University of Minnesota


# Center for Transportation Studies

## Annual Report 2010



Center for Transportation Studies

**Center for Transportation Studies**
University of Minnesota
200 Transportation and Safety Building
511 Washington Avenue S.E.
Minneapolis, MN 55455-0375
Phone: 612-626-1077
Fax: 612-625-6381
E-mail: cts@umn.edu
Web: www.cts.umn.edu

Editor: Pamela Snopl
Graphic Designer: Cadie Wright Adhikary
Photography: Michelle Riedel (p. 1); David Gonzalez (p. 2); Jonathan Chapman (covers, pp. 4–5, 7, 9–10, 12, 30); Brett Groehler (front cover); Matt Miranda (back cover, pp. 4, 18, 23–25, 27); Mn/DOT staff (p. 30); CTS staff

# Center for Transportation Studies

## 2010 Annual Report

This publication contains highlights of transportation research, education, and outreach activities conducted by the Center for Transportation Studies and its affiliated programs for the period July 2009 through June 2010 (fiscal year 2010).

## Contents


*Laurie McGinnis (front row, center) was part of an international scan tour organized by the American Association of State Highway and Transportation Officials and the Federal Highway Administration in 2008. One of the goals of the scan was to identify and encourage opportunities for international collaboration—a goal also featured in McGinnis's vision for CTS.*

# Director's Message

In FY10, CTS looked back at its past and moved ahead with new directions.

*Laurie G. McGinnis*

Last year was our turn for a review by the Graduate School. As a University-wide center, CTS is periodically reviewed to assess quality, productivity, continuing alignment with the strategic priorities of the University, and opportunities for future growth and development. CTS staff completed an extensive self-study report and participated in portions of a two-day review by a panel of external experts. In their final report, the review team members found CTS to be an "impressive organization that has contributed greatly to fostering multidisciplinary research, engaging stakeholders and the community, and raising the visibility of transportation research at the U of M." I couldn't agree more. The team's specific recommendations—for research, education, training, outreach, organization, and finance issues—are being addressed this year in consultation with the CTS Executive Committee.

The center review took place while a national search process was under way for a permanent CTS director. I was honored to be appointed to this position on July 5, 2010. As part of my preparation for the process, I, too, did a little self-study, and I shared my vision for how CTS can build on its success and continue to grow and prosper.

The review confirmed that CTS is a valued resource for Minnesota and is relatively well-known nationally, but we need to reach further. The next horizon is to work more closely with our faculty and other partners to establish a stronger presence nationally and globally. My vision is for the University of Minnesota to be seen as the top academic institution for transportation expertise and information, and for CTS to become the transportation resource to the world by 2015.

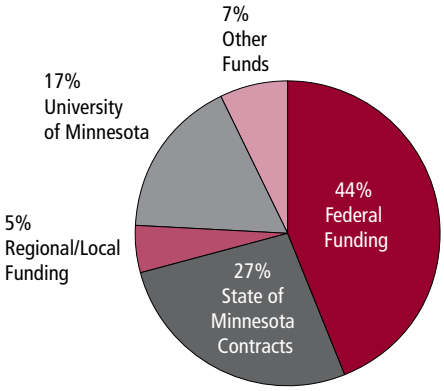
I see that taking shape in a number of ways. We will build on our strengths in areas where our reputation is growing, such as transportation and land use, transitway impacts, and technology. We will look at emerging topics—such as the connection between public health and transportation, and the broad area of sustainability—and how we're positioning ourselves to address them. And we will intensify efforts to provide decision-support information, tools, and other resources to policymakers and practitioners. Making the right connections, and building the right teams with multiple disciplines, will strengthen our efforts.

Of course, universities and transportation agencies face many challenges—uncertain funding among them—and we need to set clear priorities. We will continue to engage our stakeholders to set our direction, build solutions, and share results.

Our work would not be possible without the support of our committee members, sponsors, and many partners, and I thank you all. With your help, CTS will continue to bring diverse interests together to find answers for transportation challenges, both at home and abroad.

Laurie G. McGinnis
Director

**FY10 CTS Revenues: $21,201,900**



# Research


*Reaching destinations has been getting easier all over the Minneapolis–St. Paul metropolitan region, according to the Access to Destinations Study.*

www.cts.umn.edu/Research

## Research results sampler

**Access to Destinations Study provides new lens for policymaking**

The CTS-led interdisciplinary Access to Destinations Study was completed, opening up new frontiers of information for better policy and investment decisions. Funding sponsors included the Minnesota Department of Transportation, Hennepin County, and the McKnight Foundation, in cooperation with the Metropolitan Council.

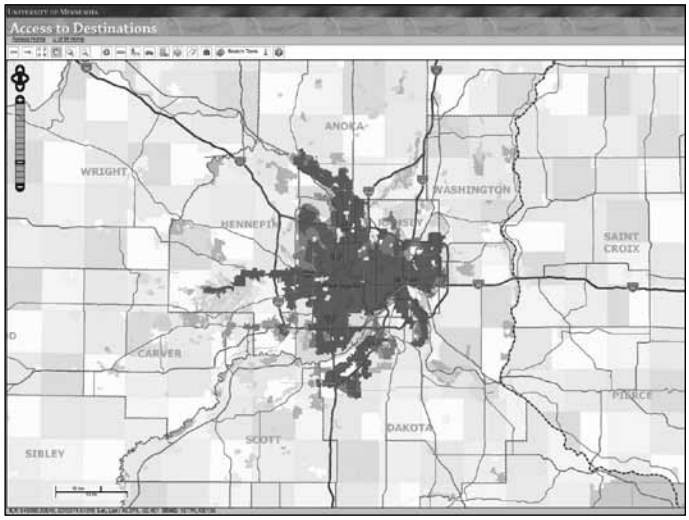
In the landmark study, researchers conducted 11 individual research projects that analyzed and mapped how *accessibility*—the ability of people to reach the destinations they need or want to visit—has changed over recent decades in the Minneapolis–St. Paul metropolitan region, whether by auto, bicycle, public transit, or on foot.

By focusing on accessibility—rather than simple congestion measures—the study changed the question from *How fast is traffic moving?* to *How easily are people reaching places they need or want to go?*

The researchers found that while congestion had been steadily worsening (until this last decade), the actual ease of reaching destinations has been getting better—all over the region, and especially by automobile. And they found that land-use changes and increased development densities explain most of the improvement.

The lead researchers were David Levinson, Braun/CTS Chair and associate professor in the Department of Civil Engineering, and Kevin Krizek, assistant professor in the Department of Planning and Design at the University of Colorado (formerly with the Hubert H. Humphrey Institute of Public Affairs). Other researchers were drawn from the Minnesota Traffic Observatory (a unit of the Intelligent Transportation Systems Institute on the Twin Cities campus), the Department of Electrical and Computer Engineering at the University of Minnesota Duluth (UMD), and the UMD Northland Advanced Transportation Systems Research Laboratories (also a unit of the ITS Institute).

A synthesis of the findings is on the study Web site (www.cts.umn.edu/access-study), along with an interactive Web tool that lets users generate accessibility maps.




*A Web tool allows users to create maps showing accessibility by location, mode, and type of trip or destination.*

CTS continues to be a catalyst for interdisciplinary research by convening multiple disciplines and providing venues for researchers to network and discuss collaborative research opportunities.

### ▸ Transitway impacts: Hiawatha LRT increases job access, property values

University expertise continued to expand in transit-related research through the Transitway Impacts Research Program.

Two projects were completed. A multidisciplinary team that included Yingling Fan, assistant professor in the Humphrey Institute, and Chen-Fu Liao, educational systems manager with the Minnesota Traffic Observatory, evaluated changes in regional labor market accessibility. They found that the Hiawatha light-rail line has made significant, positive changes in access to low-wage jobs.

Assistant Professor Jason Cao of the Humphrey Institute examined the impacts of the Hiawatha light-rail line on commercial and industrial property value. He found the Hiawatha line has increased the value of such properties within a nearly one-mile radius of light-rail stations.

The Transitway Impacts Research Program is a multidisciplinary program answering questions about the economic, travel, and community impacts of transitway corridors in the Twin Cities metropolitan area. It was launched in 2006 by the Hennepin County–University of Minnesota partnership and has grown to include a mix of University, local, regional, and state partners. Details are on the program Web site: www.cts.umn.edu/Research/Featured/Transitways/index.html.

*A study of labor markets found the Hiawatha light-rail transit line increased access to low-wage jobs.*


*Researchers audited the energy use of accessory systems on a hybrid test bus.*

### ▸ 'Superbus' project aims to cut fuel use of hybrid buses

The overall fuel efficiency of hybrid buses could be improved by more than 10 percent by changing the way electrical power is supplied to accessory systems, according to a study by graduate student Jeffrey Campbell and Professor David Kittelson of the Department of Mechanical Engineering.

The goal of the Superbus project is to reduce the fuel consumption of an industry-standard diesel-electric hybrid bus. Campbell and Kittelson completed the first phase of the research, an energy audit of major accessory systems on a test bus.

Up to half of the fuel consumed by hybrid buses goes to power accessory systems, such as air conditioning and electronic changeable-message displays. The energy audit enabled Campbell and Kittelson to estimate the benefits of converting accessory systems to an alternative electrical power supply scheme.

The research was conducted by the University of Minnesota's Center for Diesel Research, which is directed by Kittelson, with funding from Metro Transit, the University's Institute for Renewable Energy and the Environment, and CTS.

University expertise continued to expand in research related to transit and sustainable transportation.

## ► Sustainability framework to guide community development

In a study funded by the McKnight Foundation, a University team conducted research and worked with practitioners in the field to design a framework for measuring sustainable regional development.

In the first phase of the research, the study team explored a set of livability principles established by the U.S. HUD-DOT-EPA Partnership for Sustainable Communities. These principles address transportation choice, housing, economic growth, and community development. The researchers also surveyed the sustainability indicators and measures used by other cities and regions.

A second phase of research focused on refining the principles and indicators based on input from a focus group workshop of regional sustainability stakeholders and from a project advisory group. Six final sustainability principles and a comprehensive system of sustainability indicators and measures emerged from this process. The principles are:

- Provide more transportation choices.
- Protect natural resources.
- Promote equitable, affordable housing.
- Value communities and neighborhoods.
- Enhance economic competitiveness and create positive fiscal impacts.
- Coordinate and leverage government policies and investment.

The McKnight Foundation is using the framework and other findings from the study to help guide its activities in support of sustainable growth and community development.

Laurie McGinnis, CTS director, co-chaired the leadership of the effort with Ed Goetz, director of the University's Center for Urban and Regional Affairs (CURA). Members of the research team included assistant professors Jason Cao, Yingling Fan, and Carissa Schively Slotterback and research manager Kaydee Kirk (then of CURA).

In a subsequent effort, Smart Growth America is working with the McKnight Foundation, its grant recipients, and other stakeholders to use the principles, indicators, and measures from the study to develop a tool that supports and influences grant-making and policymaking in the Twin Cities region.


*Providing more transportation choices is one of the principles in a new framework for measuring sustainability.*

### ► Composite pavements may last longer

Three new test cells were constructed in the spring of 2010 at the Minnesota Road Research Project (MnROAD) facility near Albertville, Minnesota, on the 3.5-mile mainline test portion of Interstate 94. The work is part of a second Strategic Highway Research Program (SHRP 2) project to investigate the design, construction, and performance aspects of composite pavements.

The project is focusing on two promising applications of composite pavement systems: an asphalt layer over a portland cement concrete (PCC) layer, and a PCC surface over a PCC layer. While asphalt overlays over PCC are commonly used to rehabilitate a pavement, the use of a high-quality asphalt concrete layer over a new concrete layer is rare. This technique has great potential to provide a long-lasting pavement needing minimal maintenance.

The second composite under study is the use of a relatively thin, high-quality concrete surface atop a thicker, less-expensive concrete layer before the lower layer has set. The lower concrete layer includes high proportions of recycled or substandard materials that are not suitable for use in the surface layer. While the use of the wet-on-wet concrete technique is rare in the United States, these types of pavements have been constructed in Austria and elsewhere.

Field experiments at MnROAD are at the core of the four-year, $4 million SHRP 2 project, which is led by Applied Research Associates, Inc. (ARA), in partnership with its subcontractors: Mn/DOT, the University of Minnesota, the University of California, and the University of Pittsburgh. Mike Darter, principal engineer with ARA, is principal investigator for the project. In addition, University of Minnesota civil engineering professor Lev Khazanovich and researcher Derek Tompkins have key roles in the project.

*Field experiments at the MnROAD research facility are investigating the use of recycled materials in pavement construction.*

The MnROAD research facility saves the state about $33 million annually through implementation of a variety of research findings.

### ► Recycled materials could replace new ones for road construction

State and federal agencies are encouraging greater use of recycled materials for roadway construction, but a thorough understanding of their hydraulic and mechanical properties is necessary if they are to be used successfully. Professor Satish Gupta and researchers Dong Hee Kang and Andry Ranaivoson of the University of Minnesota's Department of Soil, Water, and Climate studied several materials to determine their suitability for road construction. Their research was funded by the Minnesota Local Road Research Board.

Based on the results of their tests, the researchers concluded that fly ash, recycled asphalt, and recycled concrete mixtures could serve as acceptable substitutes for virgin aggregates in road construction; foundry sand, the fourth substance tested, may not be suitable for subgrade use due to its less than optimal hydraulic properties.

## ► Tools classify ITS privacy restrictions

*Systems that identify individuals, such as red-light cameras, raise the most privacy concerns.*

New intelligent transportation systems, such as in-vehicle data recorders, photo radar, and electronically monitored toll lanes, increasingly incorporate data-gathering into the transportation infrastructure. Frank Douma, associate director of the State and Local Policy Program at the Humphrey Institute of Public Affairs, developed an ITS Privacy Law Toolbox and a Taxonomy of Privacy Issues to help transportation planners and engineers sort through the maze of legal issues surrounding the collection and use of such data.

The ITS Privacy Law Toolbox considers three issues: the level of anonymity of the data, consent issues such as whether drivers can opt in or opt out, and who is using the data.

The Taxonomy of Privacy Issues divides ITS applications into three categories. ITS applications with no privacy issues include those that collect system-level data, such as traffic counters or loop detectors used to control signals. In both cases, no identifying information is collected on individual drivers. Applications with moderate privacy impacts include license plate readers, toll transponders, or infrared carpool-lane scanners. These are needed for the system to work, but they can be an opt-in situation. Applications that raise the most privacy concerns are those that directly observe and identify the occupant of a vehicle. Examples include fingerprint or Breathalyzer readers connected to ignition interlock systems. Such data could be collected for law enforcement and other purposes.

Douma's research is part of the TechPlan program, which examines transportation planning and policy applications of ITS-related technologies. The program is supported by the ITS Institute.

## ► Portable traffic counter collects video data

*Ted Morris, Jory Schwach, and Panos Michalopoulos developed a portable traffic-data-collection system that could help agencies retime signals more often.*

Researchers from the Department of Civil Engineering and the Minnesota Traffic Observatory (MTO) developed and tested a low-cost, portable traffic-data-collection system that uses a camera to record vehicle movements at intersections and arterial roadways.

Collecting traffic data on a regular basis helps transportation officials perform essential tasks, such as retiming traffic signals. But because existing data-collection systems are costly, difficult to install, and intrusive, traffic data at intersections and arterial streets are most often collected manually: someone uses a push-button apparatus to record each passing vehicle. Such data-collection techniques are not only prone to error but also often expensive and time-consuming.

The new device can cover an intersection of up to 20 incoming lanes, and its small footprint makes it optimal for urban areas where limited space is a primary concern. Most important, the video system also provides a visual record of traffic characteristics that can be used for additional analysis and research.

The project, funded by the ITS Institute, included civil engineering professor Panos Michalopoulos, principal investigator on the project, along with MTO manager Ted Morris and graduate student Jory Schwach.

## ▸ Report updates Minnesota's transportation funding options

In FY10, 51 sources provided more than $14 million for transportation research through CTS.

Researchers at the Humphrey Institute of Public Affairs completed a report on the history and potential future of transportation funding in Minnesota. The report by Assistant Professor Zhirong (Jerry) Zhao, graduate student Kirti Vardhan Das, and research associate Carol Becker updates an earlier CTS-funded study on the same topic to reflect the implications of changes in state law enacted in 2008. The report reviews the complex history of state transportation funding and looks to the future for potential policy issues.

The first section of the report analyzes funding on the basis of funding sources, highlighting changes at all levels of government that have led to the present funding structure. In the second section, the researchers analyze funding for different types of transportation projects, including highways, transit systems, and local roads; they also examine differences in funding according to location, distinguishing between the seven-county Twin Cities metropolitan area and greater Minnesota. The final section of the report, drawing on findings of the current study and other recent research projects, suggests possible funding mechanisms for future transportation projects.

The present transportation funding system faces several challenges, as changes in the way people use the transportation system affect the amount of revenue available from motor vehicle fuel and excise taxes, the vehicle sales tax, and registration fees. The researchers outline several scenarios for future revenue from these sources and their implications for funding.

In addition to vehicle taxes, the report also deals with alternative financing methods to pay for transportation projects, including user fees and "value capture" mechanisms directed at developers and property owners.


*The current funding system faces several challenges, including the impact of improved fuel efficiency on gas-tax revenues.*

## Deployment and implementation

### ► Intersection monitoring system added to new locations

The SMART-Signal system developed by Assistant Professor Henry Liu of the Department of Civil Engineering was deployed in the cities of Eden Prairie, Minnesota, and Pasadena, California, following earlier Minnesota deployments. SMART-Signal (Systematic Monitoring of Arterial Road Traffic and Signals) collects and archives traffic signal data and automatically generates real-time performance measures including travel time, number of stops, queue length, intersection delay, and level of service. The patent-pending system's development was funded by the ITS Institute, the Minnesota Local Road Research Board, and Mn/DOT, with significant in-kind support from Hennepin County.

### ► Models guide Denali transportation plan

Denali National Park in Alaska is using a traffic model developed at the Minnesota Traffic Observatory, directed by John Hourdos, to assess options for its new 10-year transportation plan. The model simulates the complex relationships between traffic patterns and wildlife movements in the park. Park managers are using the simulation to answer questions about park use that would be impossible to test in the real world without risk of disrupting Denali's delicate balance between the needs of wildlife in the park and the experience of park visitors. The model will also allow for real-time assessment of alternatives during the next 10-year planning period.

### ► Intersection warning system deployed for field tests

A system that gives drivers reliable information about approaching traffic at unsignalized rural through-stop intersections was deployed for field-testing in several locations. The system tracks vehicles moving along a rural divided highway and warns drivers stopped on a secondary rural road when gaps in highway traffic are too small to merge or cross safely. A three-year field test of the system began in January 2010 at an intersection in Goodhue County, Minnesota, and a second system was activated in April 2010 in Washburn County, Wisconsin. The groundbreaking system was developed by researchers from the ITS Institute's Intelligent Vehicles Lab, directed by Craig Shankwitz, and the HumanFIRST Program, directed by Mike Manser, in cooperation with the Minnesota Department of Transportation.

Although field-testing is still in the preliminary stages, the early results are promising. At the Goodhue County intersection, one crash occurred during the seven months from February through July 2010; historically there have been an average of six per year. At the Washburn County intersection, no crashes occurred in the four months from April through July 2010, a time when the area is heavily traveled.


*A groundbreaking system warns drivers when it's unsafe to merge or cross at this rural intersection in Goodhue County, Minnesota.*

### ▸ Design advice improves signs to airport

Kathleen Harder, director of the College of Design's Center for Design in Health, helped the Minnesota Department of Transportation make a number of design changes to new static signs guiding drivers to terminals at the Minneapolis–St. Paul International airport. The Metropolitan Airport Commission renamed the airport's Lindbergh and Humphrey terminals as Terminal 1 and 2 and put up signs with the new names in spring 2010. Before that, as many as 25,000 drivers a year chose the wrong terminal. Harder's team found that drivers responded well to both conventional and changeable message signs if the signs included airline information. Her suggestions included alphabetizing and centering the airline names to help drivers scan the information more quickly.


*Mn/DOT used University expertise in its redesign of airport signage.*

University research provides the backbone for many real-world benefits, such as safer rural roads and faster urban commutes.

*Peter Appel of the USDOT drives the test bus in Houston under the guidance of Craig Shankwitz.*

### ▸ Driver-assistive system helps bus drivers stay in lane and on time

A fleet of 10 buses equipped with driver-assistive technologies for bus rapid transit applications is scheduled to go into service in the Twin Cities in 2010 as part of a USDOT effort to reduce congestion and improve public transportation. The high-tech "Bus 2.0" vehicles will be operated by the Minnesota Valley Transit Authority (MVTA) along the I-35W/Cedar Avenue commuting corridor that connects downtown Minneapolis and the southern suburbs.

The technology, developed by researchers from the Intelligent Vehicles Laboratory (IV Lab), will help bus drivers maintain reliable schedules while operating safely on the narrow bus-only highway shoulders.

Researchers from the IV Lab, led by director Craig Shankwitz, and Mike Abegg from the MVTA showcased the driver-assistive system at the ITS America Annual Meeting and Exposition, held May 3–5 in Houston. The team also gave a demonstration to USDOT administrators and staff.

*A research team recommended measures to improve transportation and transit service in a northern Minnesota county.*

### ► Rural county implements transit service recommendations

A team of University of Minnesota researchers completed a study of potential measures for improving transportation and transit service in Itasca County, a largely rural county in northern Minnesota. The research was in response to a request for proposals issued under the Blandin Foundation's Transportation Initiative.

The research team developed a picture of the county's transportation needs through background research—including demographic analysis and mapping the location of jobs and residential centers—and a series of focus groups, listening sessions, and individual interviews. In their final report, the research team presented several recommendations for improving transportation in Itasca County. These recommendations fall into several categories, including policy and administrative changes; educational and outreach opportunities; improvements to operations, maintenance, and services; and opportunities for cost sharing and savings.

Since the study was completed, Arrowhead Transit has moved forward on implementing a number of the proposed changes, and groups have come together to create ride-sharing and share-cost programs. In addition, members of the Itasca Transportation Solutions group convened by the Blandin foundation to oversee this study continue to seek grant opportunities to implement other recommendations.

The research team included Frank Douma, associate director of the State and Local Policy Program at the Humphrey Institute, along with Assistant Professor Yingling Fan, research fellow Ferrol Robinson, graduate students Colin Cureton and Matt Schmit (all from the Humphrey Institute), and CTS assistant director for education and outreach Gina Baas.

### ► New tools help engineers monitor bridges

Engineers have two new tools for monitoring bridges, thanks to University of Minnesota researchers.

Associate director Jeff Marr and assistant engineer Matt Lueker of the St. Anthony Falls Laboratory developed a tool to select the best methods for monitoring scour at bridge sites. Riverbeds can erode away or change their positions over time, causing damage to otherwise healthy bridges.

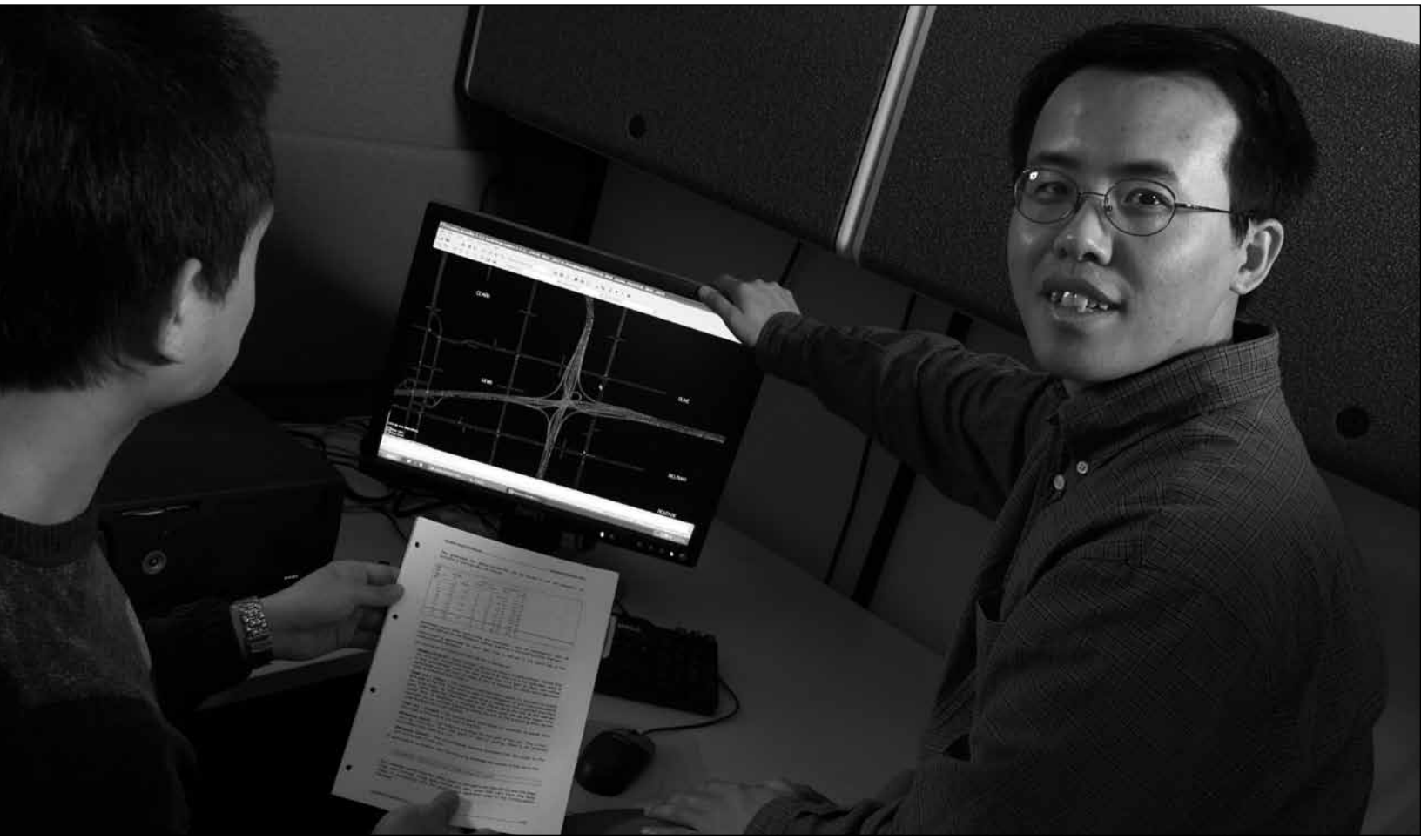
Marr and Lueker developed a Scour Monitoring Decision Framework (SMDF) in research supported by Mn/DOT. The SMDF allows a user to enter data about a specific bridge site into a Microsoft Excel workbook. Applications software embedded in the workbook processes the site-specific data and returns a list of scour-monitoring instruments suitable for use at the site while noting potential deployment issues.

In another Mn/DOT-funded study, Professor Arturo Schultz of the Department of Civil Engineering and graduate students Andrew Gastineau and Tyler Johnson conducted a survey of bridge health monitoring systems and created a Microsoft Excel application to help engineers select appropriate monitoring systems. Mn/DOT is using the tool to determine what types of bridge monitoring systems best meet their specific needs.

### ► Tools help practitioners plant trees and sample weeds

Mn/DOT, counties, and cities are using *The Road to a Thoughtful Street Tree Master Plan*, co-authored by Ken Simons, a landscape architect, and Gary Johnson, professor of urban forestry, as a pragmatic guide to selecting and placing trees in streetscapes. In addition, Mn/DOT implemented a sampling method for quantification of invasive weed species developed by biosystems engineering professor John Nieber.

# Researchers



*Henry Liu*

www.cts.umn.edu/FacultyStaff

## CTS Faculty and Research Scholars Program

CTS works with CTS Faculty and Research Scholars from a variety of University of Minnesota departments to address transportation issues. Scholars have joint appointments at CTS as well as in their own departments. Learn more about CTS Faculty and Research Scholars at www.cts.umn.edu/scholars.

### 2010 Faculty and Research Scholars

**Bridge Engineering**

**Catherine French**
Professor,
Civil Engineering

**Arturo Schultz**
Professor,
Civil Engineering

**Carol Shield**
Professor,
Civil Engineering

**Data Systems**

**Taek Kwon**
Professor,
Electrical and Computer Engineering (Duluth)

**Chen-Fu Liao**
Educational Systems Manager, Minnesota Traffic Observatory, ITS Institute

**Vassilios Morellas**
Director,
Safety, Security, and Rescue Research Center, Computer Science and Engineering

**Nikolaos Papanikolopoulos**
Professor,
Computer Science and Engineering

**Shashi Shekhar**
Professor,
Computer Science and Engineering

**Economics and Management**

**Saif Benjaafar**
Professor, Industrial and Systems Engineering

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

**Jerry Fruin**
Associate Professor,
Applied Economics

**Diwakar Gupta**
Professor,
Mechanical Engineering

**Alfred Marcus**
Professor,
Carlson School of Management

**Gerard McCullough**
Associate Professor,
Applied Economics

**Zhirong (Jerry) Zhao**
Assistant Professor,
Humphrey Institute of Public Affairs

**Environmental Impacts**

**David Biesboer**
Professor,
Plant Biology

**John Gulliver**
Professor,
Civil Engineering

**Julian Marshall**
Assistant Professor,
Civil Engineering

**Bruce Wilson**
Professor,
Bioproducts and Biosystems Engineering

**Human Factors**

**John Bloomfield**
Research Associate,
Center for Design in Health, College of Design

**Janet Creaser**
Research Fellow,
HumanFIRST Program,
ITS Institute

**Kathleen Harder**
Director, Center for Design in Health, College of Design

**Michael Manser**
Director,
HumanFIRST Program,
ITS Institute

**Pavement Engineering**

**Michael Darter**
Director,
Pavement Research Institute

**Bojan Guzina**
Shimizu Professor, Civil Engineering

**Lev Khazanovich**
Associate Professor,
Civil Engineering

**Joseph Labuz**
Professor,
Civil Engineering

**Mihai Marasteanu**
Associate Professor,
Civil Engineering

**Derek Tompkins**
Associate Director,
Pavement Research
Institute

### Traffic Engineering and Management

**Gary Davis**
Professor,
Civil Engineering

**Demoz Gebre-Egziabher**
Associate Professor,
Aerospace Engineering
and Mechanics

**John Hourdos**
Director,
Minnesota Traffic
Observatory, ITS Institute

**Eil Kwon**
Director, Northland
Advanced Transportation
Systems Research
Laboratories, ITS Institute

**David Levinson**
Braun/CTS Chair
in Transportation
Engineering,
Civil Engineering

**Henry Liu**
Assistant Professor,
Civil Engineering

**Panos Michalopoulos**
Professor,
Civil Engineering

### Transportation Planning and Policy

**Jason Cao**
Assistant Professor,
Humphrey Institute of
Public Affairs

**Frank Douma**
Associate Director,
State and Local Policy
Program, Humphrey
Institute of Public Affairs

**Yingling Fan**
Assistant Professor,
Humphrey Institute of
Public Affairs

**Ed Goetz**
Professor and Director,
Center for Urban and
Regional Affairs

**Michael Iacono**
Research Fellow, Civil
Engineering

**Ferrol Robinson**
Research Fellow, State
and Local Policy Program,
Humphrey Institute of
Public Affairs

**Adeel Lari**
Research Fellow,
State and Local Policy
Program, Humphrey
Institute of Public Affairs

**Lee Munnich**
Senior Fellow and Director,
State and Local Policy
Program, Humphrey
Institute of Public Affairs

**Carissa Schively Slotterback**
Assistant Professor,
Humphrey Institute of
Public Affairs

**Ingrid Schneider**
Professor and Director,
Tourism Center

**Thomas M. Scott**
Professor and Director
Emeritus, Center for
Urban and Regional
Affairs

**Elizabeth Wilson**
Assistant Professor,
Humphrey Institute of
Public Affairs

### Transportation and Urban Design

**Lance Neckar**
Professor,
Landscape Architecture,
College of Design

**Ignacio San Martin**
Dayton Hudson Chair
of Urban Design and
Director, Metropolitan
Center, College of Design

**Mary Vogel**
Senior Research Fellow
and Director,
Center for Changing
Landscapes, College of
Design

### Vehicle Design and Fuels

**Max Donath**
Professor and Director,
Intelligent Transportation
Systems (ITS) Institute

**David Kittelson**
Professor,
Mechanical Engineering

**Rajesh Rajamani**
Professor,
Mechanical Engineering

**Craig Shankwitz**
Director,
Intelligent Vehicles
Laboratory, ITS Institute

## New faces

Nine principal investigators are participating in the CTS research program for the first time: Hongyi Chen (Mechanical and Industrial Engineering, UMD), Justin Graving (HumanFIRST Program), Greg Lindsey (Humphrey Institute), Ferrol Robinson (Humphrey Institute), Ingrid Schneider (Tourism Center), Andrea Schokker (Civil Engineering, UMD), Loren Terveen (Computer Science and Engineering), Eric Watkins (Horticultural Science), and Debao Zhou (Mechanical and Industrial Engineering, UMD).

## Awards & honors

- The Center for Changing Landscapes, co-directed by CTS Scholar Mary Vogel, received the Federal Highway Administration's Environmental Excellence Award for its comprehensive North Shore All-American Road corridor master plan and interpretive plan. The project aimed to help stakeholders and communities make better-informed decisions about future activities, growth, and development along the North Shore Scenic Byway corridor.
- Assistant Professor Carissa Schively Slotterback of the Humphrey Institute won a National Planning Award for Best Practices from the American Planning Association for the project "Design for Health," a collaborative effort among the University of Minnesota, Cornell University, and the University of Colorado. The project was also recognized with an award for research by the Environmental Design Research Association.

## International activities

Faculty are involved in a range of research and educational activities with other universities around the world, sharing their expertise and bringing home new knowledge. For example:

- Professor Rajesh Rajamani of the Department of Mechanical Engineering is advising a research team at Tsinghua University in Beijing, China, on an adaptive cruise control research project. The connection was initiated through the University of Minnesota Dean's Program to support international visits to universities in China.
- A lecturer from Beihang University in China served as a visiting scholar in Minnesota and helped in the hardware design of the next generation of Assistant Professor Henry Liu's SMART-Signal system.
- Assistant Professor Zhirong (Jerry) Zhao is working with colleagues at Zhejiang University in studies of how China is using value capture to fund public infrastructure. CTS provided seed research funding for the work.
- Assistant Professor Yingling Fan is a visiting fellow at Peking University, Beijing, China, through an ongoing research project funded by the University's Urban Development Center.
- Gerard McCullough, a former director of CTS, is a visiting professor at the Toulouse School of Economics in Toulouse, France. He works with researchers in Toulouse on economic studies of transport systems in the United States and Europe and interacts with rail officials in Germany and France.
- Professor Ignacio San Martin of the School of Architecture is an affiliate professor in the School of Architecture, University of Valladolid, Spain, and in the Graduate Urban Design Program at University Iberoamericana, Puebla, Mexico.
- Professor Alfred Marcus of the Carlson School of Management led seminars on sustainable development at the INCAE Business School in Costa Rica through a Carlson School initiative.


*Assistant Professor Yingling Fan (seated, at right) is a visiting fellow at Peking University, Beijing, China.*

# Affiliated faculty and research staff

**Aerospace Engineering and Mechanics**
William Garrard
Demoz Gebre-Egziabher*
Yiyuan Zhao

**Agronomy and Plant Genetics**
Roger Becker
Nancy Ehlke
Donald Wyse

**Applied Economics**
Jerry Fruin*
William Gartner
Gerard McCullough*
Tom Stinson
Steven Taff
Douglas Tiffany

**Biosystems and Agricultural Engineering**
Jonathan Chaplin
John Nieber
Gary Sands
Bruce Wilson*

**Carlson School of Management**
Fred Beier
Karen Donohue*
Alfred Marcus*
Mahmood Zaidi

**Child Development**
Herbert Pick
Albert Yonas

**Civil Engineering**
Roberto Ballarini
Randal Barnes
Paul Bergson
Mike Darter*
Gary Davis*
Cathy French*
Ted Galambos
John Gulliver*
Bojan Guzina*
Kimberly Hill
Miki Hondzo
John Hourdos*
Mike Iacono*
Lev Khazanovich*
Joseph Labuz*
David Levinson*
Chen-Fu Liao*
Henry Liu*
Mihai Marasteanu*
Julian Marshall*
Panos Michalopoulos*
Ted Morris
Arturo Schultz*
Carol Shield*
Karl Smith
Henryk Stolarski
Derek Tompkins*
Vaughan Voller

**College of Design**
John Bloomfield*
John Carmody
Kathleen Harder*
Lance Neckar*
Ignacio San Martin*
Robert Sykes
Mary Vogel*

**Computer Science and Engineering**
Mats Heimdahl
Ravi Janardan
Vassilios Morellas*
Nikolaos Papanikolopoulos*
Shashi Shekhar*
Loren Terveen
Richard Voyles

**Economics**
Patrick Bajari

**Electrical and Computer Engineering**
Vladimir Cherkassky
Ahmed Tewfik

**Forest Resources**
Ingrid Schneider

**Geography**
Francis Harvey
Rod Squires

**Horticulture Science**
Susan Galatowitsch
Eric Watkins

**Humphrey Institute of Public Affairs**
John Adams
Richard Bolan
John Bryson
Jason Cao*
Barbara Crosby
Frank Douma*
Yingling Fan*
Ed Goetz*
Tom Horan
Adeel Lari*
Greg Lindsey
Lee Munnich*
Ferrol Robinson*
Emily Saunoi-Sandgren
Carissa Schively Slotterback*
Melissa Stone
Elizabeth Wilson*
Zhirong (Jerry) Zhao*

**Kinesiology**
Mary Jo Kane
Thomas Smith
Michael Wade

**Law School**
Stephen Simon

**Mechanical Engineering**
Lee Alexander
Ensar Becic
Saifallah Benjaafar*
Pi-Ming Cheng
Janet Creaser*
Jane Davidson
Max Donath*
William Durfee
Peter Easterlund
Alec Gorjestani
Justin Graving
Diwakar Gupta*
Carolyn Hayes
David Kittelson*
Perry Li
Michael Manser*
Arvind Menon
Bryan Newstrom
Curt Olson
Rajesh Rajamani*
Craig Shankwitz*
Patrick Starr
Kim Stelson
Zongxuan Sun

**Plant Biology**
David Biesboer*
Iris Charvat

**St. Anthony Falls Laboratory**
Jeff Marr
Omid Mohseni
Fotis Sotiropoulos
Peter Weiss

**School of Public Health**
Judith Garrard
Matt Simcik

**Soil, Water and Climate**
Paul Bloom
Peter Graham
Satish Gupta
Thomas Halbach
Mark Seeley
Dong Wang

**Urban and Regional Affairs**
William Craig
Ed Goetz*
Thomas Scott*

**Wood and Paper Science**
Bob Seavey

**University of Minnesota – Duluth**
**Chemistry and Biochemistry**
John Evans
Venkatram Mereddy

**Civil Engineering**
Eil Kwon*
Andrea Schokker

**Computer Science**
Carolyn Crouch
Donald Crouch
Richard Maclin
Peter Willemsen

**Electrical and Computer Engineering**
Stanley Burns
Mohammed Hasan
M. Imran Hayee
Taek Kwon*
Jiann-Shiou Yang
Hua Tang

**Geography**
Stacey Stark

**Mathematics and Statistics**
Zhuangyi Liu
Harlan Stech

**Mechanical/Industrial Engineering**
Hongyi Chen
Robert Feyen
Richard Lindeke
Ryan Rosandich
Xun Yu
Debao Zhou

**Natural Resources Research Institute (NRRI)**
Brian Brashaw
Kurt Johnson
Ron Moen
Lawrence Zanko

**Physics**
Michael Sydor

**University of Minnesota – Morris**
**Division of Social Sciences**
Stephen Burks

**University of Minnesota Extension**
Gary Wyatt

** CTS Faculty and Research Scholars as of November 2010*

## Selected research reports published in FY10

University researchers published 47 research reports in FY10. A few are highlighted below; for more, see www.cts.umn.edu/Research.

*Development and Evaluation of a Cellular-Phone-Based Teen Driver Support System*
Janet Creaser, Richard Hoglund, Michael Manser, Max Donath
CTS 09-22

*Using Archived Truck GPS Data for Freight Performance Analysis on I-94/I-90 from the Twin Cities to Chicago*
Chen-Fu Liao
CTS 09-27

*Application of a Rural Safety Policy Improvement Index (RSPII) Framework*
Keith K. Knapp, Brad Utecht
CTS 10-07

*I-394 Phase II Planning Study*
Lee Munnich, Kenneth Buckeye
CTS 10-08

*The Interactions between E-Shopping and Store Shopping: A Case Study of the Twin Cities*
Jason Cao, Frank Douma, Fay Cleaveland, Zhiyi Xu
CTS 10-12

*Statistical Methods for Materials Testing*
Diwakar Gupta, Amy Peterson
Mn/DOT 2009-41

*Asphalt Mixture and Binder Fracture Testing for 2008 MnROAD Construction*
Mihai O. Marasteanu, Ki Hoon Moon, Mugur Turos
Mn/DOT 2009-24


*Researchers developed a new version of a Teen Driver Support System, a smart phone mounted on a vehicle's dashboard that gives teen drivers real-time visual and audio feedback about driving performance.*

The growing number of peer-reviewed articles and proceedings demonstrates a strong commitment from faculty and research staff to publish research findings and share new knowledge with the academic community and practitioners.

# Education


*An exhibitor networks with a student at the annual Transportation Career Expo.*

www.cts.umn.edu/Education

## Degree programs and courses

### ► Graduate and undergraduate degree programs

Several University of Minnesota departments and schools offer programs and provide graduate and undergraduate degrees in transportation-related disciplines. Core areas include the College of Science and Engineering (civil engineering, mechanical engineering, computer science and engineering) as well as the Humphrey Institute of Public Affairs, the College of Landscape Architecture, the Carlson School of Management, and the College of Design.

*CTS assistant director Gina Baas with certificate recipients Arthur Huang, Shanjiang Zhu, Cole Hiniker, Jason Borah, Jason Junge, and Nicholas Flanders*

### ► Graduate certificate

Nine students completed their graduate certificate in transportation studies: Jason Borah, Nicholas Flanders, Cole Hiniker, Feili Hong, Arthur Huang, Jason Junge, Pavithra Parthasarathi, Nebiyou Tilahun, and Shanjiang Zhu.

### ► Advanced Transportation Technologies Seminars

The Intelligent Transportation Systems (ITS) Institute sponsors a series of Advanced Transportation Technologies Seminars each fall semester. Degree credit is available.

A total of 137 undergraduate and graduate students participated in CTS research programs. More than 3,400 undergraduates enrolled in transportation-related courses.

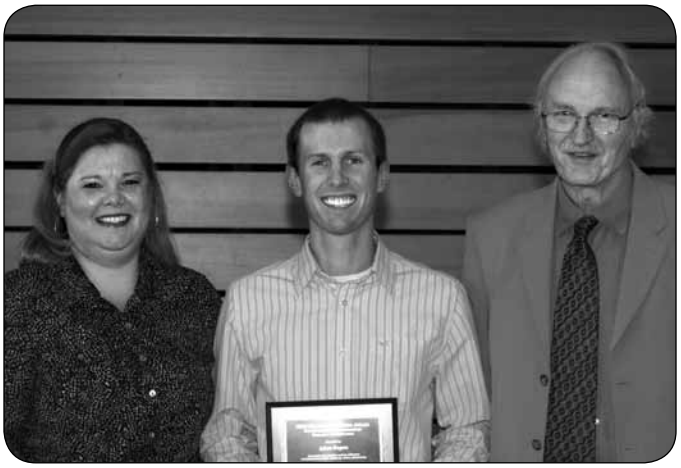
## Student awards

### ► Huber and Adams Excellence in Transportation Awards

***The Matthew J. Huber Award*** is given to students in engineering, science, and technology fields. Two students received awards: Adam Ragatz, a master's candidate in mechanical engineering, and Xinkai Wu, a doctoral candidate in civil engineering.

Ragatz, advised by Professor David Kittelson, worked on a project sponsored by Honeywell involving the development of sensors to detect the failure of the particle filters used on 2007 and newer trucks and buses.

Wu (next page) contributed to the development of SMART-Signal, an arterial performance measurement system. His advisor was Henry Liu.

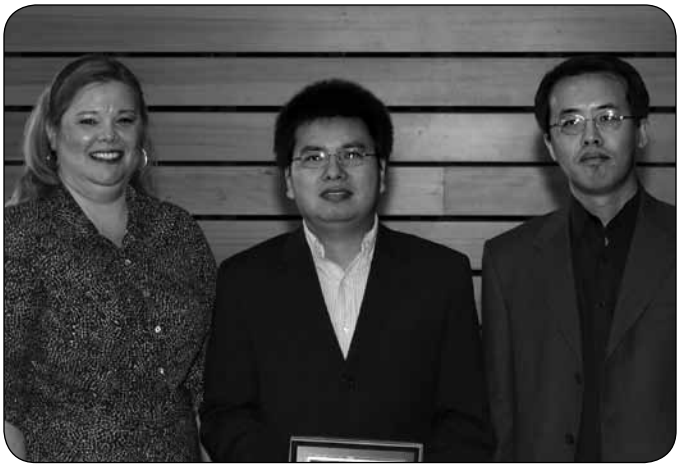


*Gina Baas, Adam Ragatz, and David Kittelson*

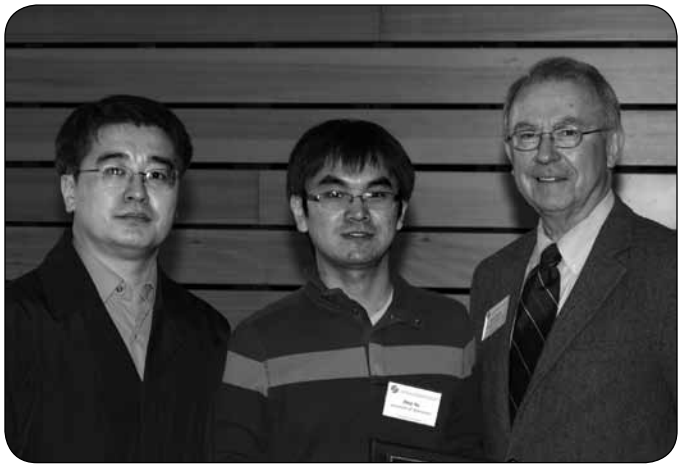
***The John S. Adams Award*** is given to students in policy and planning fields. Two students received awards: Zhiyi Xu, a master's candidate in urban and regional planning, and Shanjiang Zhu, a doctoral candidate in civil engineering and a master's of science candidate in applied economics.

Xu's research, advised by Assistant Professor Jason Cao, looked at the impacts of online shopping on traditional store shopping.

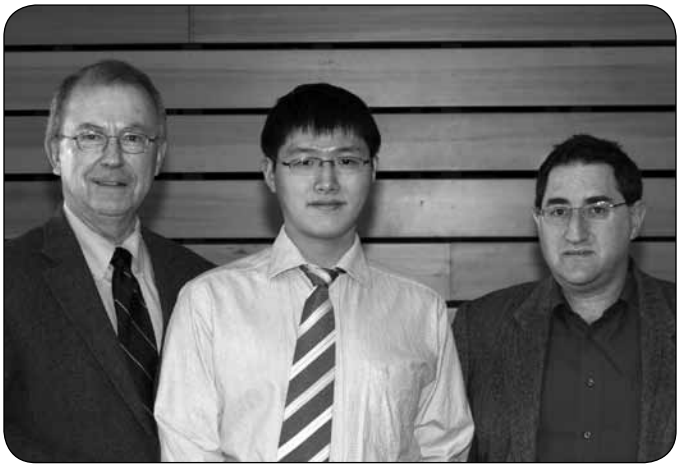
Zhu's research examined the route choice behavior of individual travelers before and after the reopening of the I-35W bridge. His advisor was Associate Professor David Levinson.



*Gina Baas, Xinkai Wu, and Henry Liu*



*Jason Cao, Zhiyi Xu, and John Adams*



*John Adams, Shanjiang Zhu, and David Levinson*

## ► ITS Institute Student of the Year Award

The U.S. Department of Transportation's Research and Innovative Technology Administration presents an outstanding student of the year award to each of its University Transportation Centers (UTCs). The recipient of the 2009 award at the ITS Institute, a UTC housed at CTS, was Fay Cleaveland, a recent graduate with a master's degree in urban and regional planning. Cleaveland's work included research on e-shopping and its effect on traffic conditions, bicycle facilities, and public policy. Since graduating from the Humphrey Institute, Cleaveland has begun a career as a transportation planner at the Minnesota Department of Transportation. Frank Douma, a Humphrey Institute research fellow, was her advisor.

*ITS Institute director Max Donath, Fay Cleaveland, and Frank Douma*

### ► Robert Dexter Memorial Scholarship

The Department of Civil Engineering awarded the first Robert Dexter Memorial Scholarship to Gannon Stromquist-LeVoir, a structural engineering undergraduate advised by Professor Carol Shield. Stromquist-LeVoir worked in the MAST (Multi-Axial Subassemblage Testing) Laboratory for two and a half years, helping with a variety of structural engineering research projects. In his last year, he investigated optical-based methods for measuring strain and the onset of buckling in steel members.

Dexter served as a faculty member from 1997 until his death in 2004. He was renowned for his expertise in steel fatigue and fracture and was active in graduate and undergraduate research and education.

### ► Travel awards

CTS and the ITS Institute funded a total of 27 students to attend the annual conferences of the Transportation Research Board and the Women's Transportation Seminar, as well as several other technical conferences.

At the WTS conference, Avital Barnea, a student in the master's of urban and regional planning program, was on stage to witness Secretary of Transportation Ray LaHood and WTS president Elaine Dezenski sign a memorandum of cooperation in pursuit of joint efforts promoting STEM (science, technology, engineering, and math) education through WTS chapters and university transportation centers. CTS director Laurie McGinnis serves on the steering committee for the WTS/DOT STEM initiative.

## Educational and career resources

### ► Newsletter and learning tools

CTS launched the *Transportation Education E-News,* a semiannual publication designed to inform university faculty of tools, initiatives, and activities for improving transportation education, especially in the field of transportation engineering. The newsletter is sponsored by CTS, the ITS Institute, and the STREET (Simulating Transportation for Realistic Engineering Education and Training) project.

The STREET project is funded by the National Science Foundation with matching support from the ITS Institute. STREET focuses on developing a set of Web-based simulation modules and other learning tools for use in introductory undergraduate transportation engineering courses. The modules are also suitable for upper-division transportation courses and cover a variety of topics fundamental to the practice of transportation engineering, including travel demand modeling, geometric design, traffic flow, and traffic signal control. They will be tested in the curricula of a number of undergraduate transportation engineering courses at various universities. To date, more than a dozen faculty members have opted to incorporate STREET into their teaching curricula.

### ► Career expo

Transportation professionals shared experiences and advice with a capacity crowd at the annual Transportation Career Expo in March. CTS sponsors the event with several organizations.

### ► Student organization

Membership in the Interdisciplinary Transportation Student Organization (ITSO) increased this year to nearly 150 due to stronger marketing efforts by the chapter, supported by CTS and the organization's other sponsors.

CTS assisted ITSO in planning its Sixth Annual Student Transportation Conference, which featured six student presentations and remarks from Henry Liu, an assistant professor in the Department of Civil Engineering.

## Professional development

### ▸ Seminars

The CTS Seminar Series combines the following seminars:

- CTS Research Seminars, held as part of CTS research council meetings
- Advanced Transportation Technologies Seminars, sponsored by the ITS Institute

Seminars are held every week during fall semester and periodically throughout the rest of the year. A wide range of topics were covered in FY10, such as:

- privacy law for intelligent transportation systems
- value capture for transportation finance
- effects of alcohol on motorcycle riding skills
- subsurface drainage practices
- ramp metering for postponing freeway breakdown
- economic impact of upgrading roads
- driver distraction and driver drowsiness

Seminars are broadcast live on the Web and are available for later viewing. They may also be downloaded through the University's iTunes U site.

Each seminar qualifies for one professional development hour, and degree credit is available for ITS Institute seminars. CTS is also a provider of maintenance credits for American Institute of Certified Planners certification, which is applicable for many of the seminars. Providing credit for professionals is a role of growing importance for CTS.

## Technical assistance

*Minnesota LTAP coordinator Mindy Carlson (far left) and director Jim Grothaus (far right) with the 2009 Roads Scholars*

### ▸ Minnesota Local Technical Assistance Program

The Minnesota Local Technical Assistance Program (LTAP), housed at CTS, honored 15 students who acquired the necessary credits to complete the Roads Scholar Program in 2009. More than 1,500 students are enrolled in the Roads Scholar Program, a structured curriculum of training options for maintenance workers.

Minnesota LTAP also developed and delivered a Sign Management and Maintenance workshop based on 2008 Federal Highway Administration (FHWA) guidelines for sign retroreflectivity. In addition, it partnered with Mn/DOT to create a sign removal guide to aid in training state and local agencies to comply with FHWA requirements.

The Circuit Training and Assistance Program, the mobile arm of Minnesota LTAP, partnered with the Minnesota Pollution Control Agency, Mn/DOT, and several watershed districts to deliver training derived from University research on the environmental impacts of salt and sand mixtures in winter road maintenance.

More than 1,500 students are enrolled in the Roads Scholar Program, a structured curriculum of training options for maintenance workers.

### ► Airport Technical Assistance Program

Minnesota AirTAP, housed at CTS, assembled a research team and provided overall leadership and management to create the *Guidebook for Managing Small Airports* for the Airport Cooperative Research Program (ACRP). The guidebook aims to help airport personnel find resources and techniques they can apply to better meet their responsibilities. ACRP is sponsored by the Federal Aviation Administration.

Minnesota AirTAP published another guidebook—*Agricultural Aircraft Operations on Municipal Airports: A Guidebook for Municipal Airport Managers*—originally created in 1995 by several state organizations. The guidebook was featured at the Sixth Annual AirTAP Fall Forum, held in September in Mankato, Minnesota.

### ► Customized training

CTS coordinated a number of events and customized training courses for Mn/DOT. Topics included project management, context sensitive solutions, risk management, roundabouts, and utilities.

## K-12 educational activities

### ► Traffic engineering curriculum

Gridlock Buster, a traffic control game developed by the ITS Institute and Web Courseworks, continued to grow in popularity. The goal of Gridlock Buster is to provide a fun way to teach students what is involved in traffic grid management and make transportation interesting and relevant. The game is an open source file and can be linked to multiple Web sites. Since its original posting online, Gridlock Buster has garnered more than 2 million game plays.

The game has also been used at area high schools as a recruiting tool and at a University of Minnesota summer camp. It has been used by university undergraduates as part of their coursework, by elementary school children at educational events, and by FHWA staff as a training tool for police officers. CTS also demonstrated the game at the 2009 Minnesota State Fair.


*The Gridlock Buster traffic control game introduces transportation to students of all ages.*

### ► Tours and exhibits

CTS staffed exhibits and participated in numerous classes and camps to introduce K–12 students to transportation and transportation-related fields of study. For example, CTS developed an exhibit for TechFest, an annual event in Edina, Minnesota, for young children and adults, and it hosted the Fond Du Lac Community College and Leech Lake Tribal College Summer Transportation Camps for 80 middle and high school students.

Another event of note was a morning of educational workshops and tours of research facilities to help young students prepare for "Smart Move," the 2009 FIRST LEGO League robotics competition. More than 250 young science enthusiasts from across Minnesota converged on the University of Minnesota campus for the October event, hosted by CTS, the University's College of Science and Engineering, and the educational nonprofit organization High Tech Kids. For the 2009 competition, students were challenged to build small autonomous robots from a kit of more than 1,000 parts, including LEGO pieces, and accomplish missions related to transportation.

# Outreach and Public Engagement


*CTS hosted an exhibit at the Minnesota State Fair.*

www.cts.umn.edu/Events
www.cts.umn.edu/Publications
www.cts.umn.edu/LibraryServices

## Events

### ► Federal transportation bill events

CTS and the Humphrey Institute of Public Affairs hosted three events designed to provide direction and input for a new federal surface transportation bill. Congress is developing a successor to 2005's law, SAFETEA-LU, which has been extended pending passage of a new bill.

In January, USDOT Secretary Ray LaHood and Congressman James L. Oberstar hosted a listening session on the University of Minnesota campus attended by more than 300 people. Several CTS Executive Committee members presented remarks. Minnesota was the only university chosen to host one of the secretary's listening sessions, indicating its growing role and visibility as a national resource.

*Martin Sabo*

In November, the Bipartisan Policy Center's National Transportation Policy Project (NTPP) held a public forum at the Humphrey Institute as part of a dialogue across the country regarding the recommendations in the NTPP's June 2009 report, *Performance Driven: A New Vision for U.S. Transportation Policy*. The forum was held in conjunction with the Martin Olav Sabo Lecture Series and was co-hosted by CTS. The McKnight Foundation and SUPERVALU, Inc. provided additional sponsorship.

In August, Oberstar previewed elements of his committee's proposed bill in a public talk. Oberstar, chairman of the U.S. House Transportation and Infrastructure Committee, spoke as part of a series of public talks by prominent government leaders hosted by the Center for the Study of Politics and Governance at the Humphrey Institute. Cosponsors were the Humphrey Institute's State and Local Policy Program and CTS.

*Minneapolis mayor R.T. Rybak, U.S. Rep. Keith Ellison, U.S. Sen. Amy Klobuchar, James Oberstar, and Ray LaHood*

*Metropolitan Council chair Peter Bell, Rep. Mary Liz Holberg, Hennepin County commissioner Peter McLaughlin, Sen. Scott Dibble, and Mn/DOT commissioner Tom Sorel were panelists at the NTPP public forum.*

CTS played a convening role in the national discussion of a new federal surface transportation bill. Minnesota was the only university chosen to host a USDOT listening session.

## ► Research forum, workshops, roundtable

CTS hosted a Transitway Impacts Research Program (TIRP) forum in March to allow participants to learn about initial findings, engage in active-learning discussions, and discuss the potential impacts of the research on future transitway developments. Launched in 2006 as a partnership between the University and Hennepin County, TIRP has since expanded to include a wide range of stakeholders representing regional organizations, local governments, and regulatory agencies.

CTS offered a series of educational workshops featuring results of the Value Capture for Transportation Finance Study for elected officials during the summer and fall of 2009. Researchers from the study team were also called upon numerous times to present the study results to elected officials, public agencies, and professional organizations.

Leaders discussed various toll-lane options and public acceptance of those options at a Rethinking Transportation Finance Roundtable held in October by CTS and the State and Local Policy Program of the Humphrey Institute. The occasional roundtables bring together Minnesota leaders to hear the latest ideas in transportation finance.

*Eric C. Peterson*

*Catherine Ross*

*Tom Sorel*

## ► Research conference

The 21st Annual CTS Transportation Research Conference included more than 75 presentations by researchers and practitioners, including a half-day workshop on innovations in the communication and exchange of transportation information.

The conference opened with a plenary presentation by Eric C. Peterson, president of the American High Speed Rail Alliance, titled "How National Transportation Priorities Influence Local Decisions: Building Momentum for Sustainable American High Speed Rail," followed by a reactor panel with four local experts. Catherine Ross, Harry West Professor and director of the Center for Quality Growth and Regional Development at Georgia Tech's College of Architecture, gave the conference luncheon presentation, titled "Mega-regions: 21st Century Way of Understanding 21st Century Issues." She was preceded by Mn/DOT commissioner Tom Sorel, who outlined the department's activities.

*Laurie McGinnis and Eric C. Peterson with panelists Tim Henkel (Mn/DOT), David Levinson (U of M), Jim McDonough (Ramsey County), and Robert McFarlin (Metropolitan Council) at the CTS research conference opening session*

### ► Symposium on Mileage-Based User Fees

CTS cosponsored the second annual two-day Symposium on Mileage-Based User Fees in cooperation with the Humphrey Institute's State and Local Policy Program, directed by Lee Munnich, and the Texas Transportation Institute's University Transportation Center for Mobility. The April symposium brought together more than 80 national and international stakeholders interested in the further development of a mileage-based approach to generating transportation revenue. Wilbur Smith Associates, IBM, and SRF Consulting provided some financial sponsorship for the event.

*Lee Munnich*

*Laurie McGinnis moderates a conversation circle at the Symposium on Mileage-Based User Fees.*

### ► Teen driver safety forums

U.S. Rep. James Oberstar and transportation safety experts held a forum in June to discuss with community members and safety advocates ways to address the safety challenges presented by teen drivers. The forum, sponsored by the Center for Excellence in Rural Safety (CERS) and the Intelligent Transportation Systems (ITS) Institute, was held at Anoka-Ramsey Community College in Cambridge, Minnesota.

Max Donath, director of the ITS Institute, introduced a new version of the Teen Driver Support System (TDSS) in development at the ITS Institute with support from Mn/DOT and the USDOT. The system is a smart phone mounted on a car's dashboard to provide the driver real-time visual and audio feedback about driving performance. It also collects the data for parents. Oberstar received a live demonstration of the TDSS in a test vehicle just prior to the forum.

Donath also demonstrated the TDSS to U.S. Sen. Amy Klobuchar and David Strickland, administrator of the National Highway Traffic Safety Administration, as part of a teen driving safety forum held in June at Tartan High School in Oakdale, Minnesota.

*Amy Klobuchar, Max Donath, and David Strickland*

## ► Luncheons

CTS luncheons continued to bring speakers to Minnesota to share the latest national trends and issues in transportation.

*Dan Davids*

***CTS Fall Luncheon***: Dan Davids, president, Plug In America, "Why Electric Cars?"

***CTS Winter Luncheon***: Alison Smiley, president, HumanFactors North, Inc., and adjunct professor, University of Toronto and Ryerson University, "Saving Us from Ourselves: Human Factors and the Design of Safer Roads"

## ► Freight and logistics symposium

The effects of the recession on the freight and logistics industries will likely linger for some time even after the economy recovers, according to presenters at the 13th Annual Freight and Logistics Symposium held in Minneapolis in December. The event was sponsored by CTS in cooperation with Mn/DOT, the Minnesota Freight Advisory Committee, the Council of Supply Chain Management Professionals–Twin Cities Roundtable, the Metropolitan Council, and the Transportation Club of Minneapolis and St. Paul.


*Transportation alumni celebrate homecoming.*

## ► Alumni gatherings

The CTS Transportation Alumni group held its first golf outing in July and a homecoming get-together before the Gopher football game in October. CTS initiated the group in 2007 to provide University of Minnesota transportation-related alumni and friends ways to connect with each other, stay abreast of the latest news and research in transportation, and participate in activities as part of the University community. The group has more than 90 members and friends.

## ► State Fair exhibit

People of all ages stopped by the CTS exhibit at the Minnesota State Fair in September. The main attraction was "Transportation Jeopardy," hosted by the Minneapolis *StarTribune's* former blogger and columnist Jim Foti. Visitors also had the opportunity to check out Gridlock Buster, an interactive traffic-control game designed by the ITS Institute, and SafeRoadMaps.org, a crash-mapping tool from the Center for Excellence in Rural Safety.


*Jim Foti hosts Transportation Jeopardy at the State Fair.*

## ► Other events and services

CTS partners with and provides administrative and management services for organizations offering transportation-related events. Following are examples from FY10:

- Toward Zero Deaths (TZD) Conference, Duluth, Minnesota
- Transportation Engineering Road Research Alliance (TERRA) Innovation Series event, Grand Rapids, Michigan; TERRA Pavement Conference (formerly the Minnesota Pavement Conference), St. Paul
- Minnesota Spring Maintenance Training Expo, St. Cloud, Minnesota
- Center for Excellence in Rural Safety (CERS) Summer Institute, Williamsburg, Virginia

## Communications

### ▸ Social networking and Web updates

CTS entered the world of social networking, joining Facebook, Twitter, and LinkedIn. The tools offer new opportunities for CTS to disseminate research and interact with varied audiences.

Twitter played a big role in the annual research conference, with staff, attendees, and presenters tweeting highlights from the sessions and adding links to relevant resources in real-time. The number of followers grew by about 30 percent during the conference.

In addition, research seminars held by CTS and the ITS Institute are now available on iTunes U.

CTS also redesigned the Center for Excellence in Rural Safety (CERS) Web site, making it easier to access news and information. CTS maintains the site for CERS.


### ▸ Newsletters and research briefs

CTS launched three new e-newsletters: the *ITS Institute Update,* a brief update about research and educational activities; the *Transportation Education E-News*, designed to inform university faculty of tools, initiatives, and activities for improving transportation education; and *TAG-line*, an electronic newsletter of the Transportation Alumni Group.

CTS also began publishing a series of research briefs. The briefs, which summarize research projects for a wide audience, are posted online and distributed at selected events and meetings. They join other materials such as ITS Institute and TERRA fact sheets that provide easy-to-read and visually interesting summaries of University research and other topics.

### ▸ Media outreach

A wide range of University research and education projects were highlighted in the print, online, and broadcast media, from smart snowplows to rural traffic safety policies to technology for improving safety for teen drivers. For example, *USA Today* reported on findings from a Center for Excellence in Rural Safety survey that found Americans strongly support public policies to reduce highway deaths, including some measures that many elected officials consider too restrictive.

CTS entered the world of social networking, joining Facebook, Twitter, and LinkedIn.

## Library services

CTS expanded its library services by adding live chat reference. In addition, CTS and Mn/DOT Library staff gave a joint presentation at the 2010 CTS Research Conference about the Minnesota Transportation Libraries program, a partnership of CTS, Mn/DOT, and the Minnesota Local Road Research Board. The program's goal is to make transportation-related information more readily accessible.

CTS was also part of the research team for a National Cooperative Highway Research Program project that published NCHRP Report 643: *Implementing Transportation Knowledge Networks*, which explores a business plan for the development of such networks in the United States.

# About CTS


*An automated system designed to reduce the use of road salt won the Research Partnership Award.*

www.cts.umn.edu/About

## Executive Committee

**Chair: Fred Corrigan**
Executive Director, Aggregate & Ready Mix Association

**Wayne Gladfelter**
Professor and Associate Dean of Academic Affairs, College of Science and Engineering, University of Minnesota

**Brian J. Lamb**
General Manager, Metro Transit

**Tom Sorel**
Commissioner, Minnesota Department of Transportation

**Michael Beard**
Representative, Minnesota House

**Jeff Hamiel**
Executive Director, Metropolitan Airports Commission

**Colleen Landkamer**
State Director, USDA Rural Development

**Derrell Turner**
Minnesota Division Administrator, Federal Highway Administration

**Debra R. Brisk**
Senior Project Manager, Kimley-Horn & Associates

**Ronald Have**
President, Freightmasters, Inc.

**Keith Langseth**
Senator, Minnesota Senate

**Douglas Weiszhaar**
Vice President for Special Projects, WSB & Associates, Inc.

**Caren Dewar**
Executive Director, Urban Land Institute–Minnesota

**Mark Hoisser**
President, Dakota Area Resources and Transportation for Seniors

**Greg Lindsey**
Associate Dean, Humphrey Institute of Public Affairs, University of Minnesota

**Charles Zelle**
CEO/President, Jefferson Lines

**D. Scott Dibble**
Senator, Minnesota Senate

**John Houle**
General Manager, 3M Traffic Safety Systems Division

**Bob McFarlin**
Member, District 3, Metropolitan Council

**Left during FY10:**
**Larry Lair,** General Manager, 3M Traffic Safety Systems Division

**Margaret Donahoe**
Executive Director, Minnesota Transportation Alliance

**James Hovland**
Mayor, City of Edina, Minnesota

**Peter McLaughlin**
Commissioner, Hennepin County

**Jim Erkel**
Attorney and Program Director, Minnesota Center for Environmental Advocacy

**Michael R. Huber**
Cardiovascular Health Consultant, BlueCross BlueShield of Minnesota

**Richard Murphy Jr.**
President, Murphy Warehouse Company

**Tom Fisher**
Professor and Dean, College of Design, University of Minnesota

**Robert Jones**
Senior Vice President of System Academic Administration, University of Minnesota

**Adolph Ojard**
Executive Director, Duluth Seaport Port Authority

**Andy Furco**
Associate Vice President for Public Engagement, University of Minnesota

**Rick Krueger**
Senior Government Affairs Manager, Global Transportation Technologies

**Khani Sahebjam**
Deputy Commissioner, Minnesota Department of Transportation

## Annual awards

CTS presented the following awards at its Annual Meeting and Awards Luncheon in April.

► **Richard P. Braun Distinguished Service Award:** Recipient Lee Munnich (center), director of the State and Local Policy Program and the Center for Excellence in Rural Safety at the Humphrey Institute, with Richard Braun and Laurie McGinnis

► **Ray L. Lappegaard Distinguished Service Award:** Recipient Ferrol Robinson, former principal of transportation planning and studies at SRF Consulting Group and current part-time fellow at the Humphrey Institute, and Laurie McGinnis

► **CTS Research Partnership Award**

*Automated Friction Measurement, Data Recording, and Applicator Control for Winter Road Maintenance*

This project developed a tire-road friction measurement system and a closed-loop control system that uses these measurements for automatic applicator control. By measuring friction, only spots on the road that are indicated as icy are treated with deicing chemicals, which reduces their use. The technology is being prepared for limited deployment in two snowplows and one pick-up truck. Mn/DOT sponsored the research, and the ITS Institute provided initial funds.

*Project Partners:*

- Department of Mechanical Engineering: Gurkan Erdogan, Lee Alexander, Rajesh Rajamani
- Mn/DOT: Gabe Guevara (now with the FHWA), Dan Warzala, Curtis Gobeli, Farideh Amiri, Mark Panek, Roger Hille, Thomas Zimmerman, Sue Lodahl
- SRF Consulting Group, Inc.: Brian Scott
- Hennepin County: Dharam Bobra

► **William K. Smith Distinguished Service Award** Dan Murray (center), vice president of research at the American Transportation Research Institute, presenter John Hausladen, and Laurie McGinnis

► **Distinguished Public Leadership Award:** Steve Murphy, chair of the Minnesota Senate Transportation Committee

*Recipients Dan Warzala, Farideh Amiri, Curtis Gobeli, Dharam Bobra, Brian Scott, Rajesh Rajamani, and Lee Alexander, with assistant director Dawn Spanhake*

## CTS Board of Advisors

**Roberto Ballarini,** Civil Engineering, University of Minnesota
**Fred Beier,** University of Minnesota (retired)
**Bob Benke,** Community Resource Partnerships, Inc.
**Richard Braun,** RPB
**Carol Bufton,** Minnesota Safety Council
**Lyndon Carlson,** Minnesota State Representative
**Tom Colbert,** City of Eagan
**Jay Cowles,** Unity Avenue Associates
**Duane Crandall,** Consultant
**Gary DeCramer,** Humphrey Institute, University of Minnesota
**Jim Denn,** Former Mn/DOT Commissioner
**Doug Differt,** URS
**Gary Eikaas,** Dedicated Logistics, Inc.
**Ron Erhardt,** Minnesota House of Representatives (retired)
**Peter Fausch,** SRF Consulting Group, Inc.
**Carol Flynn,** Minnesota Senate (retired)
**David Fricke,** Minnesota Association of Townships
**Bill Goins,** Federal Express
**Randy Halvorson,** Cambridge Systematics
**John Hausladen,** Minnesota Trucking Association
**Ann Johnson,** Professional Engineering Services
**Curtis Johnson,** Citistates Group
**Linda Koblick,** Hennepin County
**Connie Kozlak,** Metropolitan Council
**Leonard Levine,** Levine & Associates, Inc.
**Vince Magnuson,** University of Minnesota Duluth
**Arlene McCarthy,** Metropolitan Council
**Marthand Nookala,** Hennepin County
**Elliott Perovich,** Anoka County
**Catherine Petersen,** CJ Petersen & Associates
**Bob Sands,** Jacobs Engineering Group
**Thomas Scott,** Center for Urban and Regional Affairs, University of Minnesota
**Michael Sheehan,** Olmsted County
**Chuck Siggerud,** SEH (retired)
**Gene Skok,** Civil Engineering, University of Minnesota (retired)
**Jim Solem,** Metropolitan Council (retired)
**Richard Stehr,** HNTB Corporation
**Sandra Vargas,** Minneapolis Foundation
**Tom Weaver,** Metropolitan Council
**Matthew Zeller,** Concrete Paving Association of Minnesota
**Charleen Zimmer,** ZAN Associates

## CTS councils and advisory committees

### ITS Institute Board

**Chair: Laurie McGinnis**, CTS
**Bernie Arseneau,** Mn/DOT
**Michael Baltes,** Federal Transit Administration
**Deb Bloom,** City of Roseville, Minn.
**Mark Dunaski,** Minnesota State Patrol
**Mary Ellison,** Minnesota Department of Public Safety
**Mark Hoisser,** Dakota Area Resources and Transportation for Seniors
**Tim Johnson,** National Highway Traffic Safety Administration
**Anthony Kane,** American Association of State Highway and Transportation Officials
**Mostafa Kaveh,** College of Science and Engineering, University of Minnesota
**Beverly Miller,** Minnesota Valley Transit Authority
**Susan Mulvihill,** Mn/DOT
**Dan Murray,** American Transportation Research Institute
**Marthand Nookala,** Hennepin County
**Joe Peters,** Federal Highway Administration
**James Riehl,** College of Science and Engineering, University of Minnesota Duluth
**Richard Rovang,** Metro Transit
**Rich Sanders,** Polk County
**Linda Taylor,** Mn/DOT
**Derrell Turner,** Federal Highway Administration

### Minnesota LTAP Steering Committee

**Chair: Julie Skallman**, Mn/DOT
**Deb Bloom,** City of Roseville, Minn.
**Philip Forst,** Federal Highway Administration
**David Fricke,** Minnesota Association of Townships
**Douglas Grindall,** Koochiching County
**Lee Gustafson,** City of Minnetonka
**Gregory Isakson,** Goodhue County
**Steve Lillehaug,** City of Brooklyn Center, Minn.
**Laurie McGinnis,** CTS
**Tom Peters,** Mn/DOT
**Michael Sheehan,** Olmsted County
**Tom Struve,** City of Eagan
**Linda Taylor,** Mn/DOT

### AirTAP Steering Committee

**Chair: Peter Buchen**, Mn/DOT
**Gina Baas**, CTS
**Dave Beaver**, Owatonna Municipal Airport
**Glenn Burke**, South St. Paul Municipal Airport
**Joe Harris**, Metropolitan Airports Commission
**Mark Hoyne**, Grand Rapids Airport
**John Puckropp**, Minnesota Council of Airports
**Laurie Suttmeier**, FAA Airports District Office
**Bill Towle**, St. Cloud Regional Airport
**Harold Van Leeuwen**, Bemidji Regional Airport

### Council Coordinating Committee

**Chair: Douglas Weiszhaar**, WSB & Associates, Inc.
**Ken Buckeye,** Mn/DOT
**Sue Groth,** Mn/DOT
**Connie Kozlak,** Metropolitan Council
**Michael Sheehan,** Olmsted County
**Shannon Tyree,** City of St. Paul

### Transportation and the Economy Council

**Chair: Ken Buckeye**, Mn/DOT
**John Adams,** Humphrey Institute of Public Affairs, University of Minnesota
**Deanna Belden,** Mn/DOT
**Saif Benjaafar,** Industrial and Systems Engineering, University of Minnesota
**Mark Berndt,** Wilbur Smith Associates
**David Christianson,** Mn/DOT
**William Craig,** Center for Urban and Regional Affairs, University of Minnesota
**John Doan,** SRF Consulting Group, Inc.
**Karen Donohue,** Carlson School of Management, University of Minnesota
**Jonathan Ehrlich,** Metropolitan Council
**Stephanie Eiler,** CH2M Hill
**Jerry Fruin,** Applied Economics, University of Minnesota
**Bob Gale,** Mn/DOT
**William Gardner,** Mn/DOT
**Kate Garwood,** Anoka County Highway Department
**Diwakar Gupta,** Mechanical Engineering, University of Minnesota
**Mike Iacono,** Civil Engineering, University of Minnesota
**Cory Johnson,** Mn/DOT
**David Levinson,** Civil Engineering, University of Minnesota
**Alfred Marcus,** Carlson School of Management, University of Minnesota
**Gerard McCullough,** Applied Economics, University of Minnesota
**Lee Munnich,** Humphrey Institute of Public Affairs, University of Minnesota
**Betsy Parker,** Mn/DOT
**Raymond Rought,** Mn/DOT
**Thomas Scott,** Center for Urban and Regional Affairs, University of Minnesota
**John Tompkins,** Mn/DOT
**Jerry Zhao,** Humphrey Institute of Public Affairs, University of Minnesota

### Transportation Safety and Traffic Flow Council

**Chair: Susan Groth**, Mn/DOT
**Lowell Benson**
**John Bloomfield,** College of Design, University of Minnesota
**Dharam Bobra,** Hennepin County
**Gary Davis,** Civil Engineering, University of Minnesota
**Max Donath,** ITS Institute, University of Minnesota
**Eric Drager,** Hennepin County
**Dave Engstrom,** Mn/DOT
**Robert Green,** Alliant Engineering Inc.
**Kathleen Harder,** College of Design, University of Minnesota
**John Hourdos,** Civil Engineering, University of Minnesota
**Cassandra Isackson,** Mn/DOT
**James Kranig,** Mn/DOT
**Eil Kwon,** Civil Engineering, University of Minnesota Duluth
**Taek Kwon,** Electrical and Computer Engineering, University of Minnesota Duluth
**Chen-Fu Liao,** Civil Engineering, University of Minnesota
**Henry Liu,** Civil Engineering, University of Minnesota
**Michael Manser,** HumanFIRST Program, University of Minnesota
**James McCarthy,** Federal Highway Administration
**Panos Michalopoulos,** Civil Engineering, University of Minnesota
**Steve Misgen,** Mn/DOT
**Nikolaos Papanikolopoulos,** Computer Science and Engineering, University of Minnesota
**Rajesh Rajamani,** Mechanical Engineering, University of Minnesota
**Steve Ruegg,** PB Americas, Inc.
**Wayne Sandberg,** Washington County
**Bob Sands,** Jacobs Engineering Group
**Brian Scott,** SRF Consulting Group, Inc.
**Craig Shankwitz,** Mechanical Engineering, University of Minnesota

*Membership as of November 1, 2010*

**Shashi Shekhar,** Computer Science and Engineering, University of Minnesota
**Al Smith,** Minnesota State Patrol
**Ray Starr,** Mn/DOT
**Daryl Taavola,** URS
**Linda Taylor,** Mn/DOT

### Transportation Infrastructure Council

**Chair: Michael Sheehan**, Olmsted County
**Laura Amundson,** Parsons Brinckerhoff, Americas, Inc.
**Ron Bray,** WSB & Associates
**George Cochran**
**Dan Dorgan,** Mn/DOT
**Alan Forsberg,** Blue Earth County
**Cathy French,** Civil Engineering, University of Minnesota
**Romeo Garcia,** Federal Highway Administration
**Jim Grube,** Hennepin County
**Lee Gustafson,** City of Minnetonka
**Bojan Guzina,** Civil Engineering, University of Minnesota
**Maureen Jensen,** Mn/DOT
**Lev Khazanovich,** Civil Engineering, University of Minnesota
**Mark Krebsbach,** Dakota County
**Joseph Labuz,** Civil Engineering, University of Minnesota
**Erland Lukanen,** Mn/DOT
**Mark Maloney,** City of Shoreview, Minn.
**Mihai Marasteanu,** Civil Engineering, University of Minnesota
**Clark Moe,** Mn/DOT
**Steve Olson,** Olson & Nesvold Engineers
**Linda Pieper,** Things with a Twist, Inc.
**Paul Rowecamp,** Mn/DOT
**Arturo Schultz,** Civil Engineering, University of Minnesota
**Carol Shield,** Civil Engineering, University of Minnesota
**Linda Taylor,** Mn/DOT
**Jill Thomas,** Minnesota Asphalt Pavement Association
**Curt Turgeon,** Mn/DOT
**Matthew Zeller,** Concrete Paving Association of Minnesota

### Transportation Planning and the Environment Council

**Chair: Connie Kozlak**, Metropolitan Council
**John Adams,** Humphrey Institute of Public Affairs, University of Minnesota
**Lisa Austin,** Mn/DOT
**Larry Blackstad,** Blackstad Consulting
**Lynne Bly,** Mn/DOT
**Scott Bradley,** Mn/DOT
**Jason Cao,** Humphrey Institute of Public Affairs, University of Minnesota
**Elizabeth Colburn**
**Frank Douma,** Humphrey Institute of Public Affairs, University of Minnesota
**Yingling Fan,** Humphrey Institute of Public Affairs, University of Minnesota
**John Gulliver,** Civil Engineering, University of Minnesota
**Chris Hiniker,** SEH
**Bruce Holdhusen,** Mn/DOT
**David Kittelson,** Mechanical Engineering, University of Minnesota
**Julian Marshall,** Civil Engineering, University of Minnesota
**Tim Mitchell,** Mn/DOT
**Susan Moe,** Federal Highway Administration
**Lance Neckar,** College of Design, University of Minnesota
**Sam O'Connell,** Dakota County
**Frank Pafko,** Mn/DOT
**Jeffrey Peltola,** ASCE/AAAS
**Gavin Poindexter,** URS Corporation
**Alan Rindels,** Mn/DOT
**Mike Schadauer,** Mn/DOT
**Carissa Schively Slotterback**, Humphrey Institute of Public Affairs, University of Minnesota
**Ingrid Schneider,** Tourism Center, University of Minnesota
**Doug Snyder,** Mississippi Watershed Management Organization
**Robert Sykes,** College of Design, University of Minnesota
**Dave Van Hattum**, Transit for Livable Communities
**Mary Vogel,** College of Design, University of Minnesota
**Bruce Wilson,** Bioproducts and Biosystems Engineering, University of Minnesota
**Elizabeth Wilson,** Humphrey Institute of Public Affairs, University of Minnesota
**Jeanne Witzig,** Kimley-Horn and Associates, Inc.

### Education/Outreach Council

**Chair: Shannon Tyree**, City of St. Paul
**Jake Akervik,** Mn/DOT
**Jessica Dauer,** SRF Consulting Group, Inc.
**Gary Davis,** Civil Engineering, University of Minnesota
**Jan Ekern,** Mn/DOT
**Catherine Flannery,** College of Continuing Education, University of Minnesota
**Dale Grove,** Bonestroo, Rosene, Anderlik, and Associates
**Sheila Hatchell,** Mn/DOT
**Ann Johnson,** Professional Engineering Services
**Henry Liu,** Civil Engineering, University of Minnesota
**Michael Marti,** SRF Consulting Group, Inc.
**Jane Prosch-Jensen,** The JPJ Group
**Micky Ruiz**
**Brian Smalkowski,** Kimley-Horn and Associates, Inc.

## Staff

**Laurie McGinnis**
Director

**Cadie Wright Adhikary**
Graphic Designer

**Gina Baas**
Assistant Director, Education and Outreach

**Joe Barbeau**
Program Coordinator

**Keith Carlson**
Operations Manager

**Mindy Carlson**
Program Coordinator

**Max Donath**
Director, ITS Institute

**Amy Friebe**
Senior Editor

**Jim Grothaus**
Director, Training and Technical Assistance

**Shawn Haag**
Program Coordinator

**Penny Harris**
Contract Coordinator

**C.J. Loosbrock**
Information Technology Professional

**Jan Lucke**
Manager, Research Administration

**Stephanie Malinoff**
Manager, Events and Outreach Services

**Arlene Mathison**
Director, Digital Information and Library Services

**Michael McCarthy**
Editor

**Christina Miller**
Program Coordinator

**Peter Park Nelson**
Editor

**Linda Preisen**
Director, Research Administration

**Toni Prekker**
Web Coordinator

**Anne Shelley**
Assistant Librarian

**Pam Snopl**
Managing Editor

**Mary Snyder**
Executive Assistant

**Dawn Spanhake**
Assistant Director, Program and Financial Management

## Students during FY10

Nicole Adyne
Adam Babel
Jeff Blanchard
Ann Blee
Simon Blenski
Amy Carlson
Robert Downs
Elizabeth Erickson
Samuel Glennen
Andrew Groth
Amy Hanson
Caitlin Johnson
Andrew LaGoo
Lyssa Leitner
Alissa Maier
Ashutosh Mehra
Karen Melton
Holly Miller
Matt Miranda
Leora Mirkin
Debra Morse
Jean Mullins
Tharinee Nukul
Nicholas Ochsner
Audra Ragan
Alec Rippberger
David Schell
Barbara Springer
Leah Stowers
Dan Tran
Sarah Van Nevel
Julia Weisgram

*Back row: Jim Grothaus, Cadie Wright Adhikary, Michael McCarthy, Dawn Spanhake, Shawn Haag, Christina Miller, Linda Preisen, Gina Baas, Toni Prekker, Stephanie Malinoff, Peter Park Nelson, Amy Friebe, C.J. Loosbrock, and Mindy Carlson. Front row: Joe Barbeau, Laurie McGinnis, Mary Snyder, Arlene Mathison, Pam Snopl, Penny Harris, Jan Lucke, and Keith Carlson*














CTS Center for Transportation Studies

www.cts.umn.edu