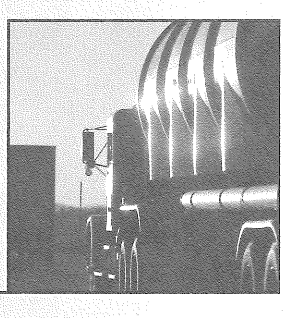
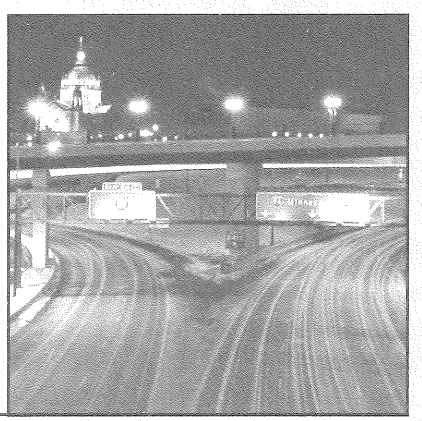
CTS CENTER FOR TRANSPORTATION STUDIES

Center for Transportation Studies

2004 ANNUAL REPORT





UNIVERSITY OF MINNESOTA

Center for
Transportation Studies

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CENTER FOR TRANSPORTATION STUDIES

UNIVERSITY OF MINNESOTA

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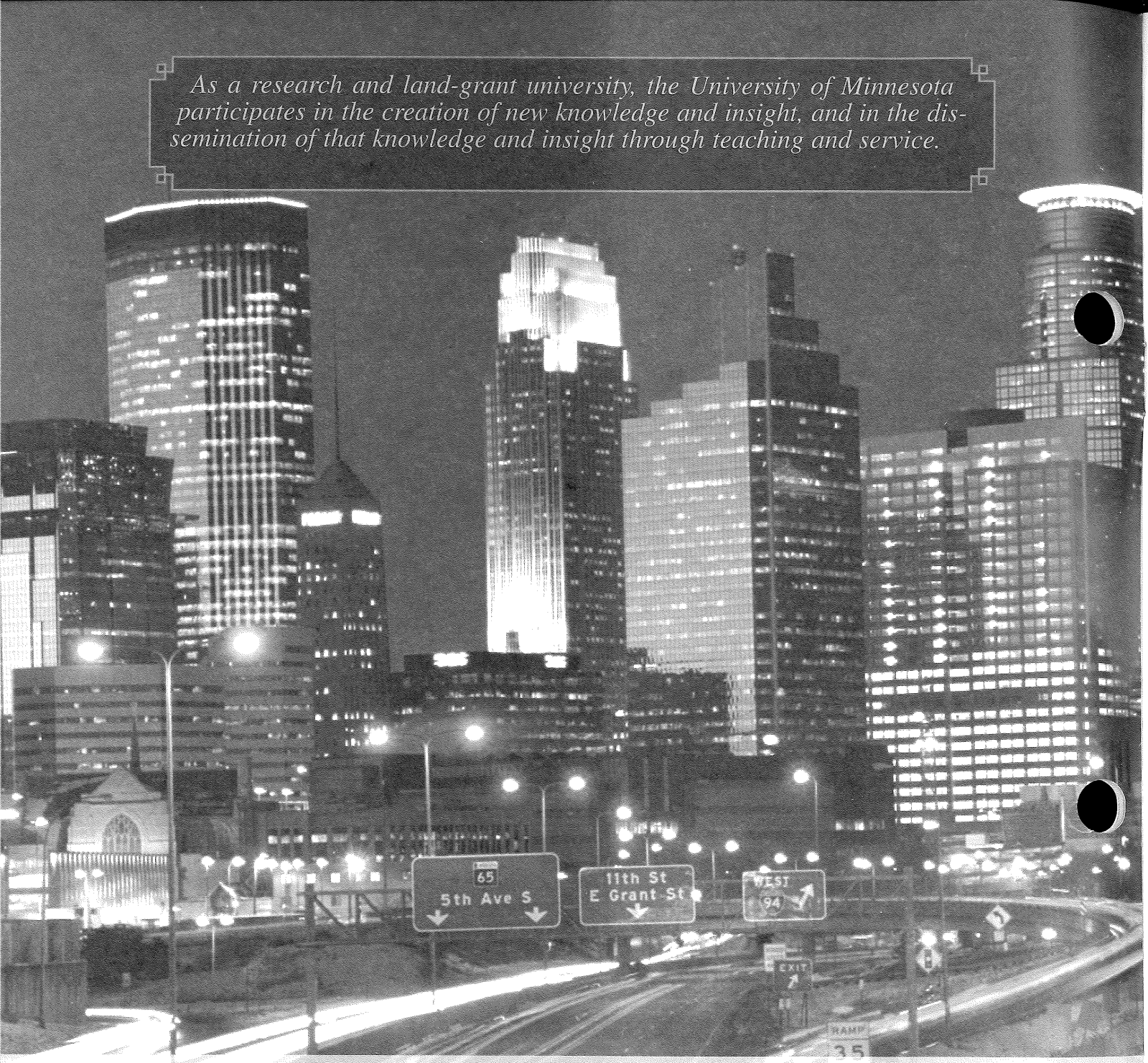
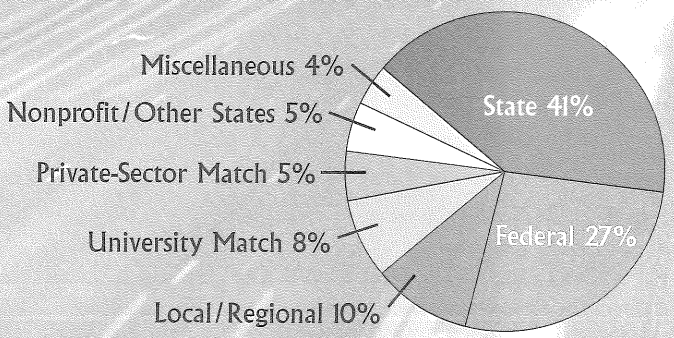
2004 ANNUAL REPORT

This publication is a report of transportation research, education, and outreach activities conducted by the Center for Transportation Studies and its affiliated programs for the period July 2003 through June 2004 (fiscal year 2004).

CONTENTS

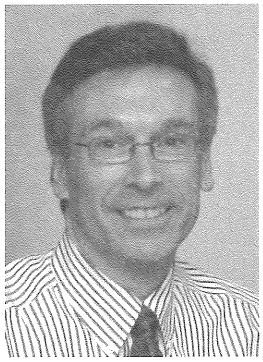
As a research and land-grant university, the University of Minnesota participates in the creation of new knowledge and insight, and in the dissemination of that knowledge and insight through teaching and service.





CTS total annual revenues
FY2004: $12,607,938

DIRECTOR'S MESSAGE



In Richard Florida's provocative book, *The Rise of the Creative Class* (Basic Books, 2002), he describes a transformation in progress that is bigger and more powerful than the transformation from the agricultural to the industrial age. The new creative age is based on human intelligence, knowledge, and creativity. Our economic productivity and living standards come from the new ideas and better ways of doing things that are developed by people paid to do creative work for a living—scientists, engineers, artists, musicians, designers, and knowledge-based professionals. In his view, the presence of a major research university is a basic infrastructure component of the creative economy—more important than canals, railroads, and freeway systems of past epochs.

Our Center is fortunate to be guided by an executive committee of Minnesota leaders (Appendix A) who understand the need for creativity in transportation and the important role of our research University. Through their strategic planning efforts, our Center is focused on excellence in five areas that are critical for creativity in transportation: *fostering ideas and knowledge development*, *championing formal education*, *promoting applied problem-solving*, *initiating public and stakeholder participation*, and *strengthening University expertise*.

This annual report is organized by these areas, showing the highlights of our accomplishments in each this past year. In an era when public financial support of our University and of other public research universities continues to decline—a direction that seems unwise if Richard Florida is correct—we are proud to continue to be successful in helping attract resources for research and education in transportation at the University of Minnesota, totaling approximately $12.6 million last year. About three-quarters of these funds are for research by our CTS scholars (*see* page 31) and other researchers, largely in support of graduate students working in their academic departments on faculty-led research covering a variety of transportation-related topics.

Included in these resources is more than $1.8 million of funding for an impressive set of projects that individual researchers were awarded as a result of their entrepreneurial efforts outside of CTS-coordinated efforts. Most of these projects are building on initial efforts that were seeded by CTS funds, or by the Minnesota Department of Transportation and other funding coordinated by CTS. This successful leveraging of funding is a tribute to the creative initiative of our talented faculty and research staff. Their funding sources include the National Science Foundation, the Federal Highway Administration, other state DOTs, foundations, and private companies.

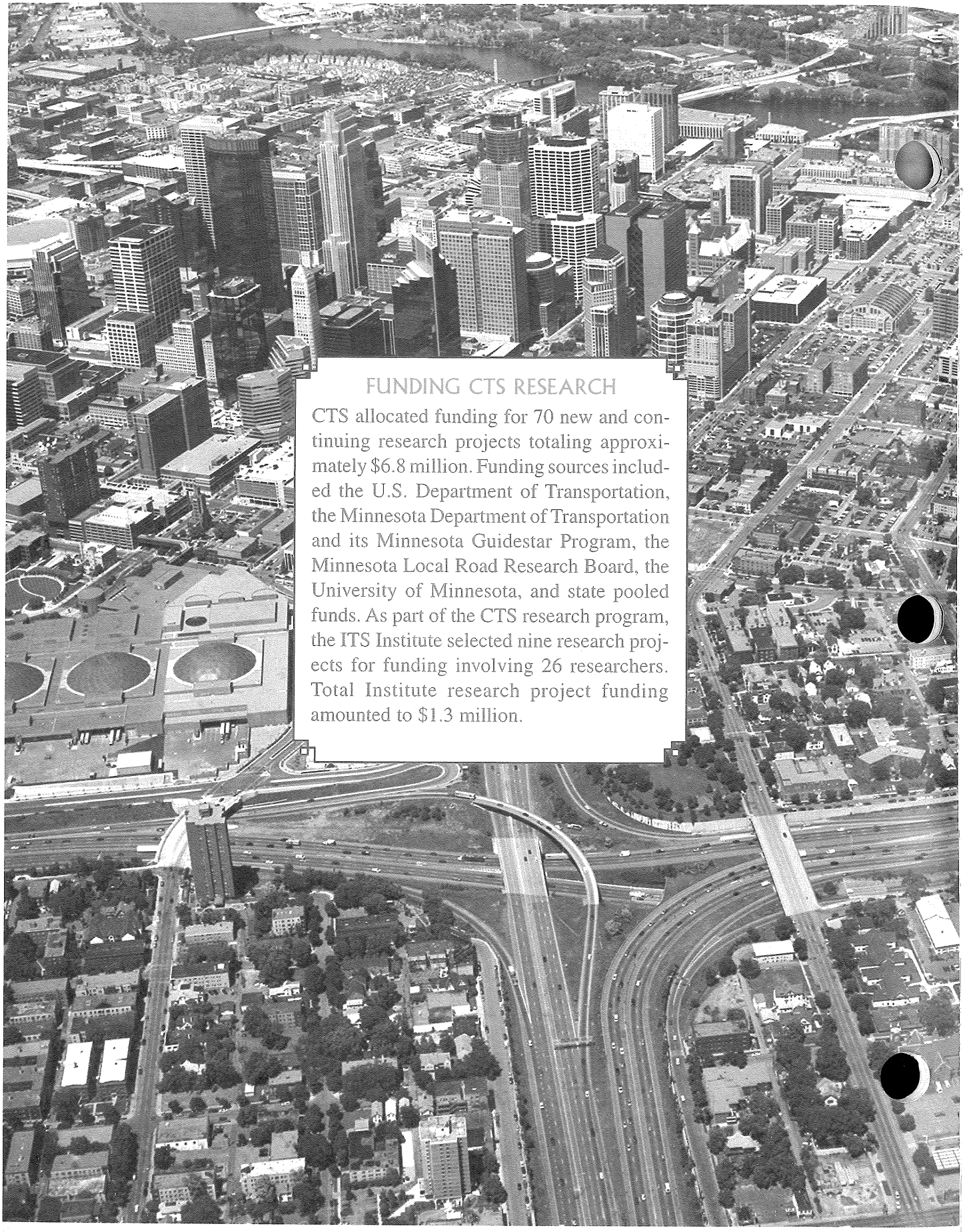
These resources help us advance all five areas of excellence defined by our executive committee. During this time of funding uncertainty, we are grateful to both the enlightened Minnesota leaders who guide and support us and to the talented faculty and staff at the University of Minnesota. Our work with them is bringing new knowledge and human intelligence to the emerging creative age, an age where ideas and creativity are essential for our transportation systems, economy, and quality of life.

Robert C. Johns, Director
Center for Transportation Studies

CTS AREA OF EXCELLENCE

IDEAS AND KNOWLEDGE DEVELOPMENT

Foster the development of new ideas and knowledge through faculty-led research programs and interdisciplinary teams that the Center administers and supports



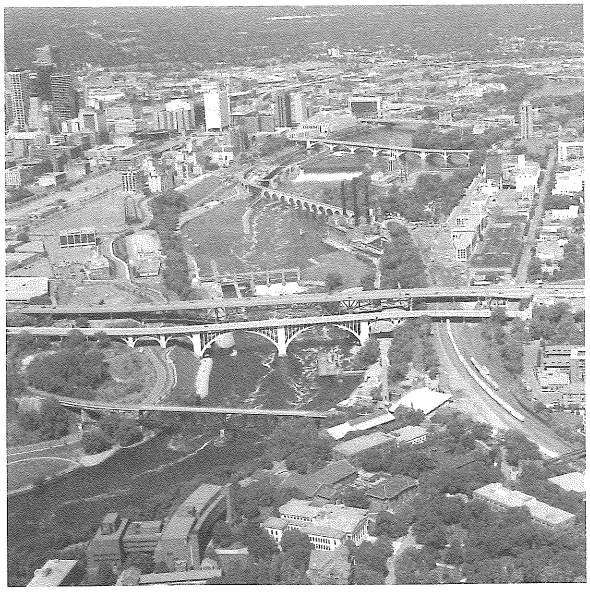
FUNDING CTS RESEARCH

CTS allocated funding for 70 new and continuing research projects totaling approximately $6.8 million. Funding sources included the U.S. Department of Transportation, the Minnesota Department of Transportation and its Minnesota Guidestar Program, the Minnesota Local Road Research Board, the University of Minnesota, and state pooled funds. As part of the CTS research program, the ITS Institute selected nine research projects for funding involving 26 researchers. Total Institute research project funding amounted to $1.3 million.

If they come, will you build it?

As freeway networks grow up around expanding metropolitan areas, transportation planners have discovered that constructing adequate infrastructure to meet the needs of urban and suburban drivers is no easy task. To manage highway network growth effectively, planners must respond to changing patterns of population growth and employment, while at the same time trying to influence how these patterns will evolve in the future. Every decision to add capacity, build new roads, or maintain the status quo is constrained by choices made in the past. Perhaps more important, today's decisions may cast a long shadow over future plans.

By studying the history of the Twin Cities' freeway network, civil engineering professor David Levinson and recent graduates Ramachandra Karamalaputi and Wei Chen have built a more complete understanding of transportation network growth, thus laying the foundation for more informed planning decisions. Their recently completed study, *If They Come, Will You Build It?* examines the growth of a highway network over time.



Levinson and his students modeled the Twin Cities' freeways as a network made up of discrete links, or highway segments. Using two decades of data on the physical characteristics of the network, construction, and traffic levels, they developed detailed models of link expansion and network growth. They reveal that most link expansions occur one lane at a time, and that the rate of expansion is continuing to decline.

The researchers also consider the development of the freeway network at the area level, dividing the region into interstate highways, divided highways, and secondary highways, using detailed GIS data from 1959 to 1990 and logit models (models that estimate the likelihood that a particular link will be expanded) to predict future network growth in the Twin Cities. Predictions using this data show that interstates are the least likely of all highways to achieve further growth. Divided highways are most likely to grow near employment zones while secondary highways are more likely to grow near residential areas.

In the final report on their research, the authors lend an intriguing perspective to the concept of transportation expansion in an urban setting. Throughout the analysis, they view the Twin Cities highway system as a dynamic force, capable of effecting and responding to change, as opposed to the more traditional view that network change occurs as the result of top-down decision making. The researchers hope that a better understanding of long-term network dynamics will enable planners to make even better decisions about how to invest scarce resources, and help policymakers understand the implications of public policy decisions.

More information about *If They Come, Will You Build It?* is available online at www.lrrb.org/more.cfm?code=1893.

INSIDE TRANSPORTATION RESEARCH AT CTS

This page and the following eight describe selected research efforts that reached milestones this year. Projects are grouped according to the Center's four research emphases:

Understanding road taxes

Minnesota state and local roads cost taxpayers $2.6 billion a year, yet, according to applied economics researcher Barry Ryan, few understand how these tax dollars are raised or spent. Ryan's study, *Paying for Minnesota Roads*, addresses the problem with baseline information about Minnesota roads and road taxes from both the government and taxpayer perspectives.

State and local roads generate 52 billion vehicle-miles of travel (VMT) annually. This translates into a statewide average cost of just 5 cents per VMT for government road service. But simple statistics can be misleading, Ryan says, since the cost of service on low-volume local road networks can far exceed the statewide average. State road aid to counties and cities helps offset these local cost disparities, saving taxpayers in many communities from higher road-related property taxes or lower levels of local road service.

Derived from three statewide taxes—motor-fuels excise taxes, motor-vehicle registration taxes, and starting in 2003, a portion (32 percent) of the motor-vehicle sales tax—road aid accounts for nearly a third of the $1.5 billion in total local-road spending annually. The remaining two-thirds comes from local government general funds, primarily property taxes and state property tax relief, also known as general-purpose aid. State roads, on the other hand, cost more than $1 billion annually, and are funded with the same three taxes that support local-road aid, along with additional federal highway grants. According to Ryan, these federal dollars result largely from the federal tax on motor fuels, and reflect the state's responsibility for federal interstate highways in Minnesota.

Lost in the intergovernmental transfers and funding distinctions are meaningful price signals or feedback to road users about the cost of service, Ryan says. For example, roads are only one public service bundled into business and homestead property taxes, and few appreciate that (averaging statewide) 20 percent of city budgets and 9 percent of county budgets are road-related expenditures. Motor-vehicle registration taxes are a more recognizable and easily understood road charge, especially since tax limits were instituted in 2001. Today, most of the state's 4 million passenger-vehicle owners pay no more than $99 a year in registration tax. Unlike this fixed annual fee, the motor-fuels tax is a road charge that varies with system use—the more you drive, the more taxes you pay.

Even though the 20-cent-per-gallon tax rate on gasoline and diesel fuel has not changed since 1988, the motor-fuels tax is still the largest single source among the three statewide road taxes. With more

vehicles on the road each year, and the average vehicle being driven more miles, the motor-fuels tax has managed to keep its lead revenue-raising position. But, Ryan suggests, more efficient and alternative fuel vehicles may soon challenge this dominance.

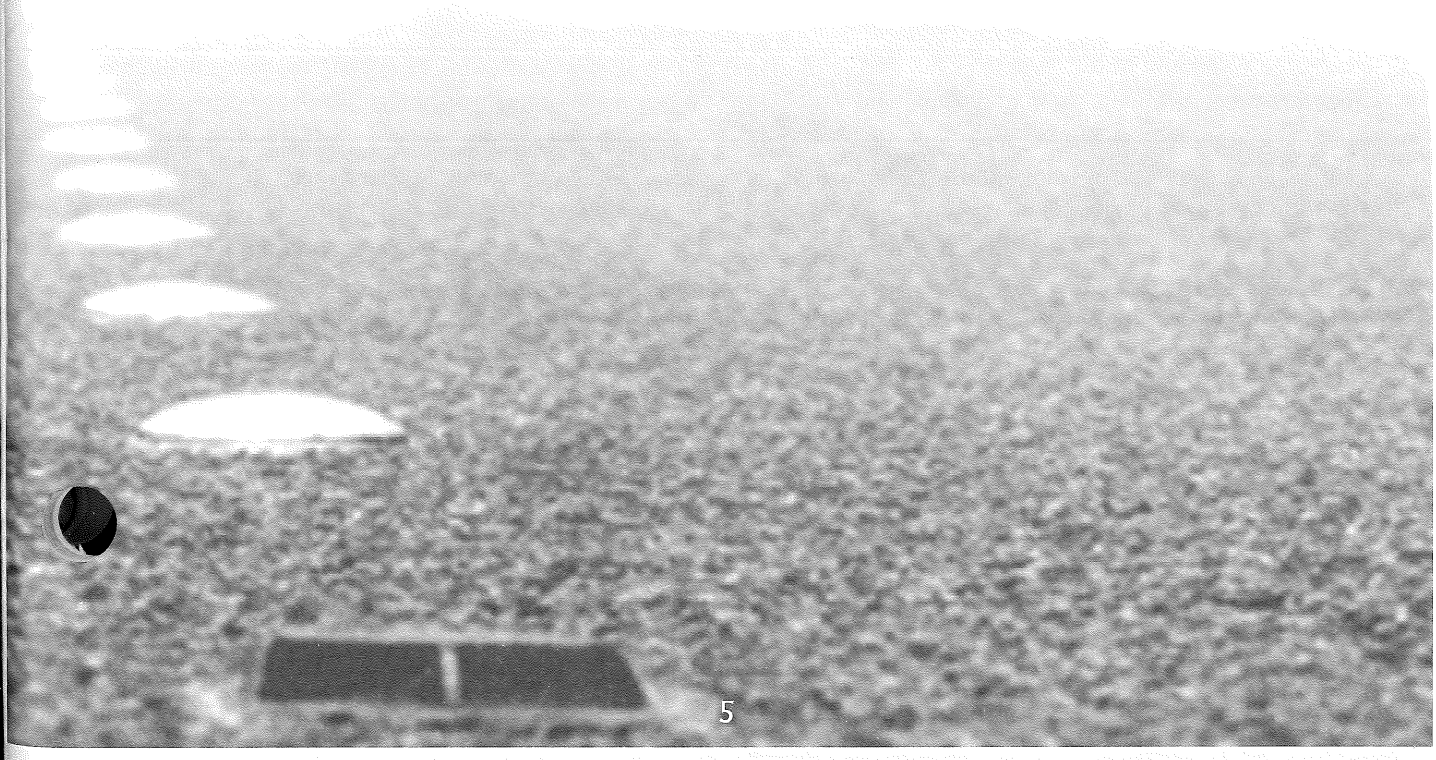
Still, the motor-fuels tax accounts for less than a third of total revenues, when all state- and local-road funding is considered. This weak price signal provides the traveling public with no economic incentive to moderate driving habits or lend support to additional road spending, Ryan points out. The lesson is not that road tax policy should be based solely on pay-as-you-go taxes, but that policymakers need strategies that keep road users in touch with the true cost of service. This true cost, often referred to as full-cost pricing, would cover more than the explicit government costs, and include the price of congestion, pollution, and other negative externalities.

ACCESS TO DESTINATIONS

CTS successfully competed for a grant from the University to plan and host a conference on "Access to Destinations: Rethinking the Transportation Future of Our Region" as part of the President's 21st Century Interdisciplinary Conference Series. The conference initiates an interdisciplinary research and outreach program by University faculty and researchers for Mn/DOT and the Metropolitan Council.

Like any good tax strategy, road taxes can be measured against three policy goals, Ryan concludes. First, taxes should promote efficient resource allocation, ensuring the best level of service at the lowest possible price. Second, tax burdens should be distributed fairly. Taxpayers need to be treated equitably not only across income strata, but also geographically, by mode of travel, and even across generations. Third, the tax system must have good management characteristics. It must be easily understood, balanced among potential sources, competitive with surrounding states, and capable of providing adequate revenues over the long run.

More information about Ryan's report, *Paying for Minnesota Roads: A Tax Policy Assessment*, is available online at www.lrrb.org/more.cfm?code=1902.



Automatic detection of accident-prone traffic conditions

Some stretches of highway are more hazardous than others. In the Twin Cities metro area, one of the most crash-prone areas is the "commons" where interstate highways 94 and 35W come together. To help prevent accidents there, traffic researchers have been studying why those crashes occur.

The Beholder system, created by the Intelligent Transportation Systems (ITS) Lab at CTS, is playing an integral role in helping two University researchers do just that. Civil engineering professor Panos Michalopoulos and research fellow John Hourdakis are working to develop a crash avoidance/prevention system for crash-prone freeway locations. Their first step was to study the reasons for and mechanics of crashes by recording them and extracting raw traffic-detector measurements.

The Beholder system is providing the team with real-time video and traffic measurements, allowing them to observe and verify the incident represented in the recorded measurements. The advantage of using the Beholder system, Hourdakis explains, "lies in the detail and resolution of the collected measurements. There is no other site in the world that [reliably and continuously] collects such information." For a stretch of highway that is more than a mile long, Beholder provides continuous individual vehicle speeds and headways around the clock.

So far, Michalopoulos and Hourdakis have collected enough information to get an idea of the year-round traffic conditions in the area and the variety of crashes that occur there, including data on approximately 150 crashes and 300 near misses. What they have found is that crashes are not entirely random but rather depend on the traffic and geometric characteristics of each location. Specifically, the team has learned that crashes in this location are frequently related to two things: the congestion shockwaves that propagate backwards from the merge area at the entrance ramp and further downstream, and the vast difference in driving speeds between the right and middle lanes, which makes changing lanes difficult and therefore dangerously distracting for drivers.

The current phase of research is reaching its conclusion, but the methods developed and lessons learned during the search for accident-prone conditions (APCs) on I-94 can be employed in research at other accident-prone locations. Along with the algorithms for APC detection, Michalopoulos and Hourdakis hope to produce a methodology for tuning the system to another crash-prone site study and to produce specific models for the I-94 location.

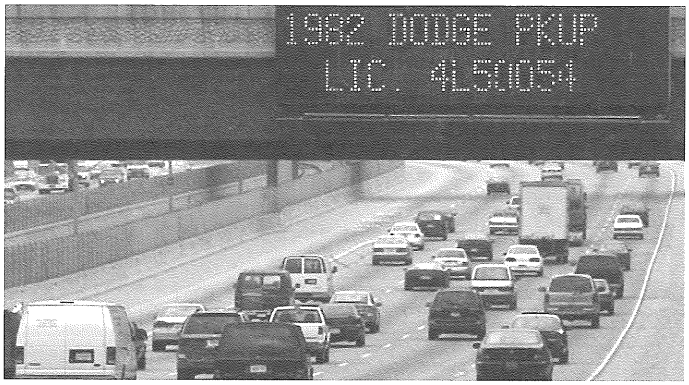
The next phase involves implementing designs where different alternatives for traffic calming and/or raising driver attention will be evaluated and prepared for deployment.

ITS INSTITUTE ANNUAL REPORT

Learn more about ITS research at the University of Minnesota from the 2004 ITS Institute annual report, available online at www.its.umn.edu.

Changeable message signs and traffic

Millions of motorists across the country rely on intelligent transportation systems for timely, accurate, and useful information to improve their commute. Changeable message signs (CMS)—also known as variable message signs and dynamic message signs—have long been used as one such ITS tool to provide motorists with real-time travel information in a wide range of applications.



Originally, these highly visible signs were intended to warn motorists about traffic tie-ups and weather conditions. But the Minnesota Department of Transportation (Mn/DOT) is considering other possible uses, including the presentation of promotional, safety, law enforcement, and travel-quality messages. As part of the nationwide program, CMS messages are also used in the Amber Alert System to flash emergency alerts to motorists when a child is abducted.

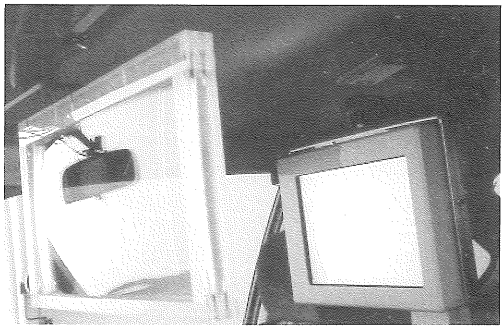
All of these possible traffic-related and non-traffic-related uses of CMS messages have provoked a number of issues about their effectiveness and the safety impacts they may have on traffic. Research associates Kathleen Harder and John Bloomfield, of the University's College of Architecture and Landscape Architecture, are attempting to answer several key questions Mn/DOT has raised regarding these issues.

Harder and Bloomfield recently conducted two back-to-back experiments in which they examined how drivers responded to traffic-related and non-traffic-related messages. Based on their findings, Harder and Bloomfield came up with a series of recommendations they believe will help increase the effectiveness of CMS messages, including Amber Alerts. First, the team suggests that the Minnesota Department of Public Safety increase its efforts to make the public more aware of the Amber Alert system. The researchers also recommend changing the content of the Amber Alert messages. Since the experiments show that it is particularly difficult for drivers to remember the license plate number flashed on a CMS, the Amber Alert messages should, instead, tell drivers to tune in to an appropriate radio station, whose call sign will be easier to remember. Then, when drivers tune in to that station, the full Amber Alert message, including the license plate number, should be repeated frequently. According to Harder and Bloomfield, this will greatly increase the likelihood that if a driver encounters the vehicle mentioned on the Amber Alert, he or she will be able to recognize it. This also will likely result in fewer slowdowns than occurred in the experiment.

More information about this research is available online at **www.research.dot.state.mn.us/detail.cfm?productID=1926**.

NORTH TO ALASKA

Head-up display (HUD) systems and vibrating seats developed by the Intelligent Transportation Systems (ITS) Institute's Intelligent Vehicles Laboratory were installed on one snowplow and one snowblower by the Alaska Department of Transportation in Valdez, Alaska.

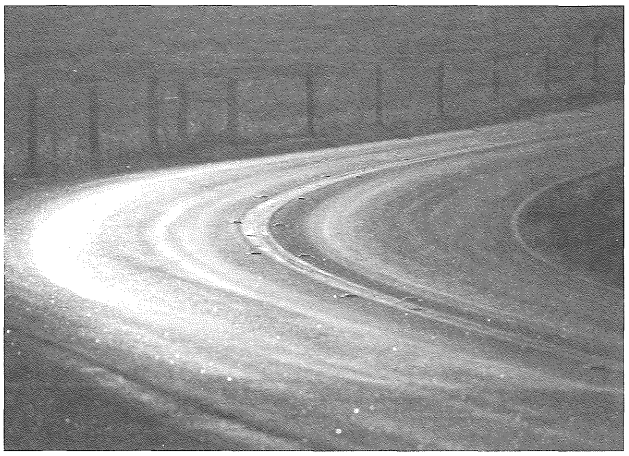


Low-volume roads go high-tech

Design and construction of asphalt pavements has been central to retiring civil engineering researcher Eugene Skok's work since he was a graduate student at the University in the '60s. During his 40-years-plus career, he has contributed to pavement management research on national and international levels with the publication of numerous research reports. But Skok's commitment to promoting practical, local applications of pavement research is best reflected in *Best Practices for the Design and Construction of Low Volume Roads*, a pavement-design manual for cities and counties. Skok, along with David H. Timm, Marcus L. Brown, and Timothy R. Clyne, authored the pavement reference guide, which was published by the Minnesota Local Road Research Board (LRRB).

The *Best Practices* manual includes best practice information on all aspects of asphalt construction including density, thickness, strength, stiffness, and surface smoothness. Also reviewed are material evaluation, construction procedures and specifications, and various methods of subgrade soil stabilization and reinforcement that have been used successfully in the state.

Best Practices gives an overview of the three methods of asphalt pavement design used in Minnesota, including Soil Factor and R-value, the methods traditionally used. A new procedure for thickness design, using an innovative new software program called MnPAVE, is also introduced. MnPAVE takes into account variables that could not be considered previously. For instance, climate, traffic, and material properties can be entered into the system,



which then calibrates the strength and expected life span of designs at various traffic levels. Road designers can choose among three input levels of MnPAVE, based on the amount and quality of data available. The software allows various combinations of materials of different thicknesses to be considered, and recommends the most cost-efficient pavement structural design that will protect the subgrade and support expected traffic loads and environmental conditions.

Data from MnROAD, the world's largest outdoor pavement management laboratory, and from 40-year-old test sections from around the state were incorporated into the MnPAVE program. The creation of MnPAVE was made possible through the combined efforts of the Minnesota Department of Transportation (Mn/DOT), the University of Minnesota, and LRRB.

Researchers are advising city and county agencies to use MnPAVE in conjunction with traditional design procedures. Moreover, because MnPAVE requires ongoing calibration and validation, researchers also are encouraging local practitioners to provide feedback on their MnPAVE project results, thereby continuing to add real-world data to the program and further refine the software program's design recommendations.

As a result of the knowledge gained from decades of hard work by University researchers such as Skok, local transportation practitioners throughout the state have been able to build better, more cost-efficient low-volume roads in Minnesota.

Best Pavement Design Practices for City Streets and County Roads workshop

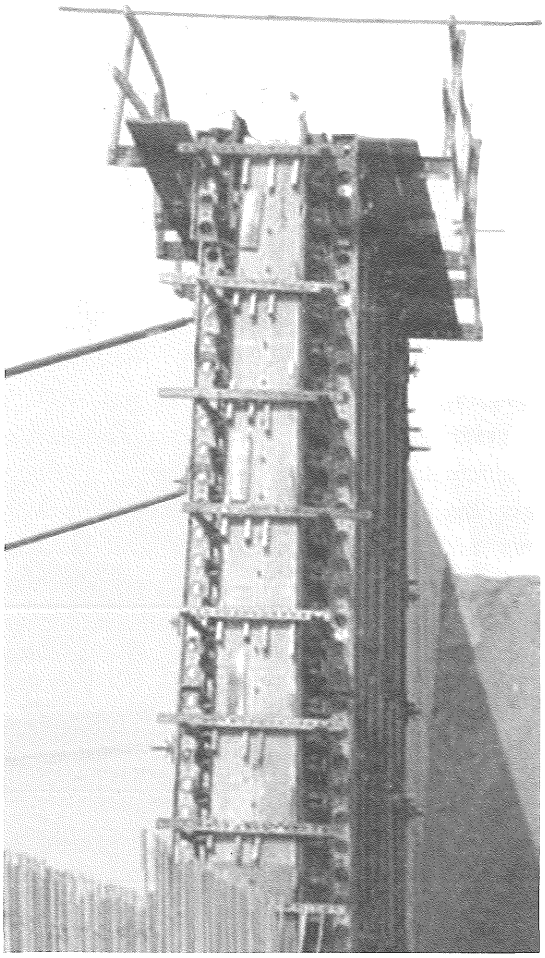
The Minnesota Local Technical Assistance Program (LTAP) offers a workshop for city and county transportation engineers to review the *Best Practices for the Design and Construction of Low Volume Roads* manual. The course is subsidized through funding by LRRB.

More information about the Best Pavement Design Practices for City Streets and County Roads workshop is available online at **www.mnltap.umn.edu/register/pavementdesign**.

If retaining walls could talk ...

One retaining wall along Interstate 494 is definitely not like the others. While the walls can serve a number of functions, including controlling erosion and reducing noise, a specially equipped retaining wall in Bloomington, Minnesota, is collecting data on the effects of earth pressure on structures. Information is continuously sent from the concrete cantilever wall to the University of Minnesota as part of a current research project.

University civil engineering professor Joseph Labuz, a specialist in geomechanics and holder of the Minnesota Surveyors and Engineers Society/Miles Kersten Land Grant Chair in Civil Engineering, and graduate student Joseph Bentler worked with the Minnesota Department of Transportation and its contractors during construction of the wall to outfit it with monitoring instruments. Several divisions of Mn/DOT were involved in the project. Highly sensitive earth-pressure cells, tiltmeters, inclinometers, strain gages, and temperature probes were built into the wall to collect data. These electrical sensing devices measure the soil pressure on the wall and monitor the tiny movements caused by this pressure. The results of the project are documented in the report *Earth Pressure Behind a Retaining Wall*, co-authored by Bentler and civil engineering associate professor Arturo Schultz.



A specially equipped retaining wall along I-494 continuously sends earth pressure data to the University of Minnesota.

The amount of earth pressure on a retaining structure depends on the physical properties of the soil, and is defined in relation to wall movement as at-rest, active, or passive. At-rest soil pressure implies no displacement between the soil and the wall. Active and passive pressures are caused by displacement between the soil and the wall, causing the soil to expand (active state) or contract (passive state).

One finding to date is sure to save Mn/DOT money by forestalling costly design changes that had been under consideration. Retaining walls in Minnesota are currently built according to design specifications set by the American Association of State Highway and Transportation Officials (AASHTO) in 1992, which assume active soil pressure, and have traditionally performed well. A proposed revision to these standards would have changed requirements to meet an at-rest soil pressure state, which had the potential to significantly increase the cost of retaining wall construction while providing no real safety benefits. Results have confirmed that the state's current protocol for retaining-wall design is reasonable, and a change in the process is unwarranted.

Through the ongoing project, which will continue to collect data for another year or so, researchers are gaining a better understanding of soil pressure against the wall and the wall's resistance mechanisms. Researchers hope to be able to make conclusions about seasonal changes in soil pressures with additional data. This will enable transportation researchers to look more closely at design assumptions and to refine construction specifications for the walls in highway settings.

Storm water detention ponds

Lakes are complex ecosystems, extremely sensitive to their physical environments. Urban lakes are especially vulnerable to contamination from storm water runoff containing pollutants washed from roadways. It has been estimated that 30 percent of surface water quality impairment can be attributed to storm water discharge. Automobile brakes, tires, fuels/oils, and deicing salts are among the contributors to runoff pollution.

Storm water detention ponds are designed for use in urban watersheds to mitigate the damaging effects of highway drainage, holding runoff for a time and releasing it after sufficient water quality standards are met. The ponds control storm water quantity and quality, performing a vital function in reducing the amount of pollution eventually making its way into our lakes.

A recent research project studied the mechanisms of sorption (pollutant removal by soils and sediments) and phytoremediation (pollutant removal by plants) at work in detention ponds. University civil engineering professor Miki Hondzo served as principal investigator for the project, which resulted in the recent publication of *Laboratory Measurements of Storm Water Quality Improvement in Detention Ponds*. Student Jeff Weiss focused his graduate work on the research. The researchers hoped to collect data to develop improved design and maintenance practices for water quality improvement in detention ponds.

Lead, zinc, copper, cadmium (heavy metals), phosphorus, and chloride are the storm water pollutants of primary concern in Minnesota. Lead, copper, and phosphorus largely settle to the bottom of the ponds through sedimentation, the primary pollutant removal mechanism of the ponds. Zinc, chloride, and cadmium in the runoff must be treated with chemical or biological means in the ponds for pollutant removal or reduction.

Detention ponds treat collected storm water with physical, biological, and chemical processes to remove contaminants. Runoff from each rain event is treated until it is displaced by the next storm.

The detention pond project laid the groundwork for a variety of field studies that could be performed to further refine the optimal design for the pools. The removal rates of the phytoremediation and sorption processes were incorporated into a numerical model to determine required detention times and percentage of plant cover for the ponds. The model will be used to develop detention pond design parameters to best meet water quality requirements set by the Minnesota Pollution Control Agency.

While storm water runoff will continue to wash away oil, grease, chemicals, metals, and litter from Minnesota's highways, the water quality of our lakes will be better protected by the design of detention ponds.

More information about this research is available online at www.lrrb.org/more.cfm?code=1928.

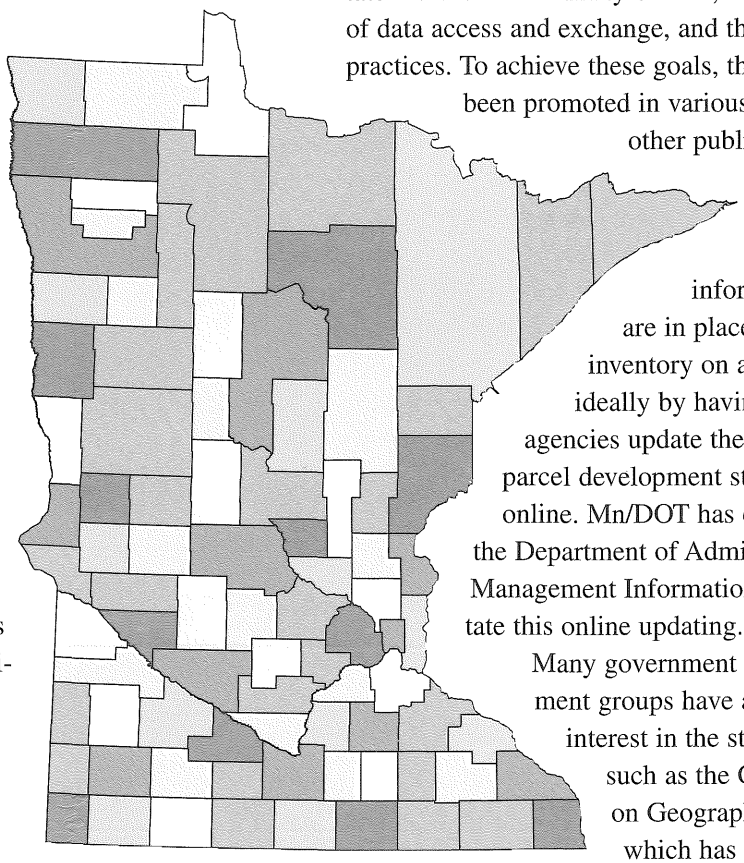
Mapping Minnesota

Throughout Minnesota, local governments, counties, and other agencies need data about land ownership to assist with road engineering work, tax assessment, zoning, environmental inventories, and a variety of other tasks. Having this information in the form of digital parcel maps is particularly useful because it supports faster updating, allows other data layers to be added, and facilitates GIS applications such as producing letters addressed to adjacent property owners.

Until recently, little was known about which counties and local governments in Minnesota had this digital parcel data, and even less was known about how accurate these maps were. However, a recent project led by William Craig of the University of Minnesota's Center for Urban and Regional Affairs (CURA) has virtually eliminated that problem.

The Statewide Digital Parcel Data Inventory Research Project is an ongoing effort to track which Minnesota counties maintain digital parcel data. The project team systematically identified existing parcel systems statewide, organized that data in a database that is accessible to all, and developed a plan for keeping the information current.

The extensive data was gathered by surveying counties across Minnesota on the extent and method of parcel data development, the frequency of maintenance, data development standards and distribution practices, key contacts for acquiring data, and more. Of the 86 counties in the state that responded to the survey, 54 are creating digital parcel maps. In well over half of those counties, parcel work is nearing completion. Most of the 32 non-digital counties are small and rural.



Of Minnesota's 87 counties, 54 are creating digital parcel maps.

In addition to reducing redundant efforts in parcel data development among state agencies, the inventory is intended to foster increased knowledge exchange and improved working relationships. The research team also hopes that the project will facilitate increased uniformity of data, improved methods of data access and exchange, and the sharing of best practices. To achieve these goals, the inventory has been promoted in various county, city, and other publications around the state. To ensure the continued accuracy of the information, plans are in place to update the inventory on an annual basis, ideally by having government agencies update their own digital parcel development status information online. Mn/DOT has contracted with the Department of Administration Land Management Information Center to facilitate this online updating.

Many government and non-government groups have already expressed interest in the study's findings, such as the Governor's Council on Geographic Information, which has a keen interest in parcel activities across the state but until now had no comprehensive inventory of current status. The inventory has helped them better understand the current situation, allowing them to direct their energies to other issues, such as standards.

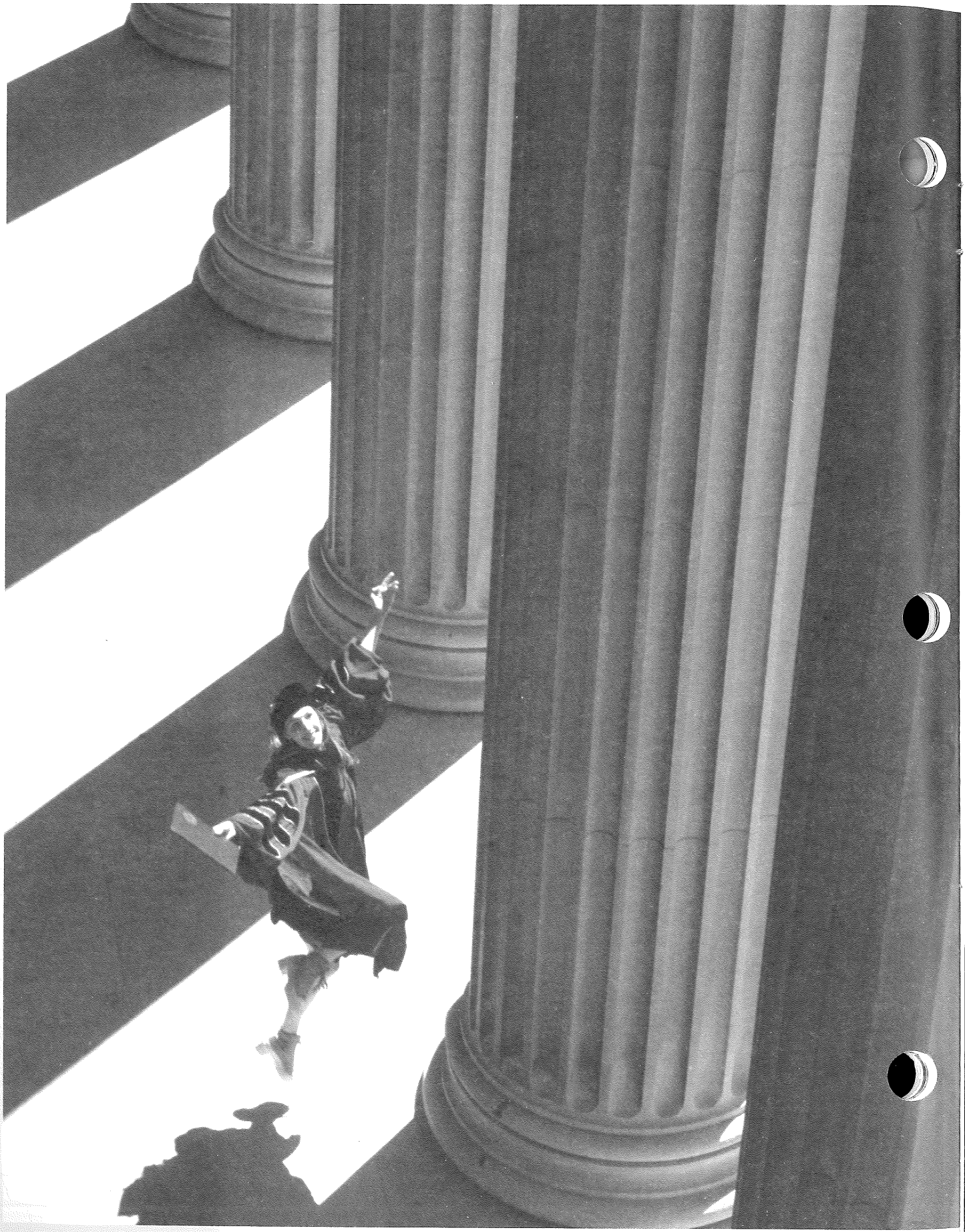
CTS rewarded the project team with the 2004 CTS Research Partnership Award in April 2004 (*see* page 24). CURA acted as the lead research organization for the project, which was sponsored by Mn/DOT and assisted by Pro-West & Associates.

More information and detailed survey results, including maps with summary data, are available online at rocky.dot.state.mn.us/SPMI/.

CTS AREA OF EXCELLENCE

FORMAL EDUCATION

Champion formal credentialed education initiatives by supporting the development of more University education programs in transportation-related areas



Graduate Certificate Program in Transportation Studies

Ten of the 22 students admitted into the Graduate Certificate Program in Transportation Studies have earned a certificate since CTS and the University of Minnesota Graduate School launched the program. In addition, semi-annual information sessions about the program consistently draw graduate students and professionals, including transportation planners, civil engineers, and public policy consultants.

John Adams (Geography), Gary Davis (Civil Engineering), Karen Donohue (Operations and Management Sciences), David Levinson (Civil Engineering), Kevin Krizek (Humphrey Institute), and Gerard McCullough (Applied Economics) served as faculty advisors for the program. Davis also serves as the certificate director of graduate studies.

The certificate program is intended for professionals in transportation-related fields as well as for students seeking a master's degree in a related discipline. By completing the flexible program requirements, participants will acquire advanced knowledge of the complex issues in transportation and gain a recognized professional credential.

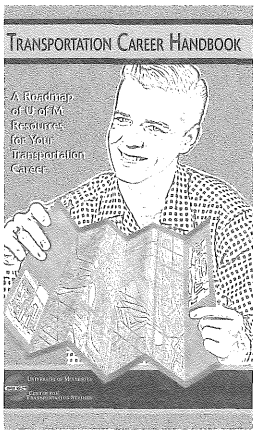
The certificate program is built around a core set of graduate-level courses in civil engineering, planning and public policy, and supply-chain management. Participants are required to complete two core courses (six-credit minimum), as well as a seminar in transportation technology. Participants also must select additional credits from a broad range of courses offered in numerous academic departments to round out a program requirement of 16 graduate-level credits.

Application materials and additional information about the Graduate Certificate Program is available online at www.cts.umn.edu/certificate.

Transportation Career Handbook

Even though the University does not offer a traditional degree in transportation, it does provide a number of opportunities for undergraduates, graduate students, and working professionals to obtain a multidisciplinary education in transportation. To help students connect their studies at the University of Minnesota to possible careers in transportation, CTS has published the *Transportation Career Handbook*.

The *Transportation Career Handbook* describes educational opportunities at the University in six categories: traffic engineering and analysis, planning and policy, vehicle design and engineering, structural and pavement engineering, management and logistics, and human and environmental factors. For those who have yet to decide on a career, the handbook includes a fun "roadmap" linking basic academic interests to possible transportation-related careers. An interactive version of this roadmap is available online.



Other features the handbook includes are listings of helpful CTS programs for students and professionals, details about the CTS Graduate Certificate in Transportation Studies, highlights of innovative transportation-related research programs at the University, and photographs of transportation from yesterday and today. Order a copy of the *Transportation Career Handbook* by contacting CTS or view it online at www.cts.umn.edu/careers.

CTS research seminars

During the 2003–2004 academic year, CTS continued to host research seminars to provide University researchers from a variety of disciplines an opportunity to share their findings. In a number of instances, research seminars were held in conjunction with meetings of the CTS Research Councils (Environment, Safety and Traffic Flow, Economy, and Infrastructure).

Fall semester presentations

"Building Our Way out of Congestion—Highway Capacity for the Twin Cities," Gary Davis and Kate Sanderson, Civil Engineering

"Mechanistic-Empirical 2002 Guide for Design of Minnesota Low-Volume Roads: The Future of Pavement Design is Here! (almost here)," Lev Khazanovich, Civil Engineering

"Accident Prevention Based on Automatic Detection of Accident Prone Traffic Conditions," John Hourdakis, Civil Engineering

"Commuter Rail, Density, and EcoSprawl," Lance Neckar, Landscape Architecture

"Attributes and Amenities of Highway Systems that are Important to Tourists," William Gartner, Applied Economics

Spring semester presentations

"Economic and Environmental Impacts of Closing the Minneapolis Upper Harbor," Jerry Fruin, Applied Economics

"Usage Patterns of Diesel and Fuel Oil in Minnesota: Considerations for Using Biodiesel to Reduce Emissions," Doug Tiffany, Applied Economics

"Earth Pressure Behind a Retaining Wall," Joe Labuz, Civil Engineering

Advanced transportation technologies seminars

During the 2003–2004 academic year, the Intelligent Transportation Systems (ITS) Institute, housed within CTS, continued its multidisciplinary seminar series at the University. These advanced transportation technologies seminars included a diverse set of presentations by local and national researchers addressing different areas of ITS research, such as traffic management and modeling, human factors, sensing, and intelligent vehicles as they relate to road- and transit-based transportation. The seminars are offered for credit and required as a course in the Graduate Certificate Program in Transportation Studies at the University of Minnesota. Seminars are videotaped and available for loan.

Fall semester presentations

"Evaluating GPS for Assessing Road User Charges," Pi-Ming Cheng, Mechanical Engineering

"ITS and Industry Clusters," Lee Munnich, Humphrey Institute of Public Affairs

"The Origins, Status, and Future of GPS," Bradford Parkinson, Stanford University, Aeronautics and Astronautics

"Inductive Loop Detector Signal Analysis," Stan Burns, UMD Electrical and Computer Engineering

"Integrated Multi-Sensor Navigation Systems," Demoz Gebre-Egziabher, Aerospace Engineering and Mechanics

"Adaptive Modulation for Bandwidth- and Power-Efficient Transmission Over Wireless Links," Mohamed-Slim Alouini, Electrical Engineering and Computer Science

"The Effectiveness and Safety of Traffic- and Non-Traffic-Related Messages Presented on Changeable Message Signs," Kathleen Harder, Architecture and Landscape Architecture

Transportation career expo

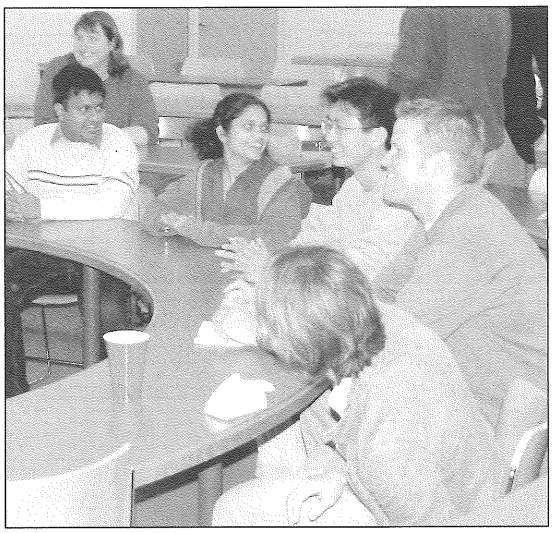
More than 100 students gathered at Coffman Memorial Union in March 2004 for the Ninth Annual Transportation Career Expo. The event provided students an opportunity to ask questions, receive seasoned advice, obtain feedback on their resumes, and network with employers. The 2004 expo was the largest to date, with 12 schools represented from three states, 22 exhibiting employers, and more students in more majors than ever before.

Employers promoted their organizations with booth displays, and transportation professionals led informational sessions on transportation-related careers in areas such as engineering, policy and planning, intelligent transportation systems (ITS), and logistics and supply-chain management. An opening interactive panel discussion covered the entire job-hunting process, from networking to resumes to interviews.

CTS offered the event in cooperation with the Minnesota Local Road Research Board, the Minnesota Local Technical Assistance Program, the Women's Transportation Seminar, and the ITS Institute.

Interdisciplinary Transportation Student Organization

Nearly 50 students, faculty, and professionals attended the inaugural meeting of the Interdisciplinary Transportation Student Organization (ITSO), which was held September 2003 at the University's Humphrey Center. By the conclusion of its inaugural year, ITSO membership topped 80 students.



ITSO (pronounced "it-so") was created with support from CTS by University of Minnesota students who are pursuing degrees in transportation-related fields. The group's main purpose is to connect with transportation professionals through monthly meetings and other events and learn about careers in transportation.

ITSO has affiliated itself with several professional organizations including the Minnesota Chapter of Women's Transportation Seminar (WTS Minnesota), the North Central Section of the Institute of Transportation Engineers (NCITE), and the Intelligent Transportation Society of Minnesota (ITS Minnesota).

Membership in ITSO is free. Students interested in becoming involved in this organization may visit the ITSO Web site at www.tc.umn.edu/~itso/.

Summer transportation programs

In July 2003, the ITS Institute partnered for the fourth year with the Fond du Lac Tribal and Community College to host the National Summer Transportation Institute, a program that emphasizes outreach to students from Minnesota's Native American communities.

The Summer Transportation Institute brought 15 students from several high schools in the Duluth area to the Twin Cities to learn about ITS-related research and technologies. The day included a presentation on the topic of ITS, discussion with Institute staff about careers in transportation, and tours of the Minnesota Department of Transportation's Traffic Management Center and TAXI 2000, a personal rapid transport development company.

The Institute also hosted 20 students from the University of Minnesota's Summer Explorations in Science, Engineering, and Mathematics (SESEM) Program. The group was introduced to the topic of ITS and given a tour of the ITS Laboratory, where they learned about the lab's facilities and current research at the Institute, including computer simulations and traffic control strategies.

By introducing high school students to advanced transportation research projects funded by the University Transportation Centers (UTC) program, the Institute hopes to encourage students to choose transportation- and technology-related educational fields when they enter college.

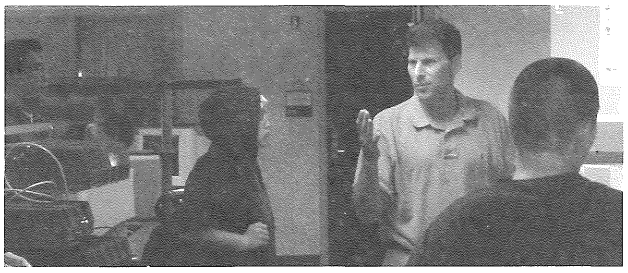
Web modules for high school students

Mark Tollefson, a local high school science teacher and the K-12 coordinator for the ITS Institute, continues to develop curriculum materials on ITS topics. Previously, he had developed a ramp metering Web module that gave high school students the opportunity to investigate ramp metering and its impact on travel. A CD-ROM containing the module and a poster explaining ITS were distributed to 160 high schools throughout Minnesota.

A Web module on Global Positioning Systems (GPS) has been completed and will also be distributed to area schools. Along with listing various Web sites about GPS, the curriculum includes quizzes that check students' learning progress. Tollefson is currently working on a new module on the topic of human factors.

Reaching students early with fun, hands-on activities is one way the Institute hopes to interest them in a career in transportation.

K-12 Web modules are available online at www.its.umn.edu/education/modules.html.



CTS Richard P. Braun Chair

As of December 2004, $335,000 of a target $500,000 has been raised in the effort to fund the CTS Richard P. Braun Chair in transportation engineering. CTS is collaborating with the University's Department of Civil Engineering to establish the new faculty chair.

Each gift to the fund will be matched twice to reach the goal of $1.5 million needed to permanently endow the chair. CTS will match dollar-for-dollar all private and industry contributions, using royalties from Autoscope, an invention in traffic detection technology developed by Professor Panos Michalopoulos. The Department of Civil Engineering will match contributions through a permanent commitment of annual department funds to support the position.

The chair is a leadership position that will build on the legacy begun by Professor Matthew Huber and will foster innovation in the academic program in transportation engineering for the Department of Civil Engineering. The position will develop new educational programs, as well as oversee research and teaching activities in transportation engineering.

Awards, scholarships, and employment

Matthew J. Huber Award for Excellence in Transportation Research and Education

Named in honor of the late Professor Matthew J. Huber, in recognition of his contribution to the teaching and study of transportation at the University of Minnesota

Yufeng Guo, graduate student
Area of study: Master of Urban and Regional Planning (Humphrey Institute of Public Affairs)
Faculty: Richard Bolan

Eray Baran, Ph.D. student
Area of study: Civil Engineering
Faculty: Catherine French, Carol Shield, and Arturo Schultz

ITS Institute 2003 Outstanding Student of the Year Award

A U.S. Department of Transportation honor awarded to an outstanding student from each university transportation center at the annual Transportation Reseach Board meeting in Washington, D.C.

Katherine (Kate) Sanderson, Ph.D. student
Area of study: Civil Engineering
Faculty: Gary A. Davis

ITS Minnesota 2004 Student Awards Competition

Awards of $1,250 to a graduate student and $750 to an undergraduate based on ITS-related work, and may comprise a paper, project, or research work done by the student

Xi Zou, graduate student
Area of study: Civil Engineering

Jeffrey Sharkey, undergraduate student
Area of study: Computer Science (UMD)

CTS HELPS FUND STUDENTS

The Center demonstrated its support of formal education in transportation by awarding ITS Institute and CTS scholarships totaling more than $20,000 to University students for student honors and professional conference participation.

Doctoral Dissertation Fellowship

Given to outstanding final-year Ph.D. candidates at the University so they may complete their dissertation within the upcoming academic year by devoting full-time effort to research and writing

Pavan Kumar Vitthaladevuni, Ph.D. student
Area of study: Electrical Engineering
Faculty: Mohamed-Slim Alouini

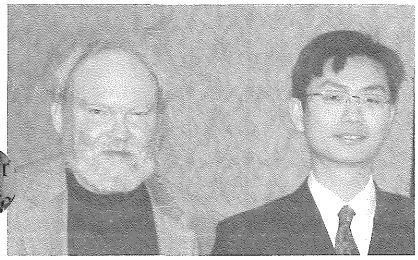
Council of Logistics Management Twin Cities Roundtable scholarship

Award of a $2,000 scholarship from the Council of Logistics Management (CLM) Twin Cities Roundtable

Jeff Dickman, undergraduate student
Area of study: Supply-Chain Management and Marketing

CTS also offers:

- Graduate assistantships and undergraduate scholarships to University transportation students
- Expense reimbursement scholarships for University student attendance at the annual TRB and ITS America conferences
- Help matching University students with possible job opportunities in transportation-related organizations (via newsletter, Web site, and events)
- Student internships in CTS research, education, and outreach programs



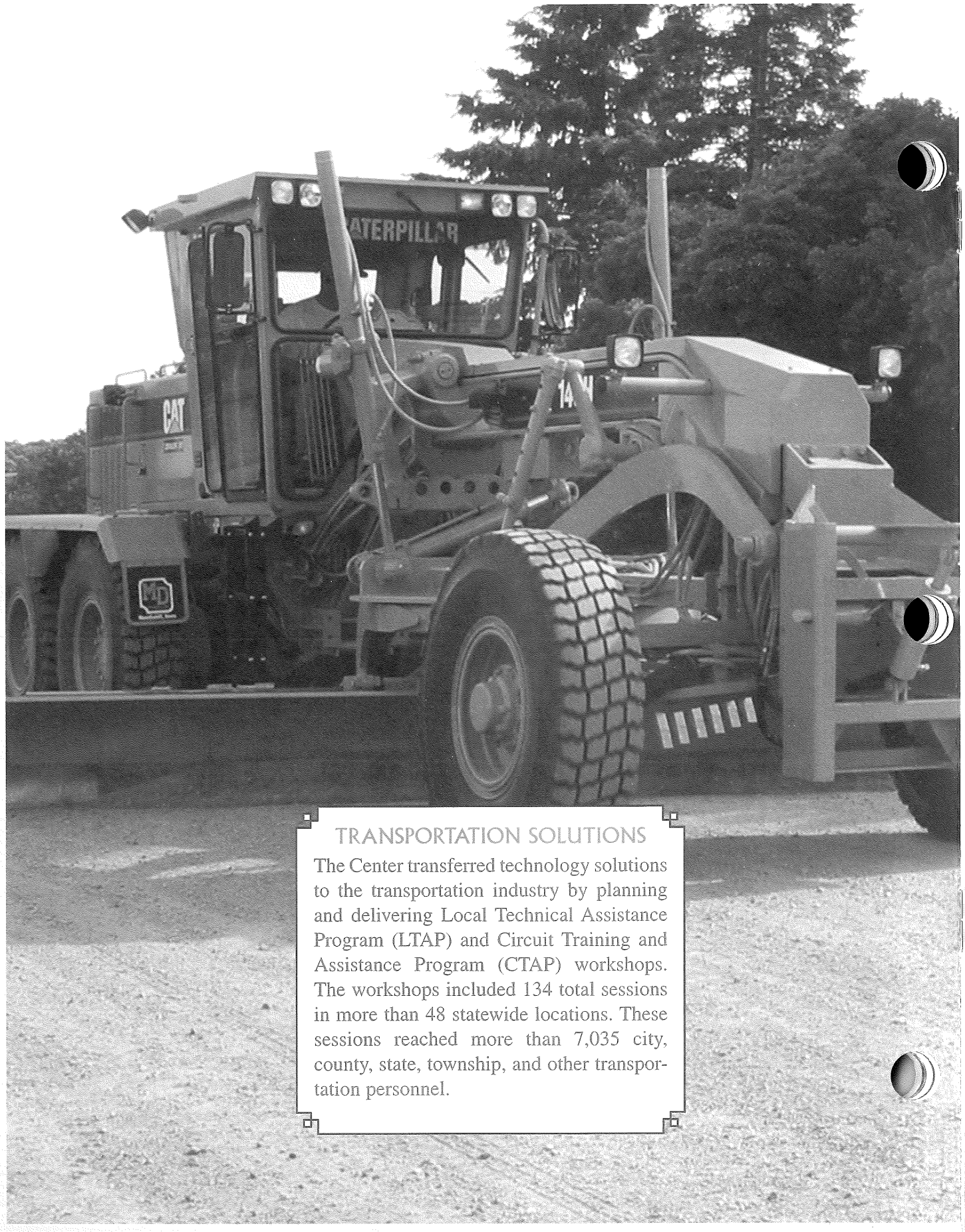
Richard Bolan with Yufeng Guo

Carol Shield with Eray Baran

Gary Davis with Kate Sanderson

APPLIED PROBLEM-SOLVING

Facilitate the implementation of research results and best practices



TRANSPORTATION SOLUTIONS

The Center transferred technology solutions to the transportation industry by planning and delivering Local Technical Assistance Program (LTAP) and Circuit Training and Assistance Program (CTAP) workshops. The workshops included 134 total sessions in more than 48 statewide locations. These sessions reached more than 7,035 city, county, state, township, and other transportation personnel.

Minnesota Local Technical Assistance Program

The Minnesota Local Technical Assistance Program, housed at CTS, is part of a network of 58 centers nationwide funded by the Federal Highway Administration's Local Technical Assistance Program, better known as LTAP. Minnesota LTAP also receives funding from the Minnesota Local Road Research Board (LRRB) and the Minnesota Department of Transportation (Mn/DOT).

Minnesota LTAP offers a statewide workshop program and partners with other organizations to cosponsor events. LTAP offered the following workshops in FY2004:

- Gravel Road Maintenance and Design
- Bridge Maintenance
- Context-Sensitive Design for Local Governments
- Design, Construction, and Maintenance of Storm Water Basins and Erosion Control
- Asphalt Pavement Maintenance and Preservation
- Reducing Risk and Liability
- Design and Maintenance Considerations for Erosion Control on Local Roads
- Advanced Automotive Training in Electricity
- Hydraulic Testing and Troubleshooting
- Minnesota MUTCD Training
- Motor Grader Operator Training

Minnesota LTAP cosponsored the following events:

- Ninth Annual Transportation Career Expo
- Eighth Annual Minnesota Pavement Conference
- Spring and Fall State Maintenance expos
- Context-Sensitive Design (Mn/DOT) workshop
- APWA "Click, Listen, and Learn" online courses
- Work-Zone Traffic-Control workshop
- Traffic Engineering Fundamentals workshop
- Truck-Weight Compliance Training

In a new effort, Minnesota LTAP, in cooperation with Mn/DOT and Northland Community College, delivered an education program on truck-weight transportation issues. Minnesota Truck-Weight Compliance Training educated 750 industry freight shippers, carriers, and public agency personnel on the proper application of Minnesota commercial-vehicle weight laws and enforcement policies. The objective of the training is to maximize hauling capacity within legal limits and to promote voluntary compliance in reducing damage to public roads and highways.

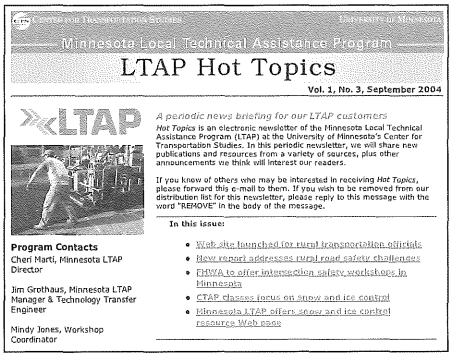
County engineers in Minnesota are adopting design practices from the University-generated manual, *Best Practices for Design and Construction of Low Volume Roads*, which documents findings from Eugene Skok's research on this topic (*for more, see* page 8). Minnesota LTAP is offering the Best Pavement Design Practices workshop, subsidized through LRRB funding, for city and county transportation engineers to review the manual.

More information about Minnesota LTAP is available online at: **www.mnltap.umn.edu**.

Minnesota LTAP *Hot Topics* electronic newsletter

In February 2004, Minnesota LTAP launched a new electronic newsletter, *Hot Topics*. The periodic newsletter shares recent publications and resources from a variety of organizations, plus other announcements of interest to LTAP readers.

So far, approximately 1,300 copies of *Hot Topics* are distributed by e-mail. More information about *Hot Topics*, including a subscription order form and back issues, is available online at **www.mnltap.umn.edu**.


Minnesota Local Technical Assistance Program

LTAP Hot Topics

Vol. 1, No. 3, September 2004

LTAP

A periodic news briefing for our LTAP customers

Hot Topics is an electronic newsletter of the Minnesota Local Technical Assistance Program (LTAP) at the University of Minnesota's Center for Transportation Studies. In this periodic newsletter, we will share new publications and resources from a variety of sources, plus other announcements we think will interest our readers.

If you knew of others who may be interested in receiving *Hot Topics*, please forward this e-mail to them. If you wish to be removed from our distribution list for this newsletter, please reply to this message with the word "REMOVE" in the body of the message.

Program Contacts

Cheri Marti, Minnesota LTAP Director

Jim Grothaus, Minnesota LTAP Manager & Technology Transfer Engineer

Mindy Jones, Workshop Coordinator

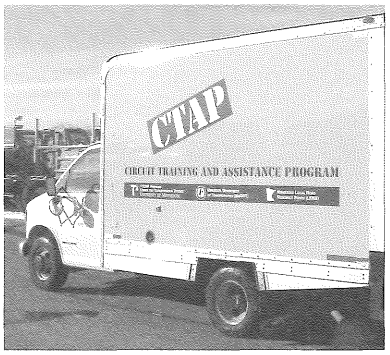
In this issue:

- Web site launched for rural transportation officials
- New report addresses rural road safety challenges
- FHWA to offer intersection safety workshops in Minnesota
- CTAP classes focus on snow and ice control
- Minnesota LTAP offers snow and ice control resource Web page

Circuit Training and Assistance Program

CTAP, or the Circuit Training and Assistance Program, is a mobile outreach effort providing training, technical assistance, and technology transfer to city, county, state, and related personnel. Workshops may be scheduled for a range of topics upon request.

During FY04, CTAP instructor Kathy Schaefer, a former maintenance supervisor with Mn/DOT, conducted training sessions for 2,857 employees from cities, townships, counties, and the state. During those presentations, she discussed the adverse environmental effects to our air, water, soil, and vegetation by the different anti-deicing materials used including sand, salt, magnesium chloride, and calcium chloride.



CTAP is sponsored by Minnesota LTAP, Mn/DOT's Maintenance Research and Operations Office, and the Minnesota Local Road Research Board. More information about CTAP is available online at www.mnltap.umn.edu/ctap.

Local Operational Research Assistance (OPERA) Program

In fall 2003, the Minnesota Local Road Research Board (LRRB) established a new program to promote and fund applied research. The Local Operational Research Assistance (OPERA) Program assists in developing innovations relating to methods, materials, and equipment used in the construction and maintenance operations of local government transportation organizations.

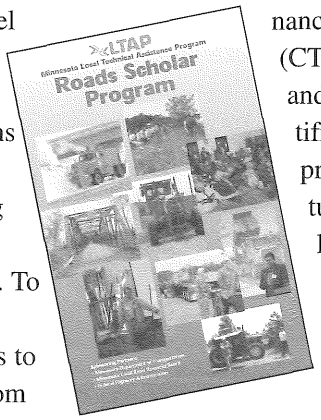
The Local OPERA Program encourages maintenance employees to get involved in research by promoting operational or "hands-on" research. The main goal of OPERA is to create a safer, easier, and more efficient environment for the maintenance operations worker and to provide a safe, efficient, and environmentally sound transportation network.

OPERA funds projects up to $10,000. Selections are made by an LRRB-appointed committee monthly or as projects are submitted. An annual report describing funded projects will also be published.

Minnesota LTAP administers the Local OPERA Program for LRRB. More information is available online at www.mnltap.umn.edu/opera.

Roads Scholar Program

Minnesota LTAP launched a new certificate program, the LTAP *Roads Scholar Program*, designed for local and state agency maintenance personnel who are committed to learning new skills and expanding their knowledge in the latest road and bridge innovations and best practices. The program combines Minnesota LTAP's many training options into a structured curriculum of half-day and one-day training sessions. To date, 150 students have enrolled.



Participants must earn eight credits to complete the program: three credits from required LTAP workshops and five elective credits from a combination of LTAP workshops, maintenance expos, and Circuit Training and Assistance (CTAP) workshops. There is no enrollment fee, and students have five years to complete the certificate. Graduates will be recognized through a press release to their local newspapers and featured in the Minnesota LTAP *Exchange* newsletter and on the Minnesota LTAP Web site.

More information about the LTAP Roads Scholar Program is available online at www.mnltap.umn.edu.

State maintenance expos

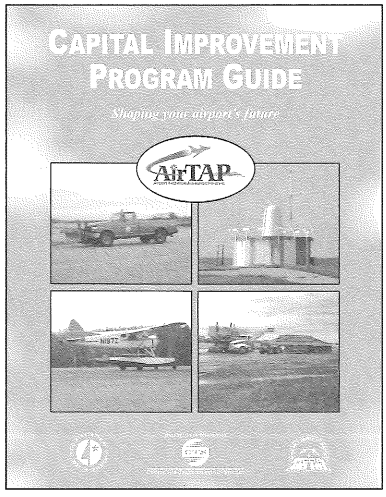
Minnesota LTAP partners with Mn/DOT, the Minnesota Local Road Research Board (LRRB), the Minnesota Public Works Association, and the Minnesota Street Superintendents Association to hold annual spring and fall maintenance research expos. These events allow transportation professionals, especially those in the maintenance area, to exchange ideas and information; learn about new technologies, practices, and materials; and improve communications within the workplace. Also included are half-day outdoor equipment demonstrations and indoor equipment displays of exhibitors' technology.

The fall 2003 expo, held October 1–2 in St. Cloud, attracted approximately 1,300 attendees from state, county, city, and township governments. The fall expo emphasized snowplow operation and heavy equipment operation, with much of it related to safety. The spring maintenance training expo drew more than 550 attendees April 27–28, 2004, also in St. Cloud. The spring expo included sessions about rural road safety, the Twin Cities light-rail transit project, pesticide application, erosion control, and wildlife control.

AirTAP

AirTAP—the Airport Technical Assistance Program—is a statewide assistance program for aviation personnel that offers practical instruction by knowledgeable, experienced trainers and also provides a range of helpful information, materials, and resources.

The program continued to publish *Briefings*, a quarterly one-page insert for the Minnesota Council of Airports (MCOA) newsletter, as well as workshop and training session highlights. Specifically, AirTAP developed and distributed summaries of two workshops: *Asphalt, Concrete, and Turf Maintenance and Preservation* and *Snow and Ice Control.*



AirTAP recently published the *Capital Improvement Program (CIP) Guide* to help public airport personnel complete their CIP information in order to receive state and federal funding for improvements. The guide can also help airport owners plan for the short- and long-term needs of their airports. The guide was delivered to airports around the state and is available on the AirTAP Web site.

A new addition to the AirTAP Web site is a collection of "current practices." Culled from airport personnel throughout the state, these are methods, processes, or innovative uses of resources that save time, reduce costs, or improve performance in airport operations.

AirTAP is sponsored by the Mn/DOT Office of Aeronautics, in partnership with CTS and the Minnesota Council of Airports.

Electronic versions of all AirTAP publications may be downloaded from the AirTAP Web site along with other useful information and resources at www.airtap.umn.edu.

CTS AREA OF EXCELLENCE

PUBLIC AND STAKEHOLDER PARTICIPATION

Serve as a catalyst for focusing the public debate on transportation-related issues while maintaining the role of an objective neutral facilitator

INFORMING PUBLIC DEBATE

The 2004 Oberstar Forum brought state and national leaders together to discuss the challenges and opportunities facing transportation in rural America. The Oberstar Forum is just one of many CTS events aimed at informing public debate.

2004 Annual Transportation Research Conference

In May 2004, CTS held the 15th Annual Transportation Research Conference in St. Paul. The event focused on cutting-edge alternatives in the areas of mobility, finance, and technology. Highlights include:

- Professor John B. Heywood, director of the Sloan Automotive Laboratory at the Massachusetts Institute of Technology, said that the global demand for petroleum is projected to grow rapidly in coming years while production of the finite resource begins an inevitable decline. But he proposed that new technologies—combined with regulatory and behavioral changes—offer promise if action is taken now. He presented his ideas in the opening session of the conference in a speech titled "On the Road in 2030: Technologies for More Sustainable Transportation."
- Professor Alfred Marcus of the U's Carlson School of Management and Eivind Stenersen of Donaldson Company joined Heywood in a panel discussion about the future of oil.
- A luncheon presentation titled "An Unseen (or Quiet) Revolution in Transportation Finance," by Professor Martin Wachs of the University of California at Berkeley, described shifting finance options from fuel taxes to local measures and tolls. (*For more about Wach's presentation, see* page 25.)
- Nearly two dozen concurrent sessions included such topics as intersection safety, Minnesota road taxes, telework and e-shopping, pavement design, transit-oriented development, air quality and alternative fuels, freight, corridor development, transportation needs of diverse populations, and futuristic transit options.

More about the 2004 Transportation Research Conference is available online at www.cts.umn.edu/news/report/2004/06.

John B. Heywood

Alfred Marcus

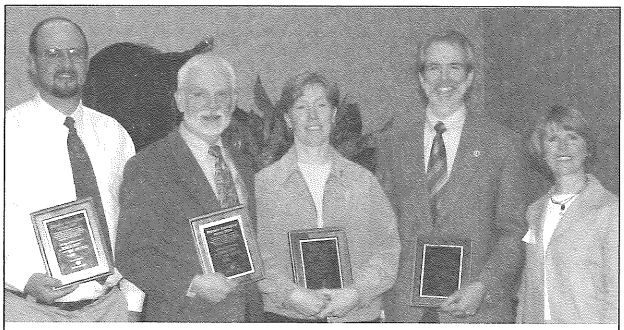
Eivind Stenersen

CTS annual meeting and awards luncheon

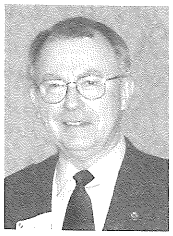
CTS staff and committee members presented annual awards to recognize significant contributions to the field of transportation.

CTS Research Partnership Award: "GIS Parcel Map Inventory"

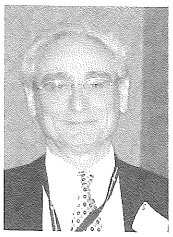
In the project, University researchers joined practitioners from several agencies to systematically collect information about parcel data statewide and put it into a database accessible to all. As a result, Mn/DOT and other state agencies can easily determine whom to contact for critical parcel information. (*For more about the project, see* page 11.)



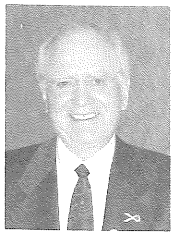
(*From left*) Project partners Jim Aamot (Mn/DOT), Will Craig (CURA), Annette Theroux (ProWest and Assoc.), and Jim Krafthefer (Mn/DOT), with CTS associate director Laurie McGinnis. *Not pictured: Rick Morey (Mn/DOT)*



Richard P. Braun Distinguished Service Award: John S. Adams, professor and chair of the Department of Geography and a faculty member at the Humphrey Institute of Public Affairs



Ray L. Lappegaard Distinguished Service Award: Natalio Diaz, director of Metropolitan Transportation Services, a division of the Metropolitan Council



William K. Smith Distinguished Service Award: Howard Gochberg, faculty member in logistics and supply chain management at Metropolitan State University

Distinguished Public Leadership Award: Bernie L. Lieder, a 20-year member of the Minnesota House of Representatives and retired county engineer

Oberstar Forum on Transportation Policy and Technology

James L. Oberstar

Regional and national transportation officials, policymakers, and professionals joined U.S. Rep. James L. Oberstar on March 14–15 to discuss the challenges and opportunities facing transportation in rural America. This was the third meeting of the transportation policy and technology forum named after Oberstar, and the first held at the University of Minnesota Duluth campus. This year's forum was co-hosted by the Northland Advanced Transportation Systems Research Laboratory and CTS.

Oberstar headlined the two-day event, which featured USDOT assistant secretary for transportation policy Emil Frankel. USDOT deputy administrator Sam Bonasso (Research and Special Programs Administration) and associate administrators Rose McMurray (Federal Motor Carrier Safety Administration) and A. George Ostensen (Federal Highway Administration) also participated along with many other state and national leaders. A panel of top transportation executives shared industry insights and took questions from the audience.

Emil Frankel

More information about this and previous Oberstar forums is available online at www.cts.umn.edu/oberstarforum.

CTS luncheon presentations

The Center's luncheon presentations provide a setting for transportation professionals, faculty, and students to interact as they listen to presentations of national issues. The spring luncheon is held in conjunction with the annual CTS transportation research conference.

Fall luncheon

At the CTS fall luncheon in October 2003, Brian Taylor, an associate professor and vice chair of urban planning at the University of California Los Angeles, proposed that a congested road system isn't a sign of failure—it's simply an inevitable byproduct of vibrant, successful cities. Taylor challenged what he called conventional planning wisdom with a number of propositions. Taylor also examined the reasons for so much hostility toward long-term solutions of congestion.

Brian Taylor

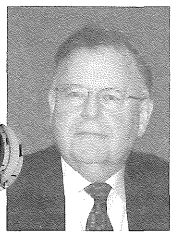
Winter luncheon

At the CTS winter luncheon in February 2004, Allan F. Williams, chief scientist at the Insurance Institute for Highway Safety (IIHS), described a widening gap between the motor-vehicle fatality rate in the United States and other countries in his speech titled "A National Perspective on Current Highway Safety Issues."

Allan F. Williams

Spring luncheon

At the spring luncheon in May 2004, University of California at Berkeley professor Martin Wachs told attendees that the nature of transportation finance is changing fundamentally and on a large scale, but the change is happening gradually and without much notice or broad discussion. In his speech titled "An Unseen (or Quiet) Revolution in Transportation Finance," Wachs explained that there has been shifting away from a historical reliance on user taxes toward a new dependence on a variety of local taxes.



Martin Wachs

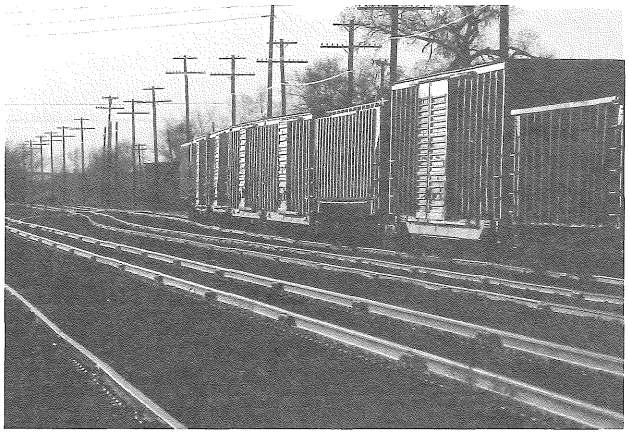
Freight and Logistics Symposium

Freight and logistics professionals, researchers, and policymakers discussed conflicts between freight-oriented industries and communities over land use, jobs, and traffic, as well as the latest news on national transportation funding reauthorization efforts, at the Seventh Annual Freight and Logistics Symposium, hosted by CTS in December 2003.

The symposium's three main sessions included a panel discussion on leading-edge trends, a panel discussion on the implications of community-integrated logistics for Minnesota, and an update on federal initiatives and legislation.

CTS sponsored the event in cooperation with the Minnesota Department of Transportation (Mn/DOT), the Minnesota Freight Advisory Committee, the Council of Logistics Management, and the Twin Cities Metropolitan Council.

A summary report detailing the entire event is available online at **www.cts.umn.edu/publications/proceedings**.



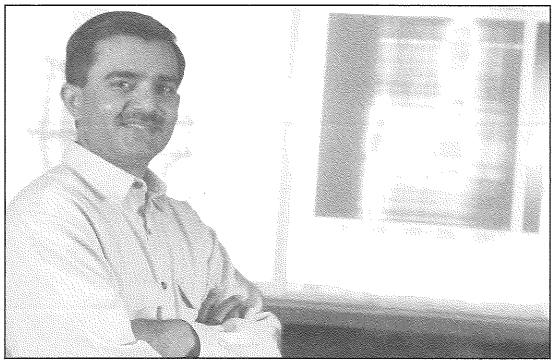
POLICY LEADERS SEMINAR

An inaugural Transportation Seminar for Policy Leaders was cosponsored by CTS and the Humphrey Institute's State and Local Policy Program. Approximately 30 local, regional, and state decision makers participated in the seminar that featured presentations by University faculty and researchers and moderated discussions.

Transportation seminar for policy leaders

State legislators, county commissioners, and other elected and appointed officials attended a one-day transportation seminar for policy leaders in January 2004. The seminar, sponsored by CTS and the Humphrey Institute's State and Local Policy Program, provided an overview of transportation trends and an opportunity to discuss policy implications with University and industry experts.

Topics discussed at the seminar's four sessions included transportation systems and trends, technological developments, transportation finance, and transportation governance. Geography professor John Adams, ITS Institute director and mechanical engineering professor Max Donath, Humphrey Institute State and Local Policy Program director Lee Munnich, Center for Urban and Regional Affairs director Tom Scott, and CTS director Robert Johns led the sessions. Barbara Lukermann, a senior fellow with the Humphrey Institute, moderated the event.



In February 2004, University computer science and engineering professor Shashi Shekhar presented his research on evacuation planning at a congressional breakfast on homeland security in Washington, D.C.

Transportation finance roundtables

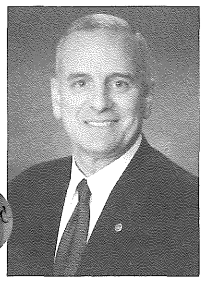
CTS and the Humphrey Institute of Public Affairs held three roundtables during the year to discuss transportation finance. The roundtable series is intended to stimulate open discussion among transportation leaders about a wide variety of transportation viewpoints.

Funding transportation

U.S. Rep. James Oberstar, the ranking Democrat on the House Committee on Transportation and Infrastructure, shared his views at a November 2003 event about how transportation should be funded. Oberstar believes highway and transit needs far exceed current proposals by the Bush administration. To come up with additional funds, Oberstar proposed drawing down on the balance in the Highway Trust Fund, restoring interest to the Highway Trust Fund, eliminating user fee (gas tax) evasion by tightening up collection procedures, directing all revenues from existing gasohol user fees to the trust fund, and indexing motor-fuel taxes to inflation. Oberstar also stressed the need to "look over the horizon" to find sustainable finance mechanisms for the future.

Highway construction

In March 2004, U.S. Sen. Mark Dayton addressed the roundtable, declaring that it is imperative to develop a large-scale, statewide solution to our transportation problems—not just to improve mobility, but also to help restore public faith in government. The main problem, Dayton said, is that the state hasn't had enough money to keep


Mark Dayton

pace with increased project costs and increasing needs for repairs, upgrades, and expansions. Without making significant changes very soon, conditions are guaranteed to worsen, Dayton pointed out. He called for more highway construction projects—two or possibly three times more than at present—over the next 10 to 20 years. To achieve those goals, Dayton proposed a five-point financing plan, which includes increasing federal funding significantly, decoupling the funding level from the Highway Trust Fund, increasing state spending for highway construction projects, aggressively using highway construction bonds in Minnesota, and establishing a Minnesota highway construction authority.

Congestion pricing

Last, experts from three high-occupancy toll (HOT) lane sites gathered in Minneapolis in April 2004 to share their evaluation findings and help inform Minnesota's approach to I-394. John Berg, former team leader with the Federal Highway Administration's Congestion Pricing Pilot Program and Value Pricing Pilot Program, set the framework for the event, noting that officials here and in other cities will be following what is done in Minnesota. Berg was followed by presentations from three evaluators of existing HOT lanes: SR 91 in Orange County, California, I-15 in San Diego, and I-10 and US-290 in Houston.

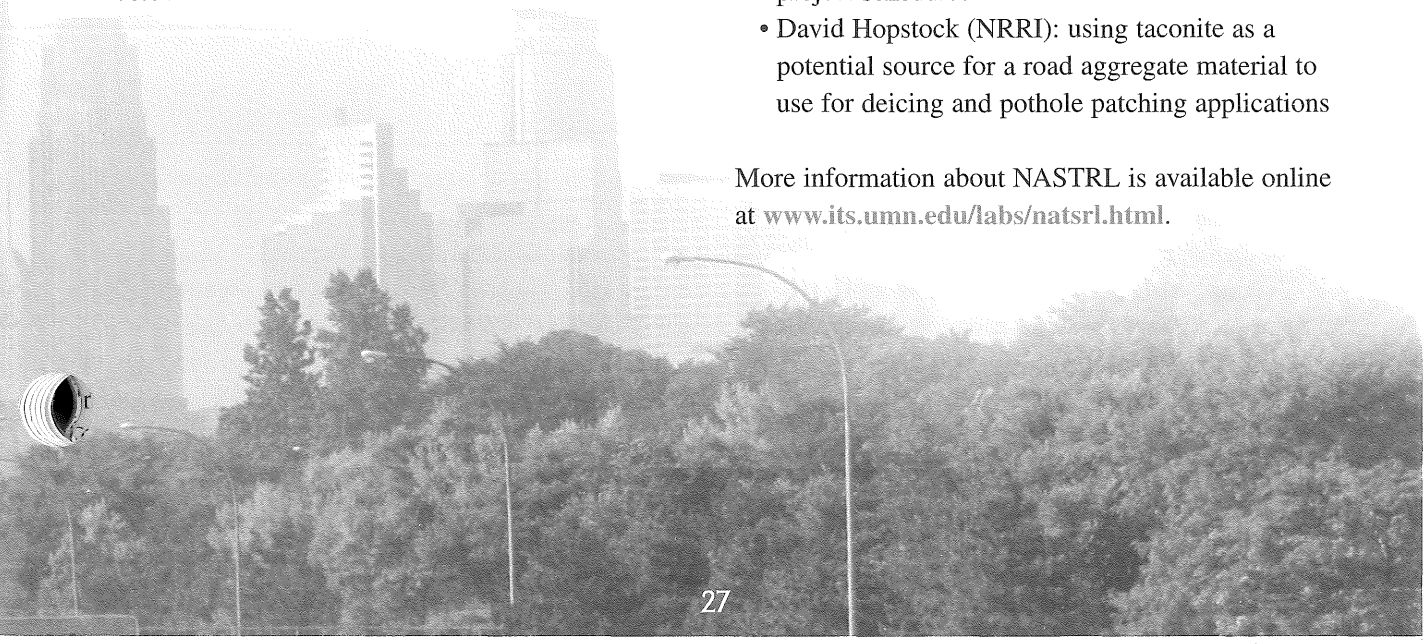
NASTRL annual research event

In November 2003, the Northland Advanced Transportation Systems Research Laboratories (NATSRL) held its second annual research day at Mn/DOT District 1 Headquarters in Duluth. A large crowd of faculty, students, transportation engineers, and others attended the day-long event. NATSRL, located at the University of Minnesota Duluth, is a program of UMD and the Intelligent Transportation Systems (ITS) Institute at CTS.

Project teams presented detailed updates on their research efforts, including:

- Martha Wilson (UMD Mechanical and Industrial Engineering): snowplow modeling
- Taek Kwon (UMD Electrical and Computer Engineering): archiving data from Mn/DOT's road sensors and developing programs to efficiently access and share the data
- Brian Brashaw (UMD's Natural Resources Research Institute (NRRI)): non-intrusive means of performing inspections on timber bridges, in use across rural areas in both Minnesota and Wisconsin
- Mohammed Hasan and Fernando Rios-Gutierrez (UMD Electrical and Computer Engineering): analysis of a sensor in surveying and detecting pavement conditions when ice/snow is present
- Ryan Rosandich (UMD Mechanical and Industrial Engineering): a model to evaluate and quantify the risk in transportation construction project schedules
- David Hopstock (NRRI): using taconite as a potential source for a road aggregate material to use for deicing and pothole patching applications

More information about NASTRL is available online at **www.its.umn.edu/labs/natsrl.html**.



Community-based transportation conference

In October 2003, CTS hosted the second Conference on Community-Based Transportation, an event that brought together participants from regional human service agencies, government, private industry, and the University of Minnesota to discuss issues related to community-based transportation (CBT) and to share ideas for improving CBT options. CBT typically refers to transportation that is provided by means other than mainline buses or private vehicles, for people who cannot drive or do not have access to vehicles.

The CBT conference was sponsored by CTS, the State and Local Policy Program at the Humphrey Institute, and Hennepin County Transit and Community Works.

A summary report detailing the entire event is available online at **www.cts.umn.edu /publications/proceedings**.

Minnesota Pavement Conference

In February 2004, participants of the Eighth Annual Minnesota Pavement Conference received the latest news in pavement research and technology from variety of practitioners and researchers. Nearly 200 conference participants attended concurrent session presentations. Presentation topics ranged from multimedia pavement tools and GPS-guided dozers and graders to European pavement methods, Superpave asphalt mix, transverse thermal cracking, and improved concrete pavements.

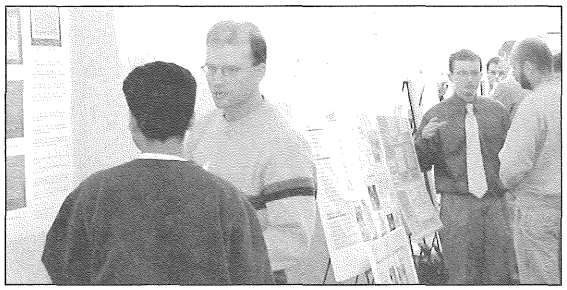
CTS hosted the event, which was sponsored by Mn/DOT, Minnesota LTAP, and a number of other organizations, and facilitated by the University's College of Continuing Education.

More about the conference is available in the spring 2004 issue of Minnesota LTAP's *Technology Exchange* newsletter, or online at **www.mnltap.umn.edu/publications**.

TRB annual meeting presentations

University of Minnesota researchers from a range of departments presented more than 35 papers and posters about such topics as freeway bottlenecks, warping pavements, and driver simulator sickness at the annual Transportation Research Board (TRB) meeting in Washington, D.C., in January 2004.

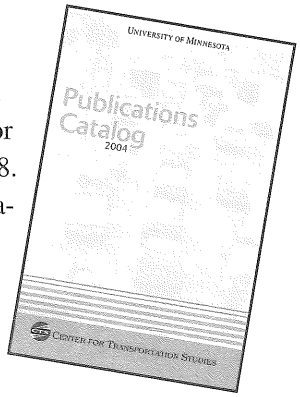
Several projects completed as part of the Transportation and Regional Growth (TRG) Study were presented at a session about traffic congestion. Geography professor John S. Adams, former University landscape design researcher Carol Swenson, Humphrey Institute researcher Gary Barnes, and landscape architecture professor Lance M. Neckar made presentations. The TRG Study, which concluded in 2003, was a multiyear initiative coordinated by CTS at the request of the Minnesota Department of Transportation and the Metropolitan Council, with support from the Minnesota Local Road Research Board.



Another session presented the results of the May 2003 CEO Leadership Forum and the follow-up activities being planned to support CEOs and their organizations in addressing the issues heard at the forum. CTS hosted the forum, which was sponsored by the American Association of State Highway and Transportation Officials (AASHTO), TRB, and the Federal Highway Administration.

CTS Publications Catalog

CTS published its first publications catalog in spring 2004. The 28-page *CTS Publications Catalog* lists transportation-related research reports produced by University of Minnesota faculty and researchers and published by CTS or Mn/DOT since 1998. The catalog also features publications, videos, and other materials produced by CTS and its affiliated programs.



CTS publications may be requested from CTS using the order form in the back of the CTS Publications Catalog, by contacting CTS, or via the publications Web page at **www.cts.umn.edu/publications**.

Midwest Transportation Knowledge Network

CTS is one of the founding members of the Midwest Transportation Knowledge Network (MTKN), a nine-state network of transportation libraries in the Midwest. The National Transportation Library funded the development of the MTKN in December 2001 as a pilot project. Its main purpose is to improve access to transportation research and information by transportation professionals in the region.

A major initiative the MTKN has been instrumental in developing is the *Transportation Libraries Catalog*—or *TL Cat*—which became available in March 2004. *TL Cat* is an online database of the holdings of 20 of the leading transportation libraries in the United States.

More information about the Midwest Transportation Knowledge Network and the *Transportation Libraries Catalog* is available online at **www.mtkn.org**. You may also contact Arlene Mathison, CTS librarian and MTKN executive committee chair, at **amathison@cts.umn.edu**.

CTS Newsletters

CTS Report
A monthly publication on transportation research, education, and outreach activities at the University of Minnesota

The Sensor
A periodic newsletter featuring research and technology news from the Center's Intelligent Transportation Systems (ITS) Institute

Technology Exchange
A quarterly newsletter from the Minnesota Local Technical Assistance Program (LTAP) featuring training and technical assistance news for local agency transportation professionals

AirTAP *Briefings*
A quarterly newsletter from the Airport Technical Assistance Program (AirTAP) featuring news and tools for personnel operating, maintaining, and administering Minnesota's public-use airports

To obtain these and other resources, please visit us online at **www.cts.umn.edu/publications** *or contact the CTS Library at 612-626-1077.*

You've got mail!

CTS expanded its use of electronic communications this year. Approximately 4,600 people receive CTS electronic publications. In addition to the *CTS Research E-News* and *Freight & Logistics E-News* launched last year, CTS and its programs produced several new e-newsletters, including LTAP *Hot Topics*, and *Intersection Decision Support E-News.*

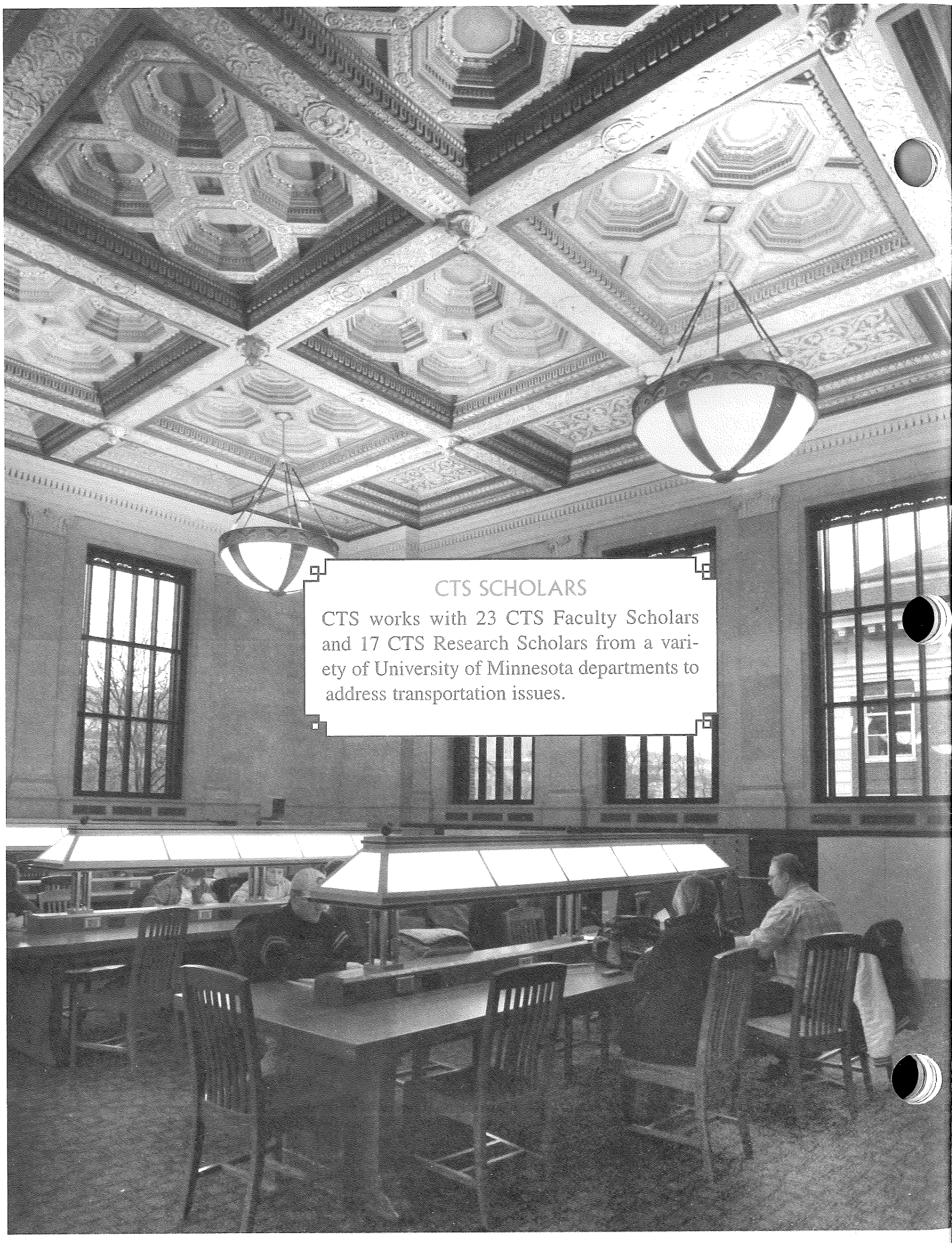
CTS also continues to send electronic announcements of all upcoming events and workshops.

More information about *CTS Research E-News* and other CTS electronic publications, including a subscription order form, is available online at **www.cts.umn.edu/publications**.

CTS AREA OF EXCELLENCE

UNIVERSITY EXPERTISE

Strengthen the research and education expertise in transportation-related fields among the faculty and staff within the University



CTS SCHOLARS

CTS works with 23 CTS Faculty Scholars and 17 CTS Research Scholars from a variety of University of Minnesota departments to address transportation issues.

CTS Faculty and Research Scholars Program

Under the CTS Faculty and Research Scholars Program, begun in 2003, scholars have joint appointments at CTS as well as in their own departments. The program provides an ongoing forum for faculty and researchers to meet with CTS staff to provide feedback, discuss interdisciplinary research opportunities, develop new education initiatives, and discuss ways to improve expertise in response to external demands. The program also addresses how to provide support and guidance to new faculty.

The researchers listed below were selected as scholars because of the transportation focus in their research and education activities, their ongoing involvement with CTS, and their successful relationships with transportation research sponsors. Their two-year appointments may be renewed or rotated to other candidates.

Learn more about Faculty and Research Scholars at www.cts.umn.edu/scholars.

2004 Faculty and Research Scholars

Transportation Planning & Policy

John Adams
Professor and Chair, Geography

Gary Barnes
Research Associate, Humphrey Institute of Public Affairs

Frank Douma
Research Fellow, Humphrey Institute of Public Affairs

Ann Forsyth
Professor and Director, Metropolitan Design Center

Kevin Krizek
Assistant Professor, Humphrey Institute of Public Affairs

Barbara Lukermann
Senior Fellow, Humphrey Institute of Public Affairs

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

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

Barbara VanDrasek
Research Associate, Geography

Mary Vogel
Co-Director, Center for Changing Landscapes

Traffic Engineering & Management

Gary A. Davis
Associate Professor, Civil Engineering

John Hourdakis
Research Fellow, Civil Engineering

David Levinson
Assistant Professor, Civil Engineering

Panos Michalopoulos
Professor, Civil Engineering

Vehicle Design & Fuels

Max Donath
Professor and Director, Intelligent Transportation Systems Institute

David Kittelson
Frank B. Rowley Distinguished Professor of Mechanical Engineering

Craig Shankwitz
Program Director, Intelligent Vehicles Program, ITS Institute

Economics & Management

Jerry E. Fruin
Associate Professor, Applied Economics

Robert Johns
Director, Center for Transportation Studies

Alfred A. Marcus
Professor, Strategic Management and Organization, Carlson School of Management

Gerard McCullough
Associate Professor, Applied Economics

Barry Ryan
Research Fellow, Applied Economics

Pavement Engineering

Andrew Drescher
Shimizu Professor, Civil Engineering

Lev Khazanovich
Associate Professor, Civil Engineering

Erland Lukanen
Director, Pavement Research Institute

Mihai Marasteanu
Assistant Professor, Civil Engineering

Bridge Engineering

Catherine French
Professor, Civil Engineering

Jerome Hajjar
Associate Professor, Civil Engineering

Steven A. Olson
Director, Multi-Axial Subassemblage Testing System (MAST) Laboratory

Carol Shield
Associate Professor, Civil Engineering

Human Factors

John Bloomfield
Research Associate, Architecture and Landscape Architecture

Kathleen A. Harder
Research Associate, Architecture and Landscape Architecture

Michael Manser
Research Associate, HumanFIRST Program, ITS Institute

Nicholas Ward
Director, HumanFIRST Program, ITS Institute

Data Systems

Taek Kwon
Professor and Director, UMD Transportation Data Research Laboratory

Osama Masoud
Research Associate, Computer Science and Engineering

Nikolaos Papanikolopoulos
Professor, Computer Science and Engineering

Shashi Shekhar
Professor, Computer Science and Engineering

Environmental Impacts

David Biesboer
Professor, Plant Biology

Bruce Wilson
Professor, Biosystems and Agricultural Engineering

Agronomy and Plant Genetics
Nancy Ehlke
Donald Wyse

Applied Economics
Jerry Fruin*
William Gartner
Gerard McCullough*
Barry Ryan*
Tom Stinson
Douglas Tiffany

Architecture and Landscape Architecture
John Bloomfield*
John Carmody
Kathleen Harder*
Lance Neckar*
Robert Sykes
Mary Vogel*

Biosystems and Agricultural Engineering
Jonathan Chaplin
John Nieber
Bruce Wilson*

Carlson School of Management
Fred Beier
Alfred Marcus*
Mahmood Zaidi

Child Development
Herbert Pick
Albert Yonas

Civil Engineering
Paul Bergson
Gary Davis*
Robert Dexter
Andrew Drescher*
Cathy French*
Ted Galambos
John Gulliver
Bojan Guzina
Jerome Hajjar*
Miki Hondzo
John Hourdakis*
Lev Khazanovich*
Joseph Labuz
David Levinson*
Mihai Marasteanu*
Panos Michalopoulos*
Steve Olson*
Shauro Schultz
Carol Shield*
Gene Skok
Karl Smith
Henryk Stolarski
Vaughan Voller

Computer Science and Engineering
Vladimir Cherkassky
Mats Heimadahl
Ravi Janardan
Osama Masoud*
Nikos Papanikolopoulos*
Shashi Shekhar*
Jim Slagle

Electrical and Computer Engineering
Mohamed-Slim Alouini

Geography
John Adams*
Francis Harvey
Barbara VanDrasek*

Horticultural Science
Susan Galatowitsch

Humphrey Institute of Public Affairs
Gary Barnes*
Richard Bolan
Frank Douma*
Kevin Krizek*
Barbara Lukermann*
Lee Munnich*

Kinesiology
Thomas Smith
Michael Wade

Law School
Stephen Simon

Mechanical Engineering
Lee Alexander
Saifallah Benjaafar
Pi-Ming Chen
Janet Creaser
Max Donath*
William Durfee
Alec Gorjestani
David Kittelson*
Michael Manser*
Rajesh Rajamani
Mick Rakauskas
Craig Shankwitz*
Patrick Starr
Nic Ward*

Metropolitan Design Center
Ann Forsyth*

Pavement Research Institute
Erland Lukanen*

Plant Biology
David Biesboer*
Iris Charvat

Public Health
Judith Garrard

St. Anthony Falls Library
Jeff Marr
Omid Mohseni

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

Urban and Regional Affairs
William Craig
Thomas Scott*

Wood and Paper Science
Bob Seavey

University of Minnesota - Duluth

Computer Science
Carolyn Crouch
Richard Maclin

Electrical and Computer Engineering
Stan Burns
Donald Crouch
Mohammed Hasan
Taek Kwon*
Jiann-Shiou Yang

Industrial Engineering
Ryan Rosandich
David Wyrick

Mathematics and Statistics
Zhuangyi Liu
Harlan Stech

NRRI
Brian Brashaw
Lawrence Zanko

* denotes *CTS Faculty and Research Scholars*

Research reports published in FY04

Many of these reports are available online at www.cts.umn.edu/publications/reports.

Transportation and the Economy research

Anderson, D. and McCullough, G., *On the Value of Minnesota's Road Network*, Mn/DOT 2004-16

Barnes, G., *Transportation-Related Impacts of Different Regional Land-Use Scenarios*, Mn/DOT 2004-03

Barnes, G. and Langworthy, P., *Increasing the Value of Public Involvement in Transportation Project Planning*, Mn/DOT 2004-20

Barnes, G. and Langworthy, P., *The Per-Mile Costs of Operating Automobiles and Trucks*, Mn/DOT 2003-19

Fruin, J., *Modal Shifts from the Mississippi River and Duluth/Superior to Land Transportation*, Mn/DOT 2004-28

Gartner, W., Limback, L., and Erkkila, D., *Transportation Barriers Affecting International Visitors to Minnesota*, Mn/DOT 2003-21

Gartner, W., Love, L., and Erkkila, D., *Attributes and Amenities of Minnesota's Highway System That Are Important to Tourists*, Mn/DOT 2003-22

Levinson, D., *If They Come, Will You Build It?* Mn/DOT 2003-37

Marcus, A., *ISO 9000's Effects on Accident Reduction in the U.S. Motor Carrier Industry*, Mn/DOT 2003-29

Munnich, L. and Barnes, G., *Minnesota Value Pricing Project*, Mn/DOT 2003-31

Munnich, L. and Douma, F., *Transportation Technologies for Sustainable Communities*, Mn/DOT 2002-26

Rose, D., *Power Plant Siting Decisions and Transport Implications*, CTS 03-09

Stinson, T. and Ryan, B., *Paying for Minnesota Low Volume Roads: A Tax Policy Assessment*, Mn/DOT 2004-04

Transportation Safety and Traffic Flow research

Carmody, J. and Harder, K., *The Effect of Centerline Treatments on Driving Performance*, Mn/DOT 2002-35

Davis, G., *Building Our Way Out of Congestion? Highway Capacity for Twin Cities*, Mn/DOT 2002-01

Donath, M., Shekhar, S., Cheng, P., and Ma, X., *A New Approach to Assessing Road User Charges: Evaluation of Core Technologies*, Mn/DOT 2003-38

Douma, F., Bolan, R., and Horan, T., *Telecommunications for Sustainable Transportation*, Mn/DOT 2004-10

Harder, K., *Evaluation Report Volume 1: System Performance and Human Factors Intelligent Vehicle Initiative Specialty Vehicle Field Operational Test*, Mn/DOT 2004-07

Harder, K., *Evaluation Report Volume 2: Benefit Analysis Intelligent Vehicle Initiative Specialty Vehicle Field Operational Test*, Mn/DOT 2004-08

Harder, K. and Bloomfield, J., *The Effectiveness and Safety of Traffic- and Non-Traffic-Related Messages Presented on Changeable Message Signs (CMS)*, Mn/DOT 2004-27

Harder, K. and Bloomfield, J., *The Effectiveness of Auditory Side- and Forward-Collision Avoidance Warnings on Snow Covered Roads in Conditions of Poor Visibility*, Mn/DOT 2003-14

Harder, K., Bloomfield, J., and Chihak, B., *Reducing Crashes at Controlled Rural Intersections*, Mn/DOT 2003-15

Kwon, E., *Development of Dynamic Route Clearance Strategies for Emergency Vehicle Operations, Phase I*, Mn/DOT 2003-27

Kwon, E., *Dynamic Estimation of Freeway Weaving Capacity for Traffic Management and Operations, Phase II*, Mn/DOT 2003-32

Papanikolopoulos, N., Masoud, O., and Wahlstrom, E., *Sensor-Based Ramp Monitoring*, Mn/DOT 2003-34

Shankwitz, C. and Donath, M., *Driver Assistive Systems for Snowplows*, Mn/DOT 2003-13

Noteworthy accomplishments

University computer science and engineering professor Nikos Papanikolopoulos was notified of a large grant award from the Department of Homeland Security to research monitoring of human activity in public spaces. Seed funding for the first phase of this research effort was provided by the ITS Institute.

CTS faculty scholar Barbara Lukermann received the prestigious 2004 American Planning Association award for distinguished leadership by a professional planner. Lukermann, a long-time researcher and instructor of planning and land-use policies at the Humphrey Institute, is now a fellow emeritus at the University's Center for Urban and Regional Affairs.

Shankwitz, C., Donath, M., Preston, H., and Storm, R., *Review of Minnesota's Rural Intersection Crashes: Methodology for Identifying Intersections for Intersection Decision Support (IDS)*, Mn/DOT 2004-31

Shankwitz, C., Donath, M., Ward, N., and Rakauskas, M., *System Performance and Human Factors Evaluation of the Driving Assistive System (DAS)*, Mn/DOT 2004-09

Shankwitz, C., Donath, M., Ward, N., and Rakauskas, M., *System Performance and Human Factors Evaluation of the Driving Assistive System (DAS): Supplement Track Test Evaluation-IVI*, Mn/DOT 2004-12

Smith, T., *Effects of Vision Enhancement Systems (VES) on Older Drivers' Ability to Drive Safely at Night and in Inclement Weather*, Mn/DOT 2002-27

Wade, M., Hammond, C., and Kim, G., *Accident Analysis of Significant Crash Rates for Low to Very Low Volume Roadways in 10 Statewide Minnesota Counties*, Mn/DOT 2004-22

Transportation Infrastructure research

Altay, A., Arabbo, D., Corwin, E., Dexter, R., and French, C., *Effects of Increasing Truck Weight on Steel and Prestressed Bridges*, Mn/DOT 2003-16

Marasteanu, M. and Clyne, T., *Evaluation of Asphalt Binders Used for Emulsions*, Mn/DOT 2003-24

Marasteanu, M. and Clyne, T., *Validation of Superpave Fine Aggregate Angularity Values*, Mn/DOT 2004-30

Marasteanu, M., Li, X., Clyne, T., Voller, V., Timm, D., Newcomb, D., and Chadbourn, B., *Low Temperature Cracking of Asphalt Concrete Pavement*, Mn/DOT 2004-23

Shield, C. and Hajjar, J., *Repair of Fatigued Steel Bridge Girders with Carbon Fiber Strips*, Mn/DOT 2004-02

Shield, C., French, C., and Baran, E., *Effects of Vertical Pre-Release Cracks on Prestressed Concrete Bridge Girders*, Mn/DOT 2003-33

Skok, E., *INV 772: Special Practices for Design and Construction of Subgrades in Poor, Wet, and/or Saturated Soil Conditions*, Mn/DOT 2003-36

Snyder, M. and Embacher, R., *Refinement and Validation of the Hydraulic Fracture Test*, Mn/DOT 2003-28

Voller, V., *Designing Pavement Drainage Systems: The MnDRAIN Software*, Mn/DOT 2003-17

Youngberg, C., Dexter, R., and Bergson, P., *Fatigue Evaluation of Bridge 69832*, Mn/DOT 2003-18

Zanko, L., Niles, H., and Oreskovich, J., *Properties and Aggregate Potential of Coarse Taconite Tailings: an Evaluation of Five Minnesota Taconite Operations*, Mn/DOT 2004-06

Transportation Planning and the Environment research

Baker, J. and Wang, L., *Mn/ROAD TDR Evaluation and Data Analysis*, Mn/DOT 2004-15

Biesboer, D., *Improving the Design of Roadside Ditches to Decrease Transportation Related Surface Water Pollution*, Mn/DOT 2004-11

Charvat, I. and Hebberger, J., *The Effects of Fire Versus Mowing on Prairie Plant Communities*, Mn/DOT 2003-20

Hondzo, M., *Laboratory Measurements of Stormwater Quality Improvement in Detention Ponds*, Mn/DOT 2004-21

Neckar, L., *Station Urban Design Issues: Red Rock Commuter Rail*, CTS 03-07

Neckar, L., Pettinari, J., and Vogel, M., *St. Paul Central Corridor Study: Pierce Butler Industrial Redevelopment Parkway*, CTS 03-08

Pavement Research Institute

In 2004, CTS established the Pavement Research Institute (PRI) steering committee to define the Institute's vision and mission, develop and implement a strategic plan, and help set directions for the Institute. CTS associate director Laurie McGinnis serves as PRI steering committee chair (*for a complete list of members, see* page 38). PRI will develop and coordinate pavement research activities with the University, the Minnesota Department of Transportation (Mn/DOT), and other funding organizations.

In December 2003, Erland O. Lukanen, P.E., was selected to direct the new institute. CTS and the University of Minnesota's Department of Civil Engineering, along with Mn/DOT and the Minnesota Local Road Research Board (LRRB), established PRI in early 2003.

CTS Executive Committee


Chair: **Richard T. Murphy Jr.**, President, Murphy Warehouse Company


Duane Crandall, Consultant (ret. CEO of AAA Minnesota/ Iowa)


Mary Hill Smith, District #3 Member, Metropolitan Council


Lt. Gov. **Carol Molnau**, Mn/DOT Commissioner


John Anderson, Associate Dean, Carlson School of Management


Steve Crouch, Associate Dean, Institute of Technology, University of Minnesota


Dean Johnson, Minnesota State Senator


Al Steger, Minneapolis Division Administrator, Federal Highway Administration*


Terri Barreiro, Vice President, Greater Twin Cities United Way*


Douglas Differt, Mn/DOT Deputy Commissioner


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


Richard Thomas, Director of Government Relations, Ames Construction


Anne Beers, Chief of Minnesota State Patrol, Department of Public Safety


Ron Erhardt, Minnesota House of Representatives


Robert Kudrle, Professor, Humphrey Institute of Public Affairs, University of Minnesota


Tom Weaver, Regional Administrator, Metropolitan Council


Tom Chaffin, Vice President, Traffic Control Division, 3M


Jeff Hamiel, Executive Director, Metropolitan Airports Commission


Colleen Landkamer, Blue Earth County Commissioner


Donn Wiski, Chair, Metropolitan Council Transportation Advisory Board


Fred Corrigan, Executive Director, Aggregate and Ready Mix Association


John Hausladen, President and CEO, Minnesota Trucking Association


Keith Langseth, Minnesota State Senator


Charleen Zimmer, President, ZAN Associates

* Completed service in 2004

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Elwyn Tinklenberg, The Tinklenberg Group
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Note: Listings are current as of September 2004.

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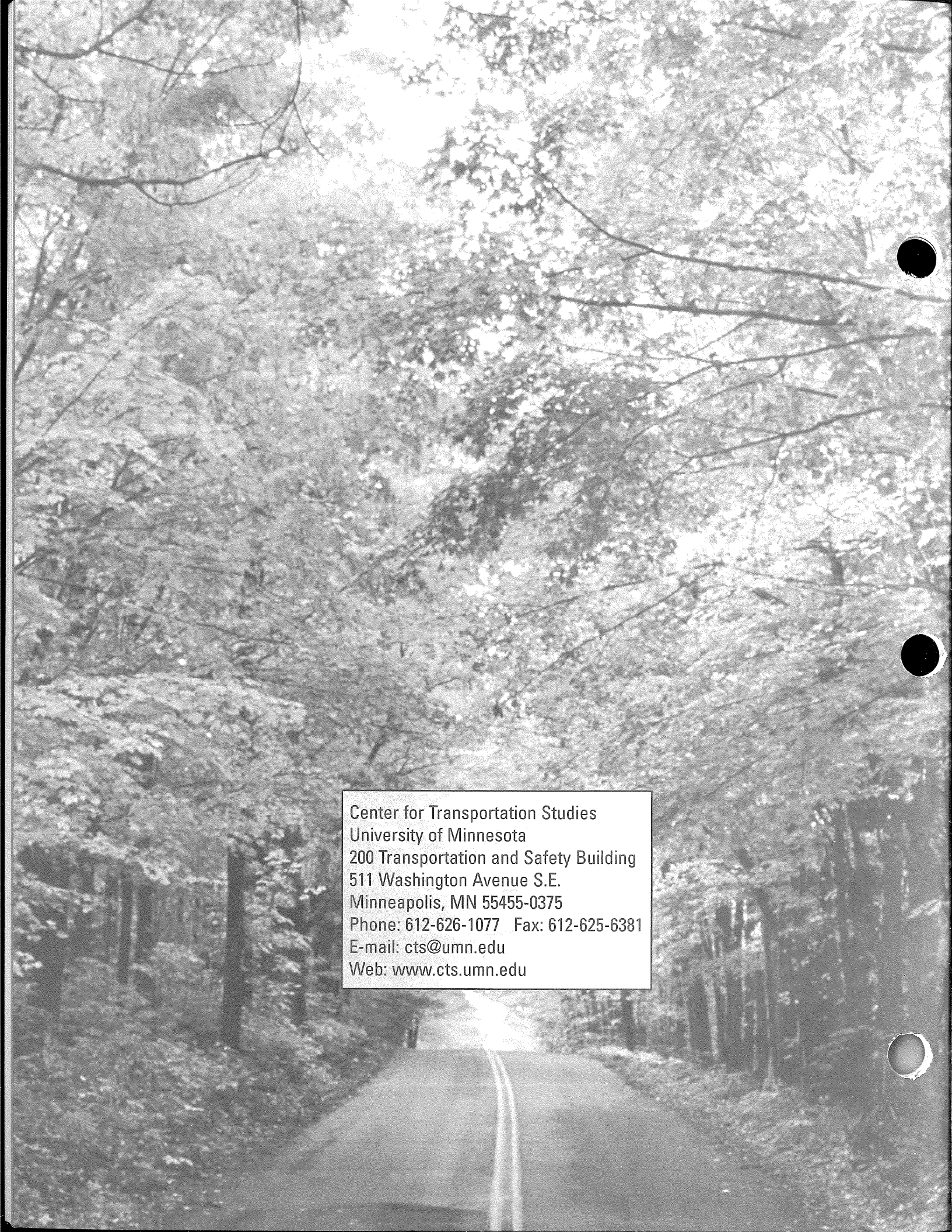

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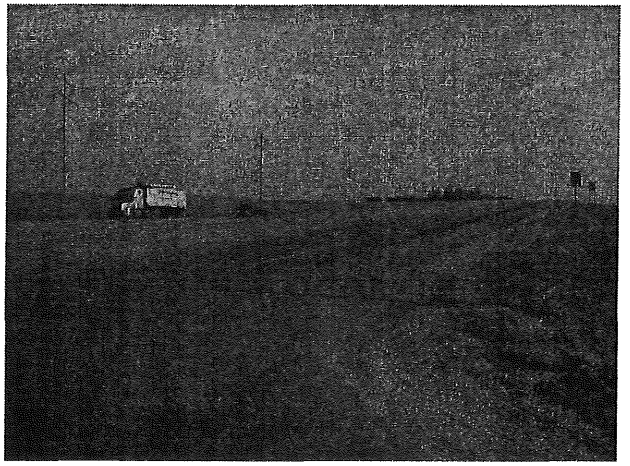
Emerging Technologies

to Enhance Safety and Mobility



Max Donath
ITS Institute
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www.its.umn.edu

Minnesota Senate Transportation Committee

January 27, 2005

Intelligent Transportation Systems Institute

- Theme:

  Human-Centered Technology to Enhance Safety and Mobility

- Scope:

  Road- and transit-based transportation

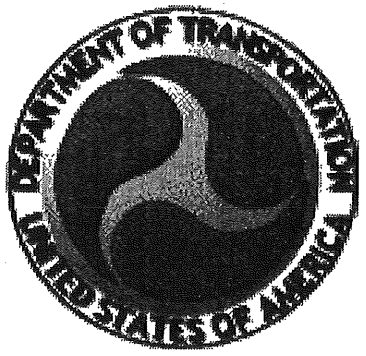
- Federally designated **University Transportation Center** (Authorized by TEA-21 Act, signed June 8, 1998); in 6th year (2004-05) of 6 year mandate; extended for 7th year

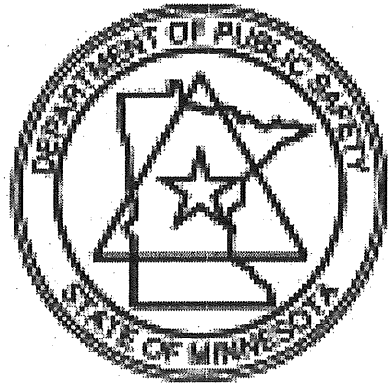
- Participants in ITS related activities across university:

  Over 35 faculty, 14 research staff, ~90 students

Work with Many Organizations

UNIVERSITY OF MINNESOTA
ITS INSTITUTE



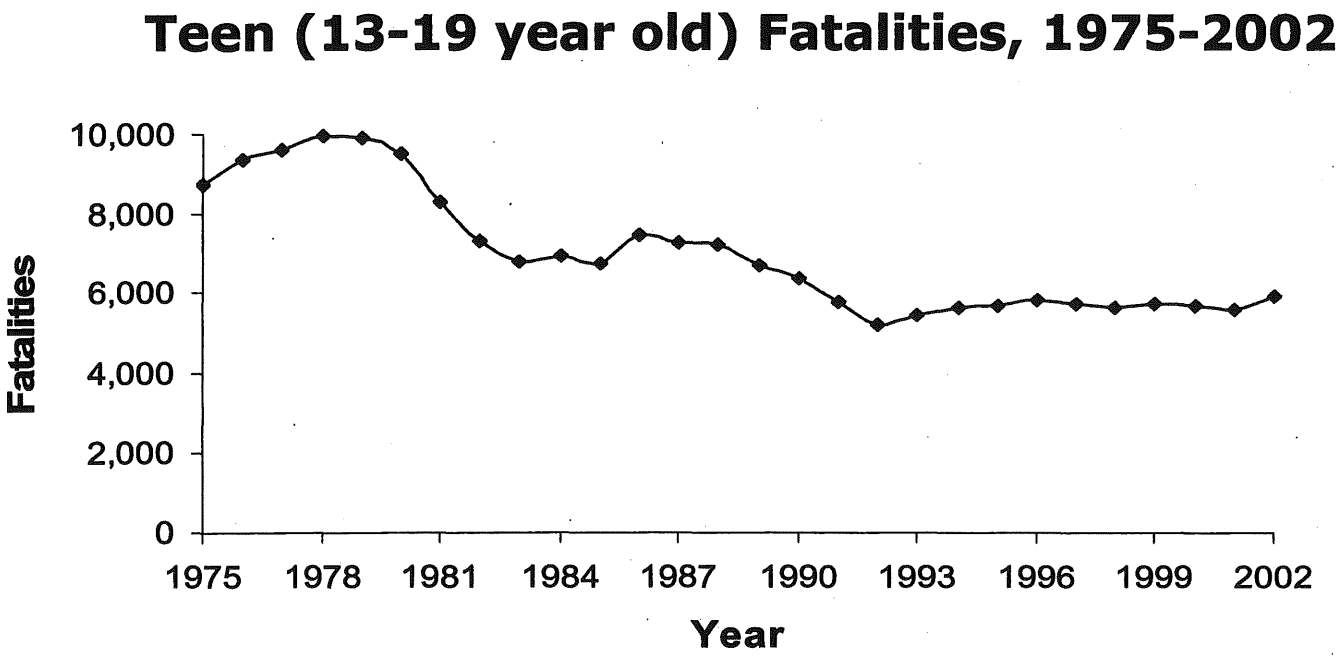


Metro Transit

...and many counties

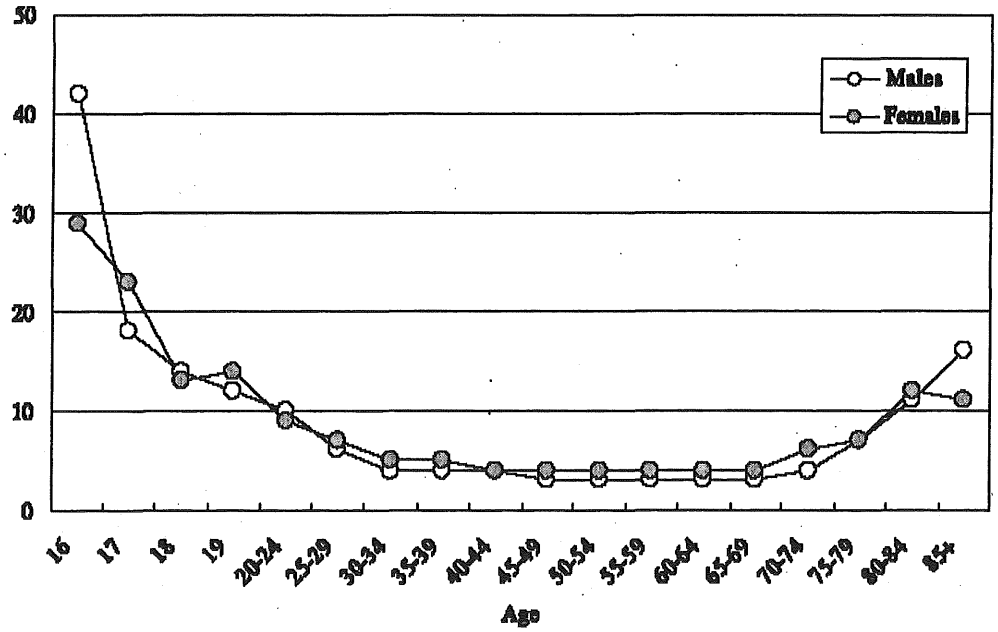
Teen Driving Fatalities: Current Trends

- In the last decade, we have seen an *increase* in teen fatalities.



Source: US DOT FARS data.

Teen Crash Risk on a Per Mile Basis



No. of Driver Crash Involvements per Million Miles Traveled, 1995

- Teens are almost **twice as likely** to be involved in a crash than the next youngest age group…

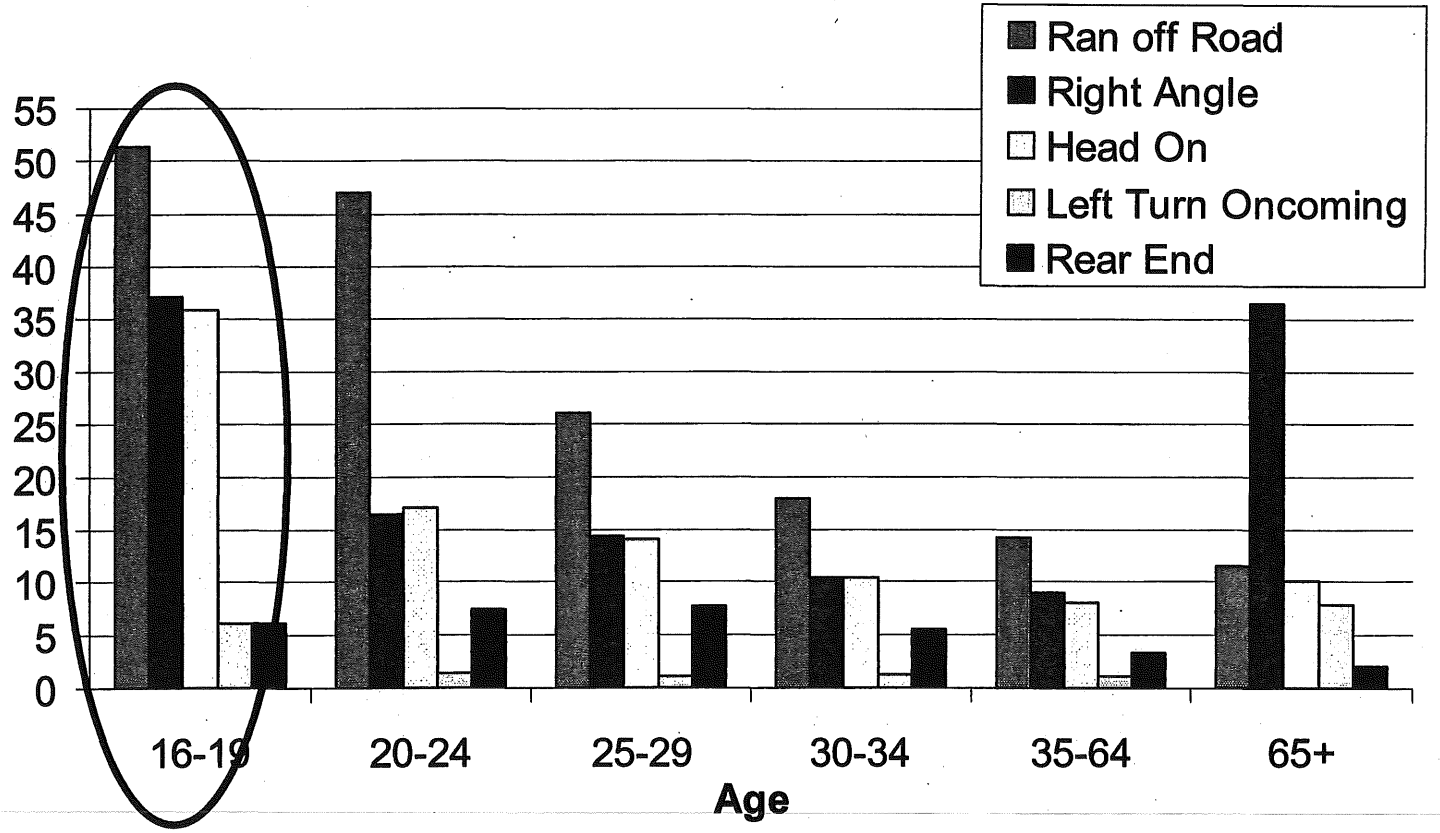
  20-24 year olds.

- 16 year olds are nearly **3 times more likely** to be involved in a crash than a 19 year old,… and almost **10 times more likely** than drivers aged 30-69.

Source: Williams, A. F., 2003. Teenage drivers: patterns of risk. *Journal of Safety Research*, 34, 5-15.

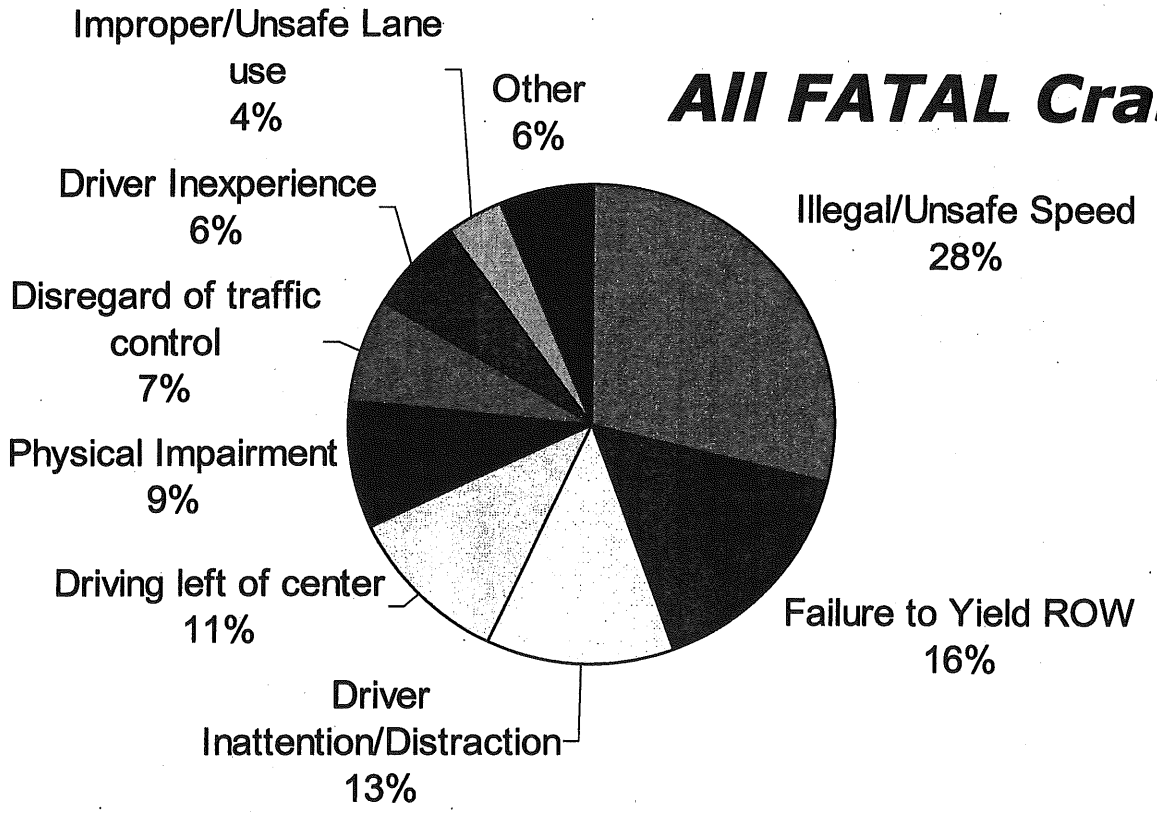
Driver Fatalities by Crash Type: For Most Crash Types, Higher for Teens

Driver Fatalities per 100,000 licensed drivers: Minnesota, 1998 - 2002.



Data provided by: Alan Rodgers, Research Analyst for the Minnesota Dept. of Public Safety

Teen Fatality Contributing Factors: Speed Kills

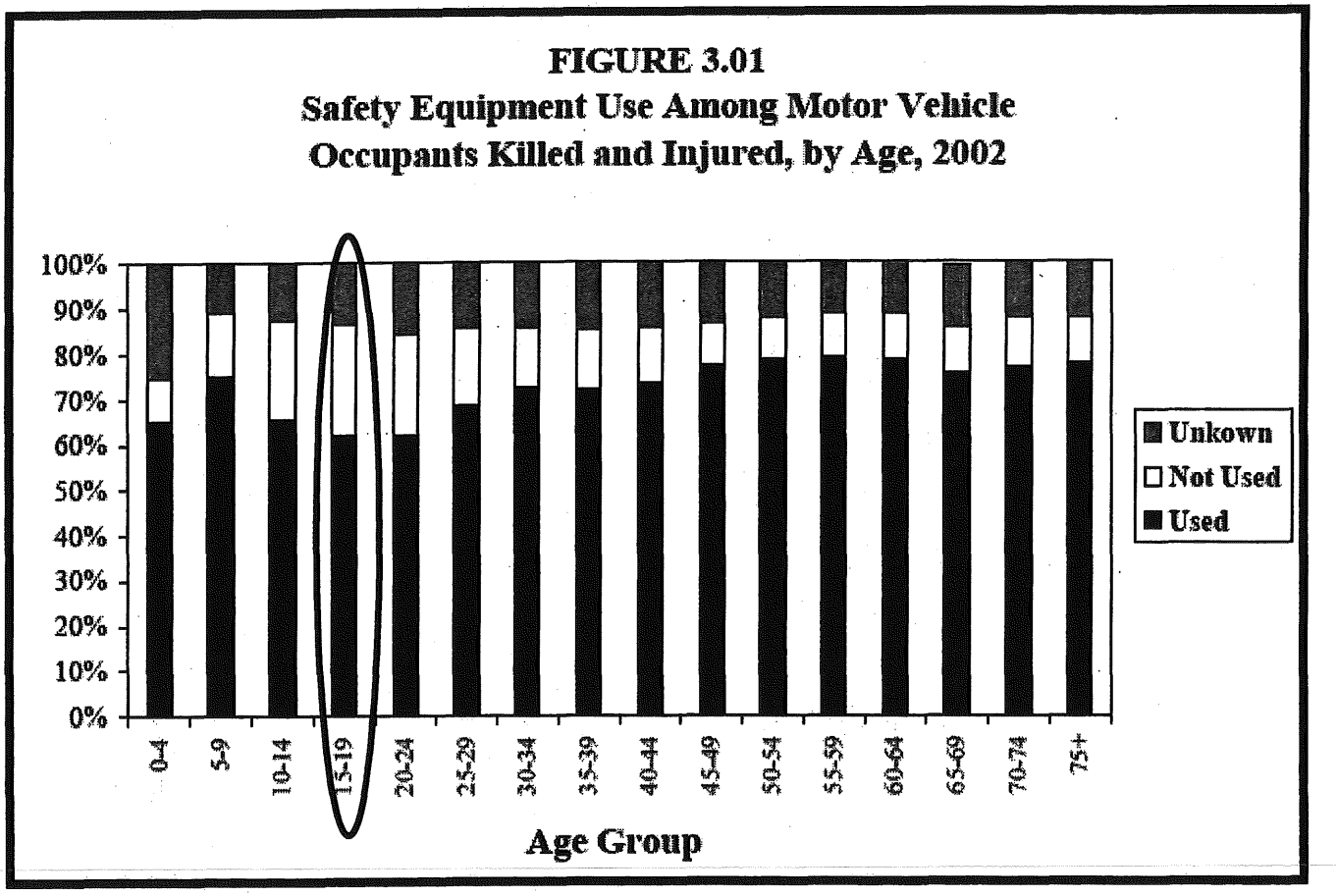


16 TO 19 YEAR OLD *DRIVERS:* MINNESOTA 1998 - 2002.

Data provided by: Alan Rodgers, Research Analyst for the Minnesota Dept. of Public Safety

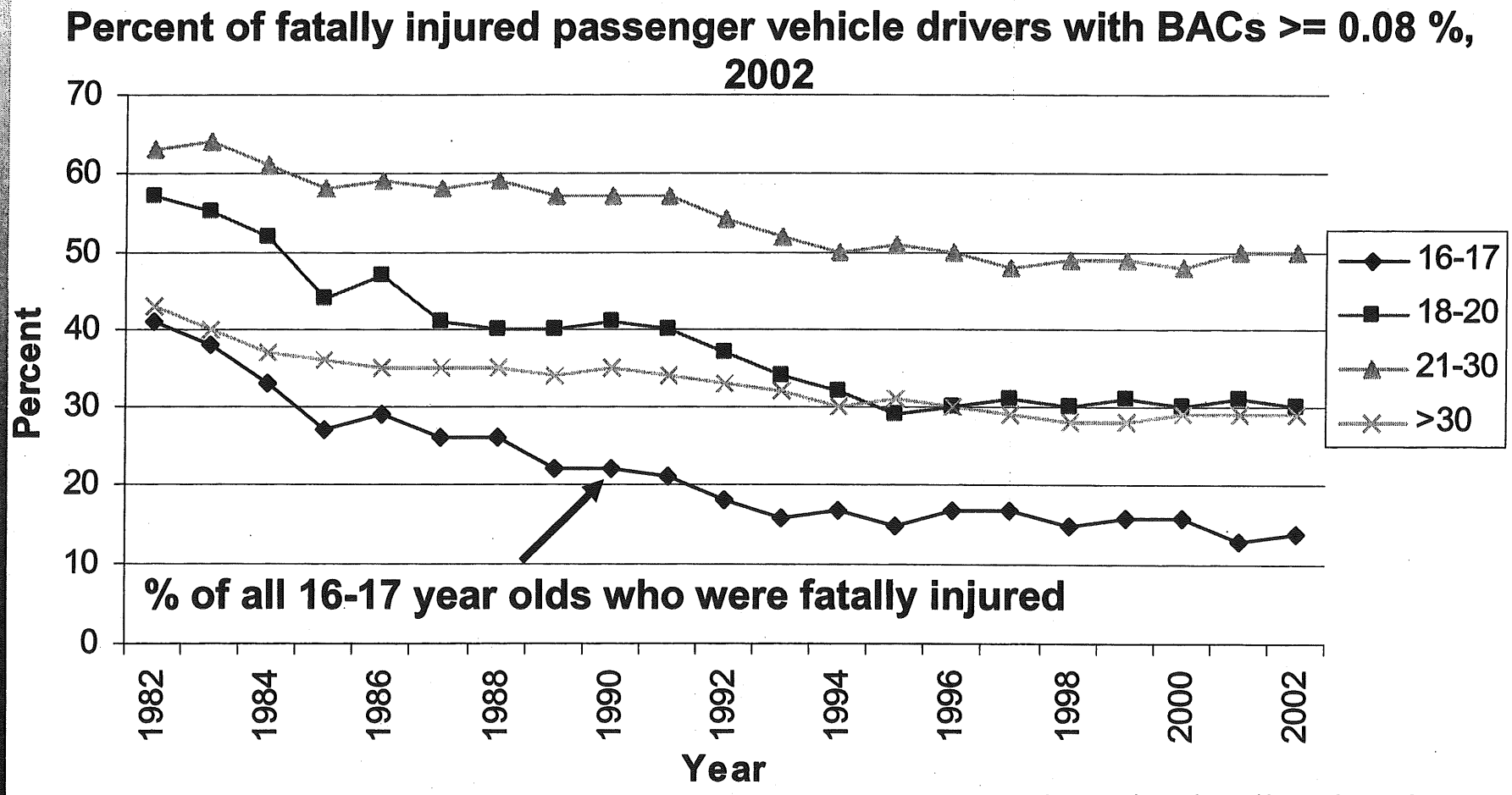
Teen Fatality Contributing Factors: Seatbelt Use

In Minnesota, seatbelt use is lowest among teenagers.



Source: Minnesota Motor Vehicle Crash Facts, 2002

Alcohol Use: For every age group, existing approaches to mitigation have hit a brick wall



Source data: http://www.hwysafety.org

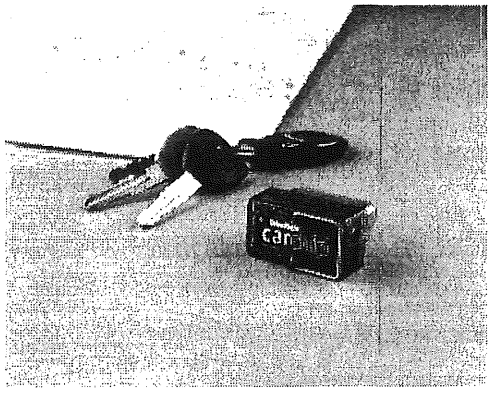
Big Brother under the Dashboard? "Financial incentive to drive safely"

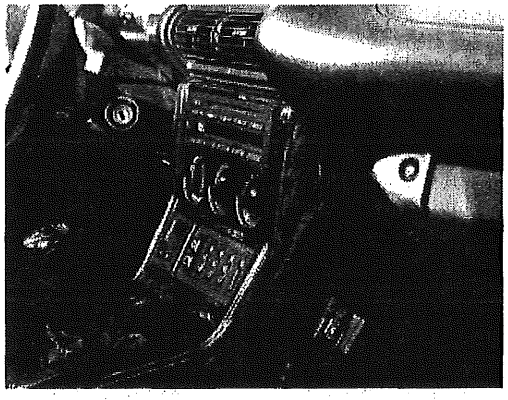
- Early in 2004, Progressive Insurance offered 250 drivers across Minnesota $25 to plug a matchbox-size device, TripSense, into their cars to collect information.
- The test worked so well that starting in August, Progressive will offer the device to 5,000 Minnesotans.
- Those who participate will be awarded discounts of up to 25 percent.
- Device is designed to "give its customers more control over their insurance rates". Those who obey speed limits and drive only when necessary can save money on their insurance.
- Privacy concerns:
  - Fear is that by waving a carrot in front of its customers, company will gather more data on people's driving habits. Once enough people have adopted the device, those who don't could face higher insurance premiums.
  - Concern that the information gathered by the tiny boxes could end up in the wrong hands.

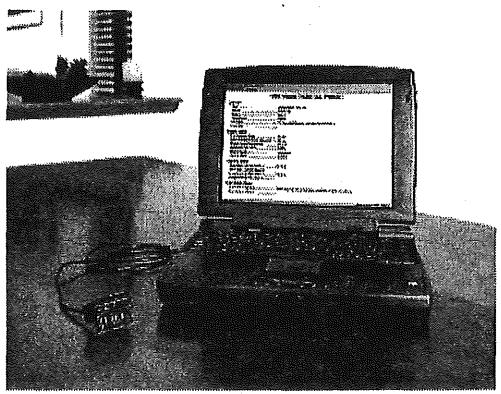
...Star Tribune, August 10, 2004

Davis Instruments: CarChip

- **Summary**
  - Records driving data saved for later viewing on home PC.
    - Time and date for each trip, distance, speed, hard accelerations and decelerations.
  - Data logger will start collecting data as soon as car is started.
  - Connected via OBD-II port (available on model years 1996+)
  - Cost: $179.

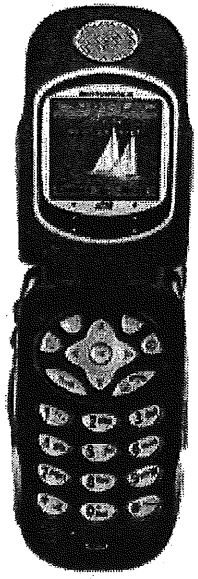


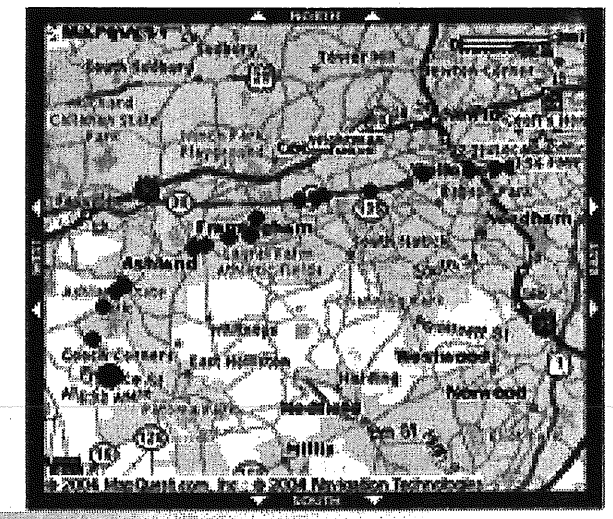




Teen Arrive Alive

- **Summary**
  - Subscription plan for phone tracking.
  - Uses technology from GPS enabled cell phone.
  - Works with selected Motorola phones and Nextel calling plans.
  - Subscription cost: ~$15/month (in addition to standard Nextel service plan fees of ~$40/month).
  - Phone location, speed, direction of travel, and time of day are reported every 2 minutes.
  - Reports are accessible by parents via website or by placing a call to secure line.



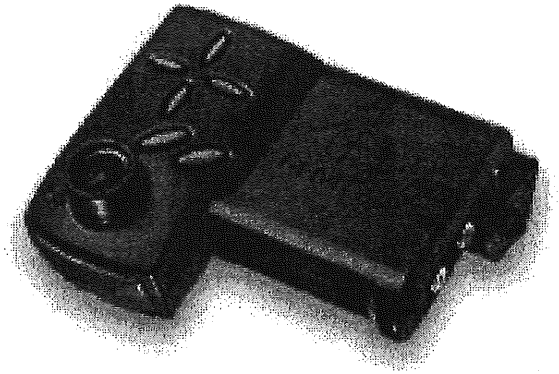


Video Monitoring: DriveCam

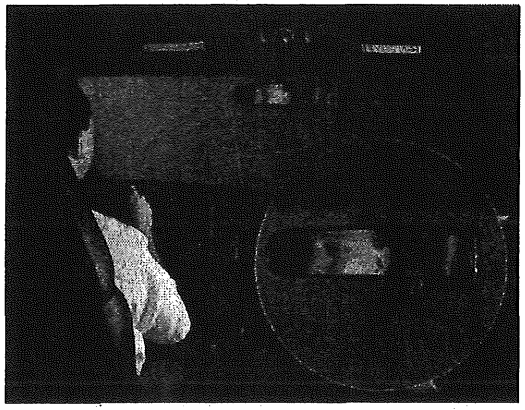
http://www.drivecam.com/drivecam-videos.asp

Features:

- Two lenses: Forward and Interior.
- 20 second buffer records 10s prior to, and 10s after event.
- Records both *Video* & *Audio*.



Cost: $1000



Limitations:

- User defined threshold - false positives.
- Difficult to record speed or impairment.
- Feedback to driver behavior provided after event (not real-time)
- Review of footage is time consuming.

In-Vehicle Technologies: Design Opportunities (and Risks)

In-vehicle technology does have ability to address fatalities by forcing behavior, providing driver feedback, and reporting driving behavior of teenagers.

- **Forcing Behavior. ("We know better than you.")**

Some unsafe actions (risks) may be habitual. Forcing requires specific behavior to occur prior to or during vehicle operation.

- **Driver Feedback. (Education and adaptation)**

Drivers may not be aware of risks. Real-time warnings can alert the driver in case of poor driving behavior or potential risks.

- **Reporting Behavior. ("Big brother is watching")**

Some drivers may purposely take risks because they feel anonymous. Vehicle parameters can be saved for inspection by parents (or other authorities).

Forcing Behavior: Interventions

Seatbelt interlock
Requires all occupants to engage seatbelt prior to starting vehicle.

Alcohol interlock
Prevents teen driver from starting vehicle if alcohol is detected.

Intelligent Speed Adaptation (ISA)

Prevents driver from exceeding road's posted limit. Achieved through combination of Global Positioning System (GPS) and digital road map. In some systems, speed is limited by link with elements of vehicle's power train, such as throttle or fuel system.

Alcohol Interlock Options

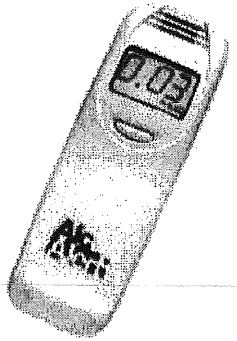
- Purchase/Lease
  - Expensive (?): $795 or $60/mo.
  - Records data log of tests, and rolling retests.
  - Interlock tolerance level can be changed.
  - Installed by certified dealer.

ADS Determinator Interlock

- Core Tech Can Be Low Cost
  - Based on personal BAC technology.
  - Zero tolerance threshold hardwired.
  - Uses low cost sensor.
  - Integrate with system.

AlcAlert BT5500

$40



ISA Summary

- Three types of ISA systems:
  - Advisory – in vehicle warning, driver ultimately limits speed.
  - Mandatory – active control, vehicle limits speed, overrides driver.
  - Voluntary – advisory with option of mandatory.
- Three notification levels possible:
  - Fixed – posted speed limit only.
  - Variable – site specific limits, ex: construction zones, school zones, curves.
  - Dynamic – limits based on hazard potential, e.g. weather, time of day, traffic congestion, pavement condition.

ISA Summary

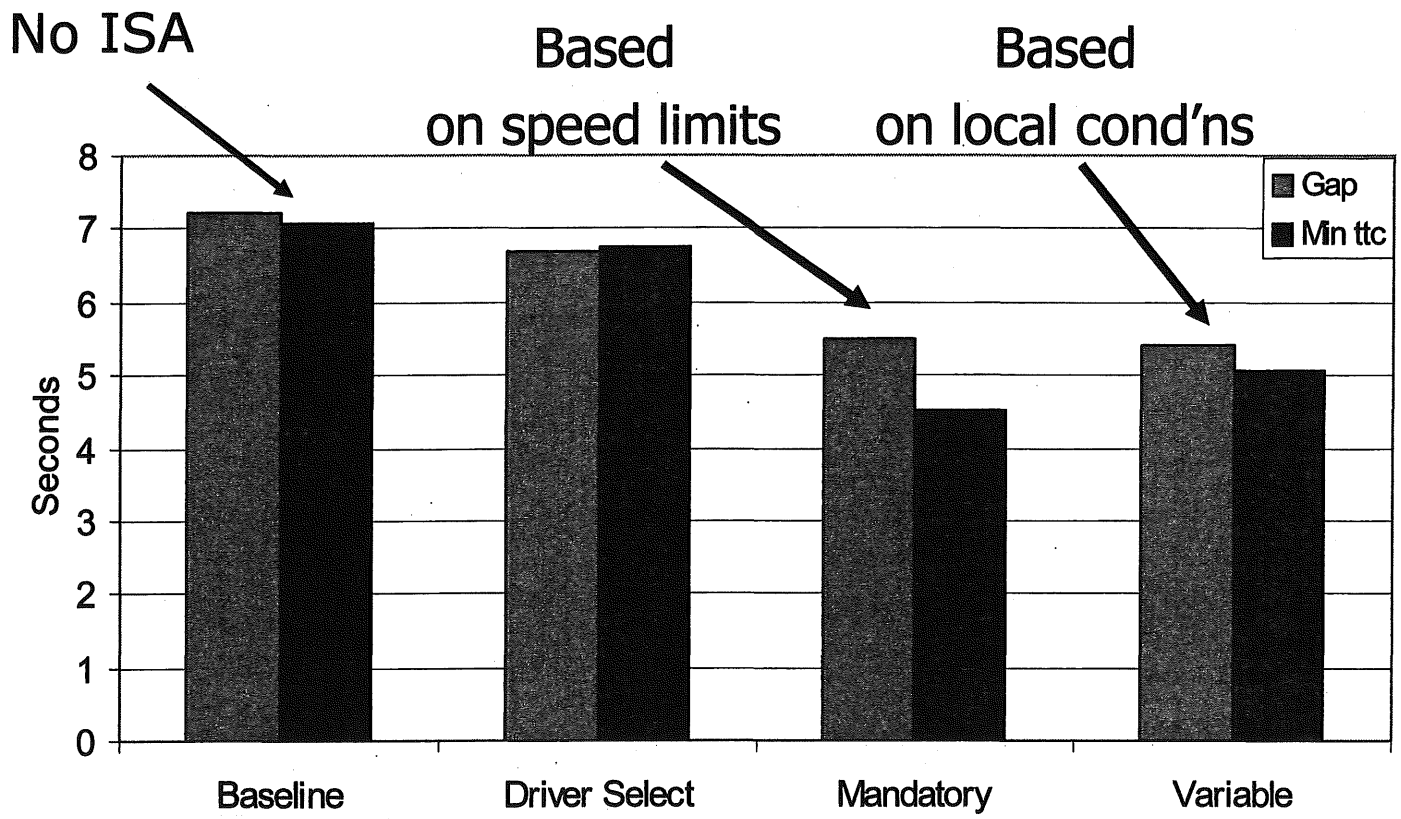
- Location
  - ISA has been evaluated in simulation and field studies in Australia and several European countries including, Belgium, France, Germany, England, Netherlands, and Sweden.
- Observations
  - In general, these projects have shown consistent reductions in speed levels, better awareness of speed limits, and improved compliance with speed limits (Besseling, 2003; Carsten & Fowkes, 2000; Vagverket, 2003).
- Impact
  - It has been estimated that speed control systems such as ISA have the potential for achieving almost 60% fatality reduction (Carsten & Fowkes, 2000).

"Car computer to stop you speeding"

... The Times, July 1, 2004

- Government to establish national speed limits database ... pave way for all cars to be fitted with devices that prevent speeding.
- The digital speed map of Britain ... essential 1st step towards introducing ISA, ... automatically applies brakes or blocks acceleration.
- On-board computer linked to satellite positioning system will use digital map to identify local speed limit. If drivers attempt to exceed limit, they hear series of bleeps and accelerator pedal starts vibrating.
- Ministers have not ruled out eventually making some version of system compulsory ....
- ...but no central speed limits database for whole country, and many local authorities have poor records of limits on their roads.
- The DfT believes the absence of a national database is hampering development of ISA.
- A DfT spokesman said: "If the whole country was mapped, it might make it more logical and practical for manufacturers to consider offering ISA. There could well be road safety benefits from ISA."

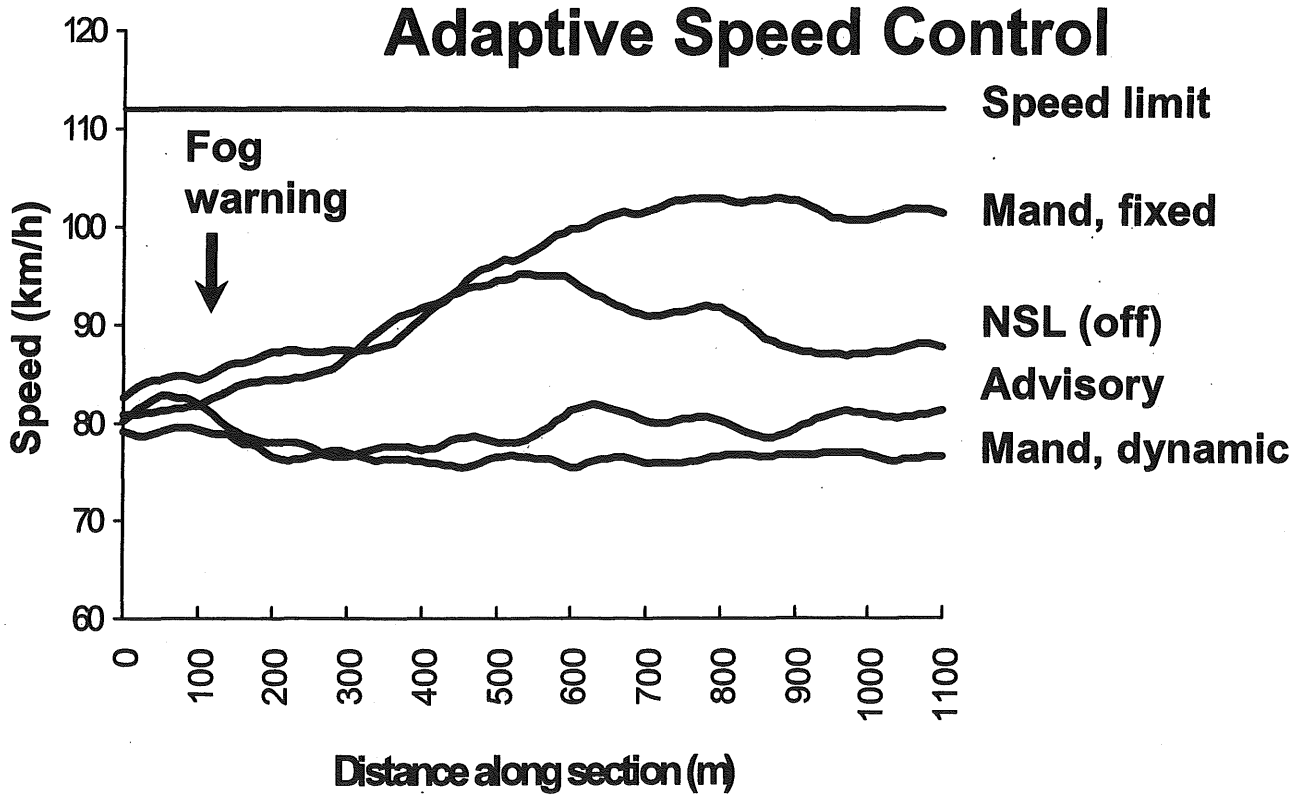
ISA: Compensation for "Lost Time"



When drivers have speed restricted by a mandatory or variable system, there may be a tendency for them to compensate by accepting shorter gaps in crossing traffic and closer following distances in traffic compared to baseline driving (or only an advisory system). This is believed to result from a perceived need to make up for limited mobility and time.

ISA: Complacency

We relax our responsibility and let the system take over



In expt, subjects drove a simulator in traffic conditions with heavy fog. Note that drivers drove at a speed lower than the speed limit with no speed control, and in response to the advisory and dynamic system. However, drivers with the mandatory system seemed to be complacent and drive to the system limit rather than use their own judgment to slow down. As a result, drivers tended to drive toward the speed limit even though conditions suggest a lower speed to be safe.

(courtesy of O. Carsten, ITS, Leeds)

Modifying Behavior: Feedback

- Important to provide context (static and dynamic)
- Provide real time auditory or other sensory signals triggered by unsafe vehicle operation
  - Excessive speed for local conditions, e.g. speeds incompatible with road curvature, can lead to lane departure.
  - "Hassles" driver until behavior is corrected.
- Prediction of road curvature can inform the driver of necessary upcoming maneuvers (especially useful in rural areas at night).
- Training tool, component of GDL

Reporting Behavior: Consequences

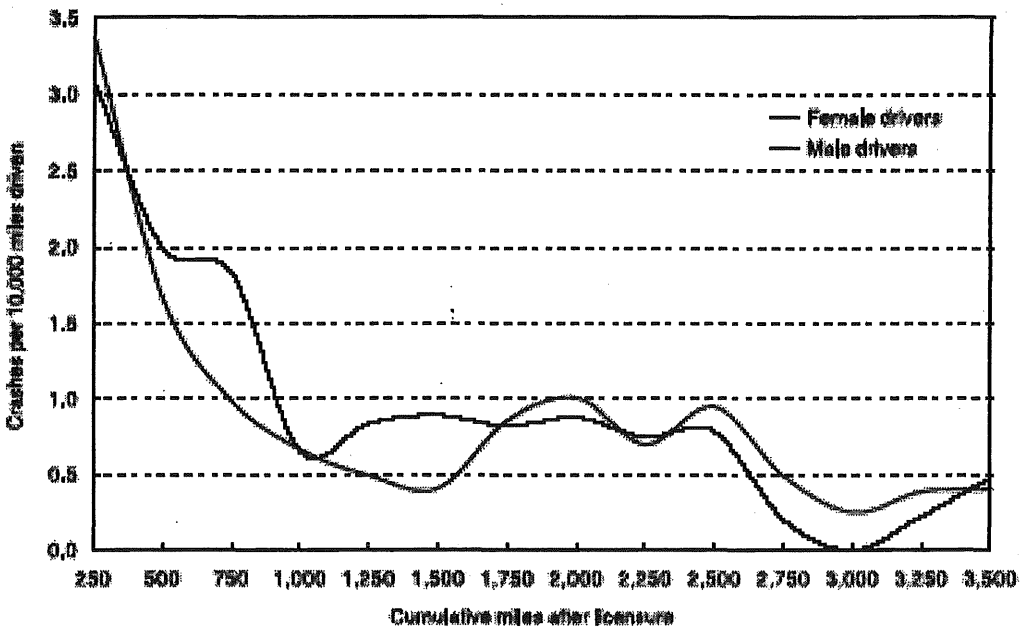
Incentives, Reward and Punishment

- Record vehicle parameters such as speed, acceleration, braking, throttle use, distance, time of day.
- Parents can be notified in real-time of unsafe driving behavior. Parents can inspect "report card" of data to review teen driving behavior offline.
  - Effect on parent-teen "trust" relationship?
- Attempts to address difficulty in enforcing compliance. Review possible by insurance (insurance premium, rebates), police (fines), DPS (license progression, awards).

When needed?

Crash rate by cumulative miles driven after licensure and by gender

- First 250 miles crash involvement rate: 3.2 (per 10K miles); next 250 miles rate is 1.3 (per 10K miles) (1)
- For novice drivers, crash rates decrease dramatically from the 1st to the 7th month (41%), then gradually decrease through the 24th month after licensing (60% overal reduction) (2)



(1) Mayhew, D.R., Simpson, H.M. and Pak, A. (2003). "Changes in collision rates among novice drivers during the first months of driving." Accident Analysis and Prevention, 35, pp. 683-691.

(2) McCartt A.T.; Shabanova V.I.; Leaf W.A. (2003). "Driving experience, crashes and traffic citations of teenage beginning drivers," Accident Analysis and Prevention, 35, (3), pp. 311-320

Mechanisms of Unsafe Driving – Speeding:

"Reporting" cannot deal with all of these

- **1. Perception:**
  - Insufficient experience to accurately perceive speeds.
- **2. Recognition:**
  - Insufficient experience to recognize unsafe limits.
- **3. Skill:**
  - Insufficient experience to acquire adequate speed control skills.
- **4. Personality:**
  - Youth and personality (sensation seeking) may attract teen driver to thrill of risk taking and unsafe speed
- **5. Motivation:**
  - Absence of external factors to motivate ("enforce") safe speeds. Anonymity. Peer pressure motivates risky behavior.
- **6. Naivety:**
  - Absence of sufficient exposure to negative consequences of speed choice to "learn" risks of unsafe speeding; optimism bias

The issue is not the "technology"

but how to take advantage of it

- Incorporate device as part of the GDL?
  - What are the tests to "graduate"? The performance criteria?
  - Speed violation? Stability of accel/decel, headway? Lane wandering? Distraction measure?
- What thresholds does one set for pass/fail on each?
- How does one come up with an overall "grade"?
- Is this a continuous driving exam? What are the thresholds for moving from one level to the next?
- Does one "exam" fit every state? …every teen?
- Feedback mechanism can be a tool for enhanced training and education. How? Incentives?

The significant problems we face cannot be solved by the same level of thinking that created them.

...Albert Einstein

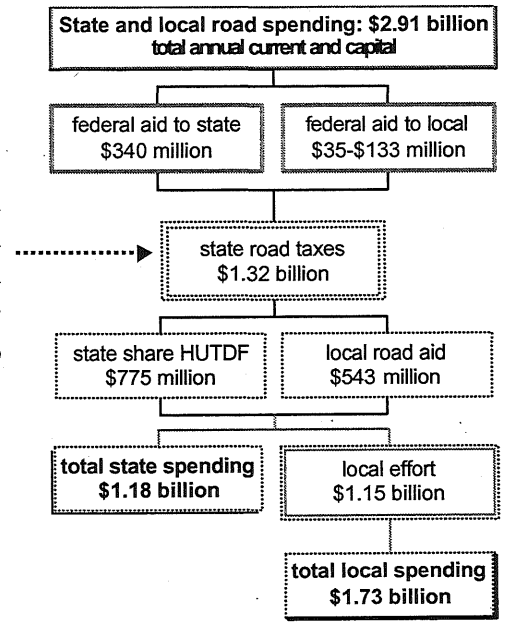
Adequacy of Minnesota Road Taxes in 2030:

Will revenues keep pace with inflation?

Barry Ryan
Department of Applied Economics
(612/625-7233) ryanx020@umn.edu

Vehicle Registration Tax
Motor Vehicle Sales Tax
Motor Fuels Excise Tax

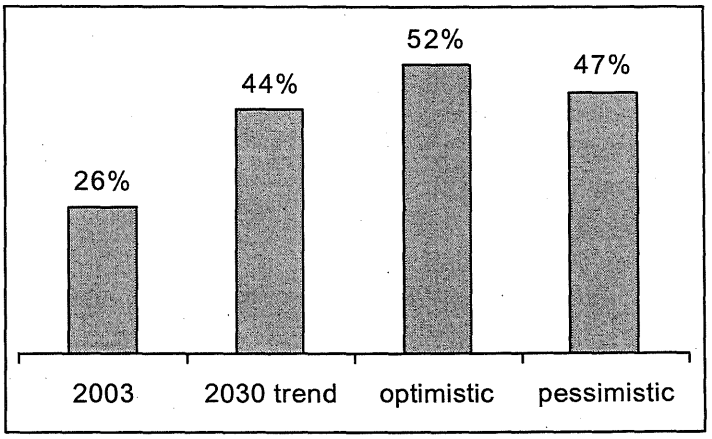
$1.3 billion in 2003



		2030	
2003	*Trend*	*Optimistic*	*Pessimistic*
Minnesota fleet: 4.1 million units	5.9 M	6.5 M	5.3 M
New light vehicle: average $25,100	$51,600	$43,900	$58,100
MV registration tax: $492 million	$933 M	$1.18 B	$875 M
MV sales tax (roads): $198 million	$658 M	$975 M	$651 M

Tax burden shifts to new vehicle registrations

share MVRT revenues paid by new light vehicle



Motor Fuels Excise Tax

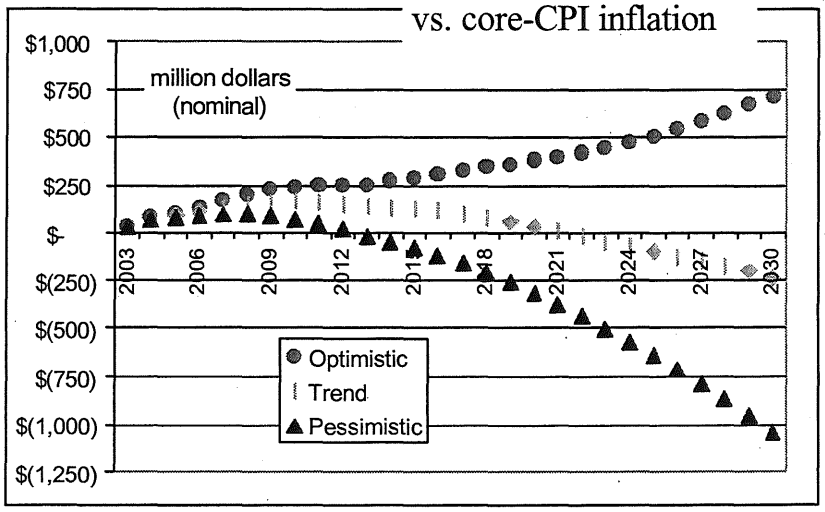
		2030	
2003	*Trend*	*Optimistic*	*Pessimistic*
MFET: **$635 million**	$1.25 B	$1.36 B	$1.14 B
Fuel use: **3.2 billion gallon/yr**	6.1 bgy	6.7 bgy	5.3 bgy

Inflated cost of today's $1.3 billion in road service:

	2030		
	Trend	*Optimistic*	*Pess.*
-using Core Consumer Price Index			
	$3.0 B	$2.8 B	$3.7 B
Average annual rate:	*3.1%*	*2.8%*	*3.9%*
-using State & Local Government Cost Index			
	$3.3 B	$3.2 B	$3.7 B
Average annual rate:	*3.5%*	*3.3%*	*3.9%*

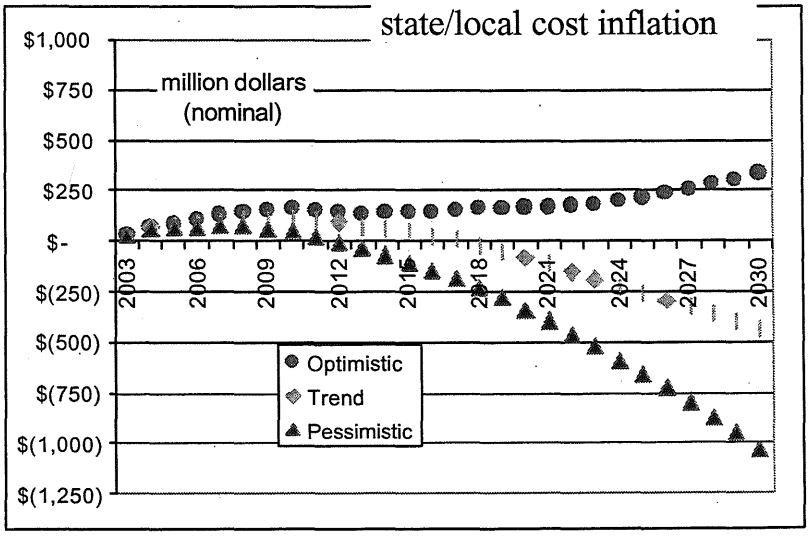
Purchasing Power

Balance of road taxes vs. core-CPI inflation

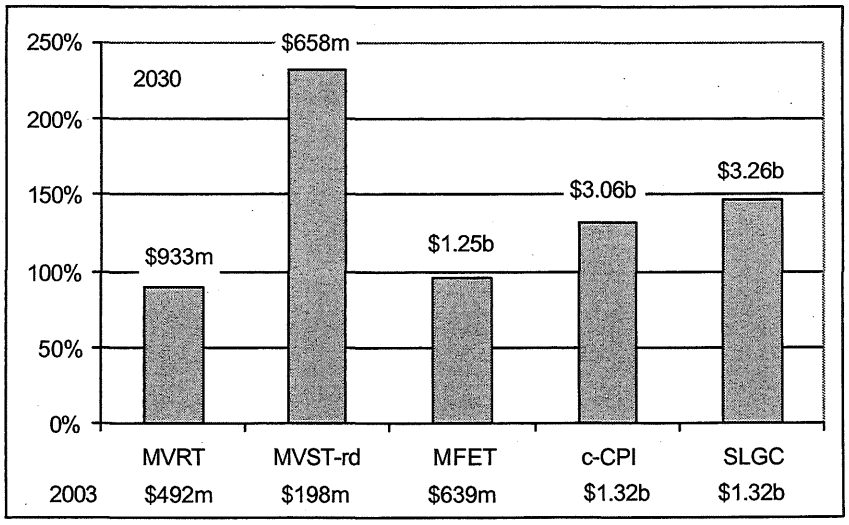


Purchasing Power

Balance of road taxes vs. state/local cost inflation



Rates of change (Trend Forecast)



- Certain growth over next 25 years
- Current law may bring unintended consequences
- Infrastructure improvements will be needed
- Inflation steals purchasing power
- Shortfall as early as 2012 - or maybe never

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Jo Anne Zoff Sellner
Director

Senate
State of Minnesota

S.F. No. 114 - Designating Purple Heart Memorial Highway

Author: Senator Paul E. Koering

Prepared by: Bonnie Berezovsky, Senate Counsel (651/296-9191) BB
Amy Vennewitz, Fiscal Analyst (651/296-7681)

Date: January 27, 2005

Section 1 designates Trunk Highway 371 from Little Falls to U. S. Highway 2 in Cass Lake as the "Purple Heart Memorial Highway." The portion of the highway known as the Brainerd Bypass that is already designated the "C. Elmer Anderson Memorial Highway" is excepted from this designation. The commissioner may not adopt a design or erect signs until being assured of the availability of funds from nonstate sources to pay all costs.

BB/AV:rer

Senators Koering, Vickerman, Dille, Murphy and Sparks introduced--

S.F. No. 114: Referred to the Committee on Transportation.

A bill for an act

relating to highways; designating Purple Heart Memorial Highway; amending Minnesota Statutes 2004, section 161.14, by adding a subdivision.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 2004, section 161.14, is amended by adding a subdivision to read:

Subd. 50. [PURPLE HEART MEMORIAL HIGHWAY.] (a) Except for that portion designated under subdivision 45, the route signed as Trunk Highway 371 on the effective date of this subdivision, from its intersection with U. S. Highway 10 near the city of Little Falls to its intersection with U. S. Highway 2 in the city of Cass Lake, is named and designated the "Purple Heart Memorial Highway."

(b) Subject to the provisions of section 161.139, the commissioner shall adopt a suitable marking design to mark the highway and shall erect the appropriate signs.

January 10, 2005

Lieutenant Governor Carol Molnau
Office of the Governor
130 State Capitol
75 Rev. Dr. Martin Luther King Jr. Blvd.
St. Paul, MN 55155

Dear Carol:

Greetings from Brainerd and Baxter! We are sending this letter of support for Senator Paul Koering's Legislative request that Hwy 371 from Little Falls to Cass Lake (except the portion already dedicated as C. Elmer Anderson Memorial Highway) be designated as Purple Heart Memorial Highway. We believe that this would truly be a permanent and constant reminder to those who travel this highway of the Veterans who have served as well as those who have given of their lives for the freedoms we continue to enjoy.

Thank you for your consideration of this Legislation. Wishing you and yours the very best for the new year ahead.

Sincerely,

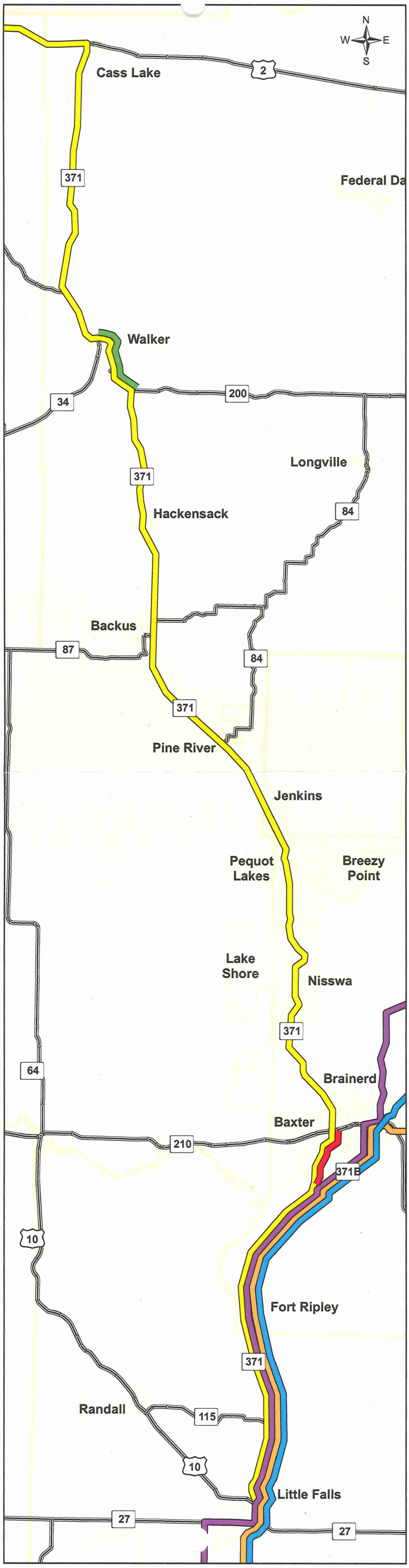
James E. Wallin
Mayor of Brainerd

Darrel Olson
Mayor of Baxter

cc: Senator Paul Koering
Terry McCollough, Brainerd Dispatch

TH 371 Highway Designations

January 26, 2005



P.H. McGarry Memorial Drive

161.14, subd. 5

Paul Bunyan Expressway

161.14, subd. 25
(part of longer route)

C. Elmer Anderson Memorial Parkway

161.14, subd. 45

Voyageur Highway

161.14, subd. 18
(part of longer route)

Hiawatha Pioneer Trail Alternate Route

161.14, subd. 12
(part of longer route)

Great River Road

161.142
(part of longer route)

MINNESOTA DEPARTMENT OF TRANSPORTATION

Senate Counsel & Research

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Jo Anne Zoff Sellner
Director

Senate
State of Minnesota

S.F. No. 191 - Requiring Display of Sticker and License Plate on Trailer with Lifetime Registration

Author: Senator Gary W. Kubly

Prepared by: Bonnie Berezovsky, Senate Counsel (651/296-9191) BB
Amy Vennewitz, Fiscal Analyst (651/296-7681)

Date: January 27, 2005

Section 1 requires display of a lifetime registration sticker for a trailer registered at a gross vehicle weight of 3,000 pounds or less. This type of vehicle is currently required under this section to display only a distinctive plate. Obsolete language is stricken from this section of law.

Section 2 extends the license plate display requirement to all trailers, not only those registered at greater than 3,000 pounds gross vehicle weight.

Section 3 requires a light-weight trailer with lifetime registration to display a numbered plate on the rear of the vehicle, in addition to the lifetime registration sticker adhered to the side of the trailer frame tongue.

BB/AV:rer

Preliminary

Fiscal Note – 2005-06 Session

Bill #: S0191-0 **Complete Date:**

Chief Author: KUBLY, GARY

Title: TRAILER LIFETIME REG PLATE DISPLAY

Agency Name: Public Safety Dept

Fiscal Impact	Yes	No
State	X	
Local		X
Fee/Departmental Earnings	X	
Tax Revenue		X

This table reflects fiscal impact to state government. Local government impact is reflected in the narrative only.

Dollars (in thousands)	FY05	FY06	FY07	FY08	FY09
Expenditures					
Highway Users Tax Distribution Fund		2,484	309	0	150
Less Agency Can Absorb					
-- No Impact --					
Net Expenditures					
Highway Users Tax Distribution Fund		2,484	309	0	150
Revenues					
Highway Users Tax Distribution Fund		0	3,251	211	217
Net Cost <Savings>					
Highway Users Tax Distribution Fund		2,484	(2,942)	(211)	(67)
Total Cost <Savings> to the State		2,484	(2,942)	(211)	(67)

	FY05	FY06	FY07	FY08	FY09
Full Time Equivalents					
Highway Users Tax Distribution Fund			1.00		
Total FTE			1.00		

Preliminary

Bill Description

Motor vehicle trailers with lifetime registration license plate and sticker display requirement.

Assumptions

- DVS assumes distribution of the plate will be through the Deputy Registrars, which under the current fee would cost the customer $7.00 for the filing fee and $3.00 for the plate fee (total of $10.00). If DVS mails out the plates, there would be additional cost.
- As of 12/31/04, there were 917,753 registered trailers. In calendar year 2004, there were 62,495 new trailers registered. DVS assumes a 3% growth on new trailer registration each year.
- DVS anticipates mailing post cards to registered trailer owners explaining the change and procedure for obtaining trailer plates. DVS assumes a postal rate of $0.23 per card. However, the United States Postal Service has indicated a rate increase in calendar year 2006.
- MINNCOR would need one year to produce plates for current registered trailers and to establish a plate inventory (approximately 1.2 million plates).
- DVS assumes the plate requirement would take effect in FY07.
- The contract price for MINNCOR to produce a plate is $2.07 per plate through FY07.
- A one-time DVS programming charge of $3,000 is assumed.
- Once the program is implemented, DVS assumes 10% of the owners of registered trailers (approximately 100,000) would be contacting DVS with questions. Therefore, two temporary (6 months) Customer Service Specialist Intermediates (CSSI) would have to be hired to handle the inquiries.

Expenditure and/or Revenue Formula

917,753 registered trailers (CY04) + 64,370 new registrations (CY05) + 33,150 (Through 6-30-06) = 1,015,273.
New registrations at 3% growth: FY07 68,290; FY08 70,339; FY09 72,449.
Cost to produce plate ($2.07): FY06 $2,484,000 (1.2 million plates); FY09 $149,969.
2 CSSI at step 3 (6 months) = 1.0 FTE at an estimated cost for FY07 of $52,258.
One-time programming changes: $3,000.
Post card notification: Duplex printing on one million post cards (INTERTECH) $20,503; postage ($0.23) $233,512 on 1,015,273 post cards mailed.

Revenue from existing registrations ($3.00 plate fee) FY07: 1,015,273 x $3.00 = $3,045,819.
Revenue from new registrations: FY07 $204,870; FY08 $211,017; FY09 $217,347.

Long-Term Fiscal Considerations

Local Government Costs

N/A

References/Sources

Agency Contact Name: Bob Cheney 651 297-5835
FN Coord Signature: FRANK AHRENS
Date: 01/27/05 Phone: 296-9484

Senators Kubly and Robling introduced--

S.F. No. 191: Referred to the Committee on Transportation.

A bill for an act

relating to motor vehicles; requiring trailers with lifetime registration to display license plate and sticker; removing obsolete language; amending Minnesota Statutes 2004, sections 168.013, subdivision 1d; 169.79, subdivisions 3, 3a.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 2004, section 168.013, subdivision 1d, is amended to read:

Subd. 1d. [TRAILER.] (a) On trailers registered at a gross vehicle weight of greater than 3,000 pounds, the annual tax is based on total gross weight and is 30 percent of the Minnesota base rate prescribed in subdivision 1e, when the gross weight is 15,000 pounds or less, and when the gross weight of a trailer is more than 15,000 pounds, the tax for the first eight years of vehicle life is 100 percent of the tax imposed in the Minnesota base rate schedule, and during the ninth and succeeding years of vehicle life the tax is 75 percent of the Minnesota base rate prescribed by subdivision 1e.

(b) Farm trailers with a gross weight in excess of 10,000 pounds and as described in section 168.011, subdivision 17, are taxed as farm trucks as prescribed in subdivision 1c.

(c) ~~Effective on and after July 1, 2001,~~ Trailers registered at a gross vehicle weight of 3,000 pounds or less must display a distinctive plate and lifetime registration sticker. The registration on the license plate is valid for the

life of the trailer only if it remains registered at the same gross vehicle weight. The onetime registration tax for trailers registered for the first time in Minnesota is $55. ~~For trailers registered in Minnesota before July 1, 2001, and for which:~~

~~(1) registration is desired for the remaining life of the trailer, the registration tax is $25, or~~

~~(2) permanent registration is not desired, the biennial registration tax is $10 for the first renewal if registration is renewed between and including July 1, 2001, and June 30, 2003. These trailers must be issued permanent registration at the first renewal on or after July 1, 2003, and the registration tax is $20.~~

For trailers registered at a gross weight of 3,000 pounds or less before July 1, 2001, but not renewed until on or after July 1, 2003, the registration tax is $20 and permanent registration must be issued.

Sec. 2. Minnesota Statutes 2004, section 169.79, subdivision 3, is amended to read:

Subd. 3. [REAR DISPLAY OF SINGLE PLATE.] If the vehicle is a motorcycle, motor scooter, motorized bicycle, motorcycle sidecar, trailer ~~registered at greater than 3,000 pounds gross vehicle weight (GVW)~~, semitrailer, or vehicle displaying a dealer plate, then one license plate must be displayed on the rear of the vehicle.

Sec. 3. Minnesota Statutes 2004, section 169.79, subdivision 3a, is amended to read:

Subd. 3a. [SMALL TRAILER.] If the vehicle is a trailer with 3,000 pounds or less GVW with lifetime registration, the numbered plate ~~or~~ must be displayed on the rear of the vehicle and the lifetime registration sticker must be adhered to the side of the trailer frame tongue near the hitch.

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Jo Anne Zoff Sellner
Director

Senate
State of Minnesota

S.F. No. 135 - Providing for Special Persian Gulf War Veterans License Plates

Author: Senator Bob Kierlin

Prepared by: Amy Vennewitz, Senate Research (296-7681) AMV
Bonnie Berezovsky, Senate Counsel (296-9191)

Date: January 27, 2005

Section 1 adds language to the existing statute which authorizes special motorcycle license plates for Vietnam veterans to include a special plate for Persian Gulf War veterans. A Persian Gulf War veteran is defined in existing statute under section 168.123, subdivision 2, paragraph (f), which authorizes special Persian Gulf War veterans plates for passenger vehicles. Plates may be issued under this section only to a person who served in the active military service in a branch of the armed forces of the United States or a nation or society allied with the United States. Plates issued under this section are not subject to the requirements of section 168.1293 relating to procedures for establishing a special license plate.

Fiscal Note – 2005-06 Session

Bill #: S0135-0 **Complete Date:** 01/21/05

Chief Author: KIERLIN, BOB

Title: VETERANS MOTORCYCLE LICENSE PLATES

Fiscal Impact	Yes	No
State	X	
Local		X
Fee/Departmental Earnings	X	
Tax Revenue		X

Agency Name: Public Safety Dept

This table reflects fiscal impact to state government. Local government impact is reflected in the narrative only.

Dollars (in thousands)	FY05	FY06	FY07	FY08	FY09
Expenditures					
Highway Users Tax Distribution Fund		1	1	1	1
Less Agency Can Absorb					
-- No Impact --					
Net Expenditures					
Highway Users Tax Distribution Fund		1	1	1	1
Revenues					
Highway Users Tax Distribution Fund		1	1	1	1
Net Cost <Savings>					
Highway Users Tax Distribution Fund		0	0	0	0
Total Cost <Savings> to the State					

	FY05	FY06	FY07	FY08	FY09
Full Time Equivalents					
-- No Impact --					
Total FTE					

Bill Description

This bill allows for the issuing of special motorcycle license plates for Persian Gulf War veterans.

Assumptions

The estimated cost from MinnCorr for embossed plates is $11.00 per plate (plus die cost of $425). The customer plate fee is $10.00. Estimate 90 vehicles would display plates. Due to the small number of plates, production cost would increase.

Expenditure and/or Revenue Formula

Expenses for 90 embossed plates @ $11.00 = $990 + $425 = $1,415. Revenues for 90 plates @ $10.00 = $900

Long-Term Fiscal Considerations

Local Government Costs

N/A

References/Sources

Agency Contact Name: Bob Cheney 651 297-5838
FN Coord Signature: FRANK AHRENS
Date: 01/20/05 Phone: 296-9484

EBO Comments

I have reviewed this Fiscal Note for accuracy and content.

EBO Signature: NORMAN FOSTER
Date: 01/21/05 Phone: 215-0594

Senators Kierlin and Murphy introduced--

S.F. No. 135: Referred to the Committee on Transportation.

A bill for an act

relating to motor vehicles; directing commissioner of public safety to issue special motorcycle license plate for Persian Gulf War veterans; making technical and clarifying changes; amending Minnesota Statutes 2004, section 168.123, subdivision 1.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 2004, section 168.123, subdivision 1, is amended to read:

Subdivision 1. [GENERAL REQUIREMENTS; FEES.] (a) On payment of a fee of $10 for each set of two plates, or for a single plate in the case of a motorcycle plate, payment of the registration tax required by law, and compliance with other laws relating to the registration and licensing of a passenger automobile, pickup truck, van, self-propelled recreational equipment, or motorcycle, as applicable, the registrar shall issue:

(1) special license plates to an applicant who served in the active military service in a branch of the armed forces of the United States or of a nation or society allied with the United States in conducting a foreign war, was discharged under honorable conditions, and is an owner or joint owner of a passenger automobile, pickup truck, van, or self-propelled recreational equipment; or

(2) a special motorcycle license plate:

(i) as described in subdivision 2, paragraph (a), ~~or~~

~~another special license plate designed by the commissioner of public safety~~ to an applicant who is a Vietnam veteran who served after July 1, 1961, and before July 1, 1978~~, and~~; or

(ii) as described in subdivision 2, paragraph (f), to an applicant who is a Persian Gulf War veteran, as defined in subdivision 2, paragraph (f).

A plate may be issued under this clause only to a person who served in the active military service in a branch of the armed forces of the United States or a nation or society allied with the United States in conducting a foreign war, was discharged under honorable conditions, and is an owner or joint owner of a motorcycle. Plates issued under this clause must be the same size as standard motorcycle license plates. Special motorcycle license plates issued under this clause are not subject to section 168.1293.

(b) The additional fee of $10 is payable for each set of plates, is payable only when the plates are issued, and is not payable in a year in which tabs or stickers are issued instead of number plates. An applicant must not be issued ~~more than two sets of~~ plates for more than two vehicles listed in paragraph (a) and owned or jointly owned by the applicant.

(c) The veteran ~~shall~~ must have a certified copy of the veteran's discharge papers, indicating character of discharge, at the time of application. If an applicant served in the active military service in a branch of the armed forces of a nation or society allied with the United States in conducting a foreign war and is unable to obtain a record of that service and discharge status, the commissioner of veterans affairs may certify the applicant as qualified for the veterans' license plates provided under this section.

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Jo Anne Zoff Sellner
Director

Senate
State of Minnesota

S.F. No. 256 - Providing for Special Firefighter Motorcycle License Plates

Author: Senator Steve Murphy

Prepared by: Amy Vennewitz, Senate Research (296-7681) AMV
Bonnie Berezovsky, Senate Counsel (296-9191)

Date: January 27, 2005

Section 1 adds language to the existing statute authorizing special license plates for firefighters to include a special plate for a motorcycle. A motorcycle plate issued under this section must be the same size as a standard motorcycle plate. Special plates issued under this section for a passenger vehicle, truck or motorcycle may be transferred to another vehicle owned by the same individual to whom the original plates were issued upon payment of a $5 fee. All fees for the sale or transfer of the plates must be deposited in the highway user fund.

Fiscal Note – 2005-06 Session

Bill #: S0256-0 **Complete Date:** 01/21/05

Chief Author: MURPHY, STEVE

Title: MOTORCYCLE LIC PLATES; FIREFIGHTERS

Agency Name: Public Safety Dept

Fiscal Impact	Yes	No
State	X	
Local		X
Fee/Departmental Earnings	X	
Tax Revenue		X

This table reflects fiscal impact to state government. Local government impact is reflected in the narrative only.

Dollars (in thousands)	FY05	FY06	FY07	FY08	FY09
Expenditures					
Highway Users Tax Distribution Fund		4	4	4	4
Less Agency Can Absorb					
-- No Impact --					
Net Expenditures					
Highway Users Tax Distribution Fund		4	4	4	4
Revenues					
Highway Users Tax Distribution Fund		3	3	3	3
Net Cost <Savings>					
Highway Users Tax Distribution Fund		1	1	1	1
Total Cost <Savings> to the State		1	1	1	1

	FY05	FY06	FY07	FY08	FY09
Full Time Equivalents					
-- No Impact --					
Total FTE					

Bill Description

This bill allows for the issuing of special motorcycle license plates for firefighters.

Assumptions

The estimated cost from MinnCorr for embossed plates is $11.00 per plate (plus die cost of $425) plus Decal cost (approximately $0.75). The customer plate fee is $10.00. Estimate 300 vehicles would display plates. Due to the small number of plates, production cost would increase.

Expenditure and/or Revenue Formula

Expenses for 300 embossed plates @ $11.75 = $3,525 + $425 = $3,950 Revenues for 300 plates @ $10.00 = $3,000

Long-Term Fiscal Considerations

Local Government Costs

N/A

References/Sources

Agency Contact Name: Bob Cheney 651 297-5838
FN Coord Signature: FRANK AHRENS
Date: 01/20/05 Phone: 296-9484

EBO Comments

I have reviewed this Fiscal Note for accuracy and content.

EBO Signature: NORMAN FOSTER
Date: 01/21/05 Phone: 215-0594

Senators Murphy; Johnson, D.E.; Sparks; Ourada and Robling introduced--

S.F. No. 256: Referred to the Committee on Transportation.

A bill for an act

relating to license plates; creating firefighter special motorcycle license plates; amending Minnesota Statutes 2004, section 168.12, subdivision 2b.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 2004, section 168.12, subdivision 2b, is amended to read:

Subd. 2b. [FIREFIGHTERS; SPECIAL PLATES.] (a) The registrar shall issue special license plates, or a single plate in the case of a motorcycle plate, to any applicant who is both a member of a fire department receiving state aid under chapter 69 and an owner or joint owner of a passenger automobile, ~~or~~ a truck with a manufacturer's nominal rated capacity of one ton and resembling a pickup truck, or a motorcycle, upon payment of a fee of $10 and upon payment of the registration tax required by law for the vehicle and compliance with other laws of this state relating to registration and licensing of motor vehicles and drivers. In lieu of the identification required under subdivision 1, the special license plates ~~shall~~ must be inscribed with a symbol of a Maltese Cross together with five numbers. No applicant shall receive special plates for more than two ~~sets of plates for~~ vehicles owned or jointly owned by the applicant.

(b) Special plates issued under this subdivision may only be used during the period that the owner or joint owner of the

vehicle is a member of a fire department as specified in this subdivision. When the person to whom the special plates were issued is no longer a member of a fire department or when the vehicle ownership is transferred, the special license plates ~~shall~~ must be removed from the vehicle and returned to the registrar. Upon return of the special plates, or special motorcycle plate, the owner or purchaser of the vehicle is entitled to receive regular plates, or a regular motorcycle plate, for the vehicle, as applicable, without cost for the remainder of the registration period for which the special plate or plates were issued. ~~Firefighter license plates issued pursuant to this subdivision may be transferred to another motor vehicle upon payment of $5, which fee shall be paid into the state treasury and credited to the highway user tax distribution fund.~~

(c) A special motorcycle license plate issued under this subdivision must be the same size as a standard motorcycle license plate.

(d) Upon payment of a fee of $5, plates issued under this subdivision for a passenger automobile or truck may be transferred to another passenger automobile or truck owned or jointly owned by the person to whom the plates were issued. On payment of a fee of $5, a plate issued under this subdivision for a motorcycle may be transferred to another motorcycle owned or jointly owned by the person to whom the plate was issued.

~~(c)~~ (e) The commissioner of public safety may adopt rules under the Administrative Procedure Act, sections 14.001 to 14.69, to govern the issuance and use of the special plates authorized in this subdivision.

(f) All fees from the sale or transfer of special license plates for firefighters ~~shall~~ must be paid into the state treasury and credited to the highway user tax distribution fund.