



April 2010 Newsletter

Message from the Director:

Teamwork brings ITS to rural areas

When WTI began its research program almost 15 years ago, deploying Intelligent Transportation Systems (ITS) in rural areas was largely uncharted territory. Urban transportation agencies were testing advanced technologies to improve safety or mobility, but rural agencies did not know how *or even if* these systems would work in areas with lower daily traffic, less infrastructure, and sparse communications.

Working together, state and local departments of transportation, research institutes, and a broad range of rural stakeholders have made tremendous progress in demonstrating how ITS can be the foundation of cost-effective solutions to critical transportation challenges, such as reducing rural crash rates or facilitating emergency response in remote areas. In this newsletter, you will read about some of these collaborative partnerships that are advancing the state-of-the-practice in rural ITS.

This issue also explores how WTI enhances research through a multi-disciplinary approach within our own organization. In the beginning, rural ITS deployment was primarily focused within our Safety and Operations program. Now, advanced technologies are integrated into projects in all of our program areas, such as transit, winter maintenance, and road ecology. In addition, we have developed a greater understanding of how our technology transfer, outreach, and education programs not only get the word out about prior research, but also lay the groundwork for the next iteration of systems, the next phase of exploration, and the next generation of researchers.

Research

Taking it to the Next Level: Systems Integration Program Accelerates

Deployment by Building on Success

The deployment of Intelligent Transportation Systems (ITS) in a rural setting has been the cornerstone of WTI's research agenda since its inception. With this emphasis on advanced technologies, the Systems Engineering, Development and Integration program was created in 2005 to provide software development, systems testing, and other high level technical support across all of WTI's research program areas.

Now, after only five years, the Systems group has tripled its staff size, developed and installed two advanced laboratory facilities, and offers extensive engineering capabilities to WTI researchers as well as research partners from other organizations. Their research approach has also expanded; the Systems Engineering staff often takes the initiative to develop its own projects, in addition to its collaborations with other WTI program areas.

For rural transportation agencies, technology advancements are often considered out of reach due to limited fiscal resources or other deployment challenges such as insufficient infrastructure, gaps in communication coverage, or lack of access to equipment or technical support. "New technology advancements should help rural areas overcome their transportation challenges - they should not be excluded from an improved transportation system because of their location or resource constraints," said Doug Galarus, Systems Engineering Development and Integration Program Manager.

The Systems group's approach is to develop functional and cost-effective solutions to everyday problems by integrating existing communication and information technologies. Galarus and his staff have worked with numerous transportation agencies in rural regions to create technology tools tailored to their specific needs, including:

- Handheld devices to pinpoint animal-vehicle hotspots.
- Specialized websites that facilitate better dissemination of traveler information.
- A tablet PC that allows emergency responders to coordinate action and assistance from the field.

With numerous successful projects completed, the Systems group has established a foundation of research upon which to build. As a result, new projects often benefit from an accelerated deployment process, thanks to a number of factors:

- *Existing models:* Rural regions share common transportation challenges. A systems integration model that was developed for one region can often be adapted to another by substituting site specific equipment, software or data inputs.
- *Established partnerships:* Previous project experience with a transportation agency allows WTI to identify technical experts and research champions, who can facilitate follow-up projects.
- *Field-tested technologies:* more and more often, WTI researchers have the opportunity to select from technologies that they have already tested in a real world setting, which can expedite the trial deployment stage.

PROJECT SPOTLIGHT: *Integration of Aviation Automated Weather Observation Systems (AWOS) with Road Weather Information Systems (RWIS)*

WTI is partnering with the California Department of Transportation (Caltrans) and the Mineta Transportation Institute at San Jose State University to develop an easy-to-use web-based tool for California's airports and heliports, particularly those used for EMS, which provides them with

localized and timely weather condition and forecast information.

The team has developed and launched a website <http://aviation.weathershare.org/> with a prototype system that displays aviation weather conditions and forecasts for the entire state. In a single location, this tool currently integrates a range of data from numerous sources and displays it on state maps. Users can view current or forecast conditions across a region, or zoom in on a specific location. From there, users can select the specific data they need, such as wind speeds aloft or on the ground, satellite photos, pilot reports, or National Weather Service alerts.

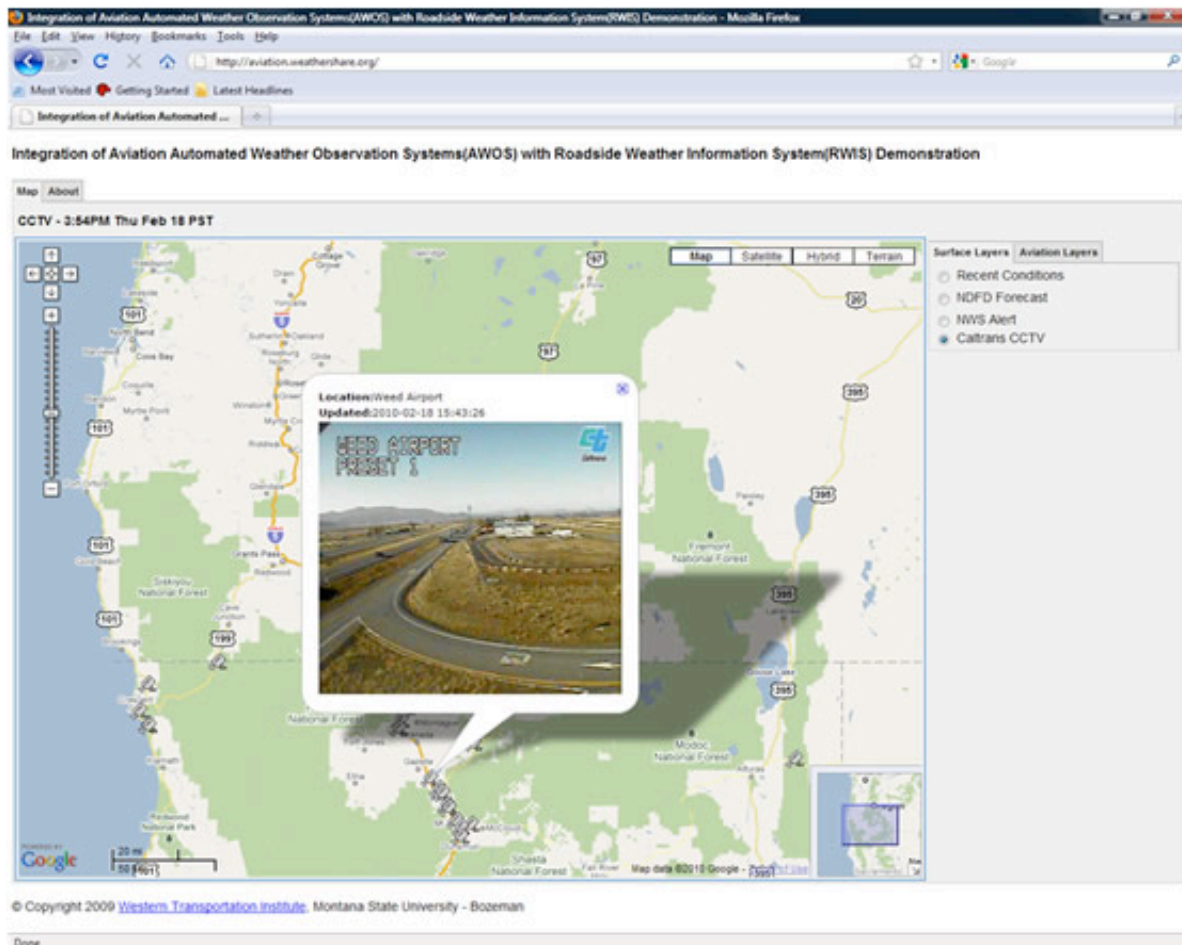


Figure 1: Caltrans CCTV Image, Shown at aviation.weathershare.org

The AWOS integration project is modeled after Caltrans' successful WeatherShare system. WeatherShare also integrates weather and forecast data from multiple sources into a single, easy-to-use, map-based computer application. WTI researchers from the Systems group initially created WeatherShare for transportation agencies and emergency responders in rural regions of California, and then worked with Caltrans to deploy it statewide.

The AWOS/RWIS web-based tool builds on the technology platform that WTI created for WeatherShare. Researchers also reteamed with many of the same Caltrans agency staff who had championed the WeatherShare project. "We are excited that we can use WeatherShare as a platform for new applications, and in uses outside of traditional highway programs, such as aviation," said Mandy Chu, Caltrans Project Manager. "With this tool, we will be able to provide a higher level of service to small and rural airports and to enhance the safety and efficiency of our transportation systems across multiple modes without investing in a major expansion of weather

station infrastructure. To us, that clearly demonstrates the value of a long-term commitment to research and innovation.”

RESEARCH SYNERGY: *Outreach and Technology Transfer fuel further progress*

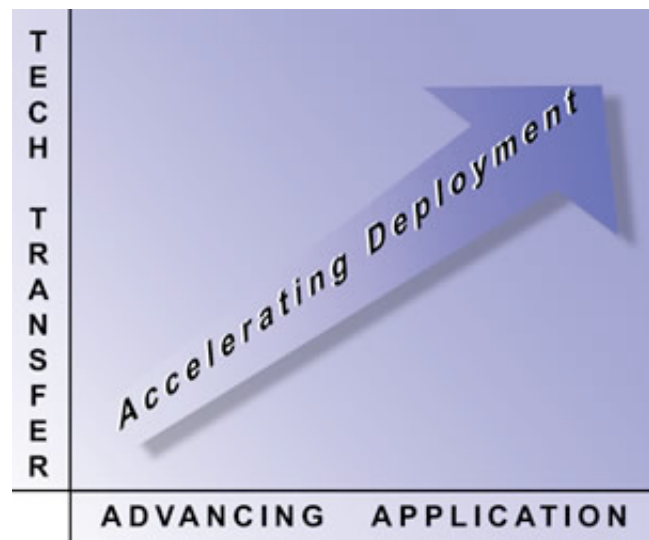
Another strategy that accelerates the deployment of new projects in the Systems Integration area is the effective use of outreach and technology transfer programs. Traditionally, researchers have used both of these efforts to disseminate information about emerging technologies or best practices, with the expectation that it will lead to broader implementation or use.

At WTI, the Systems group has found that innovations develop and advance more quickly through a more interactive approach. Increasingly, WTI sponsors forums in which researchers have the opportunity to work directly with technology users, and receive feedback on what works, what doesn't, and what should be included in the next iteration of the system.

For example, the Western States Forum (profiled later in this newsletter) is an annual opportunity for WTI staff to facilitate in-depth technology transfer on ITS technologies to rural transportation technology practitioners. “When we started the Forum, we envisioned it a training opportunity for the DOT transportation practitioner,” said Galarus, “but by hearing their input on the work of others and on some of the systems we’re developing , we get as much out of it as they do. The Forum has been instrumental in technology transfer on all sides and in all directions.”

Leveraging previous research and synergistic outreach efforts have worked together to help the Systems group develop effective transportation solutions and lay the groundwork for further advancements. “Each technology we test, each project we complete, and each partner we work with provides us with building blocks that we can use in the future,” concluded Galarus.

To learn more about research opportunities with the Systems Engineering Development and Integration program, visit the WTI website at www.westerntransportationinstitute.org or contact Program Manager Doug Galarus at dgalarus@coe.montana.edu.



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Annual Forum Nurtures Rural ITS Deployment in Western States

WTI conducts Intelligent Transportation Systems (ITS) deployment projects in rural areas across the country. However, much of the foundational demonstration research was developed in western states, through efforts such as the California-Oregon Advanced Transportation Systems (COATS) program. As a result, WTI researchers in the Safety and Operations program, and later the Systems Engineering program, developed productive and long-standing relationships with many of the departments of transportation (DOTs) in western states. All of the research partners gained extensive ITS deployment experience in the rural regions of these states. One of the lessons learned was that ongoing communication and personal contact among all ITS stakeholders is

essential to successful deployment.

As follow-up to the initial deployment phases of the COATS program, Caltrans and WTI wanted to build on the established partnerships and encourage further ITS development. To this end, they established a forum to facilitate information exchange and technical assistance between researchers and transportation practitioners in the region.

The first Western States Rural Transportation Technology Implementers Forum (WSRTTIF) was held in Mount Shasta, California in 2006. The one-day meeting was attended by state and local transportation professionals, including field engineers, maintenance staff, systems engineers, and communications technicians. Presenters with ITS technical or deployment expertise each led a session focused on a specific solution or application that had actually been deployed in the field. Each session included extensive discussion during and after the presentation to encourage detailed technical descriptions and candid recommendations. "The first forum was well received because the attendees had the opportunity to ask very specific questions of colleagues from other agencies who had deployed ITS or in some cases those who helped develop the technologies," said Doug Galarus, WTI Systems Engineering, Development and Integration Program Manager. "It gave them a much clearer picture of which systems might work in their location."

Based on the positive response, the forum has become an annual event and expanded to two days. Participation also continues to grow - the 2009 Forum was attended by 44 participants from seven western states: California, Idaho, Montana, Nevada, Oregon, Washington, and Wyoming. Presentations introduced attendees to ITS deployment projects such as:

- Automatic traffic data collection systems in Washington which use surveillance video cameras,
- Fully automated truck escape ramp notification system developed by Caltrans, and
- An Ethernet/IP backbone system created for the Wyoming Department of Transportation.

The Forum nurtures ITS deployment in several ways. In addition to providing direct technical assistance to implementers, the discussions allow participants to hear specific input about what technology users want and need. Working together, participants often identify ideas for follow-up research or second phase deployment projects. They also meet other agencies with shared interests, which can lead to opportunities to pool resources toward a common goal. "The Forum has been the birthplace of several collaborative partnerships, including the Western States Rural Transportation Consortium, a collaboration between California, Oregon, Washington, and Nevada," said Galarus.

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. "It's not often that you create a technology transfer event that produces such immediate and tangible results in the field, and that participants look forward to attending," concluded Galarus. "We hope to keep the success going for as long as we can!"

For more information about upcoming forums, please contact Leann Koon at leann.koon@coe.montana.edu.

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Sign of the Times: Dynamic Message Signs are a Cost-effective Speed Management Tool

Improving roadway safety is one of the top challenges facing rural transportation agencies. According to the US Department of Transportation, accidents on rural roads account for over half of the vehicular fatalities, even though rural roads *carry less than half* of the nation's traffic.

Excessive speed is a primary or contributing factor in many fatal accidents. Frequently, motorists (especially those unfamiliar with the area) are driving too fast for the more challenging conditions common to rural corridors: narrow or curvy roadways, extreme weather, large or slow moving vehicles, and wildlife crossing the road.

Not surprisingly, rural transportation agencies need strategies to help alert drivers to appropriate travel speeds, and when possible, warn them when their speeds have exceeded safe levels. Intelligent Transportation System (ITS) technologies offer new solutions; however, as noted elsewhere in this newsletter, major technology deployments are often out of reach for rural transportation agencies, due to fiscal or infrastructure limitations.

Despite these challenges, ITS researchers and rural agencies are finding success with at least one system option: Dynamic Message Signs (DMS). DMS work in rural environments because:

- Low-cost technology - Agencies can purchase as few or as many signs as they can afford, and integrate them with existing infrastructure to keep initial costs low.
- Flexibility - Rural agencies often choose to purchase portable DMS so they can be moved on a seasonal basis or from one hotspot to another. DMS can also be integrated with a broad range of roadway sensors, communication systems, Road Weather Information Systems (RWIS), and other ITS technologies.
- Multiple applications - DMS systems can be designed to give speed warning messages that are triggered by numerous and site-specific driving conditions, such as the presence of ice on the road, high winds, or animals approaching the shoulder.

DMS deployment and evaluation is a mainstay of WTI's rural ITS research program. "We have found DMS to be an extremely useful tool for our safety projects," said WTI Director Steve Albert. "Almost all of our large-scale regional safety programs involve at least one DMS component, if not several."

Several of WTI's previous projects have demonstrated promising safety benefits following DMS installation:

- **Dynamic Warning VMS -Wyoming Evaluation.** In conjunction with the Wyoming Department of Transportation, WTI deployed and evaluated a curve warning system on a rural road segment with a steep grade and sharp curves in the Yellowstone National Park region. Sensors were installed to classify the vehicle type and measure its speed. If a large vehicle (i.e. an RV or commercial truck) exceeded a designated speed, a DVMS unit was activated, flashing a message such as "Curve Ahead, Slow Down". In the post installation motorist survey, 85% of participants responded that they reduced their speed after seeing the sign. The vehicle speed data collection and analysis confirmed that there was a statistically significant reduction in vehicle speeds at the sharp curves for both passenger cars and trucks. For example, after the DMS was installed at a site near the beginning of the sharp curves, average speeds at that location dropped by as much as 5 mph (11%).
- **Sacramento River Canyon Curve Warning Systems.** As early as 1998, WTI evaluated five dynamic curve warning systems that were installed by the California Department of

Transportation (CALTRANS) for advance notification to motorists of alignment changes and speed advisories in the Sacramento River Canyon. The individual sign systems included a Changeable Message Sign (CMS) to display both text and diagrammatic curve warnings. The CMS sign systems were also coupled with a radar measurement and display so that both the advisory speed and operating speed of the approaching vehicles would be identified. Data from the project showed a reduction in total crashes for trucks and large vehicles. Decreases in driving speeds were recorded for both cars and trucks at several DMS installation locations. Significant reductions in speed (ranging from three to six mph) were noted in sites where the curves are located on road segments with steep downgrades. In addition, motorist surveys indicated very high levels of public acceptance, with 75% of participants responding that the DMS messages were useful, 83% responding that the locations were adequate and 96% responding that the signs were sufficiently visible.

- **Animal Vehicle Pooled Fund:** WTI, in cooperation with 15 states, directed the evaluation of advanced technologies to detect the presence of wildlife near the roadway and activate warnings to travelers. This project included pilot deployments in two of the states. The system deployed on a highway within Yellowstone National Park produced highly promising results: reliable detection of large animals near the roadway (in particular for elk) and reduced vehicle speeds in road segments with the animal detection system. Most notably, the evaluation showed a 66% reduction in the number of collisions with large animals on road segments with an operational system. Also of interest, more than 90% of motorists surveyed noticed the system and understood that animals were near the roadway when the warnings were activated.

A selection of other WTI projects helps illustrate additional applications for DMS as a flexible speed management tool on rural roadways:

- **Fredonyer Summit Icy Curve Warning System.** WTI evaluated the effectiveness of an icy pavement detection system in improving traveler safety on a rural mountain pass in northern California.
- **Evaluation of ITS Technologies in Rural Work Zones:** WTI developed and tested a prototype system for real-time delay estimation and information dissemination using message signs for a two-lane highway work zone with a lane closure where a pilot car manages traffic.
- **Greater Yellowstone Regional Traveler and Weather Information System - US 89.** This project demonstrates the use of advanced technologies and coordination of transportation providers to improve mobility and relieve congestion on U.S. 89 between Livingston, Montana and the north entrance to Yellowstone Park in Gardiner, Montana. One component of the project is the deployment of two DMS with road condition information.

WTI continues to explore new research opportunities and applications related to the use of Dynamic Message Signs, including conformity with the updated Manual on Uniform Traffic Control Devices (MUTCD), integration with in-vehicle technologies, and expanding communication options using wireless and other emerging networks. "As communication options expand and improve in rural areas, it will become even less costly and complicated for transportation agencies to use DMS," said Albert; "this will open up even more opportunities to put these signs to good use on rural roads."



Curve warning system installation in Sacramento Canyon

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Outreach

Bozeman Area Students Learn About Wildlife and Highways

Living in Montana, even in the more populated areas of the state, young people are accustomed to wildlife roaming around. Disconcerting, even though they are not yet of driving age, is that they are seeing so many road kills. Rob Ament, WTI Road Ecology Program Manager, spent time with budding young road ecologists this winter at Bozeman area schools, discussing this aspect of living in a rural state. Ament engaged more than 100 6th graders at Sacajawea Middle and Monforton Schools in lively discussions on the impacts of highways on wildlife.

The students learned how roads create barriers for wildlife and how costly wildlife vehicle collisions can be in terms of vehicle damage, human injury and fatality, and carcass removal when animals try to navigate the areas' roads. Based on the feedback from the students, most had never considered the monetary impact of wildlife vehicle encounters. Ament presented mitigation practices including animal detection systems, wildlife underpasses and overpasses with fencing and how these measures can improve human safety and reduce effects on the environment. The

presentation helped students understand the importance of collecting good data to help managers make informed decisions regarding what measures are most effective for specific areas.

Traffic Safety Culture 2010



National Summit for Rural Traffic Safety Culture

Registration is now open! Sponsored once again by the Western Transportation Institute and the AAA Foundation for Traffic Safety, the second annual National Summit for Rural Traffic Safety Culture will be held **July 11-13, 2010** in Big Sky, Montana.

Similar to the first Summit, we will continue to strive for increased understanding amongst traffic safety researchers, practitioners, and policy makers about the role of traffic safety culture on (1) behavioral factors that increase rural (and national) traffic crash risk; (2) attitudinal barriers to public and political acceptance of traffic safety interventions; and (3) organizational resistance to safety program change or implementation. This year's Summit will take these goals a step further by helping the audience to see the connections between theory and practice. Attendees should come prepared to listen, learn, share, and discuss not only their experiences, but those of others in both facilitated small-group discussions and larger question/answer sessions. The 1 1/2 day Summit will comprise a number of presentations followed by discussion in breakout or focus groups

For registration, lodging, agenda, and travel tips for the 2010 event as well as proceedings from 2009, please visit <http://www.RuralTSCSummit.org>.

2010 National Rural Intelligent Transportation Systems Conference



Huntington, West Virginia will serve as host city for the 2010 National Rural Intelligent Transportation Systems (NRITS) Conference, August 1-4. Dozens of technical sessions will complement full and half-day training opportunities. Networking functions and an ever-expanding vendor exhibition will round out this year's conference, themed - **The Bridge to Success: Engineering the Future of Rural ITS**

The 2010 NRITS Conference is sponsored in part by ITS America, Federal Highway Administration, Rahall Transportation Institute, USDOT ITS Joint Program Office, West Virginia Division of

Highways, and the Western Transportation Institute. Participant registration forms and online access will be available by April 15. For more information, please visit <http://www.nritsconference.org>.

LTAP Initiates Stakeholder Discussions on Transportation Workforce Development for Montana

The Montana Local Technical Assistance Program (LTAP) hosted a webinar in December 2009, which brought together stakeholders from a variety of transportation and training organizations. The goal of the Level One Transportation Workforce Summit webinar was to increase awareness about what programs currently exist in the state for training the transportation workforce and to set the groundwork for better coordination of efforts between training providers. One outcome of the webinar was an agreement to schedule a face-to-face meeting for training providers in order to coordinate efforts and assess training needs in the state.

LTAP hosted the Level Two Workforce Summit on March 4, 2010. Steve Jenkins, LTAP Director, presented preliminary results from LTAP's ongoing training needs assessment. During round table discussions, training providers discussed what their organizations offered, how they assess workforce needs, how they coordinate with other organizations, and where they perceive training gaps to exist.

Susan Gallagher, Education Program Coordinator for the Western Transportation Institute, presented proposed tasks for a Level Three statewide needs assessment as the next logical step in a transportation workforce development initiative for Montana. The assessment would be undertaken in coordination with the Council of University Transportation Centers' (CUTC) efforts to develop a national strategic plan for transportation workforce development. WTI is seeking stakeholder buy-in and partners to initiate the proposed statewide data collection effort.

The ultimate goal is to develop a strategic plan for effective partnerships between transportation organizations and education providers in transportation workforce development. A special note of thanks and appreciation to the Montana Department of Transportation and the Laborers AGC Training Program for their support and involvement in the Work Force Development Summit.

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Education

WTI Staff Assist Lego Robotics Teams to Explore Transportation Solutions

The FIRST Lego League is an international robotics competition for elementary and middle school students and is organized by the FIRST (For Inspiration and Recognition of Science and Technology) organization. The Lego League annual contest focuses on a different real world topic related to the sciences and each challenge in the competition is related to that theme. The 2010 Challenge name is Smart Move and the theme is transportation. In addition to building and programming robots, teams are asked to research and identify a real world problem related to the

Challenge theme, create an innovative solution, and share their solution with the community. They are encouraged to contact experts in the field to learn more about the topic.

Two robotics teams from Bozeman's Chief Joseph Middle School visited WTI in December to do just that. They were interested in learning about ways to get more vehicles off the roads and about pedestrian safety around their school. WTI research staff Rebecca Gleason, David Kack, and Pat McGowen discussed the Safe Routes to School program, public transportation, and transportation engineering and safety. After a question and answer session, the students toured the Transportation Research Applications and Instrumentation Laboratory (TRAIL) and the driving simulation lab at WTI.

In January, WTI Research Ecologist Marcel Huijser assisted a third Lego Robotics Team at Monforton School with its research on methods to reduce wildlife vehicle collisions. Dr. Huijser gave a presentation explaining the environment near the roadway, the concept of habitat connectivity and the phenomenal cost of wildlife vehicle collisions. He also explained different mitigation methods and how to determine if and where to install mitigation measures. The Monforton team chose to investigate methods of reducing wildlife vehicle collisions and present their findings for the research project portion of the competition.

After the presentation, Alec Nisbet, Monforton teacher and Lego Robotic Team Coach commented, "Many of the students said that they were happy to have Marcel come to speak to them. He gave them valuable information that they could understand. As they looked over the packets Dr. Huijser provided, they were better able to understand and relate how different methods worked. I think that because of the talk, they could really look at options with a more open mind--for example, to have Marcel explain why the animal detection system was pulled from the park, and make an educated response as to if they agreed or disagreed with that rationale!"

The Lego Robotics Team at Monforton is a competitively chosen team of sixth through eighth graders who meet twice per week during the school year as well as several times during the summer. Each year they spend 6 months preparing to compete in the FIRST Lego Competition.

The First Lego League Junior Robotics program brings hundreds of elementary and middle school students to MSU each year to test their Lego robots' ability to complete the theme-based challenge. In February thirty-eight Lego Robotics teams from all across Montana competed at MSU. The four sections of the competition are teamwork, technical presentation, research project and finally taking their robots through the tasks on the competition field. Eight WTI staff members volunteered as project judges during the competition. Taylor Lonsdale, Montana Safe Routes to School Coordinator, provided the keynote address at the tournament opening ceremony. Winning teams earned the opportunity to participate in the national competition.



The Monforton Lego Robotics team and their coach Alex Nisbet learn about wildlife crossing structures from WTI's Dr. Marcel Huijser for their upcoming competition.



WTI volunteer judges: Laura Stanley, Rebecca Gleason, Robert Parker, Kelvin Bateman, David Veneziano, Ahmed Al-Kaisy, David Kack, and Jessica Mueller

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News from the Lab

TRANSCEND Lab Update

Does your project need an open road? Located in Central Montana at the former Lewistown airport, TRANSCEND's research facility offers four miles of real-world paved test surface, a highly innovative, multidisciplinary research staff, and a comprehensive communications, power, and data networking infrastructure allowing innovations to make the jump from the laboratory to the real world. In short, it is the only laboratory of its kind: diverse, isolated, and ready to test, develop, and research virtually any innovation that relies on the open road. And while the real world features extreme weather and conditions, the facility takes a step forward and features a few perks the real world doesn't like instant wet weather, a highly innovative, multidisciplinary research team and the diagnostics to ensure every test is accurate and valuable.

To date, TRANSCEND, a Western Transportation Institute (WTI) facility, has tested de-icing equipment and techniques, evaluated animal detection systems, and confirmed the durability of fly-ash concrete. With plenty of room, long stretches of road, and zero interruptions, the lab stands ready

for whatever you can dream up.

The facility has the capability to create a wintery road scenario with no natural precipitation. TRANSCEND snow-making equipment generates 8,000 cubic feet of snow per hour using 24,000 gallons of water. As long as the temperature is below 25 degrees and the humidity is low, three, multi-positional, mobile snow guns create an impressive pile of snow in short order. These machines create a unique winter testing environment, allowing researchers to control study variables, including snow, rain, and ice. Lewistown, Montana provides a very diverse climate - hot, cold and wet seasons - to complement the snowmaking ability. When the temperature is warmer, the snow guns can create a torrential downpour and when the temperature is just right, the guns can be used to create an icy nightmarish roadway to test deicers and other winter maintenance techniques.

Using this equipment, WTI crews recently completed a Field Operational Test for the Caltrans Establishing Best Practices of Snow and Ice Removal research project. Chemicals were applied late in the afternoon with cold air and pavement temperatures. Snow was made and compacted overnight using the TRANSCEND snowmaking system and a smooth drum compactor. Test sections were evaluated early the next morning by plowing, photographing and measuring friction on the test sections.

Visit the TRANSCEND website to view a video of the snow guns in action.

<http://www.transcendlab.org/capabilities/snowmaking/>

For more information on putting your research to the test at TRANSCEND, contact Eli Cuelho, (406) 994-7886 elic@coe.montana.edu

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New Projects

Northwest Passage Rural Vehicle Infrastructure Integration - UTC

Project Objective: The goal of this project is to research and identify appropriate Vehicle Infrastructure Integration (VII) applications for a rural environment, and develop a concept for a demonstration project based on one of the promising applications.

[Find out more »](#)

FWS Traffic Monitoring Assessment and Demo

Project Objective: The purpose of this project is to evaluate the current traffic monitoring practices of the U.S. Fish and Wildlife Service, and make plans for a series of demonstration projects to test alternative techniques for improving visitor estimation.

[Find out more »](#)

Explore ITS Technologies for Work Zones and Impact Areas

Project Objective: The objectives of this project are to identify existing work zone Intelligent Transportation System (ITS) applications that are appropriate to Federal land road projects, and to provide guidance to federal land units that are considering or implementing work zone ITS systems.
[Find out more »](#)

An Experiment in Integrating an Engineering Communication Toolkit into the Industrial Engineering Curriculum

Project Objective: The objective of this project is to develop an engineering communication toolkit as a reference guide for industrial engineering students at Montana State University.
[Find out more »](#)

New Project: Making Driving Simulators More Useful for Behavioral Research

Project Objective: The overall goal of this project is to refine driving simulator research methods so that findings correspond more closely to on road behavior, in order to make driving simulators useful for roadway design.
[Find out more »](#)

Safe Routes to Schools

Project Objective: Through this project, Taylor Lonsdale, PE will serve as the state of Montana's "Safe Routes to School" Coordinator on behalf of the Montana Department of Transportation. This program aims to encourage active and healthy lifestyles by increasing the number of children in grades K through 8 who walk and bike to school.
[Find out more »](#)

Burrowing Mammal Impacts on Paved Highways - Phase I – MDT

Project Objective: The objective of Phase I of this study is to characterize the nature and extent of burrowing mammal damage to paved roadways around the state of Montana.
[Find out more »](#)

Montana Fuel Tax Refunds

Project Objective: This project will investigate Montana's motor fuel tax refund process to evaluate its current governing policies, the potential for errors, omissions, and evasions (EOE), and the possibility of moving from a paper system to an electronic tracking system.

[Find out more »](#)

Deicer Interaction with Portland Cement Concrete UTC

Project Objective: The purpose of this project is to evaluate the effect of chloride-based deicers on reinforced concrete structures, such as roadways and bridges, operated by the Washington State Department of Transportation; and to determine whether or not reducing deicer corrosiveness helps preserve the transportation infrastructure.

[Find out more »](#)

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Staff

Awards:



Tawny Hoyt, left, pictured with 2nd and 3rd place awardees for IIE Best Technical and Oral Competition Award

The Institute of Industrial Engineers (IIE) Western Conference recently awarded Tawny Hoyt Best Technical Paper and Oral Competition Award for her independent research work on “EMS Restraint Feasibility during Emergency Transport.” The recognition comes with \$500 and an invitation to represent the Western Conference in competition at the National IIE Annual Conference to be held in Cancun, Mexico in June 2010.

Tawny graduated from Montana State University in the fall of 2009 with a degree in Industrial Engineering. She is currently working as a part time research associate for WTI under Dr. Laura Stanley, continuing her research on the EMS project and assisting with the Engineering Information Foundation grant efforts. Tawny plans to attend graduate school at MSU next fall in Industrial Engineering

New Staff:

Nick Johnson

Nick Johnson joins the WTI Systems Engineering Development and Integration group as a Network/Computer Systems Administrator. Nick specializes in desktop support, systems administration, and desktop security. He will be a huge asset to the Systems team maintaining, upgrading, and troubleshooting WTI computer systems, including desktops, laptops, and student lab machines.

Nick holds a bachelor's degree in Business Management from Montana State University, with a minor in Management of Information Technology. Even prior to formal education, Information Technology was a passion and he is no stranger to the MSU IT network. As an MSU student, Nick worked in MSU's ITC Assembly configuring machines for deployment, was a member of the Desktop Support team, and eventually worked in ITC Maintenance checking functionality of the Smart Podiums.

Originally from the East coast, Nick lived in Lubbock, Texas, then Kalispell, Montana before moving to Bozeman to attend MSU. A "fix it" guy, Nick's talents don't stop with computers. He works on cars, bikes, electronics, and construction projects. When not laying wood floors, tile, or performing major and minor repairs on friends' homes, Nick can be found hiking or enjoying Montana. He can be reached at nick.johnson@coe.montana.edu.

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