For more than a decade, WTI has been a leader in rural transportation research, and more recently, an advocate of holistic, integrated approaches to that research.

We've made significant progress on several fronts. WTI has become a nationally recognized champion of rural transportation, articulating the unique needs of rural areas and why they matter to the transportation system as a whole. We have crafted innovative solutions to individual, but formidable transportation challenges in these areas, from identifying road materials that will hold up in severe weather conditions, to finding communications technologies that will work in the most remote locations.

Moving toward greater integration of our research is the logical next step. WTI has established technical expertise in our eight research program areas; when our researchers work together across disciplines, they can look at rural issues in a broader context and develop better and more comprehensive solutions.

We are convinced that this multi-disciplinary approach is the foundation of quality research. It promotes institutional teamwork that facilitates building on previous research, incorporating specialized expertise, and rigorous evaluation from peers - all of which are hallmarks of successful projects. Well integrated research cannot always be achieved internally, which is why WTI often looks to collaborative partnerships. By working with other states, university institutes or private entities, we can take integration to the next level, gaining a wider range of perspectives and pooling additional resources. Finally, since applied research cannot be conducted without consideration of political and fiscal realities, WTI's integrated approach frequently incorporates stakeholder outreach, particularly among policy makers who have a "big picture" understanding of the practical feasibility and long-term implications of our work in the world around us.

Achieving research integration that incorporates all of these elements is an ambitious goal and a long-term process. In this issue of the newsletter, you will read about some of our initial successes, along with the challenges we face along the way. For example, our Research Director describes some of the administrative hurdles to integration, such as adapting decades of research business practices based on individually funded and managed projects.

However, there are many promising examples of how we are thinking outside traditional boxes and conducting our research in a cooperative fashion. One of our successes this year is a project to enhance habitat connectivity for carnivores along I-90 in Washington. Administratively, this project has been "integrated" from the outset, with a cooperative funding arrangement that includes Washington DOT, the USFS, and Seattle City Light.

Another proud moment in recent months was the Open House to celebrate the opening of WTI's new home, which offers expanded laboratory facilities for use in multi-disciplinary research projects. The event was attended by U.S. Senator Max Baucus, a long-time friend and supporter of WTI, who recognized our growing potential for attracting research partnerships that will benefit Montana, as well as the U.S. transportation system as a whole.

WTI will continue our efforts to move toward a fully integrated research program. We look forward to building on our skills and successes, and taking them to the next level of complexity, understanding and national relevance.
Challenges of Research Integration: Whose project is it?

By Jerry Stephens, Research Director

WTI has a problem, and it's getting worse. Several years ago, faced with managing a growing research portfolio, WTI was re-organized administratively into eight program areas, each centered on a distinct area of study in rural transportation research. Simultaneously, the Institute proactively focused philosophically on trying to use its diverse and complementary program areas to look at issues in a broader context and to develop better and more comprehensive solutions. The good news is that WTI has made satisfying progress on the latter initiative; the bad news is that this success has exposed the inadequate nature of our "old school" administrative structure.

In particular, when it comes time to assign projects to specific program areas for administrative purposes, the question increasingly comes up "Whose project is it?" This question is not only asked because of the cross cutting technical content within many of WTI's projects, but also from individual researchers' desire for acknowledgement of the significant contribution they have made to the project's success. Obviously, this is a good problem, and one that will be solved as our old ways of doing business catch up with the way we actually are addressing the rural transportation challenges of today.

The following projects highlight to varying degrees the integrated nature of WTI's research efforts, and in doing so, beg the question "Whose project is it?"

- Is that a road ecology project, or a project to develop web based data collection methods and protocols for a variety of applications?
- Is that a water quality project, or a project to develop a new self sustaining power supply that can be used in this and other similar applications?
- Is that a traffic operations project, or a project to develop a new tool for integrating and displaying real time sensor and other data inputs?

Note that while our efforts to adopt a broader perspective in tackling rural transportation challenges are encouraging, we still have a long way to go in this regard. The majority of WTI's integration efforts thus far have primarily occurred only on the solution side of a problem. That is, provided with what often is a relatively single (or just a few) issue problem, WTI works on an optimum cross-discipline based solution. Ideally, as researchers and sponsors collaboratively move ahead, the problems themselves, will more frequently be framed in a broader context, allowing for far reaching and better solutions.

WTI Attracts New Partners to Road Ecology Initiatives

WTI is a national leader in the advancement of road ecology. Internally we have nurtured our staff and technical expertise, and externally we are building an increasing number of innovative partnerships to expand research in this field.

This year, WTI initiated a project that is attracting new partners to the study of habitat connectivity. As part of the improvement of Interstate 90 over Snoqualmie Pass in Washington State - which will ultimately include numerous wildlife crossing structures - WTI is conducting wildlife monitoring on behalf of the Washington Department of Transportation. To complement this effort, WTI researchers initiated a project specifically focused on carnivores. The project uses DNA identification and tracking methods to determine whether roads are inhibiting the natural patterns of movement for carnivores in the region and thereby potentially threatening their long-term viability.

From the outset, WTI recruited a broad spectrum of public and private research partners to work together on this effort. The collaboration includes the USDA Forest Service, Conservation Northwest, the I-90 Wildlife Bridges Coalition, Seattle City Light, North Cascades National Park Complex, and the Washington Department of Transportation.

The project is expected to have a number of research benefits, such as the identification of barriers to carnivore movement and potential habitat linkages, the detection of rare carnivores that may inhabit the region, and the collection of data that will facilitate ongoing highway mitigation and monitoring efforts. Furthermore, the project presents a successful example of how identification and integration of common interests can also enhance how research is conducted and advanced:

- The project pools University Transportation Center funds with partner funds to increase the resources available for the research;
- The project raises awareness of an emerging issue (habitat connectivity) among a new group of stakeholders, and
- The project provides a funding collaboration model that can be replicated in other regions or for other issues.

Get on the Bus - WTI Helps Connect Small Communities on the Hi Line

In August 2008, WTI began developing a plan for Opportunity Link, Inc. of Havre, MT, for implementing a public transportation (transit) service that would serve Blaine and Hill counties, Rocky Boy's and Fort Belknap Reservations, and Montana State University-Northern. On August 24, 2009, North Central Montana Transit (NCMT), with 18 passengers on board, made its maiden voyage with over 200 supporters cheering on. Connecting small communities across the Hi Line, the fare free service will run between Havre, Harlem, Chinook, Box Elder (Rocky Boy's), and Fort Belknap, along with service twice per week to Great Falls. In the first week of operation, NCMT provided 139 rides, and followed up the second week with over 200 rides, as well as receiving its first request for placing marketing materials on the bus.
WTI assisted the rural Montana area with the foundational steps for creating a transit system and provided project management. Researchers collected data, developed a coordination plan, made implementation recommendations, and developed the application to the Montana Department of Transportation for funding. Barb Stiffarm, Executive Director for Opportunity Link, Inc., valued WTI's involvement in this project. "WTI's technical expertise was based on actual field experience and knowledge gained through intensive research. We are very grateful that they were able to walk us through the process of collecting community input, designing service delivery plans and rounding off all that information that allowed us to receive the funding needed to start up the transit system," said Stiffarm.

Opportunity Link, Inc. and the Hi Line service were in good hands, as WTI is no stranger to bringing transit services to the public. In 2002 WTI began working with the Big Sky community to improve their public transportation system, which at the time operated only during the ski season. WTI proposed and assisted in the completion of the Transit Development Plan and worked with the District to complete the Federal Transit Administration application to initiate year-round transit service in Big Sky, Montana. On December 1, 2006, the new "Skyline" transit system began providing year-round public transportation within Big Sky with service between Big Sky and Bozeman as well.

WTI also played a prominent role in making Streamline a reality for Bozeman. Streamline Transportation, operating since August 2006, is a non-profit, fare free transportation system serving Bozeman, Belgrade, and Livingston, MT. The service has connected riders to Montana State University, medical facilities, libraries, commerce, and recreation. Combined, Streamline and Skyline provided over 370,000 rides in Fiscal Year 2009, their third year of operations, and ridership for Streamline was up by 30%.

David Kack, Mobility and Public Transportation Program Manager for WTI, played an integral role in starting all three local transit systems, and he continues to serve as the Skyline Coordinator. With over 10 years of public transportation experience, including operations, coordination, marketing, and public relations, Kack has been able to bring various agencies and organizations together and works to integrate systems that are already in place. "With David Kack and WTI on board in the planning process, they brought with them a wealth of knowledge, experience, and objectivity that was key in getting partners and other stakeholders to believe in the project," says Day Soriano, Development Director, Opportunity Link Inc. "Having somebody there to answer the questions as they come up helped resolve issues and helped us visualize the outcome."

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.

To learn more about improving public mobility in rural areas, contact David Kack at (406)994-7526 or dkack@coe.montana.edu.

For more information on these public transit services, please visit: www.ncmttransit.org www.skyl inebus.com www.streamlinebus.com
worked with local and tribal governments and has provided expertise to Montana and Utah Departments of Transportation in roadway design, work zone safety, transportation planning, materials, gravel roads, winter maintenance, winter safety, equipment safety, worker safety, research and hydraulics. Jenkins holds a Master's Degree in Geotechnical Engineering.

The LTAP office is supported by a cohesive team who provide a forum for effective technology transfer. Genevieve Albert serves as Conference Coordinator/Administrative Associate. In addition to general accounting duties, she develops budget planning for fiscal-year activities and prepares quarterly reports for Montana Department of Transportation and other funding entities. Albert also commands the two largest LTAP annual conferences - APWA Snow Rodeo and MACRS Spring Conference, in addition to numerous hands-on training workshops. She is currently working with MDT's TLN department in coordinating registration for this new avenue of training for LTAP's workforce.

Michele Beck, Graphic Designer, updates the quarterly newsletter style and writes articles for the transportation audience. As the pivot point for transportation information for LTAP's constituents, Beck provides web searches and stays current with transportation libraries. Beck designs and edits Power Point workshop materials and recently gave a presentation at the National LTAP Conference. The staff is rounded out by Kali Vergeront and Bart Kraus. Vergeront is an MSU student worker providing valuable assistance redesigning the LTAP Roads Scholar program and other miscellaneous duties. Covering the eastern portion of Montana, Kraus, LTAP's Field Representative, teaches work zone clinics and PASER (Pavement Surface Evaluation Rating) training.

For inquiries, please contact the LTAP staff at 1-800-541-6674 or 1-406-994-6100. Or visit: www.coe.montana.edu/ltap.

Alaska Workshop Promotes Public-Private Partnerships

WTI researchers recently traveled to Alaska to present a professional training workshop introducing the benefits of public private partnerships and multi-agency collaborations.

In May 2009, the American Water Resources Association (AWRA) hosted a specialty conference in Anchorage, Alaska, attended by professionals in the fields of transportation, energy and environmental resources. As part of this event, the Alaska section of AWRA, the Intelligent Transportation Society (ITS) Alaska, and the Alaska Department of Transportation and Public Facilities (ADOT&PF) sponsored a workshop on transportation and technology collaborations, with the goal of promoting partnerships between agencies. "The conference is already a valuable forum for learning and networking," said Principal Investigator Jaime Eidswick; "it seemed a natural next step to help people from different agencies identify shared interests and potential joint projects."

WTI developed the content for the workshop, which included topics such as sharing resources, developing multi-modal projects, and identifying multi-disciplinary data needs. Presenters also gave an overview of current and planned transportation technology deployments in Alaska, and detailed examples of previous public private partnerships. According to Eidswick, these partnerships have been used effectively in Alaska to expand the Road Weather Information System (RWIS): "several public and private agencies have worked with ADOT&PF to either help fund RWIS, provide power and communications to RWIS sites, or provide additional equipment and sensors to ADOT&PF in exchange for the data retrieved from the sites."

The ultimate goal of the workshop was to showcase the potential benefits of public-private partnerships. "These collaborations are excellent ways to pool financial resources and technical expertise from several agencies - which saves everybody time and money," concluded Eidswick; "at the end of the workshop, we hope that participants will go back to their agencies with enough inspiration and information to start some exciting new ventures."

Senator Max Baucus Tips Hat to WTI

On August 19, 2009, the Western Transportation Institute and building owner, University Way LLC (Dick Clotfelter, Steve Forte, KC Tolliver) hosted an open house to celebrate WTI's new home in the Transportation and Systems Engineering Building. Building co-owner, Dick Clotfelter, welcomed over 150 people who attended the ribbon cutting ceremony and WTI founder, Joe Armijo gave a brief history of WTI's early days. U. S. Senator Max Baucus spoke next and was followed by Steve Albert, WTI Director.
Senator Max Baucus, the honored guest, commended WTI for the organizational growth and the relevance of the work that was being done around the country. He stated how proud he was to have played a part in the growth by including WTI as a “University Transportation Center” in the last two Highway bills, and how critical WTI’s research is to innovate, improve, and develop a modern 21st Century transportation network. “The effort to figure out how to meet transportation needs, big and small, begins in places like WTI,” Baucus told the crowd. “It starts right here with analytical thinking, innovation, and applied research. Rather than resting on laurels or becoming complacent, WTI has continued to explore new possibilities.”

WTI Director, Steve Albert, discussed how WTI research is addressing the national needs and issues Senator Baucus referred to. Following the official ribbon cutting, Albert invited all in attendance to explore the facility as WTI researchers were set up throughout the building with examples of their research and demonstrations of various labs’ capabilities. From damage caused by winter salt operations, to wildlife vehicle collisions, to lack of public transit in rural areas, researchers displayed and discussed solutions. The Systems Engineering Development and Integration Lab demonstrated cutting edge transportation applications using modern communications technology, and the Infrastructure Maintenance and Materials experts showcased concrete counter tops made of 100% recycled materials.

Research partners and fellow building tenants, Local Technical Assistance Program (LTAP), Most of Us, Northern Rocky Mountain Science Center (USGS), and Big Sky Carbon Sequestration Partnership also joined in celebrating the new building and research opportunities. These organizations opened their doors and enlightened visitors on their missions and research capabilities.

“It was an honor for me to attend the grand opening of the Transportation and Systems Engineering Building,” said Senator Max Baucus. “The Western Transportation Institute is a real credit to Montana and their research will help the nation develop a modern 21st century transportation network”.

2009 National Rural ITS Conference, Advancing Rural ITS to the Next Level

The 2009 National Rural Intelligent Transportation Systems (NRITS) Conference took place August 23-27 in Seaside, Oregon. Nearly 300 conference attendees had the opportunity to visit over 35 vendor displays and participate in a wide variety of sessions, professional tours, and activities.

Within the context of the conference theme, Advancing Rural ITS to the Next Level, keynotes for the Opening Session, Dennis Foderberg, SEH Inc., Bill Legg, Washington State Department of Transportation, Shelly Row, ITS Joint Program Officer, USDOT, and WTI's Steve Albert, outlined the evolution of rural ITS. These experts guided attendees from rural ITS’ beginnings, to current status, to goals and actions for the future.

“We are at a point where we need to move beyond rural ITS deployments that simply meet localized or isolated system needs,” said Bill Legg in his presentation entitled Rural ITS - What’s next? How do we get there? “We need to have a blue print on where we want to be and a clear vision on how that fits within an overall framework of national, regional, state, and local objectives for the next 10-20 years.”

Armed with knowledge of the past, present, and future, conference participants then had 3 full days of over 30 session opportunities, workshops, and tours, to learn more about what their organizations' roles in the future of rural ITS could be. WTI Engineers and Researchers Ahmed Al Kaisey, Doug Galarus, Laura Stanley, David Veneziano, and Shaowei Wang, along with WTI Director Steve Albert, scheduled session speakers. Their presentation topics included rural IntelliDrive applications, project deployment, personnel development, systems engineering, and integrating enforcement to address rural safety.

“The 2009 National Rural ITS conference was a great success, with many describing it as the ‘best NRITS yet’: This was definitely the place to be, with participants from across the public and private sector engaged to focus on all aspects of how ITS can improve rural transportation,” said Roderick Mackenzie, CTO & VP of Programs, Intelligent Transportation Society of America. “Strong participation, an excellent program and a beautiful location all combined to contribute to a great outcome. Kudos to the Oregon Chapter of ITS America for all their hard work in hosting a great meeting. I'm already looking forward to NRITS 2010 in West Virginia!”

This year's conference was sponsored in part by Athey Creek Consultants, CH2M Hill, David Evans and Associates, Federal Highway Administration, ITS America, ITS Canada, ITS Oregon, Oregon Department of Transportation, Open Roads Consulting, INC, Oregon Transportation Research and Education Consortium, Parametrix, PBS&J, Telegra, Inc., Telvent Transportation, North America, USDOT ITS Joint Program Office, and the Western Transportation Institute. 2010 NRITS will be held next August in Huntington, West Virginia.
The Western Transportation Institute continued its three-year Safe Passages Research Experience for Undergraduates (REU) Program in 2009, hosting an additional eight multidisciplinary undergraduate students from eight different colleges and universities nationwide. The students participated in a ten-week summer research program focusing on safety and environmental issues related to U.S. Highway 191 between Bozeman and West Yellowstone. Participants were paired on four distinct projects, which explored:

- water quality monitoring along rural transportation corridors;
- the impact of culverts on aquatic habitat connectivity;
- traffic noise effects on avian species near highways; and
- speed selection on horizontal curves along rural two-lane highways.

The interdisciplinary student teams produced final technical reports and presentations on each of their topics. The students represented Chemical, Electrical, Civil, and Environmental Engineering disciplines as well as Wildlife Ecology and the Natural Sciences.

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.

The Safe Passages REU is supported by the National Science Foundation. The program is scheduled to continue in 2010. For additional information, please visit www.wti.montana.edu/Education/REU.aspx.

New Projects

**Building Green: Development and Evaluation of the Design Properties of an Environmentally Friendly Concrete**

The objective of this project is to develop and test an environmentally friendly concrete using recycled materials including fly ash and recycled pulverized glass. Find out more »

**AWRA & Alaska DOT&PF Training: Building Public & Private Partnerships for Transportation**

The goal of this project is to develop and present a training workshop on transportation and technology partnerships for the Alaska Department of Transportation and Public Facilities. Find out more »

**Evacuation Preparedness of Public Transportation in Rural Coast Communities of the North Gulf Region**

The objective of this project is to assess the emergency preparedness of public transportation in rural coastal communities in the Gulf Coast region. The assessment will focus on how adequately prepared, and what role public transportation and school districts can play in the event of an emergency evacuation. Find out more »
The primary objective of this research is to determine scientifically valid, volitional swimming abilities of westslope cutthroat trout and rainbow trout that reside in the Northern Rockies Ecosystem. This research will aid fish passage practitioners with better assessments, designs, retrofits and construction of hydraulic structures, including bridges and culverts, within our streams and rivers.

**Use of Rural Transportation Infrastructure in Evacuation Operation for the North Gulf Coastal Region**

The objective of this project is to assess the role and capabilities of the rural transportation infrastructure in coastal communities in the Northern Gulf Coastal Region with respect to evacuation and emergency events' planning, traffic, safety, control, and management.

**Montana Rest Area Usage: Data Acquisition and Usage Estimation**

The objective of this research is to develop Montana-specific rest area usage guidelines with respect to water usage and traffic (vehicle, patrons) in order to supplement, replace and/or confirm current practices for rest area site selection, design and facilities management.

**Synthesis of Warm Mix Asphalt Paving Strategies for use in Montana Highway**

The objective of this research project is to synthesize the latest research on warm mix asphalt paving technologies and provide the Montana Department of Transportation with implementation recommendations.

**Using Naturalistic Data to Evaluate Safety and Operational Characteristics of Highways - UTC**

The purpose of this project is to perform a preliminary investigation of the use of naturalistic data in traffic flow and safety modeling/simulation.

**National Scan of Best Practices for Road Dust Control and Soil Stabilization**

The purpose of the National Scan is to examine programs and practices employed by different governmental agencies and contractors that result in effective dust control and/or soil stabilization on unpaved roads. The driving force behind this scan is that road dust and/or the additives used in its control pose a myriad of health, safety, economic, regulatory, and environmental challenges.

**Bike Sharing Programs on Federal Lands**

This project will analyze the challenges bike sharing programs in some national parks and national wildlife refuges are facing, including liability and risk management, helmet use, business models, operations and maintenance, and funding mechanisms, and offer recommendations for Federal Land Management Agencies (FLMAs) interested in implementing bike sharing programs. The results can help transfer knowledge on this new technology among the FLMAs.

**Interim Evaluation of Three Instrumented Bridges in Saco, Montana - MDT**

The objective of this project is to determine which of three deck configurations may offer the best performance by collecting and synthesizing new data from embedded sensors and by conducting visual assessments of the three bridge decks.

**Designing and Manufacturing a Removable Seed and Sediment Trap for the Undercarriage of Vehicles**
The purpose of this project is to design and manufacture a removable seed and sediment trap for the undercarriage of a vehicle, allowing for minimal seed damage when seeds are removed for inspection.

New Staff

Jaime Eidswick
WTI re-welcomes Research Engineer Jaime Eidswick. In 2002 Jaime joined WTI as a Research Associate/Engineer until she relocated to Massachusetts in 2007. She continued to assist with WTI research on a temporary, as needed basis, but in May of 2009 she returned to full time status with Safety and Operations. Her research specialties are traveler information, national parks and public lands, and ITS. Some of her recent projects include Grand Canyon National Park DMS/HAR Pilot Deployment/Evaluation, Alaska RWIS Implementation Plan, FWS Traffic Monitoring Demonstration, National Technical Assistance Center for Alternative Transportation in Public Lands, and ITS in Federal Lands Highway Work Zones.

Originally from Franklin, MA, Jaime earned a Bachelor of Science in Civil Engineering from UMASS-Amherst, and a Master of Science in Civil Engineering from Texas A&M University. She worked as a Graduate Research Assistant at the Texas Transportation Institute before joining WTI in 2002.

Jaime spends her spare time reading, hiking and running. She and her husband, Eric, live in Massachusetts with their two small children. Jaime can be reached via email at Jaime.eidswick@coe.montana.edu.