



## Research

### National Leaders Visit WTI

#### Federal focus on rural road safety brings high-level visitors to WTI

October 21, 2008 - By Michael Becker, MSU News Service

BOZEMAN – The recent and rapid population growth in the West has brought with it increased numbers of traffic-related deaths and injuries, enough of them that federal transportation officials have officially made rural road safety a national priority.

This focus on rural issues has put Montana State University's Western Transportation Institute in the spotlight. Over the past two months, WTI has welcomed several high-level visitors from Washington, D.C., who are looking for advice on how to make the country's rural roads safer.

"The U.S. Department of Transportation is beginning to recognize that if national safety goals are going to be met, then they need a national rural safety initiative," said WTI Director Steve Albert.

Senior representatives from both the National Highway Traffic Safety Administration and the U.S. Department of Transportation have visited the center since the end of August, speaking with rural transportation researchers and touring WTI's laboratories and simulators.

According to the Department of Transportation, more than 70 percent of U.S. roads are classified as rural, and 55 percent of traffic deaths happen on those rural roads. The fatality rate on rural roads – which is measured per 100 million miles driven – is 2.5 times greater than it is in urban areas.

Actually making rural roads safer is complicated, Albert said. A range of factors from human behavior and the condition of the roads to the vehicles people drive and the distance to medical help all affect safety on rural roads.

With these federal visits, Albert hopes to make it clear to Washington that solutions designed for urban areas seldom work well in rural areas, where people still drive many of their miles on two-lane roads.

"There is no silver bullet for solving rural problems," Albert said. "Solutions have to be more cross-cutting and synergistic with rural."

"Most of the good ideas happen at the local level," said Jim Ports, a deputy administrator for the National Highway Traffic Safety Administration, who visited the institute in September.

"We want to use what's going on around America at the local level," Ports said. "It's incumbent upon us to come out and learn what's out here, the good that you're doing."

Paul Brubaker, administrator of the Department of Transportation's Research and Innovative Technology Administration, said WTI is well-known for its expertise in rural matters.

"WTI obviously has a national and international reputation for excellence in rural safety," Brubaker said during his visit in late September. "If anybody's talking rural, they're going to mention WTI."

Albert said the institute is grateful that the government has made rural safety a priority and that the new funding from the Rural Safety Initiative will help WTI do even more to keep rural drivers safe.

"At the end of the day, we're about solving real world problems, not producing reports that sit on a shelf," Albert said.



WTI Director Steve Albert stands with the USDOT Research and Innovative Technology Administration's Paul Brubaker, MSU President Geoff Gamble, and MSU College of Engineering Dean Robert Marley, September, 2008

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WTI has been pioneering research to address rural transportation needs for more than a decade. In continuing our leadership role we have expanded our capabilities to address crucial and emerging challenges with the brightest minds and most advanced technologies available. Moreover, we are gratified that we are helping to raise awareness and support for rural transportation issues at the national level.

Why does rural matter? And why now? For one, by all accounts, **rural areas are facing a phenomenal period of growth and development**, accompanied by large increases in travel within and through these areas. For example, the Western Governors Association predicts that 42 million more people and cars will be added to the western transportation system by 2030. Recent migration and land use studies indicate an increase in rural and frontier populations based on "ex-urban flight," described as urban residents who are bypassing moves to traditional suburban areas in favor of rural destinations that offer greater quality of life. As travel continues to grow on rural highways, we must ensure that these roadways can safely handle more cars, more modal options, and more travelers in a safe, efficient and timely manner while protecting the environment and wildlife.

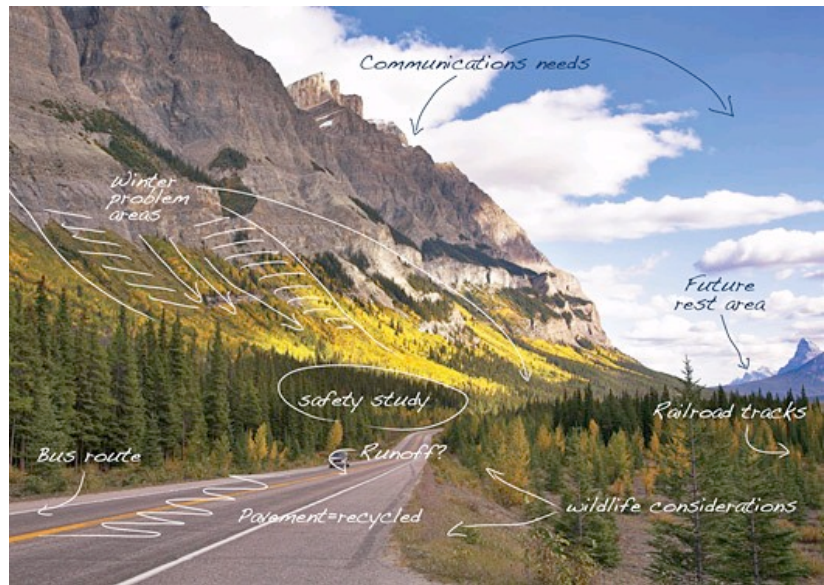
**Rural Roads and Bridges**

- Rural roads comprise 80 percent of national road miles (3.1 million rural road miles).
- Rural roads carry 40 percent of vehicle miles traveled.
- 90 percent of rural roads are 2-lane or less.
- There are over 450,000 rural bridges.

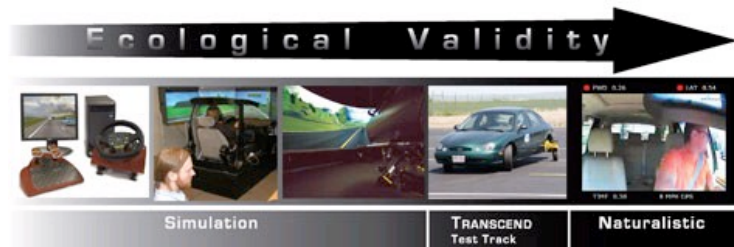
Source: FHWA

Secondly, a healthy economy demands a strong transportation infrastructure. With an increased focus nationally on economic matters, we must ensure that goods and services can move efficiently and cost-effectively across and throughout every region of the country. Therefore, **national transportation policy must address the whole transportation network** – not just isolated urban hotspots where congestion is highly visible, but also the large rural regions that hold the country together.

WTI is in an excellent position to take a leading role in rural transportation research because rural issues are our focus and we live what we study. With our location in Southwest Montana, we see firsthand not only what the issues are, but how they fit together. Therefore we take an **integrated approach to our research**. Instead of looking at one specific challenge from one specific perspective, we try to look at issues in a broader context and develop more comprehensive solutions.



In addition, in the last two years, WTI has made major advancements in **enhancing our testing capabilities and facilities**. At our MSU campus location, we have advanced laboratories to conduct leading edge research in the areas of human factors and safety, corrosion, materials, transportation management and operations, systems engineering, and development. In the field, we are partnering with state and federal agencies to develop TRANSCEND, an outdoor cold region test facility/track located in central Montana. WTI's comprehensive facilities allow us to spearhead, develop and test a research idea from the conceptual stage, through lab and "off-the-grid" field testing, and finally to trial and full deployment. In this way, we conduct research that is high quality, collaborative and nationally relevant, and the findings make significant contributions to the advancement of traditional methods and state-of-the-art technologies in rural transportation.



## Research Accomplishments

The following selection of projects highlight WTI's focus on taking basic research science and applying that understanding to solving "everyday" challenges in each focus area, as well as how well researchers benefit from WTI's facilities and multi-disciplinary collaboration to achieve innovative results.

### Safety and Operations

Enhancing traveler safety and roadway operations has been the cornerstone of WTI research since its inception. A pioneer in the development and deployment of Intelligent Transportation Systems in rural locations, WTI is broadening its expertise to include human factors, traveler information, multi-jurisdictional coordination of operations, and in-vehicle technologies. WTI has one of the largest research simulator suites in the nation in the state-of-the-art Driver Simulation Laboratory, where researchers conduct nationally significant research on rural driver behavior. To address the environment in which drivers must operate, WTI has expanded the Transportation Research Application and Instrumentation Laboratory (TRAIL), which simulates a rural traffic management center, allowing small local government to use advanced technologies to monitor and improve traffic operations.

*Advanced Vehicle-Based Countermeasures for Alcohol-Related Crashes:* Drinking and driving continues to pose a major safety hazard on American roads, accounting for nearly 40% of traffic fatalities. The National Highway Traffic Safety Administration is exploring the potential of in-vehicle devices that can detect alcohol impairment. WTI, in partnership with the University of Iowa, is using its driver simulation facilities and expertise to develop driving scenarios and experimental plans that can test the effectiveness of these potentially life-saving technologies.

### Winter Maintenance and Effects

The Winter Maintenance and Effects program at WTI develops solutions for transportation agencies challenged to keep roads open, safe, and well-maintained during and after severe weather events. Using the Corrosion and Sustainable Infrastructure Laboratory, researchers can test materials and practices for both effectiveness and durability. A growing number of projects conducted by WTI also help maintenance personnel select winter maintenance treatments, products and procedures that are also environmentally sensitive.

*Evaluation of the UDOT Weather Operations/RWIS Program:* In partnership with the Utah Department of Transportation, WTI identified and quantified the benefits of the Weather Operations/RWIS Program, which provides detailed, often customized, area-specific weather forecasts to UDOT maintenance and operations divisions. Researchers from WTI's winter maintenance program and safety and operations program worked together to develop a unique artificial neural network model to analyze labor and materials costs for each of UDOT's 77 maintenance units, concluding that the Weather Operations Program saves the department \$2.2 million per year for snow and ice control activities. ITS America selected the UDOT evaluation for its "Best of ITS" Award in the "Best Return on Investment" category.

### Road Ecology

WTI's national and international experts continue to lead groundbreaking research in the field of road ecology, which attempts to understand and balance the complex relationship between roads and the surrounding environment. Researchers completed and presented a national study to Congress detailing the most effective methods to reduce collisions between vehicles and wildlife. In the field, road ecologists are testing new practices and technologies, taking full advantage of the TRANSCEND outdoor laboratory under development at the Lewistown, Montana airport.

*Comparison of Animal Detection Systems:* In partnership with the FHWA and the Montana Department of Transportation, WTI conducted research to evaluate the reliability of nine different animal detection systems from five different manufacturers at the same site under similar circumstances. This evaluation conducted at the TRANSCEND research facility is the first known side-by-side evaluation of animal detection systems in the United States. This project identified four systems that detected 90% or more of animal movements, produced valuable data for comparing similar systems, and helped establish minimum standards for system reliability.

### Infrastructure Maintenance and Materials

As the safety and durability of the national transportation infrastructure becomes a growing priority, WTI's maintenance and materials program leads state of the practice research on advanced materials and innovative design techniques. Increasingly, researchers work across programs to address multiple engineering and environmental aspects of infrastructure construction and maintenance. Recent expansions and enhancements to the WTI Materials Lab allow for expanded research into the use of geosynthetic and recycled materials for roadway construction and rehabilitation.

*Evaluation of 100% Fly Ash Concrete:* Using the Material Lab, WTI researchers created and evaluated concrete mixes that use fly ash (a recycled material) as a substitute for traditional Portland cement. The project demonstrated the long-term durability and economic benefits of using fly ash in infrastructure construction.

### Systems Engineering Development and Integration

The Systems Engineering program sets the standard for cooperative research at WTI. Researchers have created advanced tools and integrated systems for researchers in all of the other programs, ranging from handheld devices that pinpoint animal-vehicle collision hotspots to specialized websites that facilitate coordinated transit services. The Systems group conducts much of their work in-house, using a growing Systems Lab where hardware and software can be developed and tested, and the TRAIL lab that can simulate a rural or small city traffic management center.

*Weathershare – An Integrated Source of Weather Information:* WTI researchers from the Systems Group worked with the Winter Maintenance program to develop the WeatherShare system for the California Department of Transportation. Weathershare streamlines and integrates available road weather data into a single source, which is quickly and easily accessible by incident responders, operations and maintenance personnel, and the traveling public. In addition to routine use for roadway operations, officials in California also used WeatherShare to monitor and plan response activities during recent wildfires. Originally created for rural transportation districts, Caltrans now plans to



### **Mobility and Public Transportation**

WTI's Mobility and Public Transportation program has helped a growing number of rural areas and small communities create or expand public transit options, often by identifying innovative ways to coordinate services. Increasingly, researchers are exploring transit development that incorporates multi-modal options, such as integrated airline, auto, bicycle and pedestrian facilities.

*Promoting Bicycles on Federal Lands:* On behalf of the FHWA, WTI researchers have completed a "Guide for Promoting Bicycling on Federal Lands." This new resource is designed to provide Federal land managers with practical information and guidance, including the benefits of bicycling programs, a review of policies that support bicycling, issues and challenges, and a description of the many resources already available to meet these challenges. In addition, it highlights a number of national parks, recreation areas, and other federal land units that have implemented bicycle friendly policies and programs. The guide in its entirety will be available in November from the [Pedestrian and Bicycle Information Center](#). The Guide will also be available on the [Transportation Toolkit for Federal Land Managers](#) and on the [FHWA Central Federal Lands website](#).

### **Logistics and Freight Management**

Efforts to move freight more quickly and efficiently across the country will increase in national importance as the federal government focuses on economic growth and vitality. WTI's research continues to emphasize the value of smart logistics and coordinated transport through rural areas. The Logistics and Freight Management program can work with the Systems group to develop and test advanced tools, and with Mobility researchers to explore multi-modal integration.

*Investigation of Intermodal Freight Service Opportunities in Montana:* WTI researchers are working with Prime Focus LLC (DePere, Wisconsin) on a project to identify opportunities to expand the availability of intermodal container freight service in Montana. Containerized intermodal freight service, an important mode of freight transportation particularly to access international markets, is limited in rural areas. Researchers are investigating such service in Montana's rural environment with respect to the potential demand for such service, obstacles to its implementation, and incentives that might be appropriate to promote it.

### **Transportation Planning and Economics**

As rural areas experience substantial population growth, comprehensive transportation planning becomes increasingly important. WTI's Transportation Planning and Economics program helps local and regional agencies identify solutions for sustainable development, frequently drawing on advancements developed through other WTI focus areas. Rural areas, particularly in the western United States, also frequently contain substantial areas of publically held land, such as parks, preserves, forests, etc. With their increasing use for recreational and other purposes, these lands have developed their own unique transportation needs, which again with its expertise and facilities, WTI is well equipped to solve.

*Transportation Toolkit for Federal Land Managers, Phase 2:* In partnership with FHWA, WTI created a web-based toolkit for federal land managers that helps them identify solutions to mobility and congestion challenges in national parks, forests and recreation areas. The toolkit has helped familiarize managers with many Intelligent Transportation Systems and other advanced technologies they may not have otherwise considered. In the second phase of this project, researchers will explore expansion of the toolkit into a national clearinghouse of transportation information for federal lands managers.

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## **Future Initiatives**

WTI will continue to strengthen its expertise across its eight research focus areas. Future research initiatives will build on current integration efforts to address cross-cutting issues of national import:

*Green Highways.* The FHWA is encouraging initiatives that promote environmentally sensitive, "green" highways. Much of WTI's past experience and current expertise is related to these highway themes. WTI's work on with animal vehicle collision research, recycled construction materials, transit development, context sensitive design, environmentally safe winter treatment practices, and other issues will contribute to a variety of green transportation efforts.

*Rural Traffic Safety Culture.* WTI's depth of experience with ITS safety deployments, combined with the addition of a second driving simulator, increase institutional capacity to spearhead comprehensive, nationally significant safety studies. Traffic crashes represent the largest cause of fatal injury for nearly all age groups, especially in rural America. Rural states such as Montana have the highest traffic fatality rates both in terms of exposure (VMT) and population risk (per capita). To increase understanding and unify concern amongst traffic safety researchers, practitioners, and policymakers about the role of traffic safety culture on (1) behavioral factors that increase rural (and national) traffic crash risk; and (2) attitudinal barriers to public and political acceptance of traffic safety interventions.

*Airport Maintenance and Operations.* In the coming year WTI will be utilizing its expertise in corrosion, weather monitoring and forecasting, multi-modal connectivity, infrastructure condition assessment, and ecology/environmental impacts to address aviation issues in rural America. WTI looks forward to complementing its current skill base, leveraging the TRANSCEND Research Facility at the Lewistown Airport, and expanding its research portfolio from surface transportation to addressing surface and air issues to meet local, state and federal needs.

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## Western States Rural Transportation Technology Implementers Forum Attracts Record Participation

The 3rd Annual Western States Rural Transportation Technology Implementers Forum (WSRTTIF) in Mount Shasta, California was hailed as a success by attendees and organizers alike. This unique, two-day event is specifically designed to give ITS implementers and engineers the opportunity to engage in detailed discussion about innovative engineering and communications projects addressing rural transportation challenges.

The 2008 Forum had record participation with 39 attendees from seven western states (CA, ID, MT, NV, OR, WA, WY). WTI and Caltrans have formed a solid partnership to provide ongoing support, planning, and coordination, to ensure that the Forum will continue to grow and develop. The WSRTTIF Steering Committee includes Sean Campbell, Caltrans Division of Research and Innovation; Ian Turnbull, Caltrans District 2; Doug Galarus, Program Manager of the WTI Systems Engineering Development and Integration group, and Leann Koon, WTI Systems group Research Associate.

On the first day, presenters examined how solutions were developed, focusing on applications that have been deployed in the field or have been used in live traffic situations. Presentations were 90 minutes to two hours in length allowing the speakers to delve into the "nuts and bolts" of how a project works, including specific technical guidance. The extended presentation time, limited attendance, and informal atmosphere facilitated and encouraged questions and open dialogue about equipment functionality, system performance, vendors, and other key information. Speakers discussed not only success stories, but also failures and problems, so participants could learn about what does and doesn't work and why.



This year's presentations covered diverse topics. Doug Galarus of WTI gave an in depth presentation of TMC (Transportation Management Center) to TMS (Transportation Management System) communication technologies and their potential application in rural environments. Ken Beals from Caltrans District 2 discussed RWIS (Roadway Weather Information Systems) and how to accurately use the information they collect to assist maintenance personnel or feed messages to extinguishable message signs (EMS). Ted Bailey and Matt Neeley, ITS engineers for Washington DOT, presented the findings from several field tests of wireless and microwave vehicle detection systems. Oregon DOT's Galen McGill spoke about ODOT's extensive traveler information systems and services.

The Forum also included equipment displays and a half day of technical demonstrations. The morning of the second day was dedicated to live demonstrations of Rural ITS technology and "hands-on" question and answer periods. For example, Gary Schoep and Larry Hayden brought the Civil Engineering/WTI trailers from Montana to California to demonstrate their technological and communications capabilities. Additionally, 30 minute segments were reserved for briefings on specific Rural ITS research projects and product development, which included presentations by promising student assistants and other young professionals. In addition to the speakers and demonstrations, social events provided valuable networking opportunities. Attendees enjoyed meeting and interacting with other rural ITS engineers at a dinner on the first evening and a BBQ on the beach of Lake Siskiyou on the second evening. Plans for the 2009 Western States Forum are already underway; for more information, please contact Leann Koon at [leann.koon@coe.montana.edu](mailto:leann.koon@coe.montana.edu).

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## WTI Offers Free Online Road Ecology Course

Videod portions of a Road Ecology workshop hosted by WTI are now available free on-line for professional development. The content of this workshop will be of interest to practicing transportation professionals, land resource managers, conservation groups, students, and others who want to learn more about how transportation issues interact with wildlife and habitat concerns. The course content covers:

- Basic Concepts of Road Ecology
- Mitigation of Barrier Effects and Landscape Fragmentation by Roads
- Modifying Motorist Behavior Near Wildlife and Modifying Wildlife Behavior Near Roadways
- Engineering Considerations for Fish Passage

Dr. Richard Forman, well-known Harvard landscape ecologist, provides an introduction to the workshop. Total course length is 112 minutes. Enrollees can elect to earn 0.2 continuing education units for a \$25 processing fee. To register for the free course and to view workshop content, [click here](#).

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## WTI to Host Dust Control Conference

Transportation researchers, practitioners and industry personnel will gather in San Antonio, Texas on November 13 and 14 for the 2008 Road Dust Management Practices and Future Needs Conference. Sponsored by the FHWA and WTI, the conference will provide participants with the opportunity to discuss current practices, and define future needs and research priorities. Through a face to face exchange of ideas and experiences, organizers hope that the forum will produce recommendations on the most critical dust control issues. Additional agencies that will be participating in the conference include the United States Geological Service, United States Fish and Wildlife Service, United States Forest Service, National Association of County Engineers, University of Nevada – Las Vegas, University of California – Davis, Idaho Transportation Department, San Diego State University, Midwest

## Education

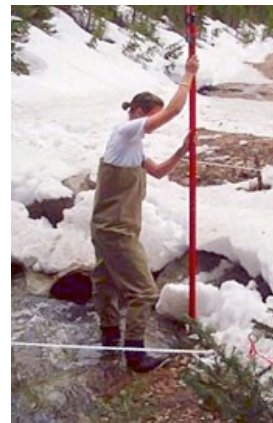
### Safe Passages Research Experience for Undergraduates (REU)

This summer, the Western Transportation Institute hosted eight multidisciplinary undergraduate students from colleges and universities nationwide in a unique ten-week summer research program. The Safe Passages Research Experience for Undergraduates (REU) Program was established to explore the complex issue of simultaneously providing for safe passage of humans, wildlife, and aquatic organisms through rural transportation corridors. The program utilized a 90 mile stretch of U.S. Highway 191, which follows pristine mountain waterways and traverses part of Yellowstone National Park, as an ideal field site for students to pursue nationally replicable solutions to this issue. Interdisciplinary student teams collected data in the field and produced final technical reports and presentations on five distinct but interrelated projects, on issues ranging from connectivity of aquatic habitats, to animal detection technologies, to rural traffic safety and enforcement programs.



The program was designed to enhance students' ability to work on interdisciplinary teams and to integrate a variety of strategies in addressing a given problem. One participant said, "I liked that what we were studying was relevant to real world engineering problems and I liked the multidisciplinary aspects of combining civil engineering with ecology, geology, and environmental studies." REU participants represented four states and Puerto Rico and six different science and engineering majors.

In addition to their project involvement, the students' REU experience was enriched by research seminars, training workshops, and a field trip to Yellowstone National Park. The educational component aimed to improve students' research, communication, and collaborative skills. "This experience has definitely made me more proficient and capable in research practices," commented a participant. "The things I have learned will be taken with me back to my university and hopefully one day, my career as a research scientist."



The Safe Passages REU is supported by the National Science Foundation. The program is scheduled to continue in 2009. For additional information, [click here](#).

### UTC Outstanding Student of the Year

Jeffrey Sharkey received the 2008 UTC Outstanding Student of the Year Award. Jeff was a participant in the Summer Research Experience for Undergraduates (REU) program at WTI in 2005. When he completed his B.S. in Computer Science at the University of Minnesota - Duluth, he returned to MSU to work towards his Masters degree. Jeff was a recipient of the WTI Graduate Transportation Fellowship and completed his Masters degree in Computer Science in May 2008. As part of his M.S. thesis research, Jeff applied Artificial Intelligence to solve various transportation problems, such as network design problems for Transportation Management Systems (TMS). Jeff's paper entitled "Radio Network Design for Rural Transportation Applications using Artificial Intelligence" was presented at a poster session during the 2008 Transportation Research Board Annual Meeting.

Jeff is a professional and enthusiastic researcher. In addition to his thesis work, he provided valuable assistance on a number of different projects within the Systems Engineering, Development and Integration Program at the Western Transportation Institute. As Project Manager Doug Galarus put it, "Beyond fulfilling the research requirements of his fellowship, Jeff has willingly assisted me and other staff on numerous projects, providing professional solutions in record time."

Until his graduation in May 2008, Jeff was an active member of the ACM and ITSA student professional organizations at Montana State University, and represented WTI at a number of conferences, including ITS America and Google Developer Day. This year he also placed among the top 10 entrants in the Google Android Developer Challenge, earning him a \$275,000 cash prize. The contest was designed to promote program development for Android, Google's new cell phone operating system. Sharkey's entry, CompareEverywhere, uses a cell phone's camera to read the barcode on any product. The program then uses the phone's Internet connection to search Web sites for information about that product, such as reviews, prices, excerpts, online vendors, and nearby stores selling that item.

## New Projects

### **Integrated PDA/GPS System to Collect Roadkill Data – FWHA**

The objective of this project is to conduct a third phase of development of the Roadkill Observation Collection System, specifically to develop software, servers, and protocols that will facilitate transfer, storage and analysis of the data. [Find out more](#)

### **Establishing Best Practices – Snow/Ice Removal in California**

Through this project, researchers will develop guidelines for optimal snow and ice removal operations designed specifically for California highway environments. [Find out more](#)

### **Integration of Aviation Automated Weather Observation /System (AWOS) with RWIS (MO-609)**

The overall goal of this project is to identify the benefits and costs of integrating AWOS/ASOS meteorological data with RWIS weather data, and to create and test a prototype of an integrated system. [Find out more](#)

### **Field Investigation of Geosynthetics Used for Subgrade Stabilization**

This project aims to construct test sections in the field to investigate the relative benefit of various geosynthetics available on the market to an unpaved road. [Find out more](#)

### **Advanced Vehicle-Based Countermeasures for Alcohol-Related Crashes**

Through this project, researchers will develop and evaluate vehicle-based countermeasures for alcohol impairment. [Find out more](#)

### **Lab Investigation of Deicer Impacts on Concrete Microstructure and Pavement Friction Coefficient**

The purpose of this project is to conduct a laboratory investigation of the impact of deicers on two key performance components of concrete pavement materials. [Find out more](#)

### **Rural EMS Driver Safety Research Program Phase 1**

This project will evaluate the feasibility of (a) gathering baseline data on behavioral crash factors associated with rural ambulance crashes as well as (b) measuring the potential safety benefits of an onboard driving quality feedback systems (QFS) within a rural ambulance fleet. [Find out more](#)

### **Fate & Transport Behavior of Anti-Icers & Deicers in Airport Soils – UTC**

This project proposes to investigate, in a controlled laboratory environment, the primary mechanisms of the transport and fate of anti-icers and deicers in typical airport conditions and environment. [Find out more](#)

### **Portable TMC-TMS Communications Demonstration – UTC**

The goal of the project is to present to Caltrans/other DOT technical staff a number of new, viable alternatives for TMC-TMS communications in a (semi-) realistic, portable demonstration environment using real ITS equipment. [Find out more](#)

### **Yellowstone Business Partnership Regional Transportation Project**

WTI will assist the Yellowstone Business Partnership with the development of a Concept of Operations Plan to enhance regional connectivity in the greater Yellowstone area. [Find out more](#)

### **Evaluation of Wildlife Mitigation Measures along US Hwy 93**

Researchers will study the effectiveness of eleven wildlife underpasses, 29 jump-outs and two wildlife guards (equivalent to cattle guards) in terms of wildlife movements and wildlife/vehicle collisions on U.S. Highway 93 near Ravalli, Montana. [Find out more](#)

### **Grand Canyon National Park Variable Message Sign**

The purpose of this project is to support implementation and evaluation of a VMS/HAR pilot deployment in Grand Canyon National Park. [Find out more](#)

### **Developing a Regional Ecosystem Framework for Terrestrial and Aquatic Resources along the I-70 Corridor, Colorado**

The objective of this project is to assist the Center for Native Ecosystems (CNE) with developing a wildlife mortality and habitat connectivity monitoring and evaluation program, and developing a mitigation plan for the I-70 Corridor in Colorado from Evergreen to Glenwood Springs in portions of the Clear creek, Blue River and Gore Creek Watersheds. [Find out more](#)

### **Safety Evaluation of the Gateway Monument Demonstration Project**

WTI researchers will conduct a safety evaluation and an economic benefit analysis of the Gateway Monument Demonstration Project. [Find out more](#)

### **Professional Capacity Building for Communication Systems**

The goal of this project is to provide training and build the professional capacity of rural ITS engineers and technicians by developing and delivering a hands-on rural ITS communications course. [Find out more](#)

### **COATS: Phase IV**

The objective of this project is to conduct technology transfer and outreach activities to enhance and expand rural ITS deployment in the COATS region. [Find out more](#)

### **Opportunity Link Public Transportation Implementation Plan**

The objective of this project is to develop a plan for implementing a public transportation (transit) service that would serve Blaine and Hill counties in Montana. [Find out more](#)

### **Channel Response Assessment for the Upper Blackfoot -How to Maximize Development &**



## New Staff

### **Robert Long**

WTI is pleased to announce that Dr. Robert Long has joined the staff as a Research Ecologist in the Road Ecology focus area. He comes to WTI after completing his post-doctoral research for the Adirondack Nature Conservancy in Keene Valley, New York. Robert holds his Ph.D. in Natural Resources from The University of Vermont, his M.S. in Wildlife Ecology from the University of Maine, one B.S. in Biology and another B.S. in Wildlife Management from Humboldt State University. With more than 17 years of experience studying a variety of wildlife species, his research interests include carnivore ecology and conservation, landscape permeability for wildlife, wildlife monitoring and survey design.

Robert currently coordinates wildlife monitoring efforts for WTI in the central Cascades of Washington State, where he is designing and implementing a wildlife monitoring program for the Washington Department of Transportation's (WSDOT's) I-90 Snoqualmie Pass East Project. This landmark project includes a number of measures that will enhance ecological connectivity across I-90. As part of his duties, Robert provides expertise to WSDOT engineers regarding the design of wildlife crossing structures. In addition, he holds an adjunct faculty position in the Biology Department at Central Washington University, and recently helped to co-edit a book focused on noninvasive survey methods for carnivores titled *Noninvasive Survey Methods for Carnivores*.

Robert lives with his wife Paula Mackay and their dog Cedar in Ellensburg, Washington. He can be reached via email at [robert.long@coe.montana.edu](mailto:robert.long@coe.montana.edu).

### **Doug Cross**

Research Associate and Project Manager Doug Cross joins the Infrastructure, Maintenance and Materials focus area at WTI, bringing with him over 20 years of experience in the construction industry. Doug's expertise in the area of concrete and the use of alternatives to Portland cement have lead to several projects at WTI fostering the use of 100 percent fly ash as an alternative to Portland cement. Specifically, Doug is completing a first-of-its-kind project that used 100 percent fly ash concrete made with pulverized glass as the aggregate throughout construction of a commercial building in Missoula, Montana.

Doug's duties at WTI include laboratory physical testing and field trials of 100 percent fly ash concrete for structural applications which dovetails with his current projects including working as a site manager at WTI's TRANSCEND Research facility overseeing the construction of three buildings using 100 percent fly ash concrete foundations and slabs. The foundation for two shops will be instrumented to monitor long term material behaviors, supplemented by several long term durability tests conducted on samples cast during construction. In addition to this work, Doug is working on the start-up and will perform field work for several projects such as testing deicers on winter roads and the effect of spray-on protection to prevent corrosion of concrete bridges.

While working at WTI, Doug is also pursuing a degree in Civil Engineering at Montana State University. Originally from Los Alamos, New Mexico, Doug lives in Bozeman with two English Mastiff dogs named Myrtle and Riley. Doug can be reached by email at [doug.cross@coe.montana.edu](mailto:doug.cross@coe.montana.edu).

### **Jason Harwood**

Research Associate Jason Harwood comes to WTI through the College of Engineering at Montana State University graduating with his Masters of Science in Mechanical Engineering. Prior to this position, Jason worked for the Mechanical Engineering Department at MSU as a Graduate Research Assistant, where he used finite element analysis to model thin film mirrors subjected to thermal loading.

Currently Jason is working with the Infrastructure, Maintenance and Materials focus area on the development of a \$1.5 million dollar construction project at the TRANSCEND Research Facility in Lewistown, Montana. He is also developing a preliminary experimental setup to identify best practices of a snow and ice removal project for Caltrans. In addition, Jason has designed and assembled the data collection system for a field project that aims to investigate the relative benefits of various geosynthetics available on the market for stabilizing soft subgrades.

Originally from Walla Walla, Washington, Jason and his wife Brittney reside in Belgrade Montana. In their spare time, they enjoy the outdoors and serving as leaders for their church youth group. Jason can be reached at [jason.harwood@coe.montana.edu](mailto:jason.harwood@coe.montana.edu).