



## SPECIAL RESEARCH CONFERENCE ISSUE

This issue of the *CTS Report* features extended coverage of the 18th Annual CTS Transportation Research Conference, held May 1–2 in St. Paul. Coverage includes:

- An opening plenary session titled “Addressing Minnesota’s Short- and Long-Term Transportation Finance Structure,” with a keynote presentation by **James Whitty** (below) and panel discussion with **Carol Molnau**, **Bernie Lieder**, and **Rick Krueger** (also below).

- A luncheon presentation titled “Zoned Out: Regulation, Markets, and Choices in Transportation and Metropolitan Land Use,” by **Jonathan Levine** of the University of Michigan (page 4).
- A sampling of concurrent sessions on topics such as transitway development, rural safety, and the impacts of biofuels (pages 5–8). **CTS**

## Oregon’s pilot program suggests promise—and hurdles—for road user fees

Mileage charging is a concept that works, said **James Whitty** of the Oregon Department of Transportation, but making it a reality will require a long transition time and a change in public attitude. Whitty,



James Whitty

manager of ODOT’s Office of Innovative Partnerships and Alternative Funding, described Oregon’s pilot program at the opening plenary session of the 18th Annual CTS Transportation Research Conference.

The ODOT Road User Fee Pilot Program ran from April 2006 to March 2007. The idea for the experiment arose six years ago, Whitty said, when state legislators became concerned with the growing “revenue erosion” caused by increasing fuel efficiency and use of alternative fuels. Oregon economists predict a permanent drop-off in real gas-tax revenue by 2021, he said. “It will be a long, slow slide, but an assured slide.”

Another weakness of the gas tax is that it is not directly connected to the wear and tear vehicles place on the system. “More miles traveled don’t mean more revenue,” Whitty said.

Faced with these issues, the legislature created a task force and charged it with developing a new design for

revenue collection. After discussions, the task force (made up of legislators, former DOT commissioners, and citizens) in turn gave a directive to ODOT: create a new road revenue system mirroring as closely as possible the advantages of the gas tax (such as ease of payment and administration) but with fewer disadvantages.

ODOT’s solution was the mileage fee, a per-mile charge based on vehicle-miles

traveled. In the pilot system, a GPS satellite transmits location data (divided into three zones) to an on-board device. When the vehicle pulls into a gas station, a short-range mileage reader on the fuel pump records the mileage totals and feeds the data into a point-of-sale system and a central computer. (To guard privacy, location data are wiped clean.) The central computer calculates the proper fee by

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## Panelists see mileage fees in Minnesota’s long-term future

Following the keynote presentation by **James Whitty** (see above), the opening conference session turned to a panel discussion with three Minnesota leaders: Lt. Gov. **Carol Molnau**, who also serves as commissioner of the Minnesota Department of Transportation (Mn/DOT); state representative **Bernie Lieder**, chair of the Minnesota House Transportation Finance Division; and **Rick Krueger**, executive director of the Minnesota Transportation Alliance.

“One of the administration’s top priorities is to secure a stable source of long-term transportation funding during



Carol Molnau



Bernie Lieder



Rick Krueger

this legislative session,” Molnau began. Minnesota is experiencing the same flattening of gas-tax revenues as Oregon, she noted, and mileage-based user fees offer a promising new alternative. In its 2007 transportation plan, the administration proposed a \$5 million demonstration project to promote mileage-based user fees. The pilot project would examine

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zone and relays it back to the pump for payment.

Consumers pay either the fuel tax or the mileage fee, but not both. “This is an important issue,” Whitty said. Retrofitting the various vehicle makes and models doesn’t work well, he explained, so the equipment needs to be installed pre-sale or at manufacture. This would require a long period of transition—approximately 20 years—as the mileage fee gradually becomes predominant.

Integration with the existing fuel-tax collection system is critical for several other reasons, he said. The retail station reimburses both taxes to a wholesale distributor, which then pays ODOT, keeping collection simple. Integration also provides a safeguard against system failure and tampering and ensures that motorists from other states and countries are able to pay. Plus, “you maintain the gas tax as the underlying principle,” he said.

Oregon’s mileage fee raises “substantial revenue,” Whitty said, “initially as much as the gas tax and then more.” The on-vehicle device used in the pilot cost about \$140, and state operating costs are estimated at \$1.6 million annually. The main expense is retrofitting the service stations, he said, which would be bonded at \$35 million over 20 years.

Preliminary results from the pilot show

the zone differentiation and the mileage counting worked very well. Vehicle retrofits caused some difficulty, but most cars achieved 100 percent accuracy. ODOT is now conducting an assessment of the technology, administration, and user behavior (including a participant survey) and identifying implementation issues. A report is due in September 2007.

A key next step is to gain support from

**“The public doesn’t understand the revenue erosion problem we’re trying to fix, so they won’t accept the solution...It will come grudgingly.”**

—James Whitty

auto manufacturers. “If they are not on board,” Whitty said, “we can’t proceed.” To do so, support from the FHWA or USDOT is needed to “bring them to the table,” he said. A multi-state initiative, especially with a large state such as California, could serve as a critical pathway for deployment. “Companies see a burgeoning market for the technology,” he noted.

Another big issue for the future is collection from plug-in hybrids. Payment could be added to homeowners’ utility bills, he suggested.

“The big elephant in the room is rate

structure,” Whitty cautioned. Possibilities include a flat rate or varied multiple rates based on vehicle weight or fuel efficiency, for example. (The pilot used a flat tax and retained the state’s weight-distance tax for heavy vehicles.) The ODOT project doesn’t determine what the rate should be.

The pricing system also could be used to charge differing rates in more zones or to charge higher rates at peak periods. “These are political issues that state and local [leaders] have to wrestle with,” Whitty said. “It is a viable option. It was tested in Oregon, and it worked.”

A final critical factor is public acceptance—and at this point, the concept doesn’t have it, Whitty said. “The public doesn’t understand the revenue erosion problem we’re trying to fix,” he said, “so they won’t accept the solution...It will come grudgingly.” He recommended learning more about the public’s understanding of transportation funding and correcting misperceptions. “But we won’t [gain acceptance] until they experience the difficulty of falling gas-tax revenue,” he concluded. **CTS**



Mileage reader at the pump



On-vehicle device display

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in-vehicle data and revenue-collection technologies to learn what is effective, cost-effective, and secure, she said. [Ed. note: The governor and the legislature were unable to reach agreement on a new funding bill before the session closed on May 21.]

Molnau agreed with Whitty’s view that transportation professionals need to educate the general public about the erosion of the gas tax. This tax, based on consumption rather than usage, is becoming a less efficient way of funding our system. “High-efficiency vehicles are a wonderful thing for many reasons, environmentally as well as economically, but they are on our roadways without paying, some would say, their fair share,” she said.

Molnau also believes the eventual solution needs to include all states as well as Canada and Mexico. “Mileage fees are something that will have to occur, in a timely fashion, but [implementation] has to occur nationally,” she said. And, she added, “hopefully we can find a solution that can be communicated to the general public and, with some help, be accepted.”

The panel next turned to Rep. Lieder. “We need to bring up our funding levels in Minnesota or we’re not going to have roads to drive on,” he began. Transportation as a whole, including transit, must be addressed; the problem is how to gain public acceptance for an increase in taxes.

For the past few years, Lieder continued, Minnesota has been involved in a study of mileage-based charging with the federal government and a consortium of states. [Ed. note: The ITS Institute at CTS is part of this research; see [www.its.umn.edu/Research/ProjectDetail.html?id=1999002](http://www.its.umn.edu/Research/ProjectDetail.html?id=1999002).] The effort, however, hasn’t dislodged public concerns about a range of issues such as privacy and fairness. “Those can all be addressed,” he said.

Lieder thinks Minnesota could implement a low-level, functional system (without GPS) in the proposed pilot program, using variable rates for different types of vehicles to account for public concerns about fairness. Like Oregon, an integrated collection system would retain the gas tax for unequipped vehicles and follow the same admin-

istrative procedures until a long-term phase-out. “The future is definitely going to change, it is still going to be related to a user tax, and the user tax is a fair way to go,” he said.

Krueger said that in a nutshell, Minnesota faces two problems in transportation financing: a long-term structural gap estimated at \$1.5 billion to \$2.4 billion per year, and a \$300 million shortfall next fiscal year. Pricing will not offer a quick solution, he said, because issues such as public and private infrastructure, vehicle modifications, and privacy protections need to be resolved. “New technologies for major structural changes usually take in the range of 30 to 50 years before they are implemented,” he warned.

In the meantime, Krueger said, “these types of things shouldn’t be excuses for not getting financing done...for the investments needed at this time.”

States can be laboratories for pilot programs and projects, Krueger said, but ultimately a national solution is needed. “My point is very simple...right now, a mileage-based system is not ready for prime time,” he said.

What to do in the short term was the point of a follow-up question from the audience. Whitty answered that Oregon, facing similar resistance to raising the

“My point is very simple...right now, a mileage-based system is not ready for prime time.”

—Rick Krueger

gas tax, has started looking at alternatives such as public/private partnerships, toll roads, and bonding. He predicted that mileage-based charging would need five to six years of development before implementation, and even longer to gain public acceptance.

Molnau said in Minnesota, a good first step was last year’s passage of an amendment dedicating the motor vehicle sales tax to transportation. Now the general public needs to see the state use those resources wisely and deliver on its promises, she said. Molnau doesn’t think the public is ready for a gas-tax increase. What’s more, she cautioned, “people assume that when you raise taxes, you solve the problem—and we certainly wouldn’t [be].”

Lieder again stressed public education. “We’re hitting a point where we have to address [our financing] problem,” he said. “We know we are not meeting needs and the public is getting aware of it.” **CTS**



Conference attendees viewed project posters and displays during session breaks.

## Reforms needed to free—not force—market to provide alternatives to sprawl

Picture a new low-density, auto-oriented development. To some, this is evidence of the market meeting buyers' preferences; to others, it is a sign of market excess and an argument for government intervention. These are "polar opposites" of the land use debate, said Professor **Jonathan Levine** of the University of Michigan, but both are based on a false assumption: that the free market carves this pattern of urban form. In reality, he said, government regulations create this pattern—but because the regulations are packaged as local zoning laws, they are mistakenly perceived as "the free market."



Jonathan Levine

Levine, professor and chair of the Department of Urban and Regional Planning, made his remarks at the CTS Spring Luncheon on May 1, which was held as part of the 18<sup>th</sup> Annual CTS Transportation Research Conference.

The most common belief regarding transportation and land use, Levine said, is that Americans want sprawl, and the market is uninterested or incapable of providing alternatives. If this is true, then policy reforms would need to *force* the market to build transit-oriented, high-density development. These policies would be justified only if benefits, such as reduced pollution and obesity, could be proven. But because research on this is split, he said, "we lack the rationale for reform."

Reality, however, suggests a new paradigm: The market prefers more compact development but government regulations exclude it. In this framework, Levine says, there is a robust market for alternatives to sprawl, driven by profit and changing demographics but constrained by municipal zoning. Policy reform would thus *free* the market to meet the rising demand for high-density development. Benefits would not need to be proven because this reform is an expansion—rather than restriction—of choice. Why does that matter? "It leads to two competing ideas," he answered. "Sprawl as market failure or sprawl as government failure."

The majority opinion of a number of

Exclusionary zoning imposes huge costs on residents and communities in terms of increased travel and commute time.

—Jonathan Levine

research studies, some extending back decades, supports the view that local regulations accelerate sprawl. There are "scores of stories" of disputes between developers and communities about high-density restrictions, he said. In his own research, which included a national survey of developers, Levine found that most developers want to build at greater density than regulations allow in inner-suburban areas. In effect, Levine said, these policies amount to "government preference for one American Dream over competing versions of others."

How does this happen? In a "clever redefinition," Levine said, local regulations are viewed as a kind of market force. "Somehow, when we aggregate people at the local level, we don't see it as government regulation," he observed.

Local zoning laws can be motivated by a number of factors, such as reducing traffic or school overcrowding. Residents of wealthier areas may prefer zoning for large lots, believing this keeps low-income citizens from moving in to take advantage of higher levels of services. "I would also be remiss to omit the racial dimension," Levine added.

Exclusionary zoning is considered acceptable because people can move to competing jurisdictions and markets. This view, however, "doesn't acknowledge the extent to which the market is based on the draconian hand of zoning," Levine said. It also doesn't consider the huge costs imposed on residents and communities in terms of increased travel and commute time. "When we exclude people, we incur costs," he said.

Unique in this country, Oregon is taking a different tack. Its transportation-planning rule states that local governments should adopt land use and subdivision regulations to reduce reliance on the auto and allow transit-oriented development (TOD). "The state is taking away the right to regulate out TOD," he

argued. "It is a market-enabling statute."

Levine then illustrated how cities in other countries, such as Salonika, Greece, still exhibit very compact redevelopment. "This is the ordinary course of cities: they grow out, and they grow up—except those guided by U.S.-style zoning policies, which have short-circuited the ordinary course of urbanization," he said.

In contrast is Sunnyvale, Calif., in Silicon Valley. Areas zoned for single-family housing were "zealously guarded by neighbors" as the region underwent a radical transformation, Levine said. Lots valued at \$1 million commonly contain a \$200,000 structure. Developers see huge potential profits—perhaps \$5 million in structure per \$1 million of land—but zoning means it can't happen. What's more, "the transportation impact is huge," he said. "Commute costs are imposed on the rest of the world."

In closing, Levine called for new ways of thinking about transportation and land use and for breaking out of institutional silos. Policy reform is needed not because of potential measurable benefits, but because of the huge interest in the population—estimated at 30 percent of households—in alternative development patterns. "It is incumbent upon us to seek those reforms to allow the market to express that preference," he concluded.

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Compact redevelopment in Salonika, Greece

## Transitway development in the Twin Cities

With the success of the Hiawatha light-rail transit (LRT) line, transit is fast becoming a hot local transportation option, whether it is by LRT, bus, busway, bus rapid transit (BRT), or commuter rail. A standing-room-only crowd packed into a concurrent session to find out the latest about burgeoning plans for transit in the Twin Cities and beyond. Posters with project information and maps lined the back of the room.

**Mark Furhmann**, deputy general manager of Metro Transit, began the session about transitway corridor development with a presentation on the Hiawatha LRT Before and After Study. His broad overview of the 3-year-old, 12-mile line covered ridership, customer demographics, operating productivity, traffic, special events, economic development, and transitway funding.

Hiawatha LRT average weekday ridership last year exceeded the forecast 19,600 by 44 percent, according to Furhmann. In fact, the average weekday ridership of 28,147 in 2006 exceeded the 24,300 forecast for the year 2020. Moreover, transit ridership in the Hiawatha transit corridor, which includes 27 bus lines and the LRT, increased about 44 percent from 2003 to 2006. Experts also are predicting population and employment increases in that area over the next few years.

Furhmann also detailed the impact LRT has had on economic development in the area, citing statistics and forecasts about thousands of new housing units and other permitted building activity in the corridor, from downtown Minneapolis to the Mall of America in Bloomington. “When they saw the first test trains in early 2004, there was a flood of development applications in the corridor,” he said. “The developers finally believed after 30-plus years of debate that the trains are actually going to start serving passengers in Hiawatha.”

Furhmann concluded his presentation with a high-quality video illustration of planned development for and around Minneapolis Downtown Station, the main terminal for the Northstar Commuter Rail, a project he is directing. He credited the Hiawatha LRT project for prompting more transit funding, specifically \$97.5 million



*A simulation of new development near the planned hub for the Northstar Commuter Rail in Minneapolis*

for Northstar and \$120 million from the Motor Vehicle Sales Tax (MVST) amendment. “Hiawatha’s success has helped our policymakers think positively about funding additional transitways here in the region,” he concluded.

Next, **Kathryn Fischer**, director of the Ramsey County Regional Rail Authority (RCRRA), and **Marthand Nookala**, public works administrator for Hennepin County and deputy executive director of the Hennepin County Regional Railroad Authority (HCRRA), outlined extensive transit plans for the east and west metro areas of the Twin Cities.

Fischer placed the work within the context of the Metropolitan Council’s transit master plan, which is being prepared and will set priorities for all of the area’s major transit projects. “Much of our work involves intergovernmental coordination,” she said. “We do so much work with other governmental organizations, community groups, and consulting firms.”

A key organization driving transit development in the Twin Cities is a seven-county joint-powers group, the Metro Transitways Development Board. “Their goal is to get more projects done faster,” Fischer said.

Fischer next described the Central Corridor, which is expected to serve 43,000 riders each day and feature 11 miles of light rail between the Hiawatha Line in downtown Minneapolis and a revamped Union Depot in downtown St. Paul via University Avenue. Union Depot, the proposed transit hub of the east metro,

has yet to be redeveloped, but negotiations are under way to acquire the property and relocate several businesses, including the U.S. Postal Service mail-handling facility.

The Union Depot plan calls for a multimodal transit hub for Metro Transit buses and LRT, Amtrak, Jefferson and Greyhound bus services, and eventually for other transit corridors—which may include commuter rail—such as the Rush Line (to Hinckley), Interstate 94 (to St. Croix County, Wisconsin), Red Rock (to Hastings), and Robert Street (to Rosemount). A high-speed rail line to Chicago is also a possibility someday.

Nookala listed several transit projects west of the Mississippi that feed downtown Minneapolis, including Northstar Commuter Rail, Hiawatha LRT, and Central Corridor LRT, as well as Bottineau Corridor (to Osseo along Highway 81), Interstate 394 (to Minnetonka), Cedar Avenue Corridor (from the Mall of America to Lakeville), Interstate 35W BRT (to Lakeville), and Southwest Corridor (to Eden Prairie).

Nookala also discussed Hennepin County efforts to develop transit projects in partnership with agencies in other jurisdictions. He specifically cited the importance of research conducted with the assistance of CTS and the Humphrey Institute of Public Affairs to evaluate the impact of transitway projects and create a data library for use in further project planning and evaluation. **CTS**

## Researchers aim to better understand rural road safety

New work being done to better understand rural road safety was a hot topic at this year's research conference. **Alec More**, a research assistant at the Center for Excellence in Rural Safety (CERS, [www.cers.umn.edu](http://www.cers.umn.edu)), is working with CERS director **Lee Munnich** on a national study to identify best practices in rural transportation safety. Though the research is in its early stages, More said some key themes are beginning to emerge.

One of those themes is a lack of understanding of how to report on rural safety issues. "Many states are unsure about reporting requirements," he said. "States are looking for guidance." The researchers hope to establish a new standard in communication between states about rural safety by collecting information that has never been gathered previously. This is especially important because more fatalities occur on rural roads each year than on urban ones.

In the preliminary stages of the study, the CERS researchers surveyed states to determine the key causes of accidents on rural roadways. Ultimately, speed combined with drinking and driving proved to be one of the most prominent concerns. In addition, lack of funding, education, and enforcement also play a role.

In his presentation, More cited



Alec More



Tyler Patterson

Washington, Utah, and Vermont as states that have taken significant action to prevent rural crashes. Washington has even installed centerline rumble strips on rural roadways in hopes of preventing more crashes. And while the research is still in its early stages, More believes that the "data can tell a story" in moving toward fewer crashes.

In a more localized study, CERS research assistant **Tyler Patterson** presented his findings for rural road safety in Minnesota. Of all roadway fatalities in Minnesota, about 70 percent occur on rural roadways—bringing attention to the need for better understanding of rural roadway safety. Patterson explained that young male drivers are a special concern, because they cause 71 percent of fatal crashes, based on research done in an east-central Minnesota study of Chisago, Isanti, Mille Lacs, Kanabec, and Pine counties.

"This is spot-on with the state average,"

he said.

Another problem is impaired driving. Patterson highlighted one program in Isanti County under Judge **James Dehn**, which is helping to solve the impaired-driving problem. Dehn has implemented a staggered sentencing program for people who have been arrested for drinking and driving. Staggered sentencing works by separating a one-year sentence into three parts. The first part is served in jail and the second part at home with an electronic Breathalyzer check-in. If the first two-thirds prove to be successful, the last third of the sentence is forgiven. Of 61 people that have gone through the program, only four have re-offended, Patterson said.

Dehn's program also includes a contest rewarding high school students for coming up with witty slogans against teenage drinking. And the community is becoming involved by keeping bars aware of individuals who were arrested after drinking at their establishments.

While both More's and Patterson's research are still in early stages, their work will help determine best practices for improving safety on rural roads. **CTS**

## Planning for alternative modes

Research into alternative transportation modes, particularly bicycling, took center stage in one concurrent session. Among the presenters was **Frank Douma**, assistant director of the State and Local Policy Program at the Humphrey Institute of Public Affairs.

Douma, within the context of urban transportation corridor development, described the history and impact of the Midtown Greenway, an off-street bicycle facility built in a trench of a former railroad right-of-way through south Minneapolis. The project, phased in three parts, has moved from the west side of the city, near Lakes Harriet and Calhoun, east to the Mississippi River and is one component in a much larger regional alternative transit plan. Space for a future transit option such as light rail was also incorpo-

rated into the project.

A key lesson of the Greenway project is how broad-based public participation is vital to the successful development of a perceived detriment—an abandoned railroad right-of-way through an industrial area—into an highly valued and widely used amenity.

Douma's research team, as part of a larger Federal Transit Administration (FTA) study, analyzed transportation corridor development within a framework considering citizen preferences, governance, financing, economic development, and design.

The researchers found that the Midtown Greenway project has been successful in connecting the neighborhoods in South Minneapolis with a large network of recreational and employment opportunities



The Midtown Greenway in Minneapolis

while also acting as a catalyst for redevelopment. Coordinated efforts to combine public-private interests and investments, as well as all five elements (governance, public participation, finance, economic

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## Roads and rails: impacts of the biofuels revolution

Minnesota’s agricultural areas are facing sweeping changes due to the boom in biofuels. What are the possible impacts on transportation infrastructure if this growth continues?

In a concurrent session titled “Food, Fuels, and Farms,” David Christianson of SRF Consulting Group offered some early ideas based on Mn/DOT’s District 7 Freight study. Now in its final stages, the study examined 13 southwestern Minnesota counties to gauge biofuel trends and their effects on roads and rail.

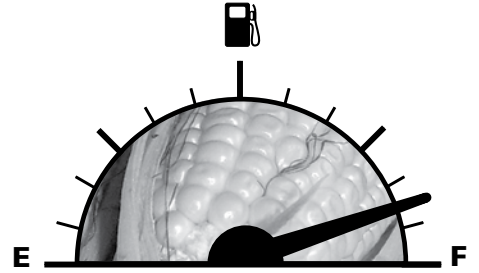
This year about one-third of District 7’s entire corn crop will go to ethanol plants. In the past, farmers used two- and three-axle trucks to transport their grain from the fields to the elevators. Now, Christianson said, they are directly transferring product in the fields to their own five-axle, 80,000-pound trucks. “That means you’re putting these heavy loads on local roads that didn’t have to handle it before,” he said.

About one-third of the corn used in ethanol production ends up as a grain byproduct. “Twenty-five percent of that is moving into international markets already,” he said. Hauling the corn, as well as the ethanol byproduct, will lead to a potential 200 percent increase in heavy commercial truck trips by 2030, Christianson said.

Rail is also hugely important to District 7’s agricultural economy. “We have to preserve the rail capacity we have because it’s going to be absolutely necessary... not only to move corn, but to move ethanol,” he said. Rails are the safest way to move ethanol (a hazardous material), but increasing weights of rail cars will stress short lines, bridges, and railroad lines, he said.

“We need an integrated freight network and can’t let any piece fall apart,” Christianson concluded. “Everything is at capacity.”

Also in the session, Jerry Fruin, an



associate professor in applied economics at the University of Minnesota, discussed the economic geography of ethanol production and markets. Though most corn ethanol plants are located in the Midwest, demand for the product is highest on the coasts, where some states are not in compliance with clean air requirements, Fruin said. This mismatch in supply and demand, he added, has a number of implications for transportation: for example, ethanol shipments by tank truck or rail could replace gas and petroleum shipments by rail, or corn may be shipped by rail to ethanol plants outside of the Corn Belt. **CTS**

## Relocating merge area on I-94 reduces multi-car pileups

Last October a double white line was painted on a stretch of I-94 in downtown Minneapolis to guide merging behavior. The new striping extends the acceleration lane of an incoming double ramp by roughly 700 feet.



John Hourdos

Despite a constant stream of violations, said John Hourdos, director of the Minnesota Traffic Observatory (MTO), the markings have shown some success. (The MTO is part of the Intelligent Transportation Systems Institute at CTS.)

The most important effect of the markings is that crash severity has been reduced, Hourdos said. Five- and six-car crashes have been eliminated, and the number of three- and four-car crashes was greatly reduced. The right lane flows more smoothly, reducing the likelihood of multi-vehicle crashes. And congestion in the right lane shrank about 30 minutes before and after the peak period.

“In respect of crash location, we see that the system has reduced the crashes at the originally high point of Portland [Avenue] and upstream,” Hourdos said. “Unfortunately, it pushed those crashes a little bit further, closer to the new merge point.” At this time it’s unknown if this is a permanent effect or if it can be remedied with greater enforcement.

Signs warn drivers they’ll risk a \$140 fine if they cross the new road markings. Yet drivers continue to do so, Hourdos said, aware that enforcement is difficult without room for a trooper to park. Mn/DOT plans to install an Interstate Grade Curb System on top of the double white lines as a possible permanent solution. These posts are designed to take hits of up to 70 miles per hour and pop back unharmed, but will dent a car as it crosses.

At certain times of the day, Hourdos said, the flow at this crash-prone area reaches 2,700 vehicles per hour, per lane, resulting in “very dense, very fast-moving traffic.” Mn/DOT turned to the MTO several years ago for an analysis

and possible solutions. For the work, the MTO designed and employed observation stations on rooftops on both sides of I-94 westbound, allowing video coverage across this entire area.

After reviewing the video—which captured 95 crashes in about a year—MTO researchers determined the core problem: a shockwave from the downstream merge moves backwards, meeting oncoming traffic at speeds between 5 and 25 miles per hour. The shockwave was caused by drivers merging too soon, despite space further ahead beyond a curve.

“They do not appreciate the available space that is downstream of this curve, so they’re actually forcing themselves to the right lane, causing back-ups,” Hourdos said. As vehicles slow down to merge, they also slow traffic in the right lane. “And that is the wave that is propagating backwards approximately 1,000 feet and generates the crashes,” he said. This effect happened in both lower and higher traffic conditions.

The most affordable and easiest solution

**Merging** continued on page 8

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development, and design) played important roles in creating this success.

According to Douma, the lessons learned from the Midtown Greenway project could serve as a guide for helping corridor planning professionals in future projects.

In a related topic about the impact of bicycle facilities on home values, **Gavin Poindexter**, a research fellow with the Humphrey Institute, described his research conducted with **Kevin Krizek**, associate professor of urban planning and civil engineering and director of the Active Communities/Transportation (ACT) Research Group at the University of Minnesota.

Poindexter examined data about neighborhoods around area facilities, such as

the Midtown Greenway and several others, to find out whether bicycle facilities are an amenity of value. Since bicycle facilities typically provide residents with the opportunity for recreation, more mobility options, and possible health benefits, Poindexter sought to determine how much residents are willing to pay for the benefits associated with living near a high-quality bicycle facility.

Specifically, the project looked at the change in sale prices of homes before and after the addition of a bicycle facility to the neighborhood, using control areas throughout the metropolitan region. Though Poindexter found both positive and negative influences on prices due to the bicycle facilities, his overall conclusion is that such facilities don't signifi-

cantly affect home values.

Another Humphrey Institute research fellow, **Michael Iacono**, presented research examining the detailed relationships between actual travel behavior and distances to various services. In particular, Iacono sought to determine the ease with which a traveler (via any mode, such as a bicycle, auto, transit, or on foot) could reach a valued destination, and what barriers there were to reaching those destinations. This research is part of the Access to Destinations Study ([www.cts.umn.edu/access-study](http://www.cts.umn.edu/access-study)), coordinated by CTS, examining the ability of people to reach destinations to meet their needs. **CTS**

### Merging from page 7

for Mn/DOT was "to change the merge location of the downstream entrance by extending road markings," Hourdos said. "So while earlier the dotted line started approximately 500 feet before the curve, now this double white line is reaching out 200 feet after the curve."

The MTO is continuing its study of the area. For more about Hourdos and the MTO, see [www.its.umn.edu/ProgramsLabs](http://www.its.umn.edu/ProgramsLabs). **CTS**

## Mark your calendars: 19th Annual CTS Transportation Research Conference

May 21–22, 2008  
Saint Paul RiverCentre

### Upcoming events

To publicize your event, call CTS at 612-626-1077, fax 612-625-6381, or e-mail [snopl001@cts.umn.edu](mailto:snopl001@cts.umn.edu). Visit the CTS Web site—[www.cts.umn.edu](http://www.cts.umn.edu)—for more comprehensive event information.

July 15–17 2007 Midwest Regional & Shortline Railroad Annual Summer Conference, Two Harbors, Minn. Sponsor: Minnesota Regional Railroads Association. Contact **Patrick Murray**, 651-556-9204, [pmurray@messerlikramer.com](mailto:pmurray@messerlikramer.com), or see [www.minnesotarailroads.com](http://www.minnesotarailroads.com).

Sept. 17–18 Toward Zero Deaths Conference, Duluth. Contact **Shirley Mueffelman**, 612-624-4754, [conferences2@cce.umn.edu](mailto:conferences2@cce.umn.edu).

Oct. 3–4 Minnesota Fall Maintenance Expo, St. Cloud. Contact **Kathy Warren**, 651-351-7432, [kwarren@usinternet.com](mailto:kwarren@usinternet.com).

Oct. 16–17 AirTAP Fall Forum, Breezy Point. Contact **Mindy Carlson** at 612-625-1813, [carlson@cts.umn.edu](mailto:carlson@cts.umn.edu). **CTS**