EDUCATION

The Institute’s activities in education encompass a multidisciplinary program of coursework and experiential learning that reinforces the Institute’s theme. The educational program includes the disciplines of computer science and engineering, electrical and computer engineering, civil engineering, mechanical engineering, human factors, public policy, and others.

By sponsoring and supporting varied educational initiatives for students, the Institute is generating interest in its core ITS science and technologies. These initiatives include developing new curriculum and courses, involving undergraduate and graduate students in research projects, sponsoring students to attend national conferences, presenting awards that recognize outstanding students, and offering research assistantships to help attract more students to the study of transportation. This section of the annual report highlights some of our efforts in the area of education.

Transportation seminars showcase ITS research

During the 2003–2004 academic year, the Institute continued its multidisciplinary seminar series at the University. These Advanced Transportation Technologies Seminars included presentations by local and national researchers addressing diverse areas of ITS research, such as traffic management and modeling, human factors, sensing, intelligent vehicles, and social and economic policy issues as they relate to road- and transit-based transportation.

The seminars provide a way for students to learn about ITS technologies in areas outside their current field of study, for researchers to learn about other projects in progress, and for practitioners to learn about the technologies of the future.

The seminar series is available as a one-credit graduate-level course, or attendees can earn one professional development hour for each seminar. The series is also a required course in the Graduate Certificate Program in Transportation Studies at the University of Minnesota. Seminars are videotaped and available for loan by request; one presentation was also Web-streamed on the Internet.

The past year’s presentations were:

- “Evaluating GPS for Assessing Road User Charges.” Pi-Ming Cheng, Mechanical Engineering
- “ITS and Industry Clusters.” Lee Munnich, Humphrey Institute of Public Affairs
- “The Origins, Status, and Future of GPS.” Bradford Parkinson, Professor Emeritus, Department of Aeronautics and Astronautics, Stanford University
- “Inductive Loop Detector Signal Analysis.” Stan Burns, UMD Electrical and Computer Engineering
- “The Effectiveness and Safety of Traffic- and Non-Traffic-Related Messages Presented on Changeable Message Signs.” Kathleen Harder, College of Architecture and Landscape Architecture

Career Expo reaches new heights

This past March, the Institute partnered once again with CTS, the Minnesota Local Road Research Board, the Minnesota Local Technical Assistance Program, and the Women’s Transportation Seminar to hold the annual Transportation Career Expo on the
Katherine (Kate) Sanderson, a graduate student enrolled in the University of Minnesota’s Civil Engineering Ph.D. program, received the ITS Institute’s 2003 Outstanding Student of the Year Award.

Sanderson has served the University and the transportation community in several ways, including as a teaching assistant in several transportation and traffic engineering courses. Dr. Gary Davis, a professor in the Civil Engineering Department who has worked closely with Sanderson, describes her as a “can-do” person and a natural leader. Sanderson has demonstrated leadership abilities as vice-president of the North Central Section of the Institute of Transportation Engineers student chapter, as president of the Minnesota chapter of Women’s Transportation Seminar, and by spearheading efforts to create the Interdisciplinary Transportation Student Organization (ITSO), now a valued networking group for students interested in transportation.

Sanderson has also been involved in a variety of research efforts at the University. Her thesis research attracted attention for her findings on the extent of highway expansion needed to accommodate future travel demand and was featured on local television news and in a newspaper editorial.

Sanderson received the award in January at the Transportation Research Board 83rd Annual Meeting in Washington, D.C. “I am honored that the ITS Institute, an organization with such a range of activities and talent, gave me the opportunity to travel to Washington, D.C., and enabled me to attend the TRB conference,” she says. “The conference is a huge event on the transportation calendar, and a great place to meet people with similar interests and learn from the technical sessions and posters.”

Sanderson is currently working as a transportation engineer at URS Consultants in Minneapolis. Previously, she received her bachelor of engineering from the University of Sydney, Australia, and her master’s of science at the University of Minnesota.
Institute sponsorships help students attend national conferences

The Institute grants travel awards to students so they can attend various conferences and report on their research to a larger audience, attend research sessions, and help staff the Institute display. This past year, the Institute sponsored 22 students to attend the national meeting of the Transportation Research Board (TRB) in January and ITS America in April.

Students attending TRB were Steven Altstad, Nicholas Andrisevic, Adinarayana Beegala, Wei Chen, Chandler Duncan, Vishnu Garg, Olivier Hoffmann, Xue Li, Yi Li, Ning Li, Justin Ocel, Jonathan Osmond, Jianping Pei, Shipeng Sun, Qiang Wang, Wuping Xin, Lei Zhang, and Ewa Zofka.

Students who attended ITS America were Adinarayana Beegala, Pete Bernardy, Deodatta Bhoite, Wenling Chen, Lei Zhang, and Xi Zou.

“Attending the TRB meeting was very useful for my research, career, and job hunting,” says student Vishnu Garg, who is planning a career as a transportation engineer. Expressing appreciation for the opportunity to travel to TRB, Garg says he learned a good deal from the sessions and from networking, “which is very important for one’s career,” he says.

Institute offers summer education events for high school students

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

The Summer Transportation Institute brought 15 students from several high schools in the Duluth area to the Twin Cities to learn about ITS-related research and technologies. The day included a presentation on the topic of ITS, discussion with Institute staff about careers in transportation, and tours of the Minnesota Department of Transportation’s Regional Transportation Management Center and TAXI2000, a personal rapid transport development company.

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

By introducing high school students to advanced transportation research projects funded by the UTC program, the Institute hopes to encourage students to choose transportation- and technology-related educational fields when they enter college.
Development continues on Web modules for students

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

A Web module on Global Positioning Systems (GPS) has been completed and will also be distributed to area schools in the fall of 2004. Along with listing various Web sites about GPS, the curriculum includes quizzes that check students’ learning progress. Tollefson is currently working on a new module on the topic of human factors.

Reaching students early with fun, hands-on activities is one way the Institute hopes to interest them in a career in transportation. The ramp meter module can be accessed at [www.its.umn.edu/education/rampmodule/index.html](http://www.its.umn.edu/education/rampmodule/index.html), and the GPS module at [www.its.umn.edu/education/gps/index.html](http://www.its.umn.edu/education/gps/index.html).

Interactive simulations enhance ITS education and outreach

ITS Laboratory senior systems engineer Chen-Fu Liao continues to work on tools that will give researchers, students, and eventually the public access to advanced computer-generated traffic simulation systems.

In addition to previous work creating simulation-based modules for courses, Liao developed a Web-based 2-D traffic simulation module for a transportation engineering course for use during fall semester of 2003. The module focuses on intersection timing analysis and optimization with different traffic demands and control strategies.

Liao is also working on an ambitious project to develop a virtual reality traffic simulation environment for use over the Web. The new module will be targeted at undergraduate and high school students, traffic engineers, and distance-learning students at the University.

In the future, Liao plans to continue supporting simulation modules used in various engineering courses and to develop new lab modules focused on different ITS technologies, such as advanced traffic signal controllers and Global Positioning Systems.

Doctoral student awarded dissertation fellowship


The purpose of the DDF program is to give outstanding final-year Ph.D. candidates who are making timely progress toward the degree an opportunity to complete the dissertation within the upcoming academic year by devoting full-time effort to the research and writing of the dissertation.

Vitthaladevuni says he was glad to have received the prestigious fellowship. “I was sure it would make my job search easier after graduation, and it did.” The fellowship allowed him to spend his last year at the University concentrating on the final problem he was solving and on writing his dissertation, titled, “Generalized Hierarchical Constellations: Design, Performance and Applications.” Vitthaladevuni has recently accepted a job with Texas Instruments to work with wireless local-area network design and implementation.