

WTI

Western Transportation
INSTITUTE

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January 2011 Newsletter

Research

Center for Health and Safety Culture Launched

Driving is a common and necessary activity for most Americans, and it is also one of the most dangerous. Despite significant improvements in the safety related features of both our vehicles and the highways we use, motor vehicle crashes claim more than 40,000 lives per year in the U.S. The risk of a fatal crash is highest in rural America not only because of the hazardous nature of the rural transportation system, but also because of the choices of individual drivers. While most rural drivers make healthy driving choices, too many rural drivers are taking unnecessary risk relative to other populations. Enduring safety improvements require that we understand and cultivate the healthy aspects of the prevailing traffic safety culture (beliefs and attitudes) and motivate more drivers to avoid risky behaviors. The Center for Health and Safety Culture at WTI works to improve health and safety through cultural transformation.

"I know firsthand that enforcement, road design, and vehicle technology can only go so far. It is critical that we address the driving cultures in our communities in order to reduce vehicle crashes and fatalities. Changing human behavior is the next important strategy toward lifesaving improvements in our public health system."

Colonel Mike Tooley, Montana Highway Patrol

Cultural transformation is key to developing safer communities

Health and safety is impacted by culture. While science and technology have made great strides in creating a safer world, transforming culture is key to further improvements. Culture is complex and multi-faceted—it is the collection of shared values, attitudes, beliefs, behaviors, rules, policies, and laws present in a community. Due to its complex nature, transforming culture to achieve lasting outcomes is challenging because it involves fundamental shifts in the way we view things. While change can be temporary, transformation is lasting, deep, and often involves paradigm shifts. The Center for Health and Safety Culture understands the challenges of cultural transformation because the researchers have been at the forefront of using science to address social issues for decades. They have extensive experience

Transportation Issues Addressed by the Center

- Transportation Safety
- Automated Enforcement
- Impaired Driving
- Distracted Driving
- Seatbelt Use
- Farm Safety
- Workplace Transportation Safety

and a unique model.

Leading the way in transforming culture

As nations strive to keep people safer, transportation leaders are embracing the need to both continually improve technology and transform culture. The Center has led efforts in increasing seatbelt use, decreasing impaired driving, and reducing underage drinking and tobacco use. The researchers use a unique approach called the Positive Community Norms (PCN) model. The PCN model focuses on three components: leadership, communication and integration of strategies unique to each issue. The center researchers work side-by-side with clients to ensure the project is a success and to build the client's capacity so they are able to sustain efforts into the future. PCN is not a program; it is a process and the researchers work with clients as this process is applied in their communities. The center solves problems by using the power of the community whether that community is a state, county, city, workplace or school. The PCN model is based on Seven Core Principles which align with seven distinct steps to create a clear road map to success.

The Center works with a variety of clients and sponsors including local, state and federal governmental agencies (e.g., state departments of transportation), private businesses, corporations, community coalitions and private foundations. By building dynamic relationships through collaborations and partnerships with other research organizations, universities and consortia, the Center ensures that all research efforts are cost effective and relevant.

"Enhancing our traffic safety culture, in my opinion, is the key to moving towards a zero death future. And, I look forward to the contributions the new Center can make to overcome the challenges associated with this cultural change."

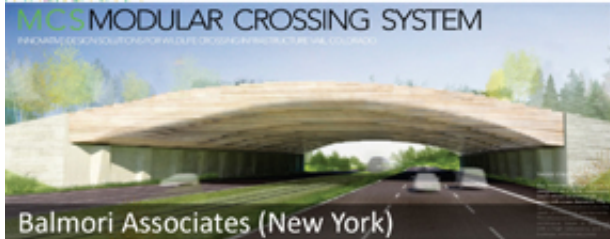
Peter Kissinger, President and CEO, AAA Foundation for Traffic Safety

If cultural transformation matters to you, then the Center for Health and Safety is your partner.

For more information, please contact Jeff Linkenbach (406) 994-3837, jwl@coe.montana.edu. Visit our website at www.westerntransportationinstitute.org/centers/culture.

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Five Finalists Compete for ARC Prize



The ARC International Wildlife Crossing Infrastructure Design Competition is nearing completion, with the five finalists preparing to present their designs at the Transportation Research Board workshop. Initiated by the Western Transportation Institute at Montana State University and the Woodcock Foundation, it now has over 18 sponsors including FHWA and AASHTO. ARC is a competition to create the next generation of wildlife crossing structures for North America's and perhaps the world's roadways. While crossing structures have demonstrated great success in protecting both wildlife and drivers, their use in the U.S. is limited, due in large part to the high cost and long design and construction process. "I think the next generation of these structures can be built for less, can be more innovative, and have better ecological sensitivities," said Tony Clevenger, the WTI Research Ecologist who initiated the concept of the competition.

In the first phase of the competition, thirty-six interdisciplinary teams - comprised of landscape architects, architects, engineers, ecologists, and other experts - submitted Expressions of Interest describing their approaches for designing an overpass for West Vail Pass on I-70 in Colorado. This mountainous site is known migration corridor for numerous species of wildlife including wolves and Canada lynx. In September, ARC announced the selection of five finalist teams, whose members represent more than a dozen firms in four countries. "We're very excited by the level of international interest in the competition," said Rob Ament, who is the Program Manager for Road Ecology at WTI; "crossing structures have been in use in countries like France and the Netherlands since the 1960s and 70s, so it will be interesting to see the broad range of new ideas that is generated by such a diverse group of participants."

The finalist teams traveled to Colorado in September to view the West Vail Pass site in person. After carefully studying the road features and geometry, as well as the wildlife habitats, the finalists created their designs that are now available for public viewing at www.arc-competition.com/finalists.php. (Click on download submission for each team). A world-class jury chaired by Harvard University Graduate School of Design's Charles Waldheim has selected the winner. The winning team will be announced in January 2011, and will receive a \$40,000 prize. Sponsors are confident, however, that the competition winner will not be the only beneficiary. As Ament concluded, "if the competition inspires innovative designs that are also cost-effective to install, then we all win."

For more information, visit www.arc-competition.com or contact Rob Ament rament@coe.montana.edu, 406-994-6423

New Methods to Shore Up Mountain Roads

In mountainous terrain, road repair can be challenging and costly. One critical problem is when settlement and creep of the slope over time (essentially caused by a slow moving landslide) causes part of the road to subside, the pavement to crack, and potentially make the road impassable.

The US Forest Service and the FHWA Federal Lands Highway Division, who together manage thousands of miles of roads through mountainous regions, have occasionally used a reinforcement technique called the "deep patch." The technique involves excavating soil from below the surface and incorporating layers of geosynthetic materials as it is built back up, usually with the native soil. This process does not involve extensive digging, thus the shallow reinforcement helps to rehabilitate only the upper portion of the slope.

Engineers have been applying the deep patch method to certain road situations as early as 1988, and in 2005 the Forest Service developed a formal design process to extend its use. The field performance, however, has not been well documented or evaluated. Eli Cuelho, leader of the Infrastructure Maintenance and Materials Program at WTI, and his team are currently leading an effort to study sites where the method has been used, which will allow them to conduct an in-depth analysis of the extent of its effectiveness.

In November 2010, the researchers visited four deep patch project sites in Oregon - constructed in 1996 and 1997, and one completed in 2001 in Washington to collect data. They conducted surveys, collected soil samples, and documented the condition of the road and slope. Over the next months, they will utilize slope stability software and finite element modeling software to compare and analyze the findings. The results will be used to provide the federal agencies with recommended changes or improvements to the design method. "We want to make sure that our research can easily and immediately be put to use," said Cuelho; "we plan to give these agencies a step-by-step recommended design procedure, as well as a detailed design example that follows the revised procedure. So far the deep patch method shows a lot of potential. It appears to be a very cost-effective means of greatly slowing the development of pavement surface distress."

WTI visited Forest Development Road (FDR) 26 at milepost 1.1 in the Gifford Pinchot National Forest in southwest Washington. As a result of a heavy precipitation event in 1996, cracks formed and settlement occurred in the road. By 1998 the cracks were over 60 feet long and 18 inches of settlement had occurred. The asphalt pavement at the affected area was removed and the area was re-graded in 2000. In 2001 a deep patch was constructed. The site visit in 2010 indicates the site is in good condition and that the nine year old deep patch is holding up well.



FDR 26 in 1998. Heavy precipitation in



FDR 26 in 2010. Deep patch was applied in 2001.

As the design method is validated and improved, Cuelho predicts that its use will spread among road maintenance agencies. "The deep patch process is attractive to agencies that need to reduce costs, and also to those concerned with resource protection," he explained; "an added benefit is that the process has fewer environmental impacts than traditional stabilization techniques such as buttressing."

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WTI Researchers to Present at Transportation Research Board 90th Annual Meeting

Poster/Presentations

Traffic Usage of Rest Areas on Rural Highways: A Recent Empirical Study

Presenter: Ahmed Al-kaisy

Poster Session: TRB 90th Annual Meeting Session 341, Mon 1/24/2011 2:30pm- 5pm Hilton
Various rest area activities have a direct impact on a number of aspects of rest area design, from parking, to facility sizing, water needs and wastewater generation and handling. These components are directly influenced by one critical factor: entering traffic volumes. This study employed data from 44 rest area study sites to examine the amount of traffic using rest areas, expressed as the percentage of the mainline hourly volume entering the rest area, as well as the effect of many of the underlying variables that are believed to affect the rest area usage.

Investigation of Parking Dwell Time at Rest Areas on Rural Highways

Presenter: Ahmed Al-kaisy

Poster Session: TRB 90th Annual Meeting Session 341, Mon 1/24/2011 2:30pm- 5pm Hilton
Rest area activities directly influence dwell time, the time a vehicle spends utilizing a rest area. This study collected and analyzed dwell time data from three rest areas in Montana and identified the mean dwell time, vehicle type, and time of day. This paper establishes updated estimates for rest area dwell time which better represent the current practice, and develops a better understanding of the variables that could affect it.

Effectiveness of Signal Control at Channelized Right Turning Lanes: An Empirical Study

Presenter: Ahmed Al-kaisy

Poster Session: TRB 90th Annual Meeting Session 596, Tuesday 1/25/2011 7:30pm- 9:30pm Marriott
This paper presents an investigation into driver behavior at channelized right-turn lanes where exclusive signal control is used for the channelized traffic movement. The study emphasizes the need for further research into the safety and operational aspects of this right-turn treatment at intersections.

Characterization of Cell Phone Use While Driving in Jordan (Podium Presentation)

Presenter: Ahmed Al-kaisy

Poster Session: TRB 90th Annual Meeting Session 209, Mon 1/24/2011 8:00am- 9:45am Marriott
This study investigated the extent of cell phone use on Jordan's roads, where 80% of the population owns a cell phone, and the characteristics of drivers who use cell phones while driving. The data was collected using a questionnaire survey and analyzed to examine the relationship between phoning while driving and drivers' demographics, driving experience and exposure, and the characteristics of users.

Challenges and Research Needs of Rural Transportation: California Case Study

Presenter: Jaydeep Chaudhari

Authors: Jared Ye, Jaydeep Chaudhari and Steve Albert

Presentation Session: TRB 90th Annual Meeting Session 313, Mon 1/24/2011 1:30pm- 3:15pm This study provides a synthesis of challenges and research needs of rural transportation in the United States by using California as a case study to identify and prioritize challenges and research needs of rural transportation. Results from the case study will be valuable for improving the safety and efficiency of rural transportation facilities, enhancing the mobility of rural travelers and conserving the ecological well being of the environment in California.

Investigating Efficiency Benefits of Campus Transit System

Presenter: Jaydeep Chaudhari, AICP

Authors: Jaydeep Chaudhari and Jared Ye

Poster Session: TRB 90th Annual Meeting Session 425, Mon 1/24/2011 7:30pm- 9:30pm

This study investigated the efficiency benefits of a campus transit system—Tiger Transit at Auburn University. The analysis compared transit versus personal vehicles for weighing efficiency benefits with consideration of parameters such as fuel economy, environmental impact, reduced parking demand, and other associate user driving cost saving.

Lessons Learned from Four Alternative Transportation System Partnership Endeavors in Public Lands

Presenters: Jaime Eidswick and Patricia Steinholtz (David Evans and Associates Inc)

Poster Session: TRB 90th Annual Meeting Session 587, Tuesday 1/25/2011 3:45pm- 5:30pm Hilton

This poster will present the lessons learned from the Paul S. Sarbane's Transit in Parks Technical Assistance Center's (TAC) first four partnership case studies: Santa Ana National Wildlife Refuge, North Moab Recreation Areas, Cape Cod National Seashore, and Grand Island National Recreation Area.

Integration of Aviation Automated Weather Observation Systems with Roadside Weather Information Systems

Presenter: Doug Galarus

Poster Session: TRB 90th Annual Meeting Session 329, Mon 1/24/2011 2:30pm- 5pm Marriott

This research and development study of the proof-of-concept system for integrating aviation weather information systems with Roadside Weather Information System (RWIS) project is targeted at small, underserved rural airfields and heliports. The objective is to meet the potential needs of providing airport managers, air traffic controllers, pilots, and related operators of air ambulance services with more comprehensive and accurate meteorological data by integrating currently used weather systems with systems used by related agencies. Implementing such an integrated system is expected to improve safety and increase efficiency.

Bike Sharing on Public Lands (Poster Board W7) (P11-0704)

Presenter: Rebecca Gleason

Poster Session: TRB 90th Annual Meeting, Session 587, Tuesday 1/25/11 3:45pm-5:30pm Hilton

Bicycle sharing programs make bicycles convenient and attractive for regular use without the responsibilities of bicycle ownership. Public bicycles are becoming an integral part of transportation networks in urban areas worldwide. This poster presents best practices from existing employee bicycle sharing programs in Federal lands settings and explores opportunities for public bicycle sharing programs on Federal lands.

Multi-Criteria Decision Making Approach to the Formulation and Selection of Anti-icing Liquids

Presenters: Xianming Shi and Michelle Akin

TRB 90th Annual Meeting, Session number 437, Jan. 25, 2011, 8:00-9:45 AM at Marriott

This work demonstrates a systematic approach to data-driven, multi-criteria decision-making, by conducting a set of laboratory tests to assess twenty blended chloride-based anti-icing formulations. The laboratory data were then used to establish predictive models correlating the multiple design parameters with the anti-icer performance and impacts or with an anti-icer composite index.

Workshops

Human Factors I: Take Me Home, Country Roads--Defining and Solving Rural Crash Issues

Presiding Officer: Nic Ward

TRB 90th Annual Meeting, Workshop 144I, Sunday 1/23/11 9:00am-5:00 pm Marriott

Dr. Ward will co-host a human factors seminar on rural traffic safety issues with Susan Chrysler from Texas Transportation Institute. This workshop examines human factors contributions to rural crashes. Discussion will focus on drivers' interaction with roadway design features and roadside characteristics, vehicle and IntelliDrive safety systems, and enforcement and driver impairment issues. Workshop topics will be unified by a discussion of safety culture in rural areas and barriers to implementing solutions. Participants will examine example crash reports and identify contributing factors and potential countermeasures.

Sustainability Made Manifest: International Wildlife Crossing Infrastructure Design Competition

Presiding Officer: Rob Ament

TRB 90th Annual Meeting, Workshop 187, Sunday 1/23/11 1:30pm-4:30 pm Hilton

The workshop will present the five finalist teams from ARC: International Wildlife Crossing Infrastructure Design Competition. The competition challenges design teams to reweave landscape for wildlife in a cost-effective manner using new methods, new materials, and new thinking. The five finalist teams will showcase their designs during this workshop, and the winner will be announced at the conclusion.

Livability: Connecting to Parks and Public Lands

Presiding Officer: David Kack

TRB 90th Annual Meeting, Session 177, Sunday 1/23/11 1:30pm-4:30pm Hilton

Co hosted by David Kack and Carol Zimmerman, this workshop focuses on the ability to define the six livability principles established by U.S.DOT, EPA, and HUD in regard to access to recreational opportunities and public lands, including federal lands such as national parks, national forests, and wildlife refuges, and how to tie livability into the recently launched America's Great Outdoors initiative. The workshop will spotlight the transportation and research implications for these initiatives in both urban and rural environments.

Laboratory Investigation and Neural Network Modeling of Deicer Ingress into Portland Cement Concrete and Its Corrosion Implications

Presenters: Xianming Shi

Session Information: Corrosion Committee Meeting, Jan. 25, 2011, 1:30-5:30 PM at Marriott

By exposing reinforced concrete samples to four common chloride-based deicers, the corrosive effect of chloride-based deicers on rebars and dowel bars was systematically investigated. The experiments were designed in such a way that the effect of deicers on reinforced concrete can be characterized in an accelerated manner, by either ponding the concrete samples with deicer solutions at room temperature, or incorporating pressurized ingress, wet-dry cycling and temperature cycling into the test regime.

Safety Culture and Safety in Certain Cultures

Presiding Officer: Nic Ward

TRB 90th Annual Meeting, Workshop 209, Monday 1/24/11 8:00am-9:45am Marriott

Dr. Ward will chair a session on traffic safety culture and safety in certain cultures. This will include research on traffic safety culture, driver attitudes, and driver risk taking from the US, Israel, and Jordan.

Understanding Traffic Safety Culture: Key to Improving Safety

Presenter/Panelist: Nic Ward

TRB 90th Annual Meeting, Workshop 269, Monday 1/24/11 10:15:00am-12:00 pm Marriott

Dr. Nic Ward will serve as a panelist in a discussion of understanding traffic safety culture hosted by Howard County Police Department. Other invited panelists hail from AAA Foundation for Traffic Safety, Volpe National Transportation Systems Center, Federal Railroad Administration, and the Western Transportation Institute.

Outreach

WTI continues to use a variety of outreach activities to disseminate research findings, share lessons learned and help advance the state of the practice in rural transportation. Our researchers have led field trips, are working to develop an institute dedicated to road dust and will be sponsoring relevant conferences.

National Rural ITS Conference

Coeur d'Alene, Idaho --August 28-31, 2011

Named by French-speaking fur traders, Coeur d'Alene, Idaho has long been a hub for exchanging goods. In 2011, we will continue this tradition as we exchange knowledge and information at the 2011 National Rural ITS Conference and ITS Rocky Mountain Annual Meeting. Located on the shore of beautiful Lake Coeur d'Alene, attendees can mix family-friendly fun with training and networking opportunities, dozens of technical sessions and exciting professional tours. Don't forget to save time for the golf tournament hosted by the ITS Rocky Mountain Chapter. You wouldn't want to miss the opportunity to hit a golf shot onto the world's only moveable, floating green! It's always an adventure here, so join us for "Adventures in ITS".

This conference will provide participants an opportunity to network and share experiences within and across a wide variety of ITS disciplines. In addition to traditional ITS topics, this event will bring together both traditional and non-traditional ITS users to address such issues as rural safety, creating and maintaining livable/sustainable communities, multi-agency coordination, and workforce development, as well as EMS and transit issues.

The many different training and networking opportunities available through this event will provide participants with the tools necessary to effectively plan and deploy ITS technologies within their own jurisdictions. More information can be found on the conference website: nritsconference.org

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2nd Road Dust Best Management Practices Conference—Save the Date!

Las Vegas, Nevada - November 7-9, 2011

This conference will bring together local, state and county road practitioners, as well as researchers and federal agencies to discuss current practices, identify best practices and lessons learned to assist practitioners, industry and researchers. The conference will feature national and international experts presenting current best management practices and will use presentations and poster sessions, roundtable dialogue and training sessions to accomplish this. The themes of the 2011 Road Dust Best Management Practices Conference will be Environmental Compatibility and Sustainability, General and International Best Practices, and Unique and Extreme Conditions. To better serve our road dust community, we will be offering a training session on How to Put Down Product and/or Understanding Dust Plume Opacity. Sponsored in part by: Federal Highway Administration-Federal Lands Highways, University of Nevada-Las Vegas, and the Western

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Road Dust Institute

The Road Dust Institute is an association being jointly developed by the Federal Highway Administration - Federal Lands Highway Division, the Western Transportation Institute at Montana State University, University of California - Davis, University of Nevada - Las Vegas, and University of Alaska - Fairbanks. The Institute is dedicated to improving road dust management in rural transportation by collecting, storing and distributing information, discussing challenges and needs, and conducting research related to road dust. The Road Dust Institute is now in the formative stage, but recently created a website (www.roaddustinstitute.org) to provide interested parties with information related to road dust, as well as engage the road dust abatement community as a whole. The Road Dust Institute seeks to advance the state-of-the-practice by promoting research and technology transfer related to road dust, improve unpaved road performance through reduction of fines loss, and reduce environmental impacts of dust from unpaved roads. All of this will ultimately help improve our nation's air, water and environmental conditions associated with unpaved roads.

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US 93 Excursions

WTI Road Ecologist, Dr. Marcel Huijser, provided another opportunity for fellow researchers to discuss and see first-hand the wildlife mitigation measures along U.S. Highway 93 on the Flathead Indian Reservation. Most recently, Dr. Huijser was joined by Dr. Aili Kang from China and Ganchimeg Wingard from Mongolia. Dr. Kang is a researcher for the Wildlife Conservation Society and does most of her work on the Tibetan Plateau, especially on the Tibetan antelope or Chiru. She visited the University of Montana for a 2 month work study program. Wingard is a Mongolian living in Missoula, conducting research on argali sheep and ibex. She returns to Mongolia in the summers for her fieldwork.

Dr. Huijser is the Primary Investigator for WTI's wildlife mitigation measures project along U.S. Hwy 93, a project in cooperation with the Confederated Salish and Kootenai Tribes and the Montana Department of Transportation. He is routinely accompanied by University of Montana students and researchers as he collects data from the dozens of wildlife crossing structures along the



Dr. Aili Kang (WCS, China) and Ganchimeg Wingard (Department of Ecosystem and Conservation Sciences, University of Montana, and Denver Zoological Foundation) at a wildlife underpass along US Hwy 93 on Flathead Indian Reservation, Montana.



road. Using wildlife cameras and sand tracking beds he examines the effectiveness of crossing structures, fences, jump-outs, and wildlife guards with regard to reducing wildlife-vehicle collisions and providing safe crossing opportunities for wildlife.

Photo: Marcel Huijser/WTI

Dr. Aili Kang (Wildlife Conservation Society, China), on wildlife overpass across US Hwy 93 on Flathead Indian Reservation, Montana

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Education

Student Successes

The fall semester has been a busy one in terms of student conference presentations and other successes. Tawny Hoyt, Industrial Engineering Masters student and recent recipient of a WTI Graduate Transportation Award, traveled to Las Vegas, Nevada to present at the Association for the Advancement of Automotive Medicine (AAAM) annual conference. Her paper (co-written with Nels Sanddal) "Seat Belt Usage and Feasibility in Rural Emergency Response Vehicles" was accepted for publication in the Annals of Advancement of Automotive Medicine. Hoyt's research focuses on the duties performed by medics in the rear of an ambulance during emergency transport and the feasibility of using seat belts while performing these duties.

Tawny and fellow Industrial Engineering graduate student Jessica Mueller were recently selected to advance to the regional competition for their project entitled "Improving Restraint Feasibility through Ambulance Layout Redesign" as part of the 22nd International Technical Conference on the Enhanced Safety of Vehicles to be held in June 2011 in Washington, DC. The student team received \$2000 in funds from NHTSA to design and build a full-scale altered ambulance layout that will allow EMS workers to provide care from a restrained position during transport of patients. The goal of the project is to minimize EMS worker injuries and fatalities during transport via creation of an altered work environment where seat belt usage is more feasible.

Two former Undergraduate Research Experience (URE) Program participants, David Schroeder and Brett Larabee, traveled with their research advisor to the American Concrete Institute's 2010 Fall Convention in Pittsburgh, Pennsylvania to present preliminary results of an ongoing research effort focused on the development and characterization of an environmentally friendly concrete made with 100 percent fly ash as the sole binder and glass as the sole aggregate.



David Schroeder, Mike Berry, and Brett Larabee at the ACI conference in Pittsburgh.

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UTC Student of the Year

Each year at the annual winter meeting of the Transportation Research Board, the US Department of Transportation honors the most outstanding student from each participating University Transportation Center for his or her achievements and promise for future contributions to the transportation field. The Students of the Year are selected based on their accomplishments in such areas as technical merit and research, academic performance, professionalism, and leadership. Janelle Booth was selected as WTI's 2010 University Transportation Center Student of the Year. Booth will travel to an awards banquet at TRB this January and will also receive a \$1,000 award.



Janelle Booth, UTC Student of the Year

Janelle is a graduate research assistant at the Western Transportation Institute and is in the process of completing her Masters degree in Public Administration from Montana State University. During her time at WTI, she has worked on projects involving the evacuation preparedness of school buses and public transportation systems in rural coastal communities, an evaluation of the rural transportation infrastructure in evacuation operations for the Northern Gulf of Mexico, and a study of the Montana fuel tax refund system. Janelle has presented papers at a number of conferences and her paper on The Role of School Buses in Rural Evacuations received a Best Student Paper award. She also represented WTI at the 2010 WTS Advancing Women in Transportation Annual Conference.

Outside of her graduate work, Janelle is a youth mentor for the Child Advancement Program at the local high school. She recently served as the U.S. representative at an international symposium in Aegina, Greece on the politics of Eastern Europe and the Black Sea region. Booth was also recently selected as the Montana Associated Students lobbyist for the 2011 Montana legislative session.

Janelle holds a Bachelors degree in Biology from South Dakota State University. She will complete her Masters this December, and hopes to work in the transportation industry at the federal level in Washington D.C. after graduation.

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Super Science Saturday

Over 250 community members attended Super Science Saturday, a free event hosted at Montana State University featuring a variety of hands-on, inquiry-based science and engineering activities for kids of all ages. WTI's table-top demonstration of an Animal Detection System (ADS) constructed with a Lego MindStorm kit was a big hit. Participants asked questions about animal and driver safety, where ADS has been tried, and how effective it is. They also learned about other methods to reduce animal-vehicle collisions, including fencing and wildlife under and overpasses. The children were able to view video taken of wildlife using underpasses along the TransCanada Highway in Banff National Park.

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TRANSCEND Lab Update



Located in Central Montana at the former Lewistown airport, TRANSCEND's research facility offers four miles of real-world paved test surface, snow making equipment, and a comprehensive communications, power, and data networking infrastructure. The 230 acre facility offers extensive space for large and custom-designed projects. Some of the projects conducted to date include testing de-icing equipment and techniques, evaluating animal detection systems, and confirming the durability of fly-ash concrete.

A 30-ft steel tower was erected in October as the hub for a wireless communications system at TRANSCEND. Hardware installed on the equipment will connect instrumentation on the weather station, in the pump stations, and on mobile data trailers to a server and DVR installed in the shop. This equipment will provide data acquisition and communication needs for projects located anywhere at TRANSCEND.

Construction of the large storage shed will soon be completed. Plows, snowmaking equipment, a skid steer, and other items will be moved out of the shop and into the shed in January to open up work space and protect the equipment from weather.

WTI staff has completed prepping the snowmaking system for events planned during this winter. These events will occur during January, February and March. For more information on the research conducted at the facility, please contact Eli Cuelho (406) 994-7886, elic@coe.montana.edu. Visit our website at www.TRANSCENDlab.org.

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Human Factors Research Facilities Update

The Western Transportation Institute is dedicated to understanding the driver role in fatal rural traffic crashes and developing driver support systems to improve traffic safety. WTI's state-of-the-art facilities allow our team of researchers to conduct complex and realistic traffic research in a controlled environment, then extending the research to the naturalistic setting of test track and open road studies.



[Naturalistic Data Lab](#)

In 2008, WTI was awarded a grant by the M. J. Murdock Charitable Trust Foundation to instrument a fleet of vehicles for naturalistic studies of rural traffic safety human factors and field tests of rural traffic safety interventions. The Murdock Naturalistic Driving Fleet and Lab uses vehicles and sensor systems to help researchers find ways to make rural roads in the US less deadly. The vehicles can be equipped with a variety of data logging and measuring devices to evaluate the driver's performance in real world driving scenarios. Future use of the Murdock equipment includes assessing the validity and transferability of simulated training for teen drivers.

The Ambulance Biomechanics project has just completed the data reduction phase in the Naturalistic data lab, with the help of WTI graduate student Tawny Hoyt. The project involves observation and analysis of behaviors exhibited by EMS care providers and their working conditions during emergency patient transportations. Next steps include data analysis, which are currently underway. Work done in the Naturalistic data lab will help to raise awareness of biomechanical issues inherent in EMS work, enabling safer patient care. Hardware used to collect data will be removed from the Bozeman ambulance in January, and placed in a research sedan for use in future driver behavior studies.

For more information, please contact Laura Stanley (406) 994-1399, laura.stanley@coe.montana.edu. Visit our website at www.westerntransportationinstitute.org/laboratories/fleet.

Driving Simulator Laboratory

WTI's driving simulator suite now represents the largest fidelity range and most advanced simulation capabilities funded and operated by any research university in North America. The suite includes high, medium, and low Fidelity simulators, eye tracking technology, and instrumented vehicles, allowing researchers to match each simulator's capabilities to the needs, complexity, and budget of the project. The simulators are used to do experimental research on driver behavior and to help engineers "visualize" new technology systems or traffic engineering designs at early stages of development. WTI has invested extensive resources into calibrating and tuning the simulators to represent real vehicle dynamics under real world driving conditions. Visit the website to download fact sheets on each of the dynamics that have been tested and calibrated (motion delays, motion filters, steering cues, pedal control, as well as sound and vibration). Whether you are interested in traffic safety research, product usability testing or driver skill training; WTI can help you conduct valid research, efficiently test products, or create specialized training scenarios.

For more information please visit www.westerntransportationinstitute.org/laboratories/driving or contact [Nicholas Ward](#) (406) 994-5942.

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New Projects

US93 Post Construction Wildlife Vehicle Collision and Wildlife Crossing Monitoring and Research

Project Objective: The objective of this project is to conduct post-construction monitoring of the wildlife mitigation efforts on US 93, and conduct an analysis of their effectiveness. The research centers on the benefits for human safety, habitat connectivity for wildlife, and a cost-benefit analysis.

[Find out more »](#)

Effect of Cold Temperature on Shear Strength and Consolidation Properties of Deep Water Soft Marine Clays

Project Objective: The objective of this project is to examine the effect of cold temperature on laboratory strength and consolidation properties of soft marine clay.

[Find out more »](#)

Interface Metrics for IntelliDrive

Project Objective: The objective of this project is to develop metrics for evaluating the most effective way to integrate and deliver multiple information sources from IntelliDrive applications.

[Find out more »](#)

Evaluation of Deep Patch Landslide Mitigation Design Methodology

Project Objective: The purpose of this project is to evaluate and improve current FHWA Office of Federal Lands Highway (FLH) and US Forest Service (USFS) deep patch design and construction methods.

[Find out more »](#)

Travel Demand Forecasting Model for Gallatin County

Project Objective: The objective of this project is to develop a travel demand forecasting model for Gallatin County, Montana, which will support current rural land use planning and analysis efforts.

[Find out more »](#)

Livability Benchmarks for Montana Transportation

Project Objective: The objective of this research is to define what livability means for Montana as it relates to transportation, through a review of existing livability definitions, practices, and initiatives.

[Find out more »](#)

Western States One-Stop Shop for Rural Traveler Information

Project Objective: The objective of this project is to create a user-friendly website that integrates and displays weather and road condition information for a four-state region.

[Find out more »](#)

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