Arturo Schultz, Professor
Carol Shield, Professor
Derek Tompkins, Associate Program Director
Steve Wojtkiewicz, Assistant Professor

College of Design
John Bloomfield, Research Associate, Center for Design in Health
Kathleen Harder, Director, Center for Design in Health
Lance Neckar, Professor, Landscape Architecture
Ignacio San Martin, Dayton Hudson Chair of Urban Design and Director, Metropolitan Center
Mary Vogel, Senior Research Fellow and Director, Center for Changing Landscapes

Computer Science and Engineering
Vassilios Morellas, Director, Safety, Security, and Rescue Research Center
Nikolaos Papanikolopoulos, Professor
Shashi Shekhar, Professor

Forest Resources
Ingrid Schneider, Professor and Director, Tourism Center

Humphrey School of Public Affairs
Xinyu (Jason) Cao, Assistant Professor
Frank Douma, Associate Director, State and Local Policy Program
Yingling Fan, Assistant Professor
Adeel Lari, Research Fellow, State and Local Policy Program
Greg Lindsey, Professor
Lee Munnich, Senior Fellow and Director, State and Local Policy Program
Ferrol Robinson, Research Fellow, State and Local Policy Program
Carissa Schively Slotterback, Associate Professor
Elizabeth Wilson, Associate Professor
Zhirong (Jerry) Zhao, Assistant Professor

Industrial & Systems Engineering
Saif Benjaafar, Professor
Diwakar Gupta, Professor

Mechanical Engineering
Janet Creaser, Research Fellow, HumanFIRST Program
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