Technology transfer plays a vital role in accomplishing the Institute’s goals. Through technology transfer, Institute research results reach local, national, and international audiences in ways that will foster implementation for real-world applications. Technology transfer is also a way to increase the visibility of the Institute and to educate students, policymakers, and the general public about ITS issues and solutions.

Graduating students joining the workforce represent the most direct, but not the only, means of technology transfer. By creating and staffing informational exhibits, sponsoring seminars, producing publications, and maintaining a web site, the Institute is able to communicate to a broad and diverse audience of researchers, students, practitioners, policymakers, and others among the general public.

This section of the Annual Report highlights the Institute’s outreach efforts over the past year.
Transportation seminars highlight diverse ITS research

During the 2000–2001 academic year, the Institute initiated a new multidisciplinary seminar series at the University. These Advanced Transportation Technologies seminars included a diverse set of presentations that covered many areas of ITS research and featured local and national researchers.

From the seminars, students learned about ITS technologies in areas other than their current field of study, researchers learned about other research projects currently underway, and practitioners learned about the technologies of the future.

The past year’s presentations were:

- “Driver-Assistive Systems” by Craig Shankwitz, Mechanical Engineering
- “Evaluation of Ramp Metering in Twin Cities Freeways” by John Hourdakis, Civil Engineering
- “Image Compression for Storage and Transmission of Digitized Images” by Vladimir Cherkassky, Electrical and Computer Engineering
- “Traffic-Responsive Ramp Metering: Current Status and Future Directions” by Eil Kwon, ITS Institute
- “Advancements in Transit-Related Research” by Walter Kulyk, Director, Federal Transit Administration Office of Mobility Innovation
- “Monitoring Weaving Sections Using Computer Vision Techniques” by Nikolaos Papanikolopoulos, Computer Science and Engineering
- “Reassessment of Road Accident Data Analysis Policy in Minnesota” by Eitan Naveh, [formerly of the] Center for Technological Leadership, and Alfred Marcus, Carlson School of Management
- “An Automatic Visibility Measurement System Based on Video Cameras” by Taek Kwon, Electrical and Computer Engineering (UMD)
- “The Influence of First- and Second-Generation Antihistamines and Alcohol on Driving Performance” by John Bloomfield, Human Factors Research Laboratory
- “Narrow Tilting Vehicles for Future Individual Transportation” by Dean Karnopp, Mechanical and Aeronautical Engineering, University of California at Davis
- “Software Issues in Critical Transportation Systems” by Mats Heimdahl, Computer Science and Engineering
- “Psychological and Roadway Correlates of Aggressive Driving” by Kathleen Harder, Human Factors Research Laboratory, and Terry Kinney, Department of Speech Communication

Institute holds first research program review

In August of 2000, the ITS Institute hosted its first Research Program Review. Faculty
and students presented information on ITS-related projects currently underway at the University of Minnesota. Tours of the Human Factors Research Laboratory, ITS Laboratory, and the SAFEPLow were offered during the two-day event.

Review committee members included representatives from the USDOT, local government, academia, and the private sector. Members met with the Institute director following the review sessions and had the opportunity to provide suggestions for improving both individual projects and the ITS Institute research program as a whole. Overall, the comments were very favorable for the Institute’s research program and its peer review process.

The peer review presentations were open to anyone interested in hearing about the Institute’s research—a benefit to practitioners and others who wanted to learn more about ITS technologies.

Institute exhibits attract crowds, media coverage

The ITS Institute was represented at the Minnesota State Fair as part of the University’s Institute of Technology exhibit in the “Wonders of Technology” building. A highlight of the exhibit was a “mini” snowplow on loan from Mn/DOT’s Office of Advanced Transportation Systems that was instrumented with some of the same advanced technologies being tested by ITS Institute researchers. Those technologies included a head-up display and an electronic rumble strip that was triggered when a “driver” steered too far to the right or left (the seat vibrated, imitating the effects of a real rumble strip).

“We had what seemed like a nonstop stream of visitors, especially kids, who wanted to ‘drive’ the plow,” says Gina Baas, CTS manager of communications and conference services. “A surprising number of adults had seen TV coverage of our plow research and recognized it. We even had several city and county workers and snowplow drivers who had heard about the research at the state maintenance expos or from their co-workers.” KARE 11, NBC’s local
TV affiliate, also covered the exhibit on its morning news show.

In addition, the Institute joined Mn/DOT’s booth at this year’s ITS America conference held in Miami June 4–7. The Institute sent staff members and students to manage the booth, run a slide presentation highlighting Institute research, education, and outreach efforts, and answer ITS-related questions. Visitors to the booth also received Institute folders, information sheets, and other publications.

**Plow demo draws federal and state officials**

An array of officials—including U.S. Senator Rod Grams and Minnesota State Senator Carol Molnau—attended a demonstration of the SAFEPLLOW at the McLeod County Fair in August 2000. The demo was part of a news conference to give elected officials a local perspective on intelligent transportation systems and an update on the Intelligent Vehicle Initiative (IVI) Field Operational Test along Highway 7 between Hutchinson, Minn., and the Twin Cities. Other officials attending the press confer-

ence included five McLeod County commissioners, the mayor of Hutchinson, and members of Hutchinson’s city council.

**Intelligent vehicles team takes troopers for a test drive**

Members of the Institute’s Intelligent Vehicles Lab hosted a demo of the SAFEPLLOW February 14 for Minnesota State Patrol officers at the University’s Rosemount, Minn., test facility. A white opaque curtain covering the plow’s windshield allowed district commander Stan Gruis, fleet manager Dick Theis, and Minnesota State Patrol Troopers Association president Matthew Hodapp to experience something akin to the white-out conditions for which the plow’s technologies were designed. Those technologies include a DGPS, magnetic lateral-position sensing, high-accuracy digital road maps, a “virtual” rumble strip, and a head-up display (HUD). The result is a projected virtual view of the roadway—with lane boundaries, fixed roadside features, and obstacles—shown on a screen in front of the vehicle’s windshield where the driver can easily view it without taking his or her eyes off the road.

“It’s impressive,” said Hodapp after taking a test drive and seeing the technology at work. Since State Patrol officers as well as snowplow operators must often drive in low-visibility conditions, the University team is installing and testing the driver-assistive technologies in a car provided by the Minnesota State Patrol. High-speed tests with the equipped patrol car are planned for September at Brainerd (Minn.) International Raceway. This research is part of the three-year IVI Field Operational Test, funded by the FHWA, Mn/DOT, and industry partners.
Visiting researchers help build Institute partnerships

During the last year, two visiting researchers worked with Institute staff on various transportation projects.

Joel Katz, traffic management coordination engineer with Mn/DOT’s Traffic Management Center (TMC), spent a six-month mobility assignment with CTS last spring and summer learning and helping to create new traffic management tools useful to Mn/DOT. He also evaluated how the visiting fellow program could improve collaboration between researchers and professionals in the future. In addition, Katz worked with Professor Panos Michalopoulos of Civil Engineering on simulation research for ramp meters.

Dr. Young-Tae Oh, associate director of the Transportation Research Institute at Ajou University in South Korea, worked with Dr. Eil Kwon, director of the ITS Institute’s Advanced Traffic Systems Program, from May to July. Oh came to learn about Mn/DOT’s TMC and to help develop an algorithm for traffic management for South Korea by the end of 2002.

Although Seoul has a subway system, it suffers from severe traffic congestion. Oh was interested in studying Minnesota’s ramp metering system and learned a great deal from the recent ramp meter shutoff.

“Transportation has to be sensitive to public opinion,” he observed. He also said he enjoyed the opportunity for connection between the universities and looks forward to future cooperation.

Media cover snowplow research

Last winter, both Twin Cities newspapers ran articles on the Institute’s snowplow research, which is part of the Intelligent Vehicle Initiative (IVI) program. The Pioneer Press’s article, “High-tech snowplows hit the roads,” and the Minneapolis Star Tribune’s article, “New snowplow can find its way in a blizzard,” highlighted the project’s driver-assistive technology for operating in low-visibility conditions and its potential safety benefits. (The Star Tribune article can be read at www.its.umn.edu/news/strib-superplow.html.)

In addition, local television station KMSP-TV covered an event in which Metro Transit bus drivers operated the test plow at the Rosemount course in January. As part of the IVI program, Institute researchers are exploring how the plow’s driver-assistive systems could be applied to transit vehicles, particularly to help drivers navigate narrow bus-only shoulders.

Institute research efforts receive attention, support from local lawmakers

Officials from the University and Mn/DOT gathered in St. Paul in February to honor U.S. Representative Martin Sabo for his sup-
port and leadership of transportation in Minnesota, including investing in transportation technology and research.

Funding secured by Sabo has meant that more graduate students could receive a transportation-related education, said Lee Munnich, director of the Humphrey Institute’s State and Local Policy Program. Many have chosen careers in transportation policy—another big impact of Sabo’s efforts.

Sabo then expressed his appreciation for the recognition. Legislators don’t question ITS expenditures in Minnesota, he said, because of “our record of success—the money is spent well and the products are good.” A key to this success is the connection between researchers and practitioners. He also called the Minnesota model, in which transportation funds are designated for university research and deployment, the “right way to structure a program like this.”

In March, U.S. Representative Jim Oberstar joined officials from the Twin Cities and Duluth campuses of the University of Minnesota, CTS and its ITS Institute, and Mn/DOT to sign a Memorandum of Understanding creating a new transportation research program at the University of Minnesota Duluth: the Northland Advanced Transportation Systems Research Laboratories (NATSRL).

NATSRL will receive $3.7 million over four years from federal transportation funds, Mn/DOT, and the University of Minnesota.
Mn/DOT Commissioner Elwyn Tinklenberg said that the event formalized work that has been going on for a while and that NATSRL will play an important role in continuing the innovative work of the ITS Institute.

Oberstar congratulated all those who worked to develop the new program, which is partially funded by TEA-21 legislation funds. According to Oberstar, TEA-21 (the Transportation Equity Act for the 21st Century) expanded funding from its predecessor, ISTEA, to advance safety and expand mobility without the need to pour more concrete. “NATSRL will move us further down that road,” Oberstar said. “I look forward to seeing really great ideas coming from this initiative.”

Institute continues to expand web site, publications

Development, updates, and expansion of the Institute’s Web site (www.its.umn.edu) continued over the last year.

Hosting of the site was transferred to a new dedicated server in-house, and work began on converting portions of the site from static HTML to dynamic content from the research database. The transition to a database-driven publishing system will give users access to more information and allow for more timely updates.

Information that site visitors can access includes current research abstracts, the Institute’s strategic plan, descriptions of Institute facilities and laboratories, contact information, ITS-related University courses, a listing of upcoming events, the Institute’s quarterly newsletter, the Institute’s annual report (as a PDF file available for download), and links to related sites of interest.

Circulation of the Institute’s newsletter, the Sensor, increased to approximately 1,800. The Sensor is one of the primary vehicles for increasing visibility of the Institute, and the increased circulation represents a wider knowledge of and interest in ITS research activities among academic and professional audiences.

Other publications that the Institute produced include a semiannual and annual report, research reports, fact sheets describing Institute laboratories and research projects, and posters publicizing the Institute’s advanced transportation technologies seminars.