

Region 8

MOUNTAIN-PLAINS CONSORTIUM NEWS

MPC to Convene Panels to Focus on Research Topics

As indicated in its strategic plan, the Mountain-Plains Consortium (MPC) will begin convening a series of advisory panels in 2008 to help identify key research topics and opportunities.

The first of those panels, focusing on pavements, is expected to meet in a workshop format in early 2008. The second, focusing on bridges and structures, will meet later in the year. Those two topics, respectively, have been identified as top MPC research priorities.

The make-up and structure of the panels and the format for their meetings was determined by the MPC Advisory Committee when it met in Denver Oct. 30-31 to discuss implementation of the consortium's strategic plan.

The panels will include university experts, department of transportation staff, MPC university specialists, and representatives from the Federal Highway Administration and other agencies. The advisory panels will not replace the peer-review project selection process that the MPC has used, but will strengthen it, commented MPC director Denver Tolliver.

"The Advisory Committee will continue to provide on-going guidance and input to ensure that the center addresses the educational, research, and workforce development needs of the region," Tolliver notes. "The advisory panels will provide detailed input on project selection. It will formalize the input process from our stakeholders.

"There will be a two-fold benefit to this approach," remarked Tolliver. "The first will be the synergy of bringing these people together to brainstorm on common concerns and opportunities. The second will be to raise awareness among DOT staff and others, of the research capabilities within the MPC."

Those attending the advisory committee included: Christine Johnson (FHWA Region 8) and Craig Larson (FHWA Colorado), Dave Huft (SDOT), Delbert McOmie (WYDOT), Peggy Catlin (CODOT), Peter Martin (University of Utah), Richard Gutkowski (CSU), Nadim Wehbe (SDSU), Khaled Ksaibati (University of Wyoming), Denver Tolliver (NDSU), Brenda Lantz (NDSU), John McGowan (NDSU) and Jody Bohn (NDSU).



New Research Projects

The following projects were selected by the MPC Executive committee for funding for 2007-2008. Selections were based on research needs of the region, input from the MPC advisory board, and research strengths of the MPC universities.

Colorado State University

- MPC-274 Beneficial Use of Waste Tire Rubber in Low-Volume Road and Bridge Construction (2nd Year)
- MPC-275 Z-Spike Rejuvenation to Salvage Timber Railroad Bridge Members (2nd Year)
- MPC-276 Use of Salvaged Utility Poles in Roadway Bridges (2nd Year)
- MPC-278 Bus-Stop Shelters-Improved Safety (2nd Year)
- MPC-291 A New Generation of Emergency Escape Ramps
- MPC-292 Traffic Safety Vulnerability Information Platform (TS-VIP) for Highways in Mountainous Areas Using Geospatial Multimedia Technology

North Dakota State University

- Vision Drive Safe: Regional Rural Transportation Safety Conference
- Agricultural and Food Truck Conference
- MPC-293 Development of GIS Multimodal Capacity Model for Northern Tier Freight Corridor
- MPC-294 Indian Reservation Roads (IRR) and Local Roads Modeling and Management Databases
- MPC-295 Integrating Security Into Small MPO Planning Activities
- MPC-296 Phase II, Driver Knowledge, Attitude, Behavior and Beliefs: Focus Group - Young Male Drivers
- MPC-297 Understanding Influence of Transportation and Other Factors on the Economic Growth of Nonmetropolitan Cities

- MPC-298 Generating Public Involvement in Transportation Policy and Funding Decision Making Processes
- MPC-299 Integrating Planning and Operations Models to Predict Work Zone Traffic
- MPC-300 Demand Estimation for Corn Transportation: A North Dakota Case Study

South Dakota State University

- MPC-279 Structural Applications of Self-Consolidating Concrete in Bridge Structures (2nd Year)
- MPC-280 Evaluation of SRICOS Method on South Dakota Cohesive Soils (2nd Year)
- MPC-281 The Assessment of Chloride Injury from De-Icing Salts in Trees along State Highways in the Black Hills (2nd Year)
- MPC-285 Structural Performance of Prestressed Self-Consolidating Concrete Girders Made with Limestone Aggregates

University of Utah

- MPC-282 Express Lane Genetic Algorithm Microsimulation Evaluation Part 2 (ELGAME2) (2nd Year)
- MPC-288 Utah Department of Transportation Traffic Operations Center Operator Training (TOC)
- MPC-289 Evaluation of Optimal Traffic Monitoring Station Spacing on Freeways (TMS)
- MPC-290 Evaluation of Transit Signal Priority Strategies for Bus Rapid Transit Project on 3500 South Street in Salt Lake County, UT (TSP)

University of Wyoming

- MPC-271 A Comprehensive Transportation Safety Evaluation Program in the State of Wyoming (2nd Year)
- MPC-286 Developing System for Consistent Messaging on Interstate 80's Dynamic Message Signs
- MPC-287 Effectiveness of Using Recycled Asphalt Materials (RAP) and other Dust Suppressants in Gravel Roads

Project Highlights

Study on SCC Bridge Girders Underway at SDSU

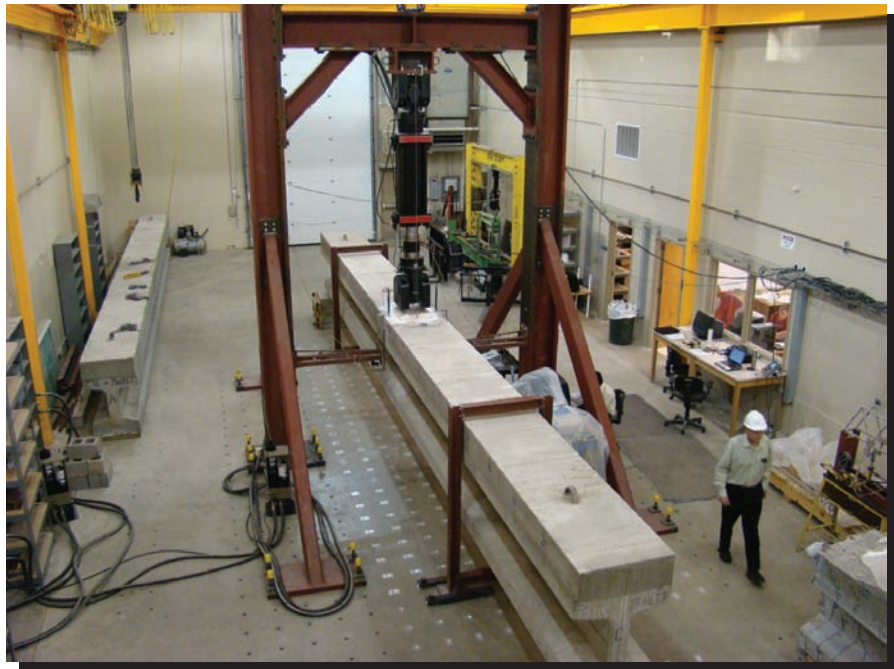
Researchers at South Dakota State University (SDSU) have attained a major milestone in their latest MPC-sponsored research study on bridge girders.

The study began in July and by early November the experimental part of the study was complete. The project, identified as MPC-285: “Structural Performance of Prestressed Self-Consolidating Concrete (SCC) Bridge Girders Made with Limestone Aggregates” seeks the development of SCC mix designs made with limestone coarse aggregates for use in prestressed bridge girders and investigates the structural performance of such girders. SCC is a highly flowable concrete that flows into the form work and consolidates without the need for mechanical vibration. The use of SCC may lead to better finished products, reduced labor, and increased safety during construction.

Experimental work was performed in the summer of 2007 at the Materials Laboratory at SDSU to measure the fresh and hardened properties of the SCC mix designs. Three girders were instrumented and fabricated in August 2007 at Cretex West fabrication facility in Rapid City. The girders were transported more than 330 miles to the Lohr Structures Laboratory at SDSU where they were tested until failure.

Analysis of the data is currently being conducted to evaluate the behavior of SCC girders and compare their performance to

that of conventional concrete girders. The study is cosponsored by the South Dakota DOT and Cretex West of Rapid City, SD. The research team consists of Nadim Wehbe, associate professor of civil and environmental engineering and Arden Sigl, professor of civil and environmental engineering, and graduate research assistants Chad Stripling and Zachary Gutzmer.



Testing of a Full-Scale Bridge Girder at the Lohr Structures Laboratory

RAP, Dust, Heavy Trucks, and Gravel Roads: Is It a Good Mix?

With the recent influx of oil and gas drilling in the Rocky Mountains region, local jurisdictions are seeing substantial increases in traffic, particularly trucks, on their road networks. Often this results in increased maintenance costs that are out of reach of many local jurisdiction budgets.

The University of Wyoming (UW) secured funding for a study to address both structural and surfacing issues associated with unpaved roads subjected to heavier traffic applications. Funding for this study will be provided by the Wyoming Department of Transportation and the MPC. Different gravel types with various dust suppressants including recycled asphalt pavement (RAP) and soil stabilizers will be evaluated in an attempt to provide the best road surface at the least total cost.

Gravel loss, primarily in the form of dust, is a common problem on Wyoming's gravel roads. This loss both degrades the road surface and creates environmental problems. For both engineering and environmental reasons, it is in the best interests of the road owners and users to minimize dust loss and provide a good road surface. As vehicles kick up dust and it blows away, the gravel surfacing loses the binding effects of fine particles. Then, washboards – rhythmic corrugations – develop on the road surface; when the loss of fine material makes the surface more permeable, more water is trapped on the surface, leading to more potholes.

When dust enters the air, it increases the risk of violating federal air quality standards. Sheridan County, Wyoming, is a non-attainment area for PM-10 particulates as designated by the U.S. Environmental Protection Agency. “As more traffic travels Wyoming's gravel roads, the risk posed by fugitive dust will only increase

unless steps are taken to reduce this air quality problem,” says Khaled Ksaibati, MPC director at UW.

He notes that many unpaved county roads throughout Wyoming carry more than 1,000 vehicles per day (vpd), yet typical recommendations for when to pave an unpaved road range from 150 to 400 vpd. “For financial reasons, many counties are unable to pave roads even though, in the long run, paving is the most economical solution.

Further complicating the issue is the knowledge that on many of these roads, traffic volumes will drop when drilling activities slow,” Ksaibati says. “Unfortunately, no one has a crystal ball that tells them just how much drilling activity will take place over the next few decades. Considering these factors, it is important to know the most cost effective ways



of managing unpaved roads, even at higher traffic volumes.”

In general, unpaved roads have lower initial construction costs but higher maintenance costs than paved roads. Balancing construction costs, maintenance costs, vehicle wear and tear, rider comfort, and safety should be the objective of any organization responsible for unpaved roads. The UW study seeks to provide information that will allow organizations to minimize the total costs on their unpaved roads. In addition, this study will provide counties in Wyoming and across the region with specific information on the cost effectiveness of using recycled asphalt pavement in gravel roads. WYDOT has committed to provide \$1 million of RAP to counties which makes it important to make sure that the RAP is used effectively.

As part of the study, test sections on Schoonover and Dead Horse roads in Johnson

County, Wyoming, will be reconstructed during the 2007 and 2008 construction seasons. These roads carry in excess of 1,200 vpd; the predominant traffic type is trucks serving drilling activities. Construction will be administered by Johnson County and monitored by the University of Wyoming.

Gravel samples will be tested by the Wyoming Department of Transportation's materials program. Sections will be monitored for two years to track maintenance activities and expenses. Traffic and dust loss also will be monitored by UW. In addition, weather data will be collected.

The goal of the analysis will be to determine the most cost effective approach to constructing and maintaining unpaved roads. In addition, specific recommendations will be made on the effectiveness of using RAP on gravel roads.

UGPTI Conducts Focus Groups on Risky Driving Among Young Men

If you want to know what prompts young male drivers to skip using seatbelts and drive while under the influence of alcohol, the best way to find out may be to just ask them.

That's what NDSU researcher Tamara VanWechel did with 14 focus group meetings across North Dakota in October, November and December. In each meeting she met with 8 to 12 men ages 21 to 34 and asked them a series of



Tamara VanWechel

questions about seatbelt use and driving while under the influence. She encouraged discussion among the participants. As the participants talked, the discussion was audio recorded while assistant Laurel Benson took notes.

VanWechel and Benson are poring through the notes and transcripts now to identify common themes, issues, and concerns. A final report will be prepared and presented to the North Dakota Department of Transportation. "Ultimately, the information will be used to develop intervention strategies to improve highway safety and reduce

fatalities and injuries," she says. VanWechel is an associate research fellow with the Upper Great Plains Transportation Institute (UGPTI) at NDSU.

The project originated with a request from North Dakota Department of Transportation's Office of Traffic Safety which wanted help identifying some of the root causes for risky driving behavior by young drivers. Based on North Dakota crash data, the researchers decided to focus on seat belt use and driving under the influence using the target group male drivers aged 21 to 34. The project is funded by the NDDOT, the MPC, and the UGPTI's Rural Transportation Safety and Security Center.

The focus groups were held around the state, with meetings held in each of the eight regions designated by the North Dakota Department of Human Services. There is at least one local Safe Communities program coordinator in each of the regions. The safe communities program uses statewide, community, and individual partnerships to identify and reduce injuries in North Dakota. The local coordinator helped identify sites and participants for the meetings.

"Driving under the influence and failing to use seatbelts are large contributors to crashes and fatalities in North Dakota," VanWechel said. "We anticipate that our findings from these focus groups will help the DOT make the most effective investment it can in an effort to reduce those crash numbers and improve safety."

Drivers on Cell Phones Clog Traffic

Motorists who talk on cell phones drive slower on the freeway, pass sluggish vehicles less often and take longer to complete their trips, according to a University of Utah study that suggests drivers on cell phones congest traffic.

“At the end of the day, the average person’s commute is longer because of that person who is on the cell phone right in front of them,” says University of Utah psychology Professor Dave Strayer, leader of the research team.

“If you talk on the phone while you’re driving, it’s going to take you longer to get from point A to point B, and it’s going to slow down everybody else on the road,” says Joel Cooper, a doctoral student in psychology. Cooper presented the study in Washington Jan. 16 during the Transportation Research Board’s annual meeting.

Cooper and Strayer conducted the study with Ivana Vladislavljevic, a doctoral student in civil and environmental engineering, and Peter Martin, an associate professor of civil and environmental engineering and director of the University of Utah

Traffic Lab. The study was partially funded by the MPC.

Martin says that, combined with Strayer’s previous research, the new study shows “cell phones not only make driving dangerous, they cause delay too.” One survey found that during any given daytime moment, 10 percent of U.S. drivers are using cellular phones.

The earlier studies found that cell phone users follow at greater distances, are slower to hit the brakes and are slower to regain speed after braking. But such research didn’t examine how traffic efficiency is influenced by individual cell phone users. Cooper and Vladislavljevic conducted the new study as a step toward an eventual computer “microsimulation” of numerous drivers and vehicles.

The new study used a PatrolSim driving simulator. A person sits in a front seat equipped with gas pedal, brakes, steering and displays from a Ford Crown Victoria patrol car. Realistic traffic scenes are projected on three screens around the



Photo caption: Joel Cooper, a University of Utah doctoral student in psychology, demonstrates how subjects in a new study talked on a cell phone while operating a driving simulator. The new Utah study found that motorists on cell phones contribute to traffic congestion because they drive slower and are less likely to pass slow-moving vehicles. Photo by Ivana Vladislavljevic.

driver. Thirty-six students drove through six, 9.2-mile-long freeway scenarios, two each in low, medium and high density traffic, corresponding to freeway speeds of 70 mph to 40 mph. Each student spoke on a hands-free cell phone during one drive at each level of traffic density. The drivers were told to obey the 65-mph speed limit and use turn signals. That let participants decide their own speeds, following distances and lane changes.

“Results indicated that, when drivers conversed on a cell phone, they made fewer lane changes, had a lower overall mean speed and a significant increase in travel time in the medium and high density driving conditions,” the researchers wrote.

In medium and high density traffic, drivers talking on cell phones were 21 percent and 19 percent, respectively, less likely to change lanes. That may seem minor, “but if you have a lot of people who are not changing lanes and driving slower, this could substantially reduce traffic flow,” Cooper says.

In low, medium and high traffic density, cell phone users spent 31 percent, 16 percent and 12 percent, respectively, more time following within 200 feet of a slow lead vehicle than undistracted drivers.

Strayer acknowledges that, “in itself, staying in a lane and not passing might be construed as being safer, just as driving slightly slower or having a greater following distance also could be considered safer. But if you are doing that so you can take your mind off the road and talk on the phone, that isn’t safer.”

Compared with undistracted motorists, drivers on cell phones drove an average of 2 mph slower and took 15 to 19 seconds longer to complete the 9.2 miles. That may not seem like much, but is likely to be compounded if 10 percent of all drivers are talking on wireless phones at the same time, Cooper says.

Vladisavljevic already has begun computer “microsimulations” of multiple vehicles. “We saw an increase in delays for all cars in a system, and the delays increased as the percentage of drivers on cell phones increased,” she says.

Strayer says it is important to show how cell phone use affects traffic because “when people have tried to do cost-benefit analyses to decide whether we should regulate cell phones, they often don’t factor in the cost to society associated with increased commute times, excess fuel used by stop-and-go traffic and increased air pollution, as well as hazards associated with drivers distracted by cell phone conversations.”

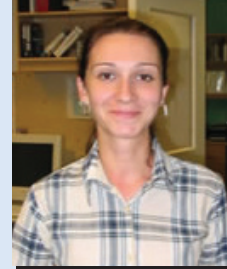
Martin says transportation analysts include two components - accidents and delay - when they calculate the “user costs” associated with road travel. “If we compile the millions of drivers distracted by cell phones and their small delays, and convert them to dollars, the costs are likely to be dramatic. Cell phones cost us dearly,” Martin says.

A University of Utah news release on the research was issued in early January and was picked up by the Deseret Morning News in Salt Lake City, CBS, Science Daily, CNN, USA Today, ABC and other news outlets.

By Lee J. Siegel, science news specialist, University of Utah Public Relations.

Cell Phones Impact Research Published

Ivana Vladisavljevic, a research assistant at the Utah Traffic Lab, is the lead author of “Integration of Mathematical and Physical Simulation to Calibrate Car-Following Behavior of Unimpaired and Impaired Drivers,” a peer-reviewed article published in World Review of Intermodal Transportation Research in 2007. Vladisavljevic earned her B.S. degree at the Department of Transportation and Traffic Engineering at the University of Belgrade, Serbia in 2004 and an M.S in civil engineering at the University of Utah in 2006. She is continuing her graduate work towards a Ph.D. at the University of Utah.



Ivana Vladisavljevic

Civil Engineers Recycle Used Utility Poles into New Idea

Colorado State University (CSU) civil engineering professor and project investigator Richard Gutkowski is turning the discards of progress into the bridge systems of tomorrow. Utilizing salvaged utility poles removed as part of road expansion projects, Gutkowski and graduate student Matthew LeBorgne are recycling reusable wood into short (20-30 foot) to medium span, (40-50 foot) bridges.

Economical solution. Layering wood and concrete to create a composite bridge, the groundbreaking idea is an economical solution for low tax base communities dependent on agricultural economies and the related freight and shipping industry. Research and construction is taking place at the Structures Laboratory, part of CSU's Engineering Research Center (ERC).

Gutkowski aims to replace conventional reinforced concrete slabs, a costly system, with a composite design. Integrating an innovative cambering, or arching technique, the researchers are using tapered utility poles that will be set in alternating directions, beneath a thinner concrete slab, to attain a concave design. The concrete layer will provide compression strength and a hard-wearing surface for vehicle wheels, keeping snow and rain off the wood. The wood layer provides tensile strength by replacing the usual lower non-structural half of the concrete, its steel reinforcement and external temporary shoring with a structural wood layer that self-shores the concrete during the curing process.

Cooperation on a worldwide scale. Researchers in New Zealand, Germany, Italy and Sweden have joined forces studying long-term creep, hygrothermal effects such as the flow of moisture between materials, and the effect of humidity changes on deflection over time in composite bridge designs. In Colorado's arid climate, Gutkowski and team have been working to overcome the special properties of dry wood, which draws water from adjacent concrete, shrinking it and negatively affecting the curing process.

Although the team is utilizing a notched-shear key system - grooves cut in the wood filled with concrete when cast - interconnecting the two layers has proved to be a challenge. Because the mechanics of shrinking concrete have not been studied at relative humidity of less than 40 percent, Gutkowski has plans to examine this issue using environmental test chamber equipment at the ERC in a later phase of the project.

"Our challenge has been the need to prevent very dry wood from extracting water from the concrete in our notch connection," said Gutkowski. "We appear to have overcome that important piece of the mechanics puzzle by using additives in the concrete and sealing the wood. With that working we can better manage the immediate and long term deflection and stress behavior."

Uprooted poles spark innovative idea. The project is funded by the U.S. Department of Transportation via the Mountain-Plains Consortium within the University Transportation Centers program. In addition, Xcel Energy provided, at little to no cost, uprooted utility poles displaced as part of construction projects.

"The idea came to me when I saw them removing the poles as I passed by each day on the way to the ERC," Gutkowski recalled. "It was like a light bulb coming on."

By Lana Hoff, Director, CSU Engineering Marketing & Communications Office

WORKSHOPS & PRESENTATIONS

SDSU Annual Structural Seminar Focuses on Innovative Bridge Design

The Department of Civil and Environmental Engineering at South Dakota State University (SDSU) held the SDSU 32nd Annual Structural Seminar Nov. 8, 2007, in Sioux Falls, SD. The one-day seminar was cosponsored by the MPC and the South Dakota Department of Transportation. “High Performance Steel” was the seminar’s theme. Five speakers, who came from Boston, MA; Lincoln, NE; Irvine, CA; and Brookings, SD, made six presentations that focused mainly on recent developments in high performance steel application in bridge design and accelerated bridge construction. The seminar was coordinated by Nadim Wehbe, MPC program director at SDSU, and was attended by more than 75 engineers and steel fabricators.



More than 75 engineers and steel fabricators attended the SDSU 32nd Annual Structural Seminar

Vision Safe Drive Conference



The first Vision Safe Drive Conference was held Nov. 29-30, 2007, in Bismarck, ND. Representatives from eight states and the District of Columbia were present with more than 100 attending and almost 30 speakers participating.

“The conference was a success in providing a venue for leaders and experts in traffic safety to make exchanges on emerging issues, successes, and challenges,” notes Kim Vachal, director of the Rural Transportation Safety and Security Center, a part of the Upper Great Plains Transportation Institute at North Dakota State University. “These exchanges will be helpful in prioritizing research and outreach needs for the region as well

as helping create a unified vision for traffic safety.”

Public health educators, roadway engineers, social researchers, law enforcement officials, and state and federal agency staff discussed issues they have in common, shared what they are doing, and identified future policy and legislative initiatives to improve the safety and security of transportation in rural areas.

Issues emerging from the discussion included:

- primary seat belt laws
- impaired driving initiatives
- Native American tribal safety planning
- simulation training or defensive driving courses for all ages at license renewal
- increased involvement with government officials and tribal representatives

(Vision Safe Drive continued on page 10)

(Vision Safe Drive continued)

- cultural awareness training
- increasing the accuracy of data
- creating a culture of safety
- behavioral and social marketing strategies, and
- technology and the future of rural driving.

American Association of State Highway and Transportation Officials (AASHTO) director of engineering and technical services, Tony Kane gave an opening keynote address focusing on the vision for future highway safety. He stressed the importance of safe roads in creating a safe and prosperous America. Specifically, Kane encouraged states to collectively adopt a vision to reduce highway fatalities by 50 percent by the year 2030 toward an ultimate goal of zero deaths.

Other speakers included leaders from federal and state transportation agencies including the Federal Highway Administration, the Federal Motor Carrier Safety Administration, the North Dakota Safety Council, the Northern Plains Tribal Technical Assistance, the Montana Department of Public Instruction, North Dakota State University, and the departments of transportation in North Dakota, South Dakota, Montana, Wyoming, Missouri and Oregon.

In addition, panel discussions were held to consider driver-based safety initiatives, how to influence rural drivers' behavior and how to provide safer roadways through design, operation, improvement and interagency cooperation. Many speakers emphasized the importance of coordination between the "four E's" – education, engineering, enforcement and evaluation.

Vision Safe Drive was sponsored by the Rural Transportation Safety and Security Center and Upper Great Plains Transportation Institute at North Dakota State University with support from the MPC and in cooperation with the North Dakota Department of Transportation and the Federal Highway Administration North Dakota Division Office.

TLN Features Two Graduate-Level Courses

The Transportation Learning Network (TLN) is hosting two graduate credit courses for the Spring 2008 semester. The network is an interactive learning network among states in the western United States.

"Airport Planning and Design," originates at South Dakota State University with Hesham Mahgoub as instructor. The course is oriented to engineering students who would like to understand how airports are designed and planned. The 3-credit course provides information on aircraft vehicle performance and airport interaction; airport planning; and analysis methods in airport engineering.

"Public Transportation" originates at North Dakota State University with Jill Hough, director of the Small Urban and Rural Transit as instructor. The 3-credit course includes concepts and models used in the transit industry, for both rural and urban settings. Policy issues, government's role in transit, transit planning, demand forecasting, performance evaluation, and system costing are also discussed.

Offering the courses on the TLN makes them available to students across the country. The network's technology also allows instructors to tap the expertise of leaders at various locations. For instance, the public transportation course will include guest lectures from transit officials and experts from the Federal Transit Administration and industry associations.

The graduate courses complement TLN's variety of workshops, short courses, seminars and other offerings designed to enhance communication, education, professional development, technology transfer, and research.

UGPTI Hosts Seminar Series at NDSU

For the second year, the Upper Great Plains Transportation Institute at North Dakota State University is hosting a transportation seminar series for students, faculty and others interested in the topics. The series has been sponsored by the MPC.

There were 14 seminars in the fall series and topics included metropolitan freight modeling; demand and cost models for small urban and rural transit; alternative fuel use and regulation; exploring the travel behavior of elderly women in rural and small urban North Dakota; and longer-term forecasting of commodity flows in the Mississippi River. Presenters included NDSU staff, faculty members, and students.

Guest presenters included Patricia Mokhtarian from the University of California, Davis, who presented on the positive utility of travel; Richard Kasper, president of Global Electric Motorcars, discussed his 10 years in the neighborhood electric vehicle industry; and Wade Kline, community planner for the Fargo-Moorhead Area Metropolitan Council of Governments, discussed transit planning in the region.

“The seminars are an opportunity for faculty and staff to learn about each others’ research and activities as well as a chance for us to introduce some new concepts and ideas,” says Jill Hough, advanced research fellow at the UGPTI. Hough helped plan and organize the seminars. Another series of seminars is being planned for the spring semester.

Papers Accepted for Publication

“Integration of Mathematical and Physical Simulation to Calibrate Car-Following Behavior of Unimpaired and Impaired Drivers” was accepted for publication in a special issue of the *World Review of Intermodal Research* on computer simulations in transportation research. Authors are Ivana Vladislavljevic, Peter Martin, and Aleksandar Stevanovic, all of the Utah Traffic Lab.

Stevanovic and Martin also wrote “An Assessment of the Suitability of Microsimulation as a Tool for the Evaluation of Macroscopically Optimized Traffic Signal Timings.” The paper (TE23469) was accepted for publication in the *Journal of Transportation Engineering*, published by the American Society of Civil Engineers.

“Influences of Repeated and Sustained Loading on the Performance of Layered Wood-Concrete Composite Beams” (ST/2007/025562) was accepted for publication in the *Journal of Structural Engineering* published by the American Society of Civil Engineers. Authors are Jenő Balogh, Metropolitan State College of Denver; Massimo Fragiocomo, University of Sassari, Italy; and Richard M. Gutkowski and R.S. Fast from Colorado State University.

“FRP Z-Spike Repairing of Wood Railroad Crossties” ST/2007/025449 was accepted for publication in the *Journal of Structural Engineering* published by the American Society of Civil Engineers. Authors are Richard Gutkowski, T J Schilling, Jenő Balogh and Donald Radford. Gutkowski, Schilling and Radford are at Colorado State University. Balogh is at Metropolitan State College of Denver.

“Repair of Full-Scale Timber Bridge Chord Members by Shear Spiking” (BE/2006/023206) was accepted for publication in the *Journal of Bridge Engineering* published by the American Society of Civil Engineers. Authors are Travis Burgers, Richard Gutkowski, Jenő Balogh and Donald Radford. Burgers, Gutkowski and Radford are at Colorado State University. Balogh is at Metropolitan State College of Denver.

Wyoming Faculty Present on Gravel Road Performance

George Huntington and Khaled Ksaibati, MPC program director at the University of Wyoming, presented a paper on gravel roads performance at the 7th national conference on transportation asset management which was held in New Orleans, November 6-8, 2007.

FACULTY ACTIVITIES



Richard Gutkowski

Gutkowski Published in the Denver Post

Richard Gutkowski, MPC program director at Colorado State University had an article published in *The Denver Post* in August 2007. As a follow-up to the bridge

collapse in Minneapolis, MN, Gutkowski addressed bridge design and structural engineering of the past, present, and future. The reader-friendly opinion-page article, “Forty years of progress in bridge engineering, well done but more is needed” was published Sunday, Aug. 12. The article is available at www.denverpost.com/opinion/ci_6587016.

CSU Engineering Innovations Breakfast Continues

For CSU engineering alumni along the Front Range area in Colorado, the CSU College of Engineering offers a special opportunity to network. Each month, the college hosts Engineering Innovations Breakfasts, which are a great opportunity to interact with alumni, friends, and former professors, as well as to hear updates on technological trends and innovative research projects.

Italian at CSU Works on Wood-Concrete Composite Floor/Deck Systems

Massimo Fragiaco, associate professor of structural design at the faculty of architecture of the University of Sassari, Italy, visited the Department of Civil Engineering of Colorado State University from May 28 to June 1. During that week, Fragiaco gave some seminars to graduate students to introduce a finite element program for numerical analyses of wood-concrete composite deck/floor and bridge systems he developed during his PhD work.

He also discussed a number of topics with different students, including finite element modeling of composite structures using software packages such as ABAQUS, experimental results obtained in previous tests to failure and in the long-term, experimental set-up of new tests, and simplified design formulas for composite structures. “It was a real pleasure to spend this week of work at CSU”, Dr. Fragiaco said. He noted that his work had much in common with CSU research and that the work could have extensive applications for refurbishing existing short-span wooden bridges and construction of new medium-to-long span floors.

STUDENT ACTIVITIES

Mitra Earns Ph.D.

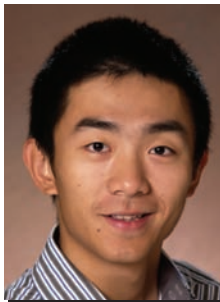


Subhro Mitra

NDSU student Subhro Mitra participated in NDSU's commencement ceremony Dec. 14 at the Fargodome to receive his doctoral degree in Transportation & Logistics. Mitra's dissertation was titled "Development of a Statewide Freight Transportation Model to Assess the Impact of Highway Spring Load Restrictions."

Mitra has been employed by the UGPTI as a GIS-specialist/transportation engineer since November 2006 and prior to that as a graduate research assistant with UGPTI. Mitra has been working with the NDDOT on a project entitled "Analyzing the Highway Needs of a Proposed Ethanol Processing Plant at Spiritwood, ND." Mitra also specializes in GIS and cube modeling and will be teaching TL 785, Spatial Analysis/Transportation Systems spring semester beginning in January 2008.

Chen Nominated for Fellowship Program



Xianzhe Chen

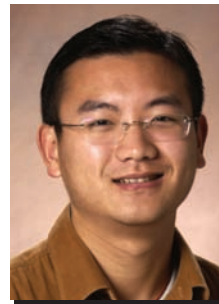
NDSU Ph.D. student Xianzhe Chen has been nominated by Jun Zhang, Department of Industrial and Manufacturing Engineering, for the IBM Fellowship Program which is a worldwide competitive program. Xianzhe has been working with Zhang on his

thesis topic of Supply Chain Management. Zhang noted "Xianzhe has been doing a phenomenal job researching and apply supply chain data."

French Students Complete Degree Requirements While at CSU

Three undergraduate students from Ecole National Supérieure Des Technologies and Industries Du Bois - Epinal, France completed a professional training degree requirement of their home institution while in residence at Colorado State University from June through August, 2007. Jonathan Guet, Adrien Mahler, and Jonathan Pernot worked at the Structural Engineering Laboratory on various research projects. These included MPC supported studies of a shear spike repair method for application to old timber trestle bridge members, composite wood-concrete bridge construction for bridges, and recycling of salvaged wood utility poles for structural use in bridges. They also provided some assistance on projects related to seismic behavior of light frame wood buildings. They will complete degrees in The Department of Wood Science and Technology in the coming year.

Zeng Defends Dissertation Prospectus



Hai "James" Zeng

NDSU Ph.D. student Hai "James" Zeng defended his dissertation prospectus Oct. 23. His dissertation title is "Economical Assessment of the Impact of RFID Technology on the Pharmaceutical Supply Chain Loss Management."

Zeng anticipates completing his degree program in the fall of 2008 or spring of 2009.

First SDSU MPC Student Takes Position with Montana Firm

South Dakota State University (SDSU) alumnus Amanda Boushek of Echo, MN, landed a job with CTA, a multi-disciplinary architecture-engineering firm, in Billings, MT. She was the first SDSU graduate to work on a Mountain-Plains Consortium (MPC)-sponsored research project.

After graduating with a B.S. degree in civil engineering in May 2006, Boushek expressed interest in pursuing a master's degree in structural engineering to her professors at SDSU. Nadim Wehbe, her advisor, offered her the opportunity to be a graduate research assistant on the self-consolidating concrete project sponsored by the MPC. Boushek jumped at the opportunity and, in May 2007, she completed her M.S. degree in civil engineering.

Her research focused on the development and evaluation of SCC mix designs for structural applications in highway box culverts. The objective of the study was to test several different designs which made use of South Dakota local aggregates. The project was cosponsored by the South Dakota Department of Transportation.

Boushek's new position at CTA allows her to put her past experiences and training into practice. Originally an innovative combination of an architect and an engineer, CTA has continued to expand this multi-disciplinary approach to now include 24 building-related disciplines under one roof. Some of the company's services include: architecture, engineering, interior design, land planning, landscape architecture, graphics, and multimedia. The company has been in business since 1938 and now employs 400 people in 15 regional offices throughout Montana, Colorado, Washington, Wyoming, Idaho, Texas, Nebraska, and Louisiana. It is also a member of the U.S. Green Building Council and embraces sustainable building practices.

At CTA Boushek mainly focuses on structural projects involving buildings, but her experiences at SDSU continue to benefit and guide her in her day-to-day work. "My coursework provided me with the education I needed to start my career

as a structural engineer. The courses at SDSU provided me with knowledge that is very relevant to the tasks I perform. I have used what I learned in those classes many times already in the first few months of my career," says Boushek.



Amanda Boushek

In addition, Boushek says that her experience with the MPC played a vital role in her career search. The opportunity to do interesting and innovative research, plus earn her degree helped her to reach her goal of working in structural engineering. Boushek says that she has already encountered many engineers who are very interested in SCC and ask her about her research.

MPC research funding was invaluable in helping Boushek reach her educational and career goals. "The MPC funding provided me with very interesting graduate research. It allowed me to complete my graduate work and focus on my research and courses. With the funding, I earned my degree more quickly than I would have without it," Boushek says.

Boushek was the first SDSU graduate to work on a MPC-sponsored research. MPC hopes to continue to partner with SDSU and support individuals like Boushek, says MPC director Denver Tolliver. "Our vision is to develop new strategies and concepts to effectively address transportation issues. If this partnership can produce more success stories like Boushek's the future looks bright for transportation research."

Scholarships Awarded at NDSU

The UGPTI awarded four scholarships at its annual Awards Banquet Oct. 11. The \$1,500 scholarships are awarded each year through the Mountain-Plains Consortium with funding from the US DOT University Transportation Centers program.



Daniel Leek Geu

Daniel Leek Geu received the Paul E.R. Abrahamson Scholarship. Geu is majoring in agricultural economics. Geu came to the United States from southern Sudan in east Africa 14 years ago and

hopes to specialize in areas such as agricultural transportation, logistics, or marketing. The Abrahamson scholarship recognizes academic achievement and promotes the education of transportation students at NDSU. The scholarship is named in honor of Paul E.R. Abrahamson, the first administrator of the North Dakota Wheat Commission and a leader in the North Dakota agricultural community.

David Bruins, Michael Grundman and Joshua Loegering received Transportation Engineering Scholarships. The scholarships recognize academic achievement and promote the education of transportation students at NDSU.



David Bruins

David Bruins is a senior in civil engineering. A native of Watford, ND, Bruins has been employed by the Fargo District of the North Dakota Department of Transportation and at the NDDOT Support Center at NDSU. Bruins has been named to the dean's list twice in the College of Engineering.

Michael Grundman is a senior in civil engineering from Osakis, MN. He works at the Advanced Traffic Analysis Center. He is a member of the NDSU cycling team and the NDSU chapter of American Society of Civil Engineers. He also participates in Golden Key International Honor Society and the National Society of Collegiate Scholars and has been named to the dean's list in the College of Engineering every semester that he has been at NDSU.



Michael Grundman

Joshua Loegering is a senior in civil engineering and originally from Milaca, MN. Loegering is involved with the ASCE chapter at NDSU, Collegians for Life and is an officer in the Knights of Columbus. He has been named to the College of Engineering Deans List four times.



Joshua Loegering

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