Policy & Planning

University, CTS welcome new transportation policy researcher

Assistant professor Yingling Fan has joined the Humphrey Institute of Public Affairs, bringing additional expertise in several key areas including land use and growth management, transportation planning and policy, time geography, and urban health issues.

Fan describes her research as an interdisciplinary investigation of the effects of spatial planning practices (such as transportation planning and growth management strategies) on human activities. Her work combines ecological and behavioral approaches, and has been published in several urban planning and transportation studies journals.

After joining the Humphrey Institute, Fan was also named a member of the CTS Faculty and Research Scholars—a group of leading University of Minnesota researchers whose work takes on important transportation-related issues.

Fan holds a Ph.D. in city and regional planning from the University of North Carolina at Chapel Hill and a bachelor's degree in transportation engineering from Southeast University, Nanjing, China. In addition to her research, she also teaches courses in land use planning and policy analysis at the Humphrey Institute.

Transportation and the Environment

Researchers improve stormwater runoff model for construction projects

An improved model for assessing environmental risk due to stormwater runoff from construction sites has been created by researchers from the University of Minnesota’s Department of Bioproducts and Biosystems Engineering. The research team of professor Bruce Wilson, research associate Aleksey Sheshukov, and adjunct associate professor Aida Mendez made enhancements to the Watershed Assessment Tool for Environment Risk (WATER) model to consider off-site practices, include watershed-scale processes, and allow the integration of spatial data sets into the simulation framework.

Since 2003, the Minnesota Pollution Control Agency has required any construction project that disturbs more than one acre of ground to include a stormwater pollution prevention plan. Currently, many different strategies are used to mitigate runoff. The need for effective planning was one reason that the Minnesota Department of Transportation and Minnesota Local Road Research Board supported the development of the WATER simulation software.
WATER, developed by a research team that included Wilson and Sheshukov, was designed to assist in making decisions about which measures are most appropriate for a project. The initial version was featured in the January, 2007 Research E-News. Among the notable features of the WATER model is integration of weather data through a sub-module known as WINDS, or Weather Input for Nonpoint Data Simulations.

Among the new enhancements to WATER are subroutines that simulate the effects of rock check dams, vegetative filters, and detention ponds with gravel and rock infiltration filters. Two different algorithms are used to analyze detention pond performance.

The enhancements to the WATER model are documented in a new report, Design Tool for Controlling Runoff and Sediment from Highway Construction, available from the CTS Web site.

**Total cost of ownership drives fleet management model**

"Don't laugh—it's paid for" is a classic of bumper sticker literature, but agencies that operate large fleets of vehicles need to take a more thoughtful approach to replacing and upgrading their valuable assets. Researchers David Wyrick and Santiago Erquicia of the Northland Advanced Transportation Systems Research Laboratories (NATSRL), located on the Duluth campus of the University of Minnesota, have conducted research with the goal of helping the Minnesota Department of Transportation manage their fleet of passenger and maintenance vehicles more effectively, as documented in a new report. NATSRL is a program of the Intelligent Transportation Systems Institute.

The NATSRL research focused on the total cost of ownership for a variety of vehicles, including the cost of acquisition, maintenance, use, and replacement. Previous NATSRL research had examined only snowplows in two Mn/DOT districts, but the current study was expanded to deal with more types of vehicles.

The current study also relied heavily on data from Mn/DOT's M4 computerized asset management system, rather than the Minnesota Accounting Procurement System (MAPS) data used in earlier work. Data from MAPS were analyzed to verify the results of the new methodology.

One of the most challenging aspects of this study, the researchers note, was collecting high-quality data for life-cycle cost modeling. They point out that data gathered automatically are, in many cases, preferable to data based on evaluations or reports entered manually for the purpose of evaluating total cost of ownership. Many fleet management employees seem to be wary of newly imposed automatic data collection practices, however.

The researchers also point out that so-called intangible factors, such as safety and operator convenience, can play a role in determining the value of fleet assets.

**Fleet Life Cycle Costing with Intelligent Vehicles** (CTS 08-13) is available from the CTS Web site.

**Transit, Bicycling, and Walking**

If you build it, will they ride? Research examines the impact of new bicycle facilities

Freshly paved trails make commuting by bicycle easier—but how much impact do bicycle trails have on commuters’ likelihood to travel by bicycle? Researchers Gary Barnes and Kevin Krizek of the University of Minnesota’s Humphrey Institute of Public Affairs (both Barnes and Krizek have since left the University) examined this question in a 2005 research report that evaluated the effects of trail construction on bicycle commuting in the Minneapolis-St. Paul area. Now, Humphrey Institute researchers Frank Douma and Fay Cleaveland have expanded on that research by examining six other cities using the same methodology.

Douma and Cleaveland asked whether the results seen in the Twin Cities—a small but statistically significant increase in mode share for bicycling following the construction of new bicycle facilities—would be reflected in other cities as well. To answer this question, the researchers studied six other cities that had also experienced significant bicycle facility expansion during the 1990s: Austin, Texas; Chicago; Colorado Springs; Salt Lake City; Madison, Wisconsin; and Orlando, Florida.

The research identified three key contextual factors that Douma and Cleaveland believe strongly influence the success of new bicycle facilities in attracting riders: location along usable commuting routes, overall network connectivity, and amount of publicity and promotion given to the facilities. In cities where these three factors were not effectively addressed, the number of commuters traveling by bicycle did not increase significantly.

In their final report, the researchers point out that the results of this study raise several questions for future research. One of the most interesting is whether bicycle facilities constructed after 2000 will produce the same effects as facilities constructed in the 1990s. They also note that quantitative investigation of bicycle commuting would be useful to local policymakers who are considering whether to invest in new bicycle facilities. The research was funded by the Minnesota Department of Transportation.

**The Impact of Bicycling Facilities on Commute Mode Share** (Mn/DOT 2008-33) is available from the CTS Web site.

**TCRP research publications available online**

The federal Transit Cooperative Research Program (TCRP), administered by the Transportation Research Board, provides practical transit research to address technical and operational issues. TCRP emphasizes putting research results into the hands of organizations and individuals that can use them to solve problems.

Recent TCRP publications include:

- Effects of TOD on Housing, Parking, and Travel (TCRP Report 128)

**Transportation Infrastructure**
New bridge technique holding up well after two years

Researchers evaluating a new construction technique that promises to reduce the time needed to construct many concrete bridges recently announced findings from a 24-month study of a bridge equipped with instruments to measure structural stresses. Civil engineering professors Catherine French and Carol Shield led the project, in which a variety of strain gages were installed during construction of the bridge; their most recent report on the project was co-authored by graduate students Matthew Smith and Whitney Eriksson.

The Mn/DOT Precast Composite Slab Span System (PCSSS) combines precast, prestressed inverted-T elements with a cast-in-place concrete deck. A similar technique, known as the poutre-dalle system, has been used as an alternative to traditional cast-in-place construction methods in France. The Minnesota design modifies the French approach with input from University of Minnesota researchers and local fabricators, and is intended to speed up the construction of bridges with short or moderate spans (20–50 feet).

French and Shield documented the development of the PCSSS approach and the process of instrumenting the bridge under study in previous research reports. Since 2005, their research team has been gathering data from the strain gages installed in the new bridge, as well as carrying out loading tests and conducting detailed inspections of the structure. The research also included laboratory testing of a two-span specimen in order to investigate the performance of different design variations.

Data from this field study showed some cracking had occurred over the 24 months, associated with restraint of environmental effects and shrinkage of materials. Significant reflective cracking was not observed. Transverse load distribution, evaluated using a static load test, compared well with predictions for the design, but the results of the laboratory tests indicated that better performance could be obtained by reducing the thickness of the flanges use in the precast elements.

The researchers conclude that PCSSS has performed well and represents a viable alternative to cast-in-place slab construction. The research was supported by funding from the Minnesota Department of Transportation.

Monitoring and Analysis of Mn/DOT Precast Composite Slab Span System (PCSSS) (Mn/DOT 2008-41) is available from the CTS Web site.

Announcements

Call for Presentations: 2009 research conference

CTS has issued a Call for Presentations for its 20th Annual Transportation Research Conference. The call invites all interested individuals to submit a one-page abstract for a presentation (or poster) at the conference, to be held May 19–20, 2009.

Please note that the 2009 conference will be held at the Sheraton Hotel in Bloomington, Minnesota.

If you or your organization would like to share the results of your research or innovations in transportation-related fields, please submit an abstract by November 14.

All abstracts must be submitted electronically. Go to the CTS Research Conference Web page and follow the instructions to submit your abstract.

For further information, contact Sara Van Essendelft, 612-624-3708, cceconf5@umn.edu.

Upcoming Events

Access to Destinations Study workshops scheduled in November

Researchers contributing to the Access to Destinations Study will share their latest findings next month at a pair of public workshops on the University of Minnesota’s Minneapolis campus.

On Tuesday, November 11, Minnesota Traffic Observatory director John Hourdos will describe the techniques used to gather data about travel on arterial streets and estimate travel times across the Twin Cities road network.

Two weeks later, on November 25, Access study co-leader Kevin Krizek will talk about his team’s work on estimating accessibility via non-motorized travel modes.

Both workshops will be held in Room 1130 of the Mechanical Engineering Building between the hours of 3:00 and 4:30 p.m. (CDT). Video of the workshops will be streamed live over the Internet and archived on the Access to Destinations Study Web site; check the Study’s events page for more information.

The Access to Destinations Study is an interdisciplinary research effort coordinated by the Center for Transportation Studies, with support from the Minnesota Department of Transportation, Hennepin County, the Metropolitan Council, and the McKnight Foundation. By focusing on the ability of people to reach the destinations that they need to visit in order to meet their needs—rather than on simple congestion measures—the Study aims to produce a more complete and meaningful picture of transportation and its role in our lives.

More Upcoming Events

October 21

October 27-28
Minnesota Water Resources Conference, Saint Paul RiverCentre. Call 612-624-3708, e-mail cceconf5@umn.edu.

October 28
Economy Council Seminar: Economic Impacts of Transitways: The Hiawatha Light Rail Line, 1130 Mechanical Engineering Building, Minneapolis.
November 1  
Transportation Alumni Group Homecoming Get-Together, Minneapolis. Contact Stephanie Malinoff, 612-624-8398, malinoff@cts.umn.edu.

November 4  
Advanced Transportation Technologies Seminar: Improving Transit System Performance with the Benefit of Automatic Data-Collection Systems, 1130 Mechanical Engineering Building, Minneapolis.

November 6  
CTS Fall Luncheon, Radisson Metrodome, Minneapolis. Contact Sara Van Essendelft, 612-624-3708, cceconf5@umn.edu.

November 7  
Graduate Certificate in Transportation Studies Information Session, 12:00 to 1:00 p.m., Room 202, Civil Engineering Building. Contact Stephanie Malinoff, 612-624-8398, malinoff@cts.umn.edu.

November 11  
Access to Destinations Workshop: Arterial Data Acquisition and Network-Wide Travel Time Estimation—Phase II, 1130 Mechanical Engineering Building, Minneapolis.

November 16-20  
Intelligent Transportation Society of America’s 15th World Congress, New York, New York.

November 25  