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WOOD NAMED STUDENT OF THE YEAR FOR MPC



Recent U of U graduate Jonathan Wood was honored in January as the Outstanding Student of the Year from the Mountain Plains Consortium at the 16th Annual Council of University Transportation Centers Winter Banquet

Wood earned his MS in civil and environmental

engineering from the U of U in December 2012. He also holds a BS in civil and environmental engineering from the same institution. He has performed research on the safety performance of road segments; particularly related to the safety effects of geometric design and maintenance decisions. His thesis, "Safety Impacts of Design Exceptions in Utah," focused on modeling the safety impacts of design exceptions on road segments in Utah. He also worked on developing performancebased methods for making safety-based maintenance decisions, including those related to wildlife fencing, snow removal, and pavement conditions.

Wood was also a teaching assistant for the junior-level civil engineering course in transportation engineering. He was also president of the U of U's student chapter of the Institute of Transportation Engineers. Jonathan coauthored two peerreviewed journal papers and one final research report during his master's program. He is now working on a PhD at the Pennsylvania State University.



SDSU researchers present their research findings at national and international forums

Drs. Nadim Wehbe and Allen Jones, both of SDSU, have been presenting their MPC-sponsored research findings at prominent national and international forums.

In June 2012, Wehbe and Jones participated in the 2012 fib Symposium on "Concrete Structures for Sustainable Communities" in Stockholm, Sweden. Wehbe presented a paper entitled "Optimization of Concrete Mixtures for Sustainable Jointed Plain Concrete Pavement." The paper presented by Jones was entitled "Character, Extent, and Severity of Corrosion in Continuously Reinforced (CRC) Pavements for Service-Life Extension and Improved Sustainability." The symposium attracted more than 300 abstracts of which only about 160 were accepted for presentation and publication.

In September 2012, Wehbe attended the 18th Congress of the International Association for Bridge and Structural Engineering (IABSE) which was held in Seoul, Korea. Wehbe presented a paper entitled "Pretressed SCC Bridge Girders under Monotonic and Fatigue Loading." The Congress was followed by a special public session on load rating and assessment of bridges during which invited papers were presented by speakers from a US group of researchers and their Korean hosts. Wehbe's presentation for the public session was entitled "Calibration of AASHTO's Ice Loads Equations for Bridge Piers in South Dakota." The 2012 International Conference on Long-Life Concrete Pavement was held on September 18-21 in Seattle, WA. The conference was organized by the Federal Highway Administration and the National Concrete Pavement Technology Center. Jones presented a paper entitled "Character, Extent, and Severity of Corrosion in Continuously Reinforced Concrete Pavements in South Dakota" with coauthors Dr. Nadim Wehbe and Stephanie Klay, a former graduate student now at Barr Engineering Co. in Minnesota. The research focused on an extensive field testing program that was initiated to identify factors and interaction of factors that contribute to observed levels of corrosion in CRC pavements constructed in South Dakota.

Porter receives university awards

Dr. R.J. Porter, University of Utah MPC Program Director, received the Civil Engineering Department's Outstanding Faculty Award, based on student success and outstanding research projects. Porter also received the Ben Jacobsen Kingfisher Bend Ranch Award for exceptionally effective teaching in the College of Engineering at the University of Utah. This award is presented annually to one or two faculty within the College of Engineering who are exceptionally effective teachers, exemplifying the characteristics and standards for teachers set forth by the Department, the College, and the University for the prior academic year.

Wehbe is invited speaker at Engineering Society Conference

Dr. Nadim Wehbe was an invited speaker at the 51st Annual South Dakota Engineering Society Conference. The conference was held on March 31-April 1, 2011 in Pierre, SD. Dr. Wehbe's presentation, entitled "Evaluation of Concrete Mixtures for Jointed Plain Concrete Pavement Applications," covered results from a portion of a study on performance of jointed plain concrete pavement. The study is co-sponsored by MPC and SDDOT.

SDSU faculty attended the 2nd National Tribal Transportation Safety Summit

The national fatal crash database, the Fatality Analysis Reporting Systems (FARS) reported that Native American accounted for 26% of all traffic fatalities from 2001 to 2005 in South Dakota. In fact, the motor vehicle fatality rate of Native American in South Dakota is significantly overrepresented, more than three times higher than the other South Dakotans. SDSU faculty members have been involved in multiple research projects that aim to reduce crashes and improve public health on tribal lands.

Dr. Xiao Qin from the Department of Civil and Environmental Engineering is collaborating with Dr. Haifa Samra from the College of Nursing on a MPC-sponsored research entitled Improving Rural Emergency Medical Services (EMS) through Transportation System Enhancements. Dr. Qin is also involved in two other studies; NCHRP 17-49; Guide for Effective Tribal Crash Reporting, and Evaluating Local and Tribal Rural Road Design with Interactive Highway Safety Design Model (IHSDM) in partnership with Dr. Vachal at NDSU. The 2nd National Tribal Transportation Safety Summit held at Mystic Lake, MN from August 29-30, 2012 provided an excellent opportunity for tribal safety stakeholders to network, build capacity and knowledge and identify and prioritize needs and technologies. About 200 participants representing engineers, enforcement officers, educators, and EMS workers attended the summit, including Dr. Qin, Dr. Samra and PhD candidate Julie Hanson from SDSU.

Researcher wins TRB Best Paper Award

Richard J. Porter, assistant professor of civil and environmental engineering at the University of Utah, and his co-authors received the annual Best Paper Award in January from the Transportation Research Board's committee on geometric design. The award



Porter

was presented at the board's annual meeting which typically attracts more than 10,000 transportation professionals from around the world. Porter's awardwinning paper describes the interaction of geometric design, speed, and safety on roadways. In particular, he and his colleagues addressed five critical questions about the relationships between road geometry and operating speeds, including how road geometry influences operating speeds, safety and security, and what the impacts would be for large vehicles. The researchers also discussed aspects of the speed/safety trade off. Titled "Geometric Design, Speed, and Safety," the paper was co-authored by Eric T. Donnell, and John M. Mason, and was recently published in the Transportation Research Record: Journal of the Transportation Research Board.

NDSU research at TRB

MPC researchers from NDSU participated in the 92nd Annual Transportation Research Board Meeting in Washington, DC, January 13-17. The event attracts more than 11,000 transportation professionals from around the world and features more than 4,000 presentations.

Brenda Lantz presided over the Truck and Bus Safety Committee meeting. She also presided over the committee's session, "Using GIS for Locating Specific Types of Truck-Bus Crashes and Countermeasures."

"Transportation Impacts of New Gas Developments" was presented by MPC director Denver Tolliver.

"Rolling-stock Automatic In-situ Line Quality, Car Operation, and Tracking System" was presented by Pan Lu, Raj Bridgelall and Tolliver, all of the UGPTI.

University of Utah paper wins honors from IEEE

Dr. Xuesong Zhou, Jay Przybyla (MS '12), Jeff Taylor (MS '12), and Jason Jupe of Armstrong Forensic Engineers received the Best Paper Award at the 15th Annual IEEE Intelligent Transportation Systems Conference, held Sept. 16-19, in Anchorage, AK. Their paper is titled "Simplified, Data-Drive, Errorable Car-Following Model to Predict the Safety Effects of Distracted Driving."

Bartlett work in spotlight

Dr. Steven Bartlett and his research were recently highlighted by the University of Utah University News Center. His research that focuses on Geofoam Technology will help reduce pressure on gas lines during an earthquake. The full news release can be found at http://unews.utah.edu/news_releases/ protecting-pipelines-from-earthquakes-2/

Bordelon receives award for younger authors

Dr. Amanda Bordelon received the Bengt Friberg Award for Best Paper by a Younger Author at the 10th International Conference on Concrete Pavements, held in Quebec City, Quebec, July 8-12, 2012. Her paper is titled, "Distribution of Fiber-Reinforcement in Thin Concrete Overlays." The award is given to the best reviewed and nominated paper, where the primary author is under the age of 35.

Paper honored at Urban Street Symposium

Dr. R.J. Porter and student Thanh Le's paper, "Safety Effects of Cross Section Design on Urban and Suburban Roads" was selected as one of the top four papers at the 4th Urban Street Symposium, held in Chicago, IL in June 2012.

NEW FACULTY

Colorado State University



Caroline M. Clevenger is an assistant professor of construction management at Colorado State University. She has earned a Ph.D. and B.S. from Stanford University, where her graduate work, "Design Guidance: Assessing Process Challenge, Strategy and Exploration," was funded by the Precourt Energy Efficiency Center. She also holds a

Clevenger

M.Arch and M.S. from the University of Pennsylvania. Clevenger's background includes extensive work as a professional consultant in sustainable design and construction. In addition to sustainability, her research focuses on the role of multidisciplinary systems thinking and Building Information Modeling (BIM) processes in performance-based architecture, engineering, and construction practice. While studying for her doctorate, she served as a Visiting Fellow to the General Services Administration (GSA) 3D-4D BIM Program. She is currently the Mortenson Faculty Scholar at CSU and is a registered architect and licensed engineer in the State of Colorado.



Mehmet E. Ozbek is an assistant professor and the graduate program coordinator in the Department of Construction Management. He holds a PhD in civil engineering with a focus on construction engineering and management. Since the beginning of his graduate studies at Virginia Tech's Center for Highway Asset Management Programs, he has been

Ozbek

performing research related to road infrastructure asset management, performance and productivity measurement-improvement-benchmarking, performance-based contracting and specifications, warranties in contracts, public-private partnerships, condition assessment, road maintenance performance measurement/improvement, optimization models, sustainable infrastructure, project delivery, and construction contracts. His work has been published in the American Society of Civil Engineers (ASCE) Journal of Infrastructure Systems, ASCE Journal of Transportation Engineering, Transportation Research Record Journal, International Journal of Construction Education and Research, Construction Management and Economics, and an ASCE special publication on Alternative Project Delivery, Procurement, and Contracting Methods for Highways. In addition to being an active reviewer for and serving in the editorial board of ASCE Journal of Construction Engineering and Management, Ozbek is a reviewer for seven other journals. He serves in three national committees related to construction and infrastructure: the ASCE Construction Institute Management Practices in Construction Committee, the Construction Industry Institute Academic Committee, and the ASCE Transportation and Development Institute Infrastructure Systems Committee. Dr. Ozbek teaches "Construction Contracts and Project Administration" and "Applied Sustainable Project Delivery" and advises graduate and undergraduate students. He is serving as the faculty advisor for the Construction Management Association of America Student Chapter at Colorado State University.



John van de Lindt has returned to the Department of Civil and Environmental Engineering at Colorado State University as the George T. Abell Professor in Infrastructure after serving two years as the Garry Neil Drummond Endowed Chair in Civil Engineering at the University of Alabama. His research focuses on the development of new design methodologies and

application of advanced technologies to mitigate natural hazards. He has worked with the Michigan DOT and Colorado on a number of bridge and other structural projects since 2001.

North Dakota State University



Dybing

Alan Dybing is an associate research fellow with the Upper Great Plains Transportation Institute where he studies the economic impacts of transportation infrastructure, transportation and rural agricultural processing, and infrastructure to support energy development. Dybing earned a BS in agricultural education and an MS in agribusiness and

applied economics from NDSU. He expects to be awarded his PhD in transportation and logistics from NDSU this spring. He has been an associate research fellow since 2005. Before that he was a araduate research assistant with the UGPTI for two years.



EunSu Lee, an associate research fellow, first joined the UGPTI as a graduate research Assistant in 2005 while pursuing a Ph.D. in transportation and logistics. Lee has a variety of experience in areas such as information technology, logistics, supply chain management, and transportation. Since 2005, he has been involved in projects concerning general aviation

Lee

planning, bridge management, agricultural and oil transportation in North Dakota, and crash and emergency services. Lee provides his knowledge of logistics, transportation, and GIS modeling to agencies around the state to improve transportation infrastructure and quality of life. He is especially interested in the large-scale of transportation analysis, such statewide freight analysis and global containerized freights for intermodal transportation. He is also an instructor in graduate transportation and logistics courses. Lee earned his PhD in transportation and Logistics in 2011 and his MS in industrial management and engineering in 2006, both from NDSU. He also holds an MBA in operations and service management from Hanyang University, Seoul, South Korea, and a BE in computer science and engineering from Kwandong University, Gangwon-do, South Korea.



Pan Lu joined UGPTI as a graduate research assistant in 2005. In 2010, Pan became a research analyst focusing in the area of asset management, freight transportation, sustainable transportation, and GIS-T applications. In 2012, Lu was named an associate research fellow focusing on road impact analysis of agricultural freight transportation,

investment needs stemming from oil-related traffic, multi-mode transportation energy efficiency analysis and rural road congestion impacted by large truck transportation. In addition, she will teach graduate courses in the transportation and logistics program.

University of Colorado Denver

Jimmy Kim is an associate professor in the Department of Civil Engineering at the University of Colorado Denver after spending the last five years as an assistant professor at NDSU. His current research encompasses structural rehabilitation using advanced composite materials such as carbon fiber reinforced polymer (CFRP), performance evaluation of constructed facilities, bridge engineering, concrete structures, science-based structural engineering, and intelligent structural systems.

University of Utah



Bordelon

Amanda Bordelon is an assistant professor in the University of Utah Department of Civil and Environmental Engineering. She received her BS, MS, and PhD degrees in transportation from the University of Illinois. Her research interests include fiber-reinforced concrete, pavement design, thin concrete overlays, and fracture mechanics. She is a member of

Transportation Research Board (TRB) committees on pavement rehabilitation and on basic and emerging technologies in concrete. She is a member of the International Society for Concrete Pavements and is active in the American Concrete Institute through involvement in international committees, as a local chapter board member, and as a student chapter faculty advisor.



Luis Ibarra is an assistant professor in the University of Utah Department of Civil and Environmental Engineering. His current research addresses the seismic behavior of different structural systems, such as high strength concrete moment resisting frames, and dry storage casks used to store spent nuclear fuel. The MPC is supporting Ibarra's research

Ibarra

to evaluate the seismic performance of concrete filled steel tube bridge columns for potential use in emergency or accelerated bridge construction projects. Before joining The University of Utah, he was a senior research engineer at Southwest Research Institute in San Antonio, TX. As a research assistant at Stanford University and at the National Autonomous University of Mexico, Dr. Ibarra assessed the seismic performance of structural systems at different limit states. He has also designed concrete and steel buildings, factories, and urban structural facilities. Dr. Ibarra is a registered professional engineer in Texas.

PRESENTATIONS AND PUBLICATIONS

Johnson, J. and **Ozbek**, M.E. (2012). Determining the Items that Structure Bridge Management Components and their Relative Weights–Focus on Implementation. 13th AASHTO/TRB Maintenance Management Conference, July 15-19, Seattle, WA.

Ozbek, M.E., de la Garza, J. M., and Triantis, K. (2012). "Efficiency Measurement of the Maintenance of Paved Lanes using Data Envelopment Analysis." *Construction Management and Economics* 30 (11), 995-1009.

Ozbek, M.E., Clevenger, C.M., and Fillion, A. C. (2012). "Quantitative Decision-Making Framework to Evaluate Environmental Commitment Tracking Systems: Colorado Department of Transportation Case Study." *Transportation Research Record* (2270), 188-194.



RECENT GRADUATES

Krista Nordback graduated from UC-Denver's PhD program in civil engineering with a focus on transportation engineering. Her time at the university was funded by a grant from the National Science Foundation through their Integrative Graduate Education and Research Traineeship program and scholarships from the Eisenhower Fellowship program,



Nordback

the Centers for Disease Control and Prevention, the American Association of University Women, and Women's Transportation Seminar. During the past year she has received awards for her research from the Institute of Transportation Engineers Colorado/ Wyoming Section and the Association of Pedestrian and Bicycle Professionals and was chosen to serve on the Transportation Research Board's Bicycle Committee. Her doctoral dissertation, "Estimating Annual Average Daily Bicyclists and Analyzing Cyclist Safety at Urban Intersections" develops a new method for estimating bicycle traffic volumes and provides the first safety performance functions for bicyclists in the United States. Nordback is currently working through the university on a project for the Colorado Department of transportation to create a method to create factors for estimating annual average daily non-motorized traffic based on short term counts. In March she will start a postdoctoral

position at Portland State University which will allow her to continue her research on non-motorized transportation.

University of Utah student **Jonathan Wood** graduated with his MS Degree and is now pursuing a PhD at Pennsylvania State University. Wood also holds a BS degree from the University of Utah in civil and environmental engineering. He was the 2013 University Transportation Centers Student of the Year from the Mountain Plains Consortium.

University of Utah student **Ivana Tasic** graduated with her MS degree and is now pursuing a PhD at the University of Utah. Tasic has been working at the Utah Traffic Lab at the University of Utah since 2010. She received her BS in traffic and transportation engineering at the University of Belgrade, Serbia. For her master's program, she reviewed advanced traveler information systems and their influence on traffic incident management.

Qingqing Yin recently graduated with her MS in the transportation option of the agribusiness and applied economics program at NDSU. Her thesis was "Transporting and Disposing of Wastewater from North Dakota Oil Producers." She was advised by Dr. Robert Hearne. Yin is from Xuzhou, China. She has a BA in economics and management from Nanjing Forestry University. She has returned to her home country. Milan Zlatkovic earned his PhD from the University of Utah and is now a full-time post-doctoral researcher in the Utah Traffic Lab. He holds a BS degree in traffic engineering from the University of Belgrade, Serbia, and an MS degree in civil engineering from the University of Utah. For his PhD, he evaluated and analyzed benefits and impacts of transit signal priority for bus rapid transit and light rail transit using VISSIM microsimulation software, as well as analysis of urban traffic networks.

STUDENTS AWARDED ITE SCHOLARSHIP

University of Colorado Denver students Alejandro Hengo (PhD) and Max Henkle (MS) received a \$1,000 Colorado-Wyoming Section Graduate Level Scholarship from the Institute of Transportation Engineers. University of Colorado Denver master's student Rachael Bronson received the \$500 Executive Committee Award. The scholarships are intended to encourage students pursuing careers in transportation-related fields. The Colorado-Wyoming Section of the Institute of Transportation Engineers (ITE) is composed of about 500 members, students, and local affiliates who work/study in the fields of transportation and traffic engineering.

(Wood continued)

The award was sponsored by the U.S. Department of Transportation (USDOT). The event, held in conjunction with the annual meeting of the Transportation Research Board, is an opportunity for the USDOT to honor outstanding students from participating University Transportation Centers for their achievements and promise for future contributions to the transportation field.

UC-DENVER STUDENTS WIN SCHOLARSHIP HONORS

UC-Denver PhD student Kara Luckey was awarded the Helene H. Overly Graduate Memorial Scholarship by the Colorado Chapter of Advancing Women In Transportation. The \$10,000 was established in 1981 to encourage women to pursue career paths in transportation. Each year this scholarship is awarded to a female student pursuing graduate studies in transportation or a related field.

UC-Denver master's student Lisa Truong was recently awarded the Parsons Brinckerhoff Jim Lammie Scholarship by the American Public Transportation Foundation. The \$2,500 scholarship is awarded annually to an applicant dedicated to a public transportation engineering career.



RIPPLINGER EARNS BEST DISSERTATION AWARD

Dave Ripplinger was awarded the American Economic Association Transportation and Public Utilities Group's "Best Dissertation Award" on Jan. 5 at the AEA/TPUG Meetings in

Ripplinger

San Diego, California. The award is one of the highest honors that TPUG can bestow on a young scholar. Ripplinger's dissertation was "Organizing Transit in Small Urban and Rural Communities." The paper can be found at http://www.ugpti.org/resources/reports/ details.php?id=723

Ripplinger conducted the research for his dissertation as a PhD student at NDSU and a researcher at the Upper Great Plains Transportation Institute employee. He is now a researcher with the NDSU Department of Agribusiness and Applied Economics. TPUG is an international forum for people practicing and researching these topics and industries, including air and surface transportation, energy, electronic communications, water, and sewage.

NDSU STUDENTS PRESENT AWARD-WINNING RESEARCH AT GIS-PRO CONFERENCE

Students from NDSU's Transportation and Logistics program presented papers at the GIS-PRO Annual Conference in Portland Oregon in October. The conference was sponsored by URISA, the Association for GIS Professionals.

Nimish Dharmadhikari and Zijan Zheng presented "Study of the Public Transit System Accessibility Based on the Average Opportunity Accessibility Measure – a Case Study of Fargo, ND." The paper received second place in the 2012 URISA Student Paper Competition.

In addition, PhD student presented Vu Dang "Impact of Distance, Traffic, and Elevation on Active Transportation to School for Children Using GIS." The paper received fourth place in the student paper competition.

STUDENT PRESENTS POSTER AND PAPER AT INFORMS CONFERENCE



NDSU transportation and logistics student Luke Holt presented his research at the 2012 INFORMS Annual Meeting in Phoenix in October.

He presented a poster titled "Establishing the Optimal Drain Tile Network Based on Field Characteristics." In the work he applied operations research analysis to drain tile network

Holt

design. Holt also gave a presentation, "Determining the Right Buffer Strategy during Red River Floods, ND, MN. The presentation outlined his operations research analysis to determine a buffer strategy to provide appropriate protection from unpredictable flooding in the Red River region. INFORMS is a leading association for professionals in the fields of operations research, management science, and analytics.

STUDENTS TOUR FARGO-MOORHEAD BUS FACILITIES

In October 2012, nine students in NDSU's chapter of the Association of Transportation & Logistics (ATL) met with transit officials from Fargo-Moorhead and toured the Metro Transit Garage. The focus of the tour and meeting was for ATL members to become acquainted with day-to-day operations of a transit agency.

The students met with Lori Van Beek, transit manager for the city of Moorhead, and Gregg Schildberger, transit planner for MATBUS. The roundtable discussion included benefits of public transit in the Fargo-Moorhead area as well as the challenges of running a transit agency that is split between two cities, two counties and two states. Students also learned about fixed bus routes and the effort that is involved in route planning. Van Beek and Gregg Schildberger sought input from the students with regard to class studies regarding route development and the need to reach those in the community who most need services.

During the tour, students saw bus maintenance facilities and talked to the MATBUS's maintenance manager. They observed buses undergoing routine maintenance checks and saw buses being washed. They also saw the routine for parking buses at the end of the day so that they were ready for the next day's service. The student's also were able to see some of MATBUS's new hybrid diesel-electric buses.





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NEW STUDENTS

Colorado State University



Albeiruti



Nasser Albeiruti is a graduate student and the financial officer in the Department of Construction Management, and he is also currently pursuing an MBA. Albeiruti has a BS in chemical engineering and an MS in accounting. His research interest is focused on alternatives to fuel tax revenue to help increase funding for highways.

Chris Bright earned his BS in civil engineering in 2011 from Tennessee Technological University in Cookeville, TN. He participated in TTU's cooperative education program, where he worked for a structural engineering firm in Tennessee that specializes in various mining applications, as well a civil engineering firm in

Bright

South Australia. He was also a founding member of the TTU chapter of Engineers Without Boarders and has participated in a historical and international engineering study program in France. He is pursuing an MS in civil engineering and is conducting research for MPC project 408 "Exploring Unique Plastic-Reinforced Bridge Decks" under the supervision of Dr. John van de Lindt and Dr. Rebecca Atadero.



Alex Hesse earned his BS in civil and environmental engineering at the University of Wisconsin -Madison. He is currently pursuing a master's degree in civil and environmental engineering with an emphasis in structural engineering. He has a specific interest in bridge design and repair. He is a graduate research

assistant working on determining the accuracy and reliability of nondestructive evaluation techniques on bridges.

Kirsten Peterson recently

received a BS in civil engineering from Embry-Riddle Aeronautical University in Daytona Beach, FL and is pursuing an MS in civil engineering with a focus in structures She will be studying aluminum plastic composites for use in transportation infrastructure.

Sherona Simpsonis is an MS student in the Construction Management Master of Science Program. She obtained a bachelor of science in quantity surveying from the University of Technology in Jamaica. Simpsonis hopes to contribute to the development of quantity surveying and construction management courses at the University of Technology to



Peterson



Simpsonis

include aspects of sustainable design and facilities management.

North Dakota State University

Brian Gallagher is an MS student in the transportation concentration of the agribusiness and applied economics program. He is from Ames, IA. Gallagher is working on a project with a transportation focus with Dr. Won Koo as adviser.

Martin Fowel is studying to earn the Master of Managerial Logistics Program. He earned his bachelor's degree in Nigeria. Fowel plans to continue obtaining his PhD in transportation and logistics management. With his degrees, he wants to work within the U.S. railway system.

Ken Ibold is a master's student in the Transportation and Urban Systems Program. Ibold earned his BS in journalism at University of Wisconsin-Madison. He is one of the few people in the nation working on the licensing and planning of commercial spaceports for horizontal launch and landing vehicles.



lbold



Chijioke Ifepe is a PhD student in transportation and logistics. He earned a BS in engineering polymer and textile engineering, as well as an MS in transportation. In the future, he plans to be a consultant in the logistics and supply chain industry.

lfepe

Chipo Nsereko is enrolled in the Master of Managerial

Logistics Program. He earned his BS in management information systems from Metropolitan State University in Minneapolis after attending Anoka-Ramsey Community College in Coon Rapids, MN, where he earned AS in business.



Yong Shin Park is a student in the Master of Managerial Logistics Program. He holds a BS in industrial engineering from NDSU. A native of South Korea, Park is interested in logistical planning and the economic effect of integrating the railroad and highway systems of North Korea and South Korea.

Park

Dale Stith is in the master's program in Transportation and Urban Systems. He plans to use the skills and knowledge he develops in the program to become more effective in developing more comprehensive and integrated transportation plans. Stith graduated from Old Dominion University with a BS in geography.



Tiapo

Napoleon Tiapo is a PhD student in transportation and logistics. He holds a master's degree from NDSU. His future goals include teaching, research, assessments, and program management.

South Dakota State University



Todd Pauly, a native of Arlington, MN, is a graduate research assistant. He began his studies at SDSU in September of 2008 and graduated with a BS in civil and environmental engineering in May of 2012. Pauly gained engineering experience while working for HDR Engineering in Sioux Falls, SD, during the summers of 2010-2012. His current research

Pauley

project, which is funded by the MPC, will evaluate the seismic performance of self-consolidating concrete (SCC) compared to conventional concrete. The results will help state DOT's design and construct SCC in bridge columns in seismic regions. Pauly anticipates earning his MS in civil engineering in December.



Zhao Shen, is now a graduate research assistant with the Department of Civil & Environmental Engineering. He earned his BS in traffic and transportation in June 2012 from Southeast University, China. At present, his major is traffic engineering and his research focuses on traffic safety. He is involved the Evaluation and Mitigation of Vehicle

Shen

Impact Hazards for Overpasses project, which is cofunded by MPC and South Dakota Department of Transportation.



Melissa McMullen is a native of Vermillion, SD, and earned her BS in civil and environmental engineering in May 2012 from SDSU. She plans to complete her MS in civil engineering by December. She has acquired engineering experience by working for SDDOT as a field engineering intern and by working for SDSU as a student operator at the Brookings

McMullen

Wastewater Treatment Facilities. She is currently working on a research project co-funded by the MPC and SDDOT that involves the implementation of accelerated bridge construction within SDDOT. This involves the formulation of a catalog of commonly used ABC techniques and developing a method for determining if the use of ABC on specific SDDOT projects would be feasible.



Kai Wang, an international student from China, is now a graduate research assistant at SDSU. He began at SDSU in September of 2011 and will earn his master's degree in Civil and Environmental Engineering in August 2013. The focus of Kai's research is "Selection of Interest and Inflation Rates for Infrastructure Investment Analysis" which is co-funded by

MPC and SDDOT. Following graduation, Kai plans to continue to pursue his PhD's degree.

Brett Tigges began his undergraduate education at SDSU in September of 2008 and completed his Bachelor of Science degree in Civil and Environmental Engineering in December of 2012. Brett has been appointed as a graduate research assistant at SDSU. The focus of his research is "Evaluation and Mitigation of Vehicle Impact Hazards for Overpasses", which is co-funded by MPC and the South Dakota Department of Transportation. He began his research on the topic in the September of 2012 as an undergraduate student. The work will include evaluating the overpasses in South Dakota which ones are susceptible to collapse from vehicular (tractor-trailers in particular) impact, as well providing mitigation solutions to protect the overpasses. He anticipates earning his MS degree in civil engineering in December of 2013. Brett is a native of Ringsted, IA.

University of Colorado Denver



Rachel Bronson relocated to Denver from Charleston, SC, in 2012 to begin work on her masters in civil engineering. Prior to moving to Colorado, Rachel worked for four years as the executive director of the Palmetto Cycling Coalition, a non-profit organization working to make South Carolina a more safe place to bicycle. Bronson is passionate about transportation

Bronson

infrastructure that is sustainable and cost-effective and is interested in the policies and designs that successfully drive these innovations. At CU Denver, Bronson is secretary of the ITE student chapter and a member of the ACT Research Group. She is also the recent recipient of the ITE CO/WY Section Executive Committee Leadership Award and the WTS Colorado Leadership Legacy Scholarship. Bronson is engaged in research exploring how multi-modal transportation options make communities more resilient when faced with catastrophic events.



Max Henkle is a master's student in the transportation engineering program. He holds a BS in environmental sciences from the University of California, Berkeley, and a master's in Urban Regional Planning from the University of Colorado, Denver. He is focusing his studies on the application of GIS tools for decision making, transportation planning, multi-

Henkle

modal transportation, and complete streets. Henkle is a recipient of Institute of Transportation Engineers ITE CO/WY Graduate Level Scholarship.

Kara Luckey is a PhD student in the College of Architecture and Planning where her work is focused on the relationship between urban infrastructure, economic and community development, and social equity. She is studying neighborhood change processes, transportation and housing equity, and the public transit's role as a community and economic development tool. Kara is the recipient of a fellowship in Sustainable Urban Infrastructure through the National Science Foundation's Integrative Graduate Education and Research Traineeship (IGERT) program. Luckey holds a BSE in civil engineering from The Cooper Union for the Advancement of Science and Art in New York City, and has more than seven years of experience in planning practice. She has worked as a planner and project manager predominantly in transit and transportation planning, but also in contexts related to urban revitalization, waterfront redevelopment, and planning for public and federal lands. Luckey's research interests include transportation and housing equity, economic and community development around urban infrastructure investment, urban and regional governance structures, and residential location decision-making.



Jerry Ogden is a PhD student and received his MS from the University of Colorado, Denver. Ogden plans to explore the relationships between weatherrelated collision incidents involving commercial vehicles in a GIS study. In the study, he will attempt to correlate geographical features, seasonal issues, and remote sensing as a means of assisting commercial

Ogden

carrier dispatching centers with route selection, vehicle/load configurations, and the use of mitigating equipment such as additional ballast for trailer stability in wind-prone regions, or open-shoulder tire tread designs in regions prone to ice and snow. Ogden owns a consulting firm that conducts business across the Central and Western US and Hawaii.

University of Utah

Dylan Brown holds a BS in civil and environmental engineering at the University of Utah and is currently working on his MS degree. Brown is researching repair techniques for precast bridge columns connected to footings with grouted sleeved connectors.

Charan Kumar Chandika is an MS student in civil and environmental engineering. His research is on oil sands, which is a mixture of sand and bitumen, to try to predict the viscoelastic behavior and critical cracking temperature of oil sands mixes under low temperature conditions.

James Coleman received his BS degree in psychology from the University of Utah in 2010. He is a master's student in the Applied Cognition Lab and the Center for the Prevention of Distracted Driving. He is studying individual differences in working memory capacity and how those differences dictate attention control and executive function

Zach Gibbs is working on his master's degree. He earned his bachelor's degree in civil and environmental engineering at the University of Utah. Gibbs is studying surcharging of embankments and its effect on the rate of secondary settlement of the Bonneville clays, and how much more settlement can be expected if the surcharge is removed before primary settlement has completed.

Zachary Jones holds a BS in civil and environmental engineering at the University of Utah and is currently working on his master's degree. He is researching the low-temperature performance of pavements through bending beam rheometer testing of field and laboratory pavement samples.

Shun Li is currently a master's student in civil and environmental engineering. Li earned a BS in civil engineering from Changsha University in China. Li is studying the secondary consolidation settlement of foundation soils at deep, clay sites that can cause damage to bridge approaches and pavements.

Anusha Musunuru holds a bachelor's degree in civil engineering from Jawaharlal Nehru Technology University in India and is working on an MS in civil and environmental engineering. Her research is focused on performance-based highway design that incorporates risk and reliability analysis into the process of establishing road geometric design criteria and making road design decisions. Mohammed Javad Ameli Renani is currently a PhD student in civil and environmental engineering. He also holds an MS degree from the University of Utah and a BS from Sharif University of Technology in Iran. He is a member of a research team that is currently studying the seismic performance of grouted splice sleeve bridge connections.

Jeffrey Taylor holds a bachelor of science in civil and environmental engineering at the University of Utah and is working on his master's degree. His research touches on topics in transportation planning, transportation modeling and simulation, dynamic traffic assignment, transportation safety, emissions estimation, and traffic flow theory.

Catherine Tucker is working on an MS in civil and environmental engineering. She also holds a BA in art from Lewis & Clark College in Portland, OR, and a master of architecture from the University of Utah. She is currently evaluating the potential use of concretefilled steel tubular columns for accelerated bridge construction.

Jonna Turrill is a graduate student in the Cognition and Neural Science program at the University of Utah. After receiving her BA in psychology from Biola University in 2009, she moved to Utah to work in Dr. David Strayer's Center for the Prevention of Distracted Driving lab. She is examining attentional allocation and how distraction affects drivers through the use of driving simulations, an instrumented vehicle, and behavioral and EEG methodologies. Arwen A. Behrends is in the second year of the social psychology doctoral program. She earned her bachelor's degree from Brigham-Young University-Idaho. Arwen's research focuses mainly on various components and processes of decision making as well as attitudes and their impact on social interaction and physiological health outcomes. She is also assisting Dr. David Strayer on MPC Project 407, "The Effect of Multi-tasking on Self-Assessments of Driving Performance."

Shannon M. Moore received her BA from Elizabethtown College in Elizabethtown, PA, in 2011. She is in the social psychology doctoral program and is working with Dr. David Strayer on MPC Project 407, "The Effect of Multi-tasking on Self-Assessments of Driving Performance." Her other projects examine how aspects of the self have an impact on decision making and how knowledge of others guides our interpersonal decision making.

Additional students

Zant Dotty (undergraduate) Hao Li (doctoral) Joel Parks (masters) Wade Stinson (Undergraduate)



NDSU transportation and logistics students evaluate bridge options in oil country

Traffic and road issues related to oil development in North Dakota became part of the curriculum for students in an advanced transportation and logistics class last semester.

For a class project, students in TL 752: Transportation Planning and Environmental Planning were asked to help assess possible location for a new bridge across the Little Missouri River between Medora and Teddy Roosevelt National Park. Engineers from KLJ Engineering presented the challenge to the class: investigate possible bridge locations by assessing the possible environmental impacts of each. Key components of the assessment were to be fuel consumption and likely emissions as well as dust created.

KLJ came to NDSU and the students because they have access to a western North Dakota traffic model developed by the NDSU's Upper Great Plains Transportation Institute. "The UGPTI's model is the best information out there right now with regard to traffic projects," KLJ engineer and NDSU alumnus Troy Ripplinger told the class. The traffic model had been developed by UGPTI staff to assess road infrastructure investment needs for the state, counties and townships when existing models could not account for the rapid growth and development there. Currently no bridge exists across the Little Missouri River from the I-94 bridge near Medora to the Long X Bridge on Highway 85 at the entrance to the North Unit of Theodore Roosevelt National Park – some 70 miles. Billings County attempted to find a location for a bridge in the 1980s and 1990s, but abandoned the project in the face of opposition. Oil development and the resulting traffic and congestion have prompted renewed calls for a bridge. Local officials say the bridge is necessary to alleviate congestion on area highways and to improve accessibility for emergency services. Others argue the bridge and resulting traffic will have a negative effect on surrounding properties and could impact the National Park.



Specialists from the engineering firm of Kadrmas Lee & Jackson, Kayla Torgerson, Troy Ripplinger, and Jennifer Turnbow, are pictured with course instructor EunSu Lee. The three outlined the course project for students in October.

In early October, Ripplinger and KLJ planners Kayla Torgerson and Jennifer Turnbo presented background information to the class. They described potential bridge locations and outlined state and federal environmental assessment requirements that had to be met. By early December the student teams had run analysis on various potential bridge locations, prepared a formal presentation and addressed the class and a representative from KLJ with their findings.

Students Vu Dang, Ciaran Kelly, and Yognshin Park presented "Fuel Consumption Based on 20 – Year Vehicle Miles Traveled Forecast: A Study of the Little Missouri River, North Dakota." Students Brett Korporaal, Chippo Nsereko, and Stephen Seifert presented "Fugitive Dust Emissions on the Little Missouri River Bridge Alternatives."

"This project provided students with real-world experience on issues facing our region," noted course instructor EunSu Lee. "At the same time we were able to provide some specialized expertise that was of value to the engineering firm."

Researchers examine seismic retrofit of spliced sleeved connections for precast bridge piers

Researchers at the U of U are studying the use of splice sleeved connections for connecting precast concrete elements in accelerated bridge construction (ABC) and their ability to withstand significant stresses and deformations in large earthquakes.

Researchers Chris P. Pantelides, M.J. Ameli, Joel Parks and Dylan Brown note that there is a great need to be able to retrofit bridge piers that will use spliced sleeved connections. Specifically, the objectives of this research are to:

- Quantify the tensile capacity of splice sleeved connections
- Perform quasi-static cyclic tests of a retrofitted damaged precast concrete column to footing splice sleeved connection, and a retrofitted damaged precast concrete column to bent cap beam connection using mechanical sleeves; the retrofits will be accomplished by using traditional construction materials and carbon fiber reinforced polymer (CFRP) jackets; and



Transportation and Logistics student Yognshin Park discusses the impact of possible bridge locations on total vehicle miles travelled in the region.

 Evaluate to what extend the retrofitted sleeved connections behave in a manner consistent with the earthquake resisting elements that would be expected with traditional construction methods, as described in the AASHTO Guide Specification for LRFD Seismic Bridge Design.

Air tests of the two spliced sleeved connections have been carried out. Two different spliced sleeved connections are being tested connecting two #8 bars. The research team has investigated the performance of the individual components of both connection types, including tension tests on the dowel rebar extending out from both sleeved ends (sleeve tests) and rebar tension tests. Compressive tests of the two different grout types for the NMB sleeve and Lenton Interlock have also been carried out. These tests were conducted to obtain the properties of the various components of the substructure, including rebar tensile yield strength and strain and ultimate tensile strength and strain, grout compressive strength, the strength of the spliced-sleeved individual NMB and Lenton Interlock connections, and their failure modes.

Half-scale tests were designed to represent actual bridge details regarding spliced-sleeved column-tofooting connections using NMB and column-to-cap beam connections using Lenton Interlock. Cyclic quasi-static tests have been conducted on the column-to-footing connection using NMB (see figures 1-4). The following parameters are being evaluated: lateral load capacity, displacement ductility, and damage failure modes. The research team has begun the seismic retrofit of the subassembly shown in the figure using conventional materials and CFRP jackets. In the next stage the retrofitted NMB column-tofooting subassembly will be tested, along with the retrofitted Lenton Interlock column-to-cap beam subassembly.

Expected outcomes of the research include the evaluation of the seismic retrofit of two types of systems for ABC construction of bridges. Specifically the NMB Splice Sleeve and the Lenton Interlock will be evaluated for column to footing and column to cap beam connections using precast concrete elements. Design recommendations for the seismic retrofit will also be developed.



Figure 1. Test of Specimen NMB 1: 2% drift – cracking



Figure 2. Test of Specimen NMB 1: 3% spalling



Figure 3. Test of Specimen NMB 1: 6% spiral exposed



Figure 4. Test of Specimen NMB 1: 9% two bars brake



Examining transportation resiliency

The aftermath of catastrophic events such as Hurricane Sandy suggests that cities such as New York return to normalcy more quickly due to the abundance of multi-modal transportation options.

This research project at the UC-Denver is investigating the resiliency value of such modal options for a second-generation mass transit light rail system in Denver, a region that was, and still is in many cases, extremely auto-dependent. The project is titled, Building a Framework for Transportation Resiliency and Evaluating the Resiliency Benefits of Light Rail Transit in Denver, CO,

Principal investigator Wesley Marshall notes that justification for transportation infrastructure and major transit investments are often measured in terms of mobility improvements, congestion relief, environmental benefits, operating efficiencies, cost effectiveness, and/or economic impacts. Calculating such measures is an important step in alternative analysis, but these same measures – even in combination – fail to properly illustrate the added resiliency provided by a diversity of mode options and compact, mixed-use, mixed-income, transit-rich developments.

So far, the research team has delved into the resiliency literature (including that of Kevin Heaslip

at USU) and is working with the Denver Regional Council of Governments to run a number of resiliency-related scenarios in their new activitybased transportation model (i.e. the Focus model).

In the next stage, the these scenarios will be analyzed across a number of dimensions to not only help assess the value of the light rail transit system, but to also better understand the interdependence of land use and non-motorized transportation with respect to various socioeconomic and sociodemographic groups as well as toward increasing the overall resilience of a city.

CSU researchers improve traffic risk prediction models

Researchers at CSU are developing improved statewide traffic risk prediction models for state highways to help traffic managers and state patrol officers plan for accidents.

Like many other states in the nation, Colorado experiences high accident numbers and serious injuries on highways. With highways located in different counties and cities across the state,

poral and spatial scales to serve the potential needs of Colorado State Patrol. Finally, several GIS-based interactive maps are developed to demonstrate the application of the prediction models. specific weather, terrain, traffic characteristics, highway conditions, population and economy development conditions are different from one another. As a result, the mechanisms of traffic crashes and associated injury severity can vary significantly.

For individual state patrol officers or traffic manager working in the different regions, it is crucial to know to which extent the crash and injury situations may look like for a given scenario, which requires more refined traffic accident prediction models. In this 2-year study supported by the Colorado State Patrol, researchers are developing state-wide traffic risk prediction models with refined scales on major highways in Colorado. The research team is lead by professor Suren Chen and also includes postdoctoral fellow Feng Chen and PhD student Xiaoxiang Ma.

As a first step in the project, researchers conducted a comprehensive investigation of traffic crashes, injury and related law enforcement issues by considering the site-specific weather, terrain, highway and driving conditions as well as their inherent relationships in Colorado. Based on the findings, the study team further developed the traffic accident frequency prediction models in both refined tem

Based on the findings from this project, MPC has sponsored a new study to continue investigating the interactions between law enforcement and traffic safety.

Researchers study effect of low-cost safety improvements on rural roads for older drivers

Researchers at Upper Great Plains Transportation Institute at NDSU are studying the effects of low-cost safety improvements for older drivers on rural roads.

A primary focus of the study was to test safety improvements using NDSU's DriveSafety driving simulator, UGPTI researcher Kim Vachal said. She noted that if the driving simulator can be used to identify effective low-cost safety improvements, they could be promoted and implemented much faster than longer-term infrastructure improvements.

The driving simulator is located in NDSU's Center for Visual and Cognitive Neuroscience in the Department of Psychology. That's why faculty from collaboration with researchers from those facilities is essential, Vachal said. The research team includes Linda Langley, Mark McCourt, Robert Gordon and Mark Brady, all faculty members in the NDSU Department of Psychology and the NDSU Center for Visual and Cognitive Neuroscience. Undergraduate research associates and computer programmers were also involved in the project.

Vachal, who is director of the UGPTI's Transportation Safety and Security Center, helped define the project objectives; design, create, and test the driving scenarios; and review the interim project findings. She noted that the North Dakota Department of Transportation has identified a need for improvements that will increase the safety of older drivers, particularly in rural areas of the state.

Baby boomers are aging, increasing the population of older drivers. Seniors ages 65 and older will contribute to 23% of the ND population in 2020, with the highest concentration in rural areas. More than half of seniors choose driving over other forms of transportation. "Unfortunately, the fatality rate from car crashes is higher in seniors than in any other age group except teenagers," Vachal said.

With the driving simulator, researchers were able to manipulate the distance and presence of signs on a simulated rural highway and examine the resulting driving performance of older adults under alternative advance warning scenarios where road signage was used to alert the driver to an upcoming driver maneuver such as making a turn. Simulations included 18 day-time driving scenarios and 18 at night. Participants included 19 middle-aged adults (ages 40-58) and 19 older adults (ages 60-84.) Participants drove down a rural highway and turned right or left at the target intersection. The target intersection was preceded by 0, 1, or 2 intersections, each with destination road signs placed different distances from the intersections. Collisions and accidents, traveling speed, braking, turning speed, turn accuracy, and speed at the destination sign were all noted metrics used in understanding driver response.

Some of the Mountain-Plains Consortium critical issues this research addresses include high-risk rural roads, human factors, effective safety management, and low-cost safety improvements.

The researchers found that both driving safety and preparatory turn behaviors in middle-aged and older drivers can be increased by low-cost changes in rural areas such as using warning signs and moving the destination road sign farther from the intersection.

Evaluation of ice loads on bridge structures in South Dakota

A research study to measure ice loads on bridge piers in South Dakota is well under way. Since the study was initiated in late 2011, the research team at SDSU has selected two bridge structures for instrumentation and designed, fabricated, calibrated, and installed two transducers for measuring ice loads on piers of two bridge structures.

One of the instrumented bridges is located in Huron, SD on Highway 14 over the James River. The other instrumented bridge is located south of Brookings, SD on Interstate 29 over the Big Sioux River. The data loggers at the two sites have been activated to start collecting and storing data streams from the sensors. The stored data can be downloaded remotely by means of a cellular digital modem. Data collection is anticipated to span over two winters.

The research team is comprised of Dr. Shiling Pei, Dr. Nadim Wehbe, and graduate student Brittney Ahrenstorff. The study is co-sponsored by MPC and the South Dakota Department of Transportation.



Instrumentation of bridges for measuring ice loads. Left: bridge on US 14 over the James River in Huron, SD. Right: bridge on I-29 over the Big Sioux River in Brookings, SD.

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