SPECIAL RESEARCH CONFERENCE ISSUE

This issue of the *CTS Report* features extended coverage of the CTS Seventeenth Annual Transportation Research Conference, held May 24–25 in St. Paul. Coverage includes:

- A plenary presentation titled "Privacy and Movement: New Challenges for Technology-Enhanced Transportation" by **Colin Bennett** and panel discussion with **Marthand Nookala**, **Dan Murray,** and

Ken Keller (see below).
- A luncheon presentation titled "Leading Multiple Generations: From Pearl Harbor to Helicopters" by **Tom DeCoster** of AASHTO's Leadership Institute (page 3).
- A sampling of concurrent sessions on topics such as teen driving, the Hiawatha LRT corridor, and more (pages 4–8). **CTS**

Privacy policies needed to build trust for transportation projects

Transportation is brimming with opportunities for improving safety and efficiency through technology, but some of these approaches involve capturing private data. Americans fear and distrust this data collection, said **Colin Bennett,** the opening speaker at the annual CTS research conference, yet unlike other developed countries, the United States lacks national data-privacy standards. Until this vacuum is filled, Bennett said, organizations and researchers must set and clearly communicate their own privacy policies to gain trust for their work.

Bennett, professor and chair of the Department of Political Science at the University of Victoria in British Columbia and a self-described "privacy wonk," was followed by comments from three local panelists: **Marthand Nookala**, assistant administrator of public works with Hennepin County; **Dan Murray**, vice president of research with the American Transportation Research Institute (the not-for-profit research arm of the trucking industry); and **Ken Keller**, Charles M. Denny Jr. Professor of Science, Technology, and Public Policy at the Humphrey Institute of Public Affairs and a former University of Minnesota president.

"It has been a mythology," Bennett began, "that since 9/11…security issues in the U.S. tend to trump privacy issues." A recent poll

Colin Bennett

shows that 70 percent of Americans worry about the invasion of their privacy through new technology, higher than the percentage in Australia (64 percent), Great Britain (59 percent), and New Zealand (57 percent). "This issue does resonate," he said.

There are three types of justifications for privacy in western societies, Bennett explained. First is the right of a person to have a zone of personal privacy in which to engage in private affairs. Second is a political value, a check against powerful state and private-sector organizations. Third is an instrumental value, he said, "to ensure that the right data about us are used by the right people for the right purposes." Privacy serves as an instrument for institutions to build consumer trust and engage in interactions such as e-commerce. "When we have privacy and an ability to control the personal information that relates to us," he said, "we can ensure that other rights and obligations and services are rendered correctly."

A number of assumptions lie behind information policy, Bennett believes. Key is that there is no "inherently sensitive" data; privacy problems only occur in the way information is used. For example, it is appropriate for your doctor to ask for your medical information but not to announce it at a conference. "It's the context that produces the risk," he said. Second, there are no data property rights;

UMD selects director for transportation programs

The University of Minnesota Duluth has hired Dr. **Eil Kwon** to direct its expanded transportation research program. Kwon was the 3M McKnight Visiting Professor in UMD's Department of Electrical and Computer Engineering in 2000. During that appointment, he helped lay the groundwork for the establishment of the Northland Advanced Transportation Systems Research Laboratories (NATSRL), a program of the Intelligent Transportation Systems (ITS) Institute at CTS.

Eil Kwon

Kwon returns to university life after a stay at Mn/DOT's Office of Traffic Safety and Operations, where he was the director of traffic research. While working for Mn/DOT, Kwon also served on the NATSRL advisory board and was involved in the selection process for UMD's transportation research projects.

Kwon previously served as program director of advanced traffic systems at the ITS Institute and was a long-time staff member at CTS.

In his new position, Kwon will direct NATSRL (www.its .umn.edu/labs/natsrl.html) and serve as UMD's codirector for the Great Lakes Maritime Research Institute (www.glmri .org). **CTS**

Privacy from **page 1**

without context, personal information has no value. And third, information privacy is more than data security—a database could be completely secure but still violate privacy if the information was collected illegally.

In the 1960s and 1970s, Bennett said, experts developed information privacy principles (see sidebar), which were commonly agreed to in other countries and adopted in the rules of many organizations.

By now, more than 30 countries have enacted comprehensive data-protection laws based on these principles, Bennett said—but not the United States (bills were in Congress at the time of the presentation). The American approach has been to develop policies for sectors or particular industries, he said, creating a "very complicated patchwork of legislative provisions at the state and federal level."

For enforcement, most advanced industrialized nations have data-protection

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Privacy principles:

Accountability
Purpose identification at time of collection
Informed consent for collection
Limited use and disclosure
Retention limitation
Data quality
Data security
Openness about policies and practices
Individual access and correction

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oversight agencies whose sole responsibility is privacy—again, with the exception of the United States (and a few others), Bennett said. The United States tends to rely on voluntary compliance and enforcement through the courts, if necessary.

Amid this patchwork, new mobile technologies are placing a range of jobs and individuals at risk of privacy violation. Newer cell phones are equipped with emergency (E11) locators; mobile workers such as truck drivers, couriers, and postal

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workers can be tracked by management; parents can track teen drivers (see related article on page 4); and rental car agencies can monitor customers' speed, location, and other data.

Owners of new vehicles are another category for which privacy issues have arisen. At least two-thirds of new vehicles come equipped with event data recorder (EDR), or "black box," technology, mostly for automatic collision notification. GM was the first to begin installing EDR, in about 1998, Bennett said, with "little fanfare and with little notification."

Although EDR offers many social benefits, Bennett said, manufacturers didn't plan how the information would be used. Issues arose, and people began asking questions about the extent and transparency of the information. "Is it enough to [describe EDR] on page 57 of the owner's manual?" Bennett asked. "Who owns that data? What about the accuracy, completeness, and quality of the data? Is it admissible in court? Can it be released to researchers…mechanics…insurance companies? What obligations do they have?"

EDR is following the pattern that usually plays out with privacy controversies, he added. First, information is collected without open privacy policies; gradually, stories appear in the media (the June 8 Minneapolis *Star Tribune* featured an article about EDR); civil libertarians become involved; and privacy policies are set—in this country, by the states. (Nine states have privacy laws, and legislation is pending in 12 others, including Minnesota.)

In countries that have comprehensive privacy policies, organizations operate within a known legal framework. Until such a framework exists in the United States, Bennett concluded, "it's incumbent on organizations to do a number of things: be proactive, to anticipate; to not identify individuals in the data; and to be transparent, open, and clear about data purposes and uses." **CTS**

(For more about Bennett's work and his upcoming book, see his Web site at http://web.uvic.ca/poli/bennett.)

Panelists offer privacy perspectives

Following **Colin Bennett**'s presentation, the session turned to the perspectives of the three panelists. **Marthand Nookala** described the federal government's Vehicle Infrastructure Integration (VII) initiative, "a communication network…between vehicles and roadside infrastructure" that aims to improve safety. When in place, the system will collect a multitude of data. Who owns that information, and how will it be used? A working group with representatives from the USDOT, 10 state DOTs, the National Association of County Engineers, and manufacturers are defining nine privacy principles for the initiative. "The fundamental philosophy," he said, "is that personal information should be acquired, disclosed, and used only in ways that protect the privacy of individuals." The group is also developing seven categories of privacy limits on uses.

Marthand Nookala

Dan Murray said the private sector has three main concerns regarding data privacy: (1) civil litigation; (2) sensitive and proprietary information; and (3) the lack of controls to prevent data used by government and researchers from finding its way back to his first two concerns. Industry policy and protocols aren't sufficient, as the vast majority of companies outed recently all had privacy policies in place. "Enron, Tyco, and MCI were all responsible for self-regulation," he noted. Privacy discussions need to be moved out of the courtroom and into legislatures and the Congress. "The United States is so far behind [in] developing a national sense of policy, we've essentially punted," he said. "We need to catch up to other countries."

Dan Murray

Ken Keller

Speaker shares advice for leading multiple generations

For the first time in U.S. history, four generations with distinctly different sets of values are in the transportation workplace. For example, Generation Xers prefer to work independently while those in Generation Y—today's youngest workers who were hovered over by doting parents—need supervision and structure. What are the management and leadership implications for handling this diversity? **Tom DeCoster**, executive director of the AASHTO Leadership Institute, shared his advice at the CTS Spring Luncheon in a speech titled "From Pearl Harbor to Helicopters: Leading Multiple Generations." The luncheon was held May 24 as part of the CTS research conference.

DeCoster began by defining the four groups: veterans, baby boomers, Generation X, and Generation Y (see table). "Tweeners" straddle the groups.

For veterans, managers should reinforce organizational rules as the "bedrock" of structure and provide a clear sense of direction, DeCoster said. Veterans expect leaders to make decisions and are reluctant to share their views, especially in a conflict of ideas. "The highest form of flattery for veterans is to privately seek their counsel and advice," he said. And because many veterans are at or nearing retirement, leaders must remind them of their contributions and let them build a legacy.

Boomers, in contrast, see themselves as the "stars of the show," DeCoster said, and view seniority as the dominant consideration in job security. To lead boom-

Tom DeCoster

ers, managers need to make decisions through consensus and offer socialization opportunities, especially where boomers can "rub shoulders with influential people" who might help them secure promotions, he said. Stress that the organization needs them, talk about their career paths, and make sure you reward seniority and the work ethic. "Reward commitment, not just performance," he said.

The most intense clash of values lies between boomers and the next cohort, the Gen Xers, who "are skeptical of management, their motives, and their greed," DeCoster said. Gen X was affected by the first surge of major social changes such as divorce and daycare. In the workplace, a significant influence on Xers was the era of great layoffs in the 1980s and 1990s. With the bonds of trust broken, this generation brought a new attitude toward work and drove new concepts such as flex time and telecommuting. "They don't live to work and aren't interested in overtime or management jobs," he said.

Leaders need to follow a very different tack for Xers, who place much less value on seniority and expect to see competence in the workplace. Xers prefer to work independently on projects with a clear beginning and end, DeCoster said, so leaders should ask them for their input and assign projects with limited controls. Xers aren't into networking, especially for activities that take place during non-work hours. Managers should provide frequent performance feedback and focus on prac-

tical rewards such as new training.

DeCoster advised the audience not to lump the next group, Generation Y, with the Xers. Gen Y grew up in a prosperous and more stable era in which families had learned to adjust to societal change. For this generation, life is good; people took care of them, and they are not negative or suspicious. In fact, parents were so attentive they hovered over their children like helicopters. "All managers can expect the day when the parent of a Yer will come with an applicant to an interview or performance review, or call to complain," he predicted.

Because of being "helicoptered," DeCoster said, Gen Y needs supervision and structure in the workplace. The most critical message for transportation managers dealing with Gen Y, though, is that this generation seeks a higher purpose in their work life. "When recruiting," he suggested, "forget the job description and focus on how transportation does good things for people." Managers should also foster a teamwork environment and collaborate with this generation, particularly finding mentoring opportunities with veterans. "They are high maintenance but high performance," he summarized.

In closing, DeCoster made several final points. First, managers should not expect generational values to change over time. "They have inculcated a different set of values," he explained. "They may mellow on the edge, but won't change." Second, no one has better values—they only have different values. And finally, "no generation is genetically impeded from being productive." **CTS**

	Veterans (born 1922–1946)	**Boomers** (born 1946–1964)	**Gen X** (born 1964–1980)	**Gen Y** (born 1980–2000)
Values	• Value chain of command, structure, discipline. • Polite, respectful. • Appreciate tradition, history. • Believe in logic, not magic. • Uncomfortable in team meetings.	• Like fair and level playing field, seniority. • Geared toward securing promotions. • Teamwork oriented. • See themselves as "stars." • Put careers first, family second.	• Self-reliant and skeptical. • Lifestyle balance is critical. • Nontraditional orientation to time and work location. • Prefer informality in work relationships. • Technologically savvy.	• Positive expectations about work and life. • Comfortable with diversity. • Can do whatever you want to. • Comfortable with team process. • Technologically sophisticated.
On the job	• No news is good news. • Hardworking on all assignments. • Reluctant to challenge management. • Work first, pleasure later. • Like the personal touch and respect.	• Money, title, corner office. • Experienced with chain of command. • Very sensitive to performance feedback. • Ignore personal conflict. • Believe in magic of leadership.	• Prefer to work independently. • Suspicious of management. • Attach little value to networking. • Impatient with non-performers and lack of progress. • Prefer projects over recurring work.	• Optimistic • Comfortable with multitasking • Need supervision and structure. • Avoid "difficult people" work environments. • Like a "you can be a hero" work environment.

Technology to monitor teen driving raises privacy questions

Several researchers at the University of Minnesota are working to address the high crash—and high fatality—rate of teenage drivers by developing in-vehicle technology to monitor and correct inexperienced drivers' unsafe behaviors behind the wheel.

Max Donath

ITS Institute director **Max Donath** described the technology in the concurrent session titled "Using ITS to Reduce Teenage Road Mortality: Impact on Privacy." **Lee Munnich**, director of the Humphrey Institute's State and Local Policy Program, moderated, and **Colin Bennett**, political science professor with the University of Victoria, followed with a perspective on privacy as it relates to the research.

The Teen Driver Support System (TDSS) aims to address the primary causes of most fatal teen-driver crashes. Speeding, Donath says, is a much more significant issue for teenagers than for other drivers, as is lack of seat belt use. Alcohol impairment is another contributing factor.

Donath also noted that many crashes occur during a driver's first 1,000 miles. "Clearly, if we can do something during the first 1,000 miles, maybe we can effect some change," he said.

The TDSS uses a combination of forcing, feedback, and reporting functions. The forcing function consists of ignition interlocks: a seat belt interlock requires all occupants to engage their seat belt, and an alcohol interlock requires the driver to pass an in-vehicle Breathalyzer test before the vehicle will start.

Feedback is provided by real-time in-vehicle warnings about illegal or unsafe speeds. The reporting function records vehicle information for later review. Donath explained that some drivers might purposely take risks when they feel anonymous; conversely, if they know their behavior is being reported, they may change it, he said.

"All current [driver reporting] systems today are much too passive," Donath said. Speed limits vary according to the road, for example, so setting a system for one maximum speed won't work.

Consequences, incentives, and rewards need to be tied to driving performance, Donath said. He is encouraged by the potential for the TDSS in a graduated driver license program, for which it could help parents or licensing agencies monitor novice drivers as they gradually improve their skills and gain experience before a full license is granted. It could also record when a new driver violates the rules or drives recklessly.

Donath acknowledged the need to plan for potential privacy issues. Any system needs to be transparent, accurate, and secure, he said.

Following Donath, Bennett raised some questions about privacy. A major consideration is whether the technology will do what it's intended to do and how its effectiveness will be evaluated. Also, public acceptability and trust is imperative for the type of systems Donath described, he said.

The use of the data should be regulated, with clear provisions in place prohibiting secondary uses, Bennett added. "This is where 'function creep' comes in. Rules get bent over time…Are we talking about teenagers today, and the elderly tomorrow?

What incentive is there for preventing this information from being used for other purposes?…That's what makes for distrust in the system."

Donath responded that evidence shows these interventions do work depending on their use and the feedback they provide. The period of time when teenagers are just learning to drive presents a rare—if not the only—opportunity to have some control and influence, he added. "Minnesota has one of the weakest graduated driver license programs in the country," Donath said. "If we can demonstrate that these [technologies help] kids learn to drive better, then we should deploy them. These young drivers face a significant risk." **CTS**

In-vehicle technology will monitor and correct teen drivers' unsafe behaviors behind the wheel.

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Ken Keller said the first thing to keep in mind is that expectations about privacy and public space keep changing. For example, a party-line telephone—a "public" space—was replaced by "private" lines, which are now complemented by cell phones and e-mail that are more accessible by others. "The problem is that the boundary between public and private is being driven primarily by technology," he said, "not by anyone's normative idea."

Keller also asserted that Americans and Europeans have much different views of privacy. In Europe, the greatest concern is toward private organizations; in the United States, it is the fear of

government. "That is the problem: we don't trust the organization that would put [privacy policy] in place," he said. "This leads to why we don't have a national policy and leaves us with the enormous chaos that we have."

This historic distrust may also explain why Americans complain more about red-light cameras at intersections than surveillance cameras at gas stations, Keller noted. To gain trust, he encouraged government organizations to clearly communicate their policies, follow their own rules, and stress the public benefit of the data collection. **CTS**

Politics and freeways: building the Twin Cities interstate system

"Transportation systems cannot be planned, developed, or implemented without contending with the politics in which they are always embedded," said **Patricia Cavanaugh**, a research fellow with the State and Local Policy Program at the Humphrey Institute of Public Affairs. She presented her findings from a study of the changing politics and participants in Twin Cities-area interstate decision making since the 1950s. The project, jointly sponsored by CTS and the Center for Urban and Regional Affairs (CURA), was advised by an expert committee including former CTS director **Richard Braun** and former CTS Executive Committee members **Peter Fausch** and **Jim Newland**.

Cavanaugh examined seven local cases representing different eras in the history of the interstate program. The era that launched the interstate in the 1950s was a period of great optimism and public support, she said, including backing by Minnesotans for gas tax increases. The protest era of the 1960s and 1970s, in contrast, saw the rise of citizen opposition and environmental advocacy. Citizen advisory committees and other groups emerged to fight freeway expansion, skeptical because of the visible effects of the interstate in other urban communities. The Minnesota Legislature also became more involved in major transportation project decisions during this time. The next—and current—era is known by many as the "era of falling behind."

Cavanaugh's case studies found three areas of political tension. First is the timeframe: major projects take decades, but citizens and elected officials operate under a shorter outlook. Second, DOTs look at a broader geographic area than cities and neighborhoods. Although both views are appropriate, she said, the divergence leads to conflict. The third area—problem definition—is the one with the most potential to alleviate through political means. Citizens may define a problem in terms of social or moral aspects—35W expansion in the late 1980s, for example—while Mn/DOT defines it in terms of reducing congestion. "When you're trying to solve different problems," she said, "you're not even in the same policy debate." These
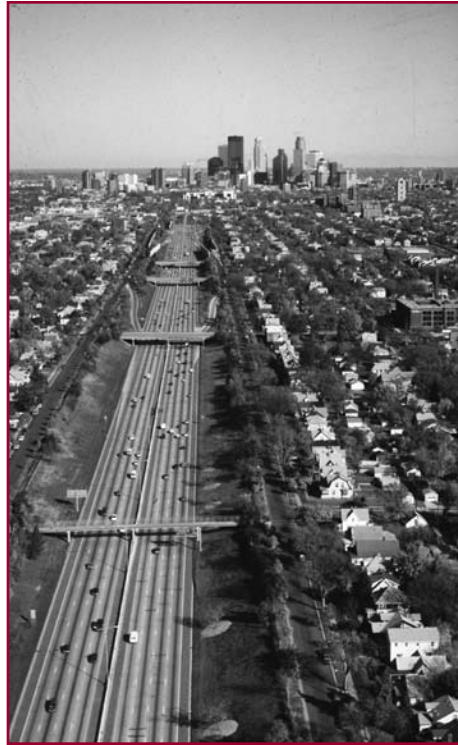
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types of differences were prevalent in the seven cases, she said.

Cavanaugh also touched briefly on historical changes in leadership and funding. In 1981, the surface transportation bill had fewer than 10 earmarks, but recent bills have had several thousand.

The report, *Politics and Freeways: Building the Twin Cities Interstate System*, is being published by CTS and CURA later this summer.

Following Cavanaugh, **Barbara Lukermann** of the Humphrey Institute moderated a panel of three local experts who played key roles in the development of the Twin Cities transportation system: **Carol Flynn**, former state senator; **Connie Kozlak**, a manager with the Metropolitan Council; and **Curt Johnson**, principal of Citistates Group and former Met Council chair.

"Today we are spending enormous amounts of money to correct those cost-savings that we chose before," Flynn began, citing the Crosstown Commons and Wakota Bridge in the southern metro as examples. Flynn also said it isn't surprising that parochial interests are rewarding for elected officials. "You don't have to solve a problem to be admired by your

voters," she said. "You can get elected if you play to the fears, anger, and biases of your constituents." For the future, she hopes officials with a regional outlook and more transportation expertise—including experience in public participation—will be elected.

Kozlak addressed the broader issue of the Met Council's role in the "new era" of earmarks. "Since ISTEA," she said, "there has been more emphasis on planning, but on the other hand, the number of earmarks has risen astronomically." Any project included in a long-range plan must identify the money to build it, she explained, but most earmarks are for projects that "just missed the cut." Because the council's plans must be fiscally constrained, she added, "you plan [according] to what you can afford to build, not a vision of what you need."

Johnson said there is a "crying need" for a better public engagement process. During his service on the Met Council, he said, he held hearings that fulfilled the obligation of the law, but "nearly everyone sensed they were a charade" that minimized public discussion. What's needed, he said, is a process that respects and informs citizens and engages them before decisions are made.

Johnson said he is also "perplexed at our politics." Transportation is in a prolonged era of constraint, yet the press and polls don't frame the problem in terms of real-life choices. The question isn't whether or not to raise the gas tax, for example, but whether citizens prefer roadway expansion or a certain level of congestion. "Would you rather pay more at the pump," he asked, "or see an accumulating problem with air quality…and have your kids write a check for the bundle of externalities?"

Johnson also said we no longer seem to care about intergenerational fairness. "If you look back, as [Cavanaugh's] study helps us do, and you look at the investment of past generations…it makes you wonder. Are we carrying our load now? It appears not." **CTS**

Impacts of Hiawatha LRT: residents cite noise, parking hassles

In a session on travel behavior and reliability, urban and regional planner **David Laverny-Rafter** presented his research studying the impacts of the Hiawatha light-rail transit (LRT) on station-area residents' travel behavior and neighborhood quality of life. Laverny-Rafter is a Minnesota State University Mankato professor and an adjunct faculty member with the Master of Urban and Regional Planning (MURP) program at the University of Minnesota's Humphrey Institute of Public Affairs.

In October 2005, Laverny-Rafter's research team surveyed residents living within walking distance (a half mile) of four Hiawatha LRT stations in south Minneapolis to determine whether LRT service has improved the quality of life in the area. The team wanted to delve deeper than Federal Transit Administration (FTA) requirements whereby sponsors of new capital investment projects, such as the Hiawatha Line, must collect information on the impact of their project. The survey, randomly distributed to 800 people, garnered 218 responses (27 percent).

Specifically, Laverny-Rafter's team of graduate students asked area residents about their use of rail transit, feeder buses, walking, and bicycling; whether they were satisfied with public transit (e.g., frequency, reliability, quality of equipment and stations); and their perception of the impact of LRT service on neighborhood quality of life (in areas such as noise and pollution, safety, parking, and traffic). Responses—rating the quality of LRT, bus transit before and after the introduction of LRT, and neighborhood quality of life—were categorized as either "high" or "low."

Overall, researchers found similar numbers of respondents rating neighborhood quality of life as high both before and after LRT. However, those rating it as low doubled, from 6 to 12 percent. According to Laverny-Rafter, more residents were upset with the additional noise, traffic hassles, and overflow parking since LRT began. Most residents (83 percent) rated the quality of transit service as high.

In terms of accessibility, the project documented that transit-dependent residents are being served, with many reporting travel-time savings, more travel options, and increased convenience. "People are seeing LRT serve broader options than just going to work," Laverny-Rafter said.

Finally, the research team found that the advent of LRT resulted in increased overall transit use, though LRT ridership replaced many bus trips. However, 60 percent of those surveyed still choose to travel primarily by auto.

During another breakout session on the Hiawatha LRT, **Gavin Poindexter**, a research fellow with the State and Local Policy Program at the Humphrey Institute, discussed strategies to analyze and evaluate the economic and social impacts of LRT. He first examined how evaluations have been performed in similar environments, accounting for differences in mode types, and then analyzed which methods may be most suitable to evaluate the Hiawatha LRT.

Poindexter said a substantial amount of data has been collected on the Hiawatha LRT—"primary data" specifically to evaluate the LRT itself and "secondary data" originally collected for other purposes but available for evaluating LRT. Secondary data includes property valuations, demographics, police reports, tax information, and building permits. The challenge, he added, is mining this secondary data, though new technology is making the task easier.

Poindexter listed several organizations conducting evaluations, such as the Met Council, the cities of Minneapolis and Bloomington, Hennepin County, the University of Minnesota, and other research entities, and he considered ways key groups can work together to share data and produce better analysis and evaluation of the LRT. **CTS**

Road research and partnerships for MnROAD

The three speakers in this session discussed the past, present, and future of road research and partnerships in Minnesota related to MnROAD, the cold-regions research lab on I-94 near Albertville, Minnesota (www.mnroad.dot.state.mn.us).

First, **Derek Tompkins**, a graduate research assistant under Associate Professor **Lev Khazanovich** of the Department of Civil Engineering, gave a preview of the "MnROAD Lessons Learned" project, which is slated to conclude in fall 2006. The comprehensive review is a research initiative between Mn/DOT and the University of Minnesota.

Fred Corrigan reviewed the background and recent activities of the Transportation Engineering and Road Research Alliance (TERRA). TERRA is the governance structure created in 2004 to attract additional research partners and chart the future of MnROAD.

The new structure, with its emphasis on including stakeholders from different segments of the transportation world, allows TERRA to take a more entrepreneurial approach to research at MnROAD than was feasible under the previous system, said Corrigan, cochair of TERRA. The TERRA structure also encourages collaboration among stakeholder groups that would otherwise have a difficult time coming together to solve problems.

A TERRA Web site is being created by CTS, and other tools will be developed to make sure research is accessible. "Communications are key to everything we do," Corrigan concluded.

The last speaker was **Ben Worel**, MnROAD operations engineer. Priorities for future research were identified by TERRA members over the last year, he said. These projects, with both national and regional interest, will define the 2007 construction season. Several high-priority ideas were posted for pooled funds on topics such as low-temperature cracking, materials properties, and environmental effects. **CTS**

Access to Destinations research under way

During a session on the multipart Access to Destinations study, civil engineering associate professor **David Levinson**, a CTS faculty scholar, discussed the importance of being accessible.

"Accessibility is one of the key factors to explain why cities form," Levinson said. He described accessibility as a measure that relates the transportation network to the pattern of activities that comprise land use, and as a way to measure the ease of reaching valued destinations. In addition, he introduced the cumulative-opportunity measure, the gravity-based measure, and the place-rank measure as ways to measure accessibility.

Levinson went on to detail the effects of accessibility on individuals, as reflected in home sale values, and on public agencies such as the Minnesota Department of Transportation, evident by studying accessibility over time versus congestion. During the 1990s, for example, density grew faster than congestion. Per passenger delay during morning peak travel increased from 19 hours in 1990 to 43 hours in 2000. Accessibility to residents from downtown Minneapolis grew from 1,870,534 in 1990 to 2,207,639 in 2000.

According to Levinson, accessibility promises to be a useful tool for monitoring the land use and transportation system, and for assessing and valuing the benefits of proposed changes to either land use or networks. He added that his research is intended for engineers, planners, administrators, decision makers, and the public.

Humphrey Institute of Public Affairs researcher **Gary Barnes**, a CTS research scholar, also presented his study of the change in daily personal travel time in the Minneapolis-St. Paul metropolitan area between 1990 and 2001. The research project examined the relationship between commute and non-commute travel time, as well as the relationship between mode choice, total daily travel time, and automobile travel time.

During the 1990s, Barnes said, average Twin Cities one-way commute durations increased by about two minutes, while total daily travel time increased by about five minutes for workers and two minutes for non-workers. This supports an earlier finding that variations in total daily travel time within the region were primarily due to differences in average commute durations rather than non-work travel.

For more about the Access to Destinations program, please visit www.cts.umn.edu/access-study. **CTS**

Transportation finance, congestion, and equity: policy perspectives

Who benefits most from transportation planning and financing, and who bears the burden of taxation? According to **Michael Iacono** from the Humphrey Institute of Public Affairs, "Mounting pressure to adopt congestion relief policy appears to direct benefits of new spending toward well-off suburban commuters." In his presentation, Iacono argued that low-income individuals not only receive few benefits from transportation finance and congestion policies, but may also be paying disproportionately for the benefits to wealthier individuals.

Iacono began his presentation with some conventional wisdom in transportation planning and financing in Minnesota and specifically the Twin Cities: urban traffic congestion is bad and getting worse. Further, the phrase "Something must be done" is common and frequent among citizens and planners.

To combat the dilemma of increasing congestion, Iacono illustrated three options: create more roads, more transit, or more roads and transit. He argued that unfortunately, "Conventional wisdom is silent on the issue of equity."

Another assumption is made that regressive taxes for transportation produce an uneven distribution of costs and benefits. Iacono defined equity as it applies to transportation planning and financing as vertical equity, or the ability of users in different economic circumstances to pay. Therefore, when significant money is invested to relieve congestion during peak rush hours, the benefits are disproportionately felt by those using the high-volume roads at those times, namely higher-income suburban users.

Iacono presented evidence for this argument by mapping patterns of highway development and road financing juxtaposed with suburban sprawl. As high-income users migrated from the city into farther suburbs, the demand for investment in routes with moderate to heavy peaking characteristics increased. As a result, these new investments did little to benefit lower-income urban users and much more to benefit higher-income suburban travelers.

To combat the equity problem in the Twin Cities, Iacono recommended financing based on facility use—for example, toll charges. This form of tax will shift the financing burden to direct users and lead to a more equal distribution of costs and benefits in transportation financing. **CTS**

Making the most of recreational trail systems

During a session on bicycle and pedestrian travel, Center for Changing Landscapes codirector **Mary Vogel**, a CTS research scholar, outlined several ways to effectively broaden community and government-agency involvement in the design of recreational trail systems, which are considered key to the economic vitality of rural Minnesota. She touted her research project, "Leveraging Value and Resources for Recreational Trail Systems on the North Shore and the Minnesota River Valley," as a "whole system approach to linking communities to amenities."

The project aimed to augment the DNR's state trail master planning and work with communities to integrate state trails into their landscapes as well as link them to other public works projects. The study widened the effectiveness of the Gitchi-Gami (on the North Shore) and Minnesota River state trails as regional amenities by creating designs and graphic information that address recreation, tourism, preservation, and development in trail corridors and the larger trail landscapes. As part of the project, the research/design team redesigned the entire community of Beaver Bay, Minnesota, with a population of 175, to integrate the new Gitchi-Gami State Trail.

"By engaging local citizens and officials from state and local entities in a design process that looks at both the larger picture and several public works projects simultaneously," Vogel said, "public works resources can be used to support individual projects that enhance each other and use scarce public resources for greater, more effective results." **CTS**

Mark your calendars:

CTS Eighteenth Annual
Transportation Research
Conference

May 1–2, 2007
Saint Paul RiverCentre

Midwest's role in the transportation information revolution: future strategy

Dave Johnson, Robert Johns, and **Maggie Sacco** presented past, present, and future efforts to improve the management and access of information in the transportation industry. Transportation has lagged behind other industries in its investment in the tools and networks to support the collection, access, and retrieval of information needed by practitioners and policymakers. Mn/DOT Library director **Jerry Baldwin** moderated the session.

The Midwest—especially Minnesota—has played a key role in advancing the industry's information management strategies, from the long-standing existence and progressiveness of the Mn/DOT Library, to the partnership between the Mn/DOT Library and CTS, to the formation of the Midwest Transportation Knowledge Network (MTKN).

Johnson, Minnesota road research manager at Mn/DOT, provided background on the origins of the MTKN, which formally began in 2001 through an initial investment by the National Transportation Library. In the past five years, the MTKN has grown to include 13 libraries in 9 states. Its successful model of collaboration serves as a model for a national transportation knowledge network.

Johns, director of CTS, presented the recommendations from *TRB Special Report 284, Transportation Knowledge Networks: A Management Strategy for the 21st Century*, which outlines how transportation information should be managed and provided. The report provides strategic advice to the federal government and the states regarding a sustainable administrative structure and funding mechanism for meeting the information service needs of the transportation sector. The report identifies the core services that need to be provided, how those services should be provided, and funding options to support those services. NCHRP project 20-75, implementing the National Research Council policy study "Transportation Information Management: A Strategy for the Future," is the next step to implementing the recommendations of Special Report 284.

Sacco, technical services librarian for the Transportation Library Connectivity Pooled Fund Study TPF(5)-105, outlined the activities of the two-year study. The objectives of the study are outreach, network development, communication of the value of transportation libraries, and technical assistance for the 11 partner libraries. **CTS**

Upcoming events

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

July 26 Minnesota Statewide Bus Roadeo, U of M Duluth campus. Contact **Lynn Frank**, 651-296-1610, lynn.frank@dot.state.mn.us.

Oct. 4–5 Minnesota Fall Maintenance Expo, St. Cloud. Contact **Kathy Warren**, 651-351-7432, kwarrren@usinternet.com.

Oct. 11–12 AirTAP Fall Forum, Breezy Point. Contact **Mindy Carlson** at 612-625-1813, carlson@cts.umn.edu.

Nov. 2–3 Toward Zero Deaths Conference, Duluth. Contact **Shirley Mueffelman**, 612-624-4754, conferences2@cce.umn.edu. **CTS**