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Region 8

MOUNTAIN-PLAINS CONSORTIUM NEWS

New Era

Welcome to the inaugural issue of the Mountain-Plains Consortium's newsletter. The newsletter will feature project highlights, student activities, and outreach efforts. It will also introduce you to new faculty and keep you up to date on activities within the consortium.

The launch of this newsletter corresponds with the Mountain-Plains Consortium's successful re-competition within the University Transportation Centers Program. This success is both an endorsement of our past success and a challenge to continue to build effective education, research and outreach programs.

Colorado State University, North Dakota State University, South Dakota State University, the University of Utah and the University of Wyoming collaborate in the consortium. The grant extends this collaborative program to 2009 and keeps us among the 60 University Transportation Centers operating across the United States to serve as a vital source of leaders prepared to meet the nation's need for safe, efficient and environmentally sound movement of people and goods.

Please contact us if you have any questions or would like additional information.

New Partner

We've added a new partner to the Mountain-Plains Consortium. South Dakota State University brings unique strengths to the partnership. SDSU is a land grant institution with about 11,000 students. It has a strong engineering program and has about 230 undergraduates and 35 graduate students enrolled in the civil engineering program. Its Geographic Information Science Center of Excellence is a joint collaboration with the U.S. Geological Survey's National Center for Earth Resources and Observation and Sciences. SDSU is home to the South Dakota LTAP program and houses a state-of-the-art structural testing facility that can be used to test full-scale bridge sub-assemblages and components. Other facilities include a fluid mechanics laboratory, an asphalt laboratory and a geotechnical laboratory.

Dr. Nadim Wehbe, associate professor of civil engineering, is the MPC program director at SDSU. Wehbe teaches courses in structural theory and dynamics as well as in materials, timber structures and concrete construction. His research interests include reinforced and prestressed concrete structures, earthquake resistant bridges and the use of advanced composites in structural systems. He is coordinator of the J. Lohr Structures Laboratory. He is a member of the American Society of Civil Engineers, the American Concrete Institute and the Earthquake Engineering Research Institute.

New Focus Areas

As program directors of the Mountain-Plains Consortium assessed its programs in preparation for re-competition, the partnership's focus areas were adjusted to better match with USDOT strategic goals as well as needs within the region.

Within the USDOT strategic objective of safety and security, the MPC will focus on high risk rural roads, rural transportation operations, effective safety management, human factors, low-cost safety improvements, work zones, heavy vehicle/commercial trucks, safety of unpaved roads, and hazardous materials.

Within the USDOT strategic objective of mobility and global connectivity, the MPC will focus on real-time traffic management, innovative demand management, freight management, finance and pricing, multimodal policy and investments, and promoting regional freight planning.

Within the USDOT infrastructure renewal and environmental stewardship strategic objective, MPC will focus on infrastructure longevity, infrastructure that minimizes environmental impacts, infrastructure safety, and economic impacts.

Project Highlights

Wyoming Research Helps Counties Determine if Roads are Legally Established

With MPC support, the University of Wyoming is helping Wyoming county officials determine if rural roads were legally established. By one estimate, Wyoming county road and bridge supervisors know only 30 percent of the time whether rural roads were legally established. Addressing that question requires that two issues be addressed: First, when and how was the road established? Second, what were the legal requirements for establishing a county road at the time and were those procedures followed?

The University of Wyoming received research funding from MPC and the Wyoming Department of Transportation to explore those issues. This project provides information to all county road programs on how to legally establish a county road in Wyoming and also how the laws have changed over the years. The history of Wyoming laws is important for Wyoming counties because the roads that were established in past years must have been created according to the laws in that year or they were not legally established.

The research was completed by Stacey Obrecht, a UW law student with an interest in rural transportation issues. She collaborated with UW College of Law professor, Alan Romero and T²/LTAP Director Khaled Ksaibati. She conducted research on the designation and development of county roads in Wyoming during the 20th century. As part of this research, UW distributed a statewide survey and received excellent feedback from all counties. In addition, UW updated and distributed a report entitled "Important Wyoming State Statutes Relating to County Highways." The report is available online at the T²/LTAP Center's Web site: www.eng.uwyo.edu/.

Half of the funding for the project was provided by the Local Government Coordinator Office of the Wyoming Department of Transportation. In addition, this project has received support from the University of Wyoming College of Law.

Workshops on the topic were held Feb. 28, March 1 and March 2 in Douglas, Riverton and Rock Springs.

Asset Management for Local Agencies

The Wyoming T² Center, in cooperation with the Local Government office of the Wyoming Department of Transportation and the MPC, recently initiated an effort to provide assistance to several counties experiencing considerable impacts from drilling activities, particularly coal bed methane drilling.

This three-year project will develop an asset management program that would quantify the damage being done by the influx of drilling traffic, as heavy trucks associated with the drilling are damaging many of the county roads in the state. The Wyoming counties of Johnson, Sheridan and Carbon are cooperating in the project.

The program is a GIS-based system that stores information about county road networks. Road surface conditions are kept for one mile segments of all roads maintained by the counties. In addition, the organizations inventoried and evaluated signs, culverts, cattleguards, approaches, and bridges.

The GIS software allows the organizations to plot various features of the road network. By comparing conditions and maintenance expenses on roads carrying drilling traffic with other roads, the damage done to county roads will be quantified.

Beyond evaluating the effects of drilling activities, the system provides the counties with a system similar to those developed for asphalt and concrete roads. These

systems allow managers to predict the overall road network condition at various funding levels. A related project developing performance curves for gravel roads will provide the models needed for these predictions.

Simple applications might include generating a map identifying all the culverts that need to be cleaned; mapping all the 36-inch stop signs; or providing a count of 16-foot cattleguards with timber bases. More sophisticated analyses will allow for better decision making, such as evaluating the initial cost of higher quality gravel compared to the long-term costs of maintaining gravel roads built with lower quality gravel.

Data is collected by teams driving county roads with a laptop computer and a global positioning system (GPS) receiver. The teams generate maps of the county roads. In subsequent years the condition of one-mile segments will be entered into the GIS database.

For example, gravel roads are rated for their overall condition, top width, crown slope, loose aggregate, potholes, gravel quality and sufficiency, washboards, rutting, drainage and dust. In addition, digital photos are taken at each segment and of each feature. With this information, county employees are provided with a comprehensive and flexible view of their county road network.

Some findings of this project will be presented at the Transportation Research Board Meeting (TRB) early in 2007. At the conclusion of this pilot study, the University of Wyoming will work with WYDOT to transfer the knowledge learned from this project to other interested counties.

TLN addresses DOT training needs

The MPC and the Transportation Learning Network are launching a four-state initiative to provide technical training to department of transportation professionals.

Gary Berreth and Julie Rodriguez have met with an executive advisory group from the departments of transportation in North Dakota, Montana, South Dakota and Wyoming to identify training needs and challenges. A report outlining strategies for addressing those needs is expected to be complete by the end of 2006.

“We’ve already received indications from the DOTs that they want to proceed to the next level, to determine common training needs and find ways to cooperate in innovative and more cost effective ways of meeting those needs,” Berreth says.

In the beginning, that may involve looking at training in each state to determine if it can be offered via video network or the Internet to other states. The Transportation Learning Network is already tailoring it’s offerings to meet needs identified by the DOTs. A series of concrete seminars has been launched and several technical presentations have been offered.

Universities within the Mountain-Plains Consortium – NDSU, Colorado State University, South Dakota State University, the University of Utah, and the University of Wyoming –have agreed to provide additional content.

“As new training delivery technologies become available, we’ll be looking at those as well,” Rodriguez notes. For example, training may be offered via Internet video or as downloadable lessons that could be replayed on an iPod or computer.

“Our goal is to help the DOTs address training needs in that environment in a way that meets the needs of their staffs efficiently and effectively,” Rodriguez says.

Small Urban and Rural Transportation Operations Coalition

The Advanced Traffic Analysis Center launched the Small Urban and Rural Transportation Operations Coalition to focus on the transportation operation needs of rural and small communities.

This initiative aims at identifying high priority small urban and rural area traffic operations needs, learning from and applying successful and tested practices, developing a resource for technical information and training opportunities, and providing a forum for professionals to network and share information. The initiative, with support from the Federal Highway Administration and the Mountain-Plains Consortium, was embraced as part of the National Transportation Operations Coalition.

Key transportation organizations participating on the coalition subcommittee include: American Association of State Highway and Transportation Officials, American Public Works Association, Federal Highway Administration, Institute of Transportation Engineers, Intelligent Transportation Society of America, National Association of County Engineers, National Association of Development Organizations, and National Association of Regional Councils. Find more information at www.surtoc.org

North Front Range Summit Identifies Transportation Priorities

The North Front Range Transportation Choices Summit held June 13 in Windsor, CO, was a regional gathering to help identify priorities for the future transportation system of the region.

Participants at the summit explored a number of choices including regional bus and rail transit service, arterial and highway widenings, interchange improvements, connections between cities and activity areas, bicycle and pedestrian mobility, system maintenance, and others. The event was designed to create a stronger understanding of regional transportation trends and funding realities; explore preferences for future transportation improvements for the region; and learn how people from the region weigh choices associated with transportation planning.

The more than 200 attendees at the summit included representatives from the business community, environmental groups, local governments, elected officials and residents from the region. Participants were divided among 27 tables to represent all parts of the region and diverse perspectives. Each group was given $1.3 billion in resources to negotiate, spend and build their future transportation vision for the region. The activity opened a dialog among participants and was a consensus approach to regional transportation planning.

"We are still reaping the benefits of the event," noted John Daggett, regional multi-modal planning manager for the North Front Range Metropolitan Planning Organization. "It appears that the region now has the political will to pursue a regional transportation authority that will begin to address many of the transportation problems we've been facing for the past several decades."

Those challenges include rapid population growth, increased trips and travel times, increased inter-regional travel, and resulting congestion. A regional transportation authority would build on the summit's initial work to establish priorities and find resources to address the region's transportation issues.

The MPC and Colorado State University were among the sponsors of the summit. "Thanks to our sponsors, the event became a huge success," Daggett said.

Workshops and Presentations

Structural Seminar at SDSU

The Mountain-Plains Consortium and the Federal Highway Administration sponsored the 31st Annual Structural Seminar at South Dakota State University Nov. 16. The "FHWA Self Consolidating Concrete Workshop" was intended for DOT engineers, structural engineers, civil engineers, architects, material testing technicians, concrete producers, building officials, specification writers and students.

The day-long event included information from FHWA specialists, university researchers, and private industry experts. There has been some reluctance in the engineering community to use self consolidating concrete because it is a relatively new product and information on the production, testing and performance of it is not widely known. The seminar was designed to present and discuss development, applications, proportioning, testing and economic impacts of self consolidating concrete.

Tech Transfer Bridge Workshop at CSU

A technology transfer workshop on composite wood-concrete technologies for short-to-medium span bridges was held Aug. 15 at Colorado State University. The workshop was sponsored by the MPC and the CSU Department of Civil Engineering.

The one-day program featured an overview of composite wood-concrete layered systems and an overview of their applications in Europe, Brazil, and Portugal. CSU faculty and several faculty members from European institutions involved in research applications of composite wood-concrete bridges made presentations at the workshop. Attendees also reviewed research at CSU and toured laboratories conducting related research projects. The audience included

county engineers, road and bridge coordinators, public works directors from small urban and rural areas and municipalities in Colorado. The program was organized by the MPC program director at CSU, Richard Gutkowski.

Shear Spike Research Presented

Colorado State University civil engineering professor Richard Gutkowski presented a technical paper, "Shear Spike Repair of Timber Railroad Bridge Chord Members" at the conference, Responding to Tomorrow's Challenges in Structural Engineering. The event was Sept. 13-15 in Budapest, Hungary and was organized by the International Association of Bridge and Structural Engineers. A written paper, co-authored with Travis Burgers (former M.S. student) and colleagues Jen Balogh and Don Radford, was published in the Proceedings of the conference. The paper detailed a recently completed phase of research sponsored by MPC.

University of Utah offers Web-Based Videoconferences

The University of Utah offered two web-based videoconferences for students and DOT professionals. The courses, "Technical Writing and Presenting for Professional Engineers" and "Statistics Made Easy," were each two and half days long and were conducted by Peter Martin, University of Utah professor and director of the Utah Traffic Lab.

The writing and presenting course is aimed at engineers, technicians and government staff and established the fundamentals of effective technical writing and technical communication through a variety of media.

The statistics course explained the fundamentals of statistical analysis in a practical way, providing insight into the correct application of basic statistical tools and providing confidence for future use.

Looking at European Universities

The MPC was one of the sponsors of a guest lecture at Colorado State University, Oct. 20. The lecture, "University Educational Programs in the European Union Community was given by György Farkas, head of the Structural Engineering Department at Budapest University of Technology and Economics.

Farkas is a frequent collaborator with faculty in the CSU Department of Civil Engineering, particularly Richard Gutkowski, the MPC program director at CSU.

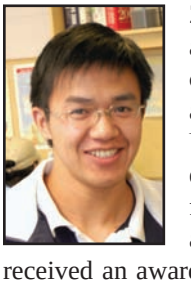
The lecture outlined the primary provisions of the 1999 Bologna Treaty adopted by the European Union to harmonize European Higher Education among its 25 member states. The treaty established uniform degree structures at universities, facilitating free interstate movement of students and educators. Farkas discussed the broad changes that the treaty is prompting at universities across Europe, with a particular focus on the impact at Budapest University.

Farcas was in Colorado as part of a commemoration of events planned by the Hungarian Club of Colorado to mark the 50th Anniversary of the 1956 Hungarian Revolution.

Student Activities

New Students – University of Utah

Dilya Yusufzyanova is from Yoshkar-Ola City, Mari El Republic-Russia, and is a masters student at the University of Utah. She earned a B.S. degree in transportation from Mari State Technical University, Russia. During her undergraduate year, Dilya earned various awards for her scholastic excellence. She is a research assistant for the Utah Traffic Lab and is researching Utah's 38 miles of express lanes.



Zuduo Zheng is a Ph.D. student at the University of Utah. He is currently studying traffic engineering and is a research assistant for the Utah Traffic Lab. He earned a B.S. degree in coastal and port engineering from Hohai University, China. While attending Hohai University, Zuduo received an award recognizing him as an Outstanding College Student of the People's Republic of China. He received his M.S. degree in traffic engineering

from Jilin University, China. As a Research Assistant, he is working on the calibration and validation of the VISSIM model of I-15.

University of Wyoming

Christopher Vokurka is investigating the relationship between road reconstruction and geometric changes to highways to the impacts that they have on the number of animal-vehicle collisions. He will graduate with his M.S. in civil engineering in December 2006. Chris earned his B.S. in civil engineering in 2003 from Colorado State University and worked for a geotechnical consultant prior to attending the University of Wyoming. He is also secretary of the UW chapter of ITE.

Zhong Cheng is working on his M.S. degree in civil engineering. He received a B.S. degree in computer science and technology from Nanjing University of Technology in China in 2004. In addition, from 1997 to 2000, Cheng attended a high school affiliated with the Xinjiang Agriculture University in Urumqi, China. Cheng has considerable experience with computers as a troubleshooter, website designer, customer service engineer and network administrator. He is working on a new MPC project with the Wyoming DOT to evaluate transportation safety in the state.

Lekshmi Sasidharan is a graduate student in the Department of Civil Engineering. She is a Ph.D. scholar focusing on transportation engineering. Currently, she is developing safety techniques and methodologies to identify and rank crash risk locations in Wyoming. The project also aims at devising cost effective safety improvement methods for rural roads. Lekshmi was born and raised in Kerala, India. She obtained a B.Tech. degree in civil engineering from TKMCE, Kerala. She earned her M.Tech. degree from National Institute of Technology Calicut in traffic and transportation planning.

NDSU

Jamie Paurus, of Frazee, MN, is working on his Ph.D. in transportation and logistics at NDSU. In addition, Paurus is researching supply chain management. He earned his B.S. in university studies in 2003 and his Master of Business Administration in 2005. Both degrees were from NDSU. Paurus is also an instructor at Valley City State, Valley City, ND in the Business and Information Technology Division. He plans to continue in that position after earning his Ph.D.

Chris Enyinda, of Huntsville, AL, is not typical of students in the transportation and logistics program. He is finishing his second Ph.D. and is a faculty member at Alabama A&M University.

Enyinda learned about NDSU's program via the Internet while doing some research and was struck by the interdisciplinary nature of the program. He says that's a key component of real-world logistics and supply chain management and one that's lacking in some academic programs. "To compete in the private sector, firms must draw on different disciplines and diverse entities for transportation and logistics," he noted. He was also impressed by the integration of GIS and GPS technology and other technology into the program.

He initially contemplated coming to NDSU on sabbatical to do some research and study (not as part of a degree program), but decided that a Ph.D in transportation and logistics would better suit his needs. He plans to return to Alabama A&M to continue research and publishing in supply chain management and risk and possibly establish an academic center focused on that topic.

Enyinda received his M.S. in economics with an option in management and an M.B.A. in management from Alabama A&M University, Huntsville. He then went on to receive his first Ph.D. in applied/ag economics with an option in logistics/transportation in 1995 from the University of Tennessee, Knoxville.

Enyinda's research focuses on modeling economic risk management in global supply chain logistics for the manufacturing industry. Upon completing the Ph.D. program, Enyinda will return to teaching, research/publishing, and consulting in the area of transportation, logistics and supply chain management for Alabama

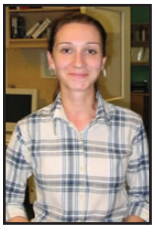
A&M University. He will return there at the end of his sabbatical and upon completing the Ph.D. program in transportation and logistics with a primary concentration in logistics and supply chain management and a secondary concentration in economics and regulations at NDSU.

Student Accomplishments

Molakatalla Graduates

Udit Molakatalla has graduated from NDSU with an M.S. degree in civil engineering with the transportation option. Molakatalla has accepted a position in Tallahassee, FL, with Kimley-Horn and Associates, Inc., a transportation and engineering consulting firm. The title of his thesis is "A Case Study Investigating Asphalt Film Thickness as a Superpave Mix Design Criterion." He is originally from India.

Vladisavljevic Wins ITE Intermountain Section Annual Student Paper Contest



Ivana Vladisavljevic received first place in the Utah Chapter of the Institute of Transportation Engineers (ITE) Student Paper Contest. Her paper, "Impact of Cell Phone Conversation While Driving on Car Following Behavior," examines the impact that distracted drivers have on traffic flow. The intermountain section includes students from universities in Idaho, Montana, Nevada, and Utah. Vladisavljevic received a $400 cash reward and has been asked to present her paper at the Intermountain Section Meeting in Jackson, Wyoming. She is a research assistant at the Utah Traffic Lab and a graduate student at the University of Utah.

MPC Supports Scholarships at NDSU

Four $1,500 scholarships are funded each year at NDSU by the Mountain-Plains Consortium through a grant from the U.S. Department of Transportation. The scholarships are awarded at the Upper Great Plains Transportation Institute's Annual Awards Banquet each fall. The Paul E.R. Abrahamson Transportation Scholarship recognizes academic achievement and interest in agricultural transportation and logistics. Kimberly Spear of Fargo and Chris Duchsherer of Drake, N.D., received the award this year. They are both seniors in agribusiness and applied economics.

Kimberly Spear

Chris Duchsherer

The University Transportation Center Engineering Scholarship recognizes academic performance and an interest in transportation. The scholarships were presented to Amy Hardy of Ellendale, N.D., and Jason Mayfield of Fargo. Hardy is a junior and Mayfield is a senior, both majoring in civil engineering. Twenty-two scholarships have been awarded since they were established in 2002.

Amy Hardy

Jason Mayfield

New Faculty

Pannapa Herabat joined the Department of Construction Management and Engineering at North Dakota State University in August as an assistant professor. She specializes in asset management systems, bridge management systems, pavement management systems, deterioration modeling and infrastructure management. She is a graduate of Carnegie Mellon University in Pittsburgh where she earned B.S., M.S. and Ph.D. degrees in civil engineering. Before coming to NDSU she was an assistant professor in the School of Engineering and Technology at the Asian Institute of Technology in Thailand.

Advisory Committee

An advisory committee was created within the last year to help MPC directors identify key research needs within the region and develop a research program that addresses those needs. The committee will play a key role in setting the MPC's research agenda.

The MPC advisory committee includes:

- Carlos Braceras, Utah DOT
- Peggy Catlin, Colorado DOT
- Loran Frazier, Montana DOT
- Anthony Giancola, National Association of County Engineers
- David Huft, South Dakota DOT
- Christine Johnson, FHWA – western region
- Grant Levi, North Dakota DOT
- Jeff Loftus, Federal Motor Carrier Safety Administration
- Delbert McOmie, Wyoming DOT
- Craig Rockey, Association of American Railroads

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