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February 2012 Newsletter

Message from the Director

Public Transportation Enhances Quality of Life and Economic Opportunities in Rural Communities

If you live in a big city, lack of a private vehicle does not prohibit you from getting around. Residents of New York, Chicago, San Francisco, and Boston can walk a block from their homes or places of work, board a bus, train, or monorail line, and arrive at another destination in minutes. Medical facilities, libraries, schools, retail services, nightlife, parks, and airports are accessible throughout public transportation routes.

But what if you live in a small town or in a rural area and need to travel to a larger community for goods and services? Distance and lack of transportation options can be restrictive for this segment of the population. Though cell phones and the internet have made our world smaller and smaller - someone in rural Idaho can video chat with someone in China, make an electronic financial transaction, then purchase ranching supplies online that are shipped directly to their front door - there will always be a need for personal interactions within and between communities and landscapes.

So how do we transport people to neighboring towns to see their doctors, buy groceries, or board a plane? And once they arrive in the neighboring town, can they move about to multiple destinations with relative ease?

In this issue, we highlight the significance of public transportation in rural settings. The Western Transportation Institute (WTI) is helping a state Department of Transportation improve the current intercity bus services in their state by surveying other frontier and rural areas and establishing best practices for future decision making. WTI also celebrates the five year anniversary and the one millionth rider of a small town public transit system, where ridership has far exceeded all expectations and a community has embraced the service.

We will also visit issues facing federal land managers - both in urban and rural areas - who are dedicated to protecting beautiful landscapes and monuments, as well as making them accessible to the public. Through the Paul S. Sarbanes Transit in Parks Technical Assistance Center (TRIPTAC) as well as a recent report on bike sharing options for public lands, WTI is helping to bridge the gap between connectivity and preservation.

In addition to improving the quality of life for residents, public transportation in rural areas and on public lands also has economic benefits. By connecting residents to more towns within a region,

businesses have access to a larger pool of both potential customers and employees. Public transportation and transit within and around federal lands such as National Parks, Recreation Areas, and Historic Sites can generate additional tourism activity, which benefits the economies of gateway communities.

As a result, WTI's efforts bolster national priorities regarding economic development, such as a recent Presidential Executive Order to increase travel and tourism in the U.S., which specifically cites the revenues and jobs generated by tourism to iconic National Parks and other public lands. WTI looks forward to continuing our work to enhance transportation systems that connect people, communities, and business to a healthy, prosperous future.

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Research

Federal Lands Technical Assistance Center Marks Second Anniversary

After only two years in operation, the Paul S. Sarbanes Transit in Parks Technical Assistance Center (TRIPTAC) has established a strong and broad array of services to help federal land managers achieve their alternative transportation goals.



As resource management professionals in public lands, federal land managers are the dedicated stewards of some of this nation's most beautiful and iconic places. TRIPTAC, which is sponsored by the Federal Transit Administration (FTA) of the U.S. Department of Transportation (USDOT), helps these managers plan and implement transportation solutions that conserve resources, protect the environment and enhance visitor experience.

A primary focus is helping FLMAs maximize the use of grants received from Transit In Parks (TRIP) grants. Since 2006, the TRIP program has distributed more than \$150 million dollars to FLMAs and their partner organizations. In fact, states, cities, tribal agencies and other collaborators have received more than half of this funding. TRIP grants have enabled the implementation of more than 290 alternative transportation projects across the country.

TRIPTAC services are provided by a team of public and private transportation professionals, led by WTI. Members of the team are nationally recognized research and consulting firms. TRIPTAC aims to be a "one-stop shop" of information, training, and personalized assistance. "We want Federal land managers to think of TRIPTAC team members as extension of their own staff," said Steve Albert, Director; "our services are available as needed, throughout the length of your project, and best of all, free of charge." Some of the services and accomplishments implemented by the TRIPTAC during the first two years include:

- Assembling an on-call panel of more than 40 technical experts.
- Providing technical assistance in response to more than 140 requests to the Help Desk.
- Developing innovative training events such as interactive webinars, resulting in a total of more than 950 contact hours of training.
- Creating guidance documents based specifically on needs identified by clients, such as 3 partnership case studies and a manual on "Good Practices to Encourage Bicycling and Pedestrians on Federal Lands."
- Gathering an extensive, searchable Resource Library of more than 130 documents, and an

online Training Catalog of more than 230 trainings, all accessible through the website (www.triptac.org).

According to TRIPTAC Manager Jenni West, the hallmark of the TRIPTAC is providing personalized technical assistance. "We help fill a valuable transportation technical assistance niche, matching Federal land managers to resources and expertise that help fill gaps or overcome hurdles as they try to implement alternative transportation projects," West explained; "this could be anything from finding specifications for alternative fuel vehicles, to identifying design guidelines for a trail network, to helping organize a stakeholder outreach event."

Specific technical assistance examples include helping Harper's Ferry National Historic Park in West Virginia to improve its shuttle service by generating, mapping out, and testing six alternative bus routes. At Sleeping Bear Dunes National Lakeshore, TRIPTAC team members are providing technical and planning guidance for the development of the 27-mile Sleeping Bear Heritage Trail, including information on trail construction materials and landscape design assistance.

Enhancing transportation in federal lands often yields additional benefits for the unit and surrounding region. "We are very pleased when these efforts also result in positive effects on the local economy of gateway communities, in the form of new job opportunities or increased tourism revenues," Albert concluded; "as we look to the future we will continue to look for ways that transportation can promote access to public lands for the next generation of visitors."

For more information on TRIPTAC, contact Jenni West, TRIPTAC Manager, jenni.west@coe.montana.edu (406) 994-7368

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WTI Studies Intercity Bus Services, Needs, and Access in Rural and Frontier Montana

Historically, residents of small towns and rural areas have depended on intercity bus service to get to larger cities or to connect to train stations and airports. Over the past few decades, however, routes have been scaled back and ridership has declined.

Researchers at the Western Transportation Institute (WTI) recently completed a study for the Montana Department of Transportation (MDT) on the state of intercity bus service (ICB) in Montana. MDT's goal was to obtain an analysis of whether current needs are being met, as well as a methodology for monitoring services on an ongoing basis. "This process can generate a lot of useful information for MDT," said David Kack, the WTI Public Transportation Program Manager who led the research project; "they can use it to identify potential new routes or decide how to allocate funding for new services, for example."

To collect background information, researchers studied the state of intercity bus services across the United States and surveyed other rural and frontier states to understand how they managed their intercity bus programs and to identify any best practices. To better understand ridership and user attitudes, they conducted a rider survey and a public telephone survey. The team also examined the connectivity of ICB services with local public transportation providers, as well as other transportation modes such as Amtrak and Essential Air Service.

Findings from this study suggest that there may be a renewed interest in intercity bus services, both on a national and statewide level. Three states that responded to the peer survey (Washington, Oregon, and Colorado) reported that they had increased ICB services in the last two years, and that they were actively promoting these services. Two of these states are already documenting increased ridership.

Within Montana, the data collected suggests that there are areas of the state that could use new or additional services. Respondents to the rider survey and telephone survey also indicated a desire for more information about ICB services and perhaps better locations for bus terminals. The study also documented the challenges of creating "meaningful connections" between local transit systems and ICB services. For example there are much greater travel times (because of significant distances) between rural areas and ICB stations. Also, many ICB departures are outside of the 7:30 am to 5:30 p.m. timeframe, which are typical operating hours for a local transit system in a smaller community.

Based on the findings, the research team is recommending an ICB review process that MDT can use every three years to supplement the annual transit funding review process already in place. The methodology includes minimal thresholds for determining whether the state's intercity bus service needs are being met, as well as criteria for evaluating whether there are sufficient connections to other transportation services.

WTI was pleased to receive positive feedback on the research from MDT Multimodal Planner Hal Fossum, who described it as "good, useful, and timely." Kack agrees: "as funding programs evolve and opportunities arise, it is helpful to understand the specific needs in our state so that resources can be directed where they are needed most."

[The final report is available on the MDT website.](#)

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Bike Sharing Report Showcases Innovative Programs and Models

As interest grows in sustainable transportation, bicycling is emerging as a beneficial and cost-effective component of a multi-modal transportation network. Many Federal land management agencies (FLMAs) are exploring how bicycle programs can give employees and visitors more travel choices, while working toward their environmental, public health, and sustainability goals.

On behalf of the Federal Highway Administration's (FHWA) Federal Lands Highways Program (FLHP) and the U.S. Fish and Wildlife Service (FWS), WTI has recently released Exploring Bicycle Options for Federal Lands: Bike Sharing, Rentals and Employee Fleets. The report is designed to raise awareness of the benefits of bicycling, and offer instructive examples of successful programs.

Specifically, this report explores three options for making bicycles more readily available in Federal lands:

- public bicycle sharing systems, which supply bikes for short-term use through a network of automated bike parking stations;
- bicycle rental programs, which are typically for-profit businesses that rent bikes for recreational use for a few hours up to several days; and
- employee bicycle fleets, which make bikes available to individuals associated with an organization to use for work, errands, and/or recreation, usually at no cost.

"All three of these types of programs are operating in various forms across the United States," said project Principal Investigator Rebecca Gleason; "for Federal land managers, the challenge is selecting and developing programs that are feasible for their unique setting, whether urban or rural in a National Park, Wildlife Refuge, Forest, Recreation Area, or other public land environment."

To illustrate components of successful bicycle programs, the report includes numerous case studies and examples. In Minneapolis, for

instance, the Nice Ride Minnesota bike share program provides over 700 bicycles across more than 65 automated stations, offering residents and visitors a unique way to travel through the Twin Cities and access National Park Service attractions in the Mississippi National River and Recreation Area. Within the category of employee bicycle fleets, one of the examples is Glacier National Park, where the GNP "Red Bikes" allow employees to cycle instead of drive for short trips within the park including campgrounds, the headquarters compound, and the bike path between Apgar and park headquarters.



Capital BikeShare, January 2011. Photo courtesy of R. Gleason, WTI

Because there is so much variation in the character and transportation needs among federal land units, the report encourages managers to consider combining concepts from bike sharing and bike rental programs. "The report describes successes and challenges for a variety of bicycle programs from cities, universities, and agencies," said Gleason; "we believe creative federal land managers can learn from these examples and modify or combine elements of programs to suit their needs."

Exploring Bicycle Options for Federal Lands: Bike Sharing, Rentals and Employee Fleets is [available here](#).

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One Million Rides and Counting

In the small, rural town of Bozeman, Montana, population 37,000, some questioned the need for a public transit system. But in August 2006, the Streamline bus service picked up its first passenger. On November 11, 2011, shortly after the service's five year anniversary, Streamline's one millionth rider boarded the bus!



The eye catching yellow-and-black, retro bustle-back buses are reminiscent of the old Yellowstone National Park tour buses from the 1950s. But unlike the original tour buses, every Streamline bus is equipped with bike racks and wheel chair accessibility. The fare-free transportation system serves Bozeman and the neighboring towns of Belgrade and Livingston, Montana. The service connects riders to Montana State University (MSU), medical facilities, libraries, commerce, and recreation - including a weekend route to the local ski areas.

Streamline is a program of the Human Resource and Development Council District IX, Inc., in partnership with the Associated Students of Montana State University in Bozeman. David Kack, Mobility and Public Transportation Program Manager for WTI, currently serves as chairman of the HRDC board and played an

integral role in launching the transit service. "Reaching the millionth rider in the first five years validates the belief we had when we started the system—people in Bozeman would use it," says Kack.

Streamline ridership continues to grow beyond expectations. When the service first began in Bozeman it estimated it would provide about 300 rides per day. Now, it is providing more than 800 rides per day, with ridership increasing to as high as 1200 rides each day during January and February. Kack points out that 60% of Streamline's riders are students or are in some way affiliated with MSU.



Kack was also instrumental in launching the Skyline bus service in neighboring Big Sky, Montana back in 2006. More recently, he worked with community groups in Havre, Montana to initiate a transit system up on the Hi Line of Montana near the Canadian border. Dubbed the "Hi Line," the North Central Montana Transit service - managed and operated by the non-profit organization Opportunity Link - connects multiple rural areas to each other, giving residents more access to services and opportunities.

WTI has been able to provide these rural communities with public transit options that have traditionally been available only in urban areas. All three transit services will continue to expand viable transportation options within the region, providing economic and environmental benefits for the communities, and a higher quality of life for residents, through greater access to education, employment, and medical services.

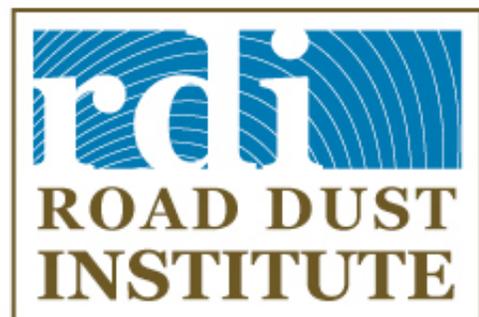
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Outreach

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 are leading field trips, developing an institute dedicated to road dust and sponsoring relevant conferences.

2nd Road Dust Best Management Practices Conference

There are millions of miles of unsealed roads around the world which are managed by a wide assortment of national, state, and local authorities as well as private entities. Unacceptable levels of dust, poor riding quality, and impassability in wet weather are experienced on much of this global unsealed road network. Although it is acknowledged that these roads are fundamental to the economies of almost every country in the world, many of the management practices followed leave much to be desired, with programs for dust control, chemical stabilization, and low-cost upgrading largely overlooked.



Hosted by the Western Transportation Institute, the 2nd Road Dust Best Management Practices Conference brought together over 135 local, state, and county road practitioners, as well as researchers and federal agencies to discuss and identify best practices and lessons learned to assist

practitioners, industry, and researchers. Held in November 2011 in Las Vegas, Nevada, the conference featured national and international experts presenting current best management practices and included presentations and poster sessions, round-table dialogue, and training sessions.

"The program encompassed a well-integrated cross section of major issues relative to road engineering and dust. I learned a lot."

Ed Little, USGS, Columbia Environmental Research Center

The themes of the 2011 Road Dust Best Management Practices Conference were Environmental Compatibility and Sustainability, General and International Best Practices, and Unique and Extreme Conditions. Within these general topics, eight concurrent and three plenary sessions were held including a Specification Showcase. Also offered were two training workshops: (1) ASU Smoke School that addressed how to read point source plumes; and (2) Unpaved Roads Workshop, providing attendees current best unpaved road practices. Vendor displays and the unveiling of the Road Dust and Fines Management Institute rounded out this highly anticipated 2nd event!

To learn more about the Road Dust Institute, please visit: www.roaddustinstitute.org

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HUD Names WTI Program Manager to National Review Panel

WTI's Mobility and Public Transportation Program Manager, David Kack, has been selected to serve on a Technical Review Panel to help guide the development of the Housing and Transportation Affordability Index (HTA Index) and its applications. The project is sponsored by the U. S. Department of Housing and Urban Development's (HUD) Office of Sustainable Housing and Communities and aims to coordinate federal housing and transportation investments with local land-use decisions to improve housing affordability and lower transportation costs for low-income families. The HTA Index is a joint initiative with the Department of Transportation (DOT) to pursue this objective.

Kack will serve as one of twelve on the review panel, composed of experts from around the country in the housing and transportation fields, as well as experts in indices and metrics. The panel will provide input on data and indices used in the development of the Index as well as the potential application of such an affordability measure. Panelists' contributions also include outreach, marketing, technical assistance, and policy recommendations.

The HTA Index will ultimately measure the combined cost of housing and transportation and help establish a baseline for these costs by location. A key objective of the project is to analyze the impacts of HUD programs on the combined cost of housing and transportation in HUD-supported communities, and assess the feasibility of improving outcomes by integrating the HTA Index as a measure of affordability into HUD's programs and policies.

The developing HTA Index will highlight that it is better to spend 35% of income on housing costs and 8% on commuting/transportation costs as opposed to 28% on housing costs, but 20% on commuting costs. The HTA index illustrates that as individuals often focus on finding affordable housing, their commuting costs increase - the total housing/commuting expenditure is often more for the individual or family.

"While the project has an urban focus, the concept is certainly applicable in rural settings," Kack noted. "Especially in many of the resort towns in the western United States, employees with lower incomes live farther away from their jobs to have affordable housing. Many times, however, they do

not consider the cost of their commute in their calculations when determining where to live."

In addition to the Index, a Housing and Transportation Cost Calculator will be developed. These tools will help to increase access to information. The Panel will provide ongoing technical support to HUD and technical assistance to interested stakeholders and the general public to ensure that this information is widely disseminated, remains current as housing and fuel costs fluctuate, and is easily usable.

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WTI's Dr. Nicholas Ward Presents at RITA Transportation Innovation Series



WTI's Dr. Nicholas Ward, presented in Washington, D.C. in December at the Research and Innovative Technology Administration (RITA) Transportation Innovation Series. Dr. Ward's presentation, "Transforming our Traffic Safety Culture: A necessary condition for Toward Zero Death (TZD)," reviewed the current traffic safety context and outlined a new traffic safety paradigm based on strategies to transform our driving culture.

The Transportation Innovation Series is a strategic outreach series hosted by the Research and Innovative Technology Administration. Dr. Ward is a senior research scientist at WTI and a professor in the Industrial Engineering Department at Montana State University.

A video of the presentation is [available here](#).

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Education

UTC Student of the Year



Levi Ewan was selected as the 2011 UTC Student of the Year. Levi earned his B.Sc. in Civil Engineering from Montana State University (MSU) Bozeman and is currently enrolled in the Civil Engineering master's program at MSU with a focus on transportation. He has provided research assistance on a diverse array of projects at WTI and has played a key role on several projects as evidenced by publications he has co-authored:

- Ye, J., Kack, D., Chaudhari, J., Ewan, L. Montana Intercity Bus Service Study. Prepared for the Montana Department of Transportation. December 2011
- Shi, X., Cross, J., Ewan, L., Liu, Y., Fortune, K. Replacing Thermally Sprayed Zinc Anodes on Cathodically Protected Steel Reinforced Bridges. Prepared for the Oregon Department of Transportation and the Federal Highway Administration. FHWA-OR-RD 12-02 SPR 682. August 2011
- McGowen, P., Chaudhari, J., Ewan, L. Livability Benchmarks for Montana Transportation:

Levi is a member of Chi Epsilon, a civil engineering honor society, and has been on the dean's list during his studies at MSU with a GPA of 3.85 during his master's program. Levi has excelled in the classroom developing a working travel demand forecasting model for the city of Bozeman (transportation planning class) and taking a leadership role in a group project evaluating the local bus system (public transit class). After the completion of his master's program Levi plans to find employment in the transportation industry or continue transportation research. Levi was raised in Three Forks, Montana and currently lives in Belgrade with his wife Aurelia.

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News from the Labs

TRANSCEND Lab Update



Located in Central Montana at the former Lewistown airport, TRANSCEND 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.

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.

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.

Driving Simulator Laboratory

WTI's driving simulator suite now represents one of the 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.

For more information please visit <http://www.westerntransportationinstitute.org/laboratories/driving> or contact Nicholas Ward (406) 994-5942 nward@ie.montana.edu.

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 Lab will be receiving an instrumented vehicle from DigitalArtefacts in Iowa by February for use in the "Modeling the validity and transfer of eye-scanning patterns for hazard perception from virtual reality training environments to reality" project. This project is funded by a National Science Foundation (NSF) Grant for research comparing eye patterns and hazard detection between virtual and real world driving scenarios. DigitalArtefacts is also developing a customized data reduction software tool that will be used for the NSF project.

The results of this research will benefit society as a whole by supplementing current driver training programs with the virtual reality parameters that promote the greatest transference to the real world. Given the potential impacts to training curriculums, policies and legislation, the dissemination of information by the team members and their students will be encouraged to expedite more collaboration among researchers, driver education programs, automobile manufacturers, and government regulators.

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

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.

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New Projects

Models for Estimating the Benefits for Winter Maintenance Operations

Project Objective - The objective of the proposed research is to identify methods for estimating the benefits - both economic and non-economic - of winter maintenance operations. Once identified, these methods and their corresponding supporting data will be employed to estimate the benefits of winter maintenance operations for different scenarios of winter-storm conditions.

[Find out more »](#)

Professional Capacity Building for Communications System, Phase 2

Project Objective: The goal of this project is to develop, deliver, and evaluate a training curriculum on plant wired ITS communication technologies for rural ITS engineers and technicians.

[Find out more »](#)

Traffic Calming for Rural 2-Lane Roads

Project Objective: The objective of this project is to summarize past and current work on traffic calming applications and recommend techniques to address safety issues along continuous, rural, 2-lane road sections on Federal Lands.

[Find out more »](#)

Assessing the Carbon Sequestration Potential of Roadsides and Roadside Revegetation

Project Objective: The objective of this project is to develop a method to determine the carbon sequestration potential of roadsides and roadside revegetation.

[Find out more »](#)

Geosynthetic Biaxial Testing Machine Design and Protocol Development

Project Objective: The objective of this project is to design a biaxial tension testing machine and develop testing protocol to measure Poisson's ratio of various geosynthetics.

[Find out more »](#)

Relative Operational Performance of Geosynthetics Used as Subgrade Stabilization

Project Objective: The main objective of this project is to determine material properties of geosynthetics that affect in-field performance of geosynthetics used for subgrade stabilization, so that DOT personnel can objectively and confidently specify appropriate geosynthetics based on material properties and cost for a specific situation, while also allowing competition from different manufacturers.

[Find out more »](#)

Passage in Plains and Prairie Waterways and Predicting Fish Response to Climate Change

Project Objective: The objective of this research is to construct flumes and swim chambers for testing swimming performances of large and small bodied fish species, as well as construct a spawning channel for physiological assessments. In addition, using the newly constructed facilities, the project will characterize swimming performance of shovelnose sturgeon, rainbow trout and westslope cutthroat and evaluate the effect of temperature on swimming performance.

[Find out more »](#)

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Dr. Yongxin Li

Dr. Yongxin Li joins WTI as a Research Associate and the new Corrosion and Sustainable Infrastructure Laboratory (CSIL) manager. He will assist projects with experimental design, project management, data analysis, and project reporting.

A chemist by training, Dr. Li has extensive research experience with electrochemical engineering, electrochemistry, nanotechnology, and sensors. He holds a Ph.D. from University of Science & Technology of China as well as a M.Sc. and B.Sc. from Anhui Normal University in China. Dr. Li has served as a Full Professor in the College of Chemistry and Materials Science, Anhui Normal University since 2007, and has worked as a Research Associate for University of Wyoming & Pacific Northwest National Lab, University of Washington, and Kansas State University.

In his spare time, Dr. Yongxin enjoys swimming, playing basketball and listening to music.

Jiang Huang

WTI welcomes back Jiang Huang as a Research Associate. Ms. Huang will assist ongoing projects in the Winter Maintenance and Effects program with design of experiments, statistical data analysis, practitioner surveys, phone interviews, and GIS mapping. A statistician by training, she has research and hands-on experience with road weather management and associated data mining.

Ms. Huang holds a M.S. in Statistics from Montana State University and a B.S. in Russian from Nanjing University in China. Ms. Huang worked previously for WTI as a full-time Research Associate from 2007-2008. She was involved with quality control of road weather data and missing data handling for the Estimating the Wet Pavement Exposure with Precipitation Data project for Caltrans.

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Montana State University College of Engineering
PO Box 174250
Bozeman, MT 59717
Tel: (406) 994-6114
www.westerntransportationinstitute.org

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