



# The Innovative Engineer

*“Innovative Engineering Against Hazards”*

Vol. 2, No. 2

Fall 2008

## From the Director

by Dr. Kevin C. Womack

This past summer has certainly been a busy one, for all of us I am sure. For me it has not only been busy, but very exciting. It began with a CUTC meeting in late June at San Jose State University. Not only was the meeting outstanding, but the extra activities and hosting by Rod Diridon were absolutely fantastic! Then, traveling to Turkey for the Performance Based Infrastructure Asset Management Workshop (see accompanying article) was a great opportunity to meet and work with transportation colleagues from across the United States and around the world. Then, later in July, I was able to attend the Federal Highway Administration/MCEER National Seismic Conference on Bridges and Highways in Charleston, South Carolina; another fantastic conference!

In between trips and preparing for the fall semester I have been working with my Utah Transportation Center associates, Drs. Marv Halling and Paul Barr, and our colleagues at Rutgers University to get the Long Term Bridge Performance Program off the ground. As I said, it has been an exciting summer.

This fall I am pleased to welcome a new colleague to the Utah Transportation Center, Dr. Kevin Heaslip (see article, page 3). Kevin comes to us from a post-doc position at the University of Florida. He will be handling our traffic engineering courses for us, working with our LTAP Center, and performing research in the areas of safety and transportation systems. Kevin will be an outstanding addition to our program.

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## Center Colleagues Travel to Turkey to Share & Expand Infrastructure Expertise

Dr. Marvin Halling and Dr. Kevin Womack were able to participate in an international workshop on performance-based infrastructure asset management (PBIAM) held in Istanbul, Turkey, July 6-9, 2008. The workshop was supported by the U.S. National Science Foundation (NSF), U.S. Federal Highway Administration (FHWA), Rutgers University and various other U.S. federal agencies and organizations from Turkey, Europe, Canada and Japan.

Both Dr. Halling and Dr. Womack took an active part in the workshop, sharing their expertise in presentation and discussion and learning from the expertise and experience of their international colleagues. As a co-PI on the Utah Transportation Center part of the Long-Term Bridge Performance Program (LTBP) research study, Dr. Marvin Halling took part in a presentation on the LTBP program. Dr. Kevin Womack made a presentation on societal measures of infrastructure performance.

Presentations and panel discussions revealed that infrastructures may be viewed in significantly different perspectives by researchers from different disciplines and cultures. Participants agreed that performance metrics for infrastructures should be formulated at the global, regional and local levels in terms of different

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Lastly, the Utah Transportation Center, in collaboration with the Utah State University Sustainable Energy Research Center and Oak Ridge National Laboratory, hosted a workshop on potential electric transportation concepts beyond plug-in vehicles. This was held in Salt Lake City, October 1-2. This was another great opportunity to exchange ideas with national experts in the area of surface transportation. (See the article below.)

Now we look forward to TRB, and the CUTC awards banquet, see you there!

# Electric Highway Workshop Held in Salt Lake City

With the high prices of petroleum and gasoline we, as transportation specialists, must look forward to what automobiles and highways will look like 50 years from now. Obviously, the goals of energy independence and reduced green house gas production must be foremost in our thinking. To this end a group of 15 experts from universities, national laboratories, electrical energy suppliers, the USDOT, and research foundations gathered at a workshop held in Salt Lake City, Utah, October 1st and 2nd to discuss the potential of an “electric highway”, and what this highway and the vehicles traveling on it might consist of in 30, 40 or 50 years.

This workshop was hosted by the Utah Transportation Center and the Sustainable Energy Research Center (both at Utah State University), and the Oak Ridge National Laboratory. The discussion centered on electric vehicles, how power might be transferred to these vehicles in real time, and how that might facilitate self guided vehicles. As a first step toward furthering this discussion, this group intends to develop a concept paper, which will be placed on the Utah Transportation Center Web site [<http://transportation.usu.edu>].

Find us on-line at:

<http://transportation.usu.edu>

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assets, and different domains for each asset. It was possible to reach consensus on many of the broader global level performance measures for infrastructures such as safety, choice, efficiency, transparency, etc.

Specific presentation and discussion topics were varied, and included: Infrastructures & Sustainability (current and future); Current State of Applications and Research Needs; Infrastructure Performance Measures (system-wide, societal, natural and engineered domains); International Research, etc. An information session was held on the FHWA Long Term Bridge Performance Program (LTBP), with a panel discussion on the opportunities for international collaborations. Significant discussion surrounded the issue of an international research agenda, and finding ways to effectively approach the study of the interaction of local, national, and multi-national infrastructure systems.

The workshop included visits to the two major suspension bridges (plus highways and viaducts) crossing the Bosphorus. Presentations were made by local highway officials regarding the management practices of this critical regional highway system.

Many of the researchers in attendance felt that the workshop was a highly rewarding experience and the U.S. researchers felt that the workshop helped refine how they conceptualized various topics related to infrastructure management.

The full synopsis of the workshop, including preliminary conclusions and recommendations can be found at the Utah Transportation Center Web site [<http://transportation.usu.edu>].



A view of the 1st Bosphorus bridge, connecting the European part of Istanbul to the Asian part.

## Center Welcomes New Transportation Faculty Member, Dr. Kevin Heaslip



The Utah Transportation Center is pleased to welcome Dr. Kevin Heaslip to the faculty of the Civil & Environmental Engineering Department at Utah State University and as a colleague of our Center! Dr. Heaslip serves as an assistant professor specializing in Transportation Engineering.

Dr. Heaslip received his PhD from the University of Massachusetts Amherst. Prior to that, he received his Master of Science degree in Civil Engineering (Transportation) and a Bachelor of Science in Civil Engineering from Virginia Tech.

Dr. Heaslip has won several paper awards and honors including: the 2005 ITS America student paper award and a 2005 Dwight David Eisenhower Transportation Fellowship. His research interests include sustainable and resilient transportation infrastructures, traffic operations, transit operations, and intelligent transportation systems. In addition, his research involves design and operations of work zones on freeways and arterials in addition to the driver's response to those design elements.

We are pleased to have the opportunity to work with Dr. Heaslip and extend him our warmest welcome!

## UTC Holds Annual Advisory Board Meeting

On June 6, 2008, the Utah Transportation Center (UTC) held its second annual Advisory Board meeting at Utah State University. Attending were Clair Fiet, Utah Transit Authority (UTA); Jim McMinimee, Utah Department of Transportation (UDOT); Ben Tang, Oregon Department of Transportation; Brenda Redwing, Federal Highway Administration (FHWA); and Bill Rahmeyer, Utah State University. The meeting was hosted by UTC Director Dr. Kevin Womack and Associate Director, Dr. Marv Halling.

The morning session began with a review by Dr. Womack of Center activities over the past year. This was followed by research project presentations by Center colleagues, including:

- Chris Winstead, River of Wi-Fi, UTA
- Keri Ryan, Seismic Retrofit of Bridges, UDOT
- Jim Bay, MSE Wall Failure Modes, UDOT
- Paul Barr, Pre-Stress Loss Verification, UDOT
- Marv Halling, Strong Motion Instrumentation, UDOT

Dr. Halling also gave a presentation on the Long Term Bridge Performance Project and the role that the Center has as a member of the consortium selected by FHWA to execute the \$25,000,000 contract for this program.

The Advisory Board reviewed the proposed budget for Fiscal Year 2009 and discussed potential activities for the upcoming year. One exciting potential activity that was discussed in detail is the potential for the UTC to conduct a "mini" Long Term Bridge Performance program in the State of Utah, focusing on bridges being constructed using accelerated bridge construction (ABC) techniques. The Utah Department of Transportation is one of the leaders in the country on the application of these techniques and a collaboration with the UTC to collect data and quantify the performance of these bridges would put the State of Utah even further in the forefront on the application of new, rapid construction techniques.



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## Center “Projects in Progress”

- UTC0701 “Evaluation of Bridges for Seismic Retrofit,” Dr. Keri Ryan, PI. Co-funded by the Utah Department of Transportation (UDOT).
- UTC0702 “UDOT’s Calibration of AASHTO’s New Pre-stress Loss Design Equations,” Dr. Paul Barr, PI. Co-funded by UDOT.
- UTC0703 “Strong Motion Instrumentation Plan for UDOT Bridges: Array Design, Typical Details, and Specifications,” Dr. Marvin Halling, PI. Co-funded by UDOT.
- UTC0704 “Failure Modes Analysis of UDOT’s MSE Wall Inventory,” Dr. James Bay, PI. Co-funded by UDOT.
- UTC0705 “Logan Bluff Landslide Risk Analysis,” Dr. James Bay, PI, state funded.
- UTC0801 “Synthesis Study and Field Evaluation of In-Situ Culvert Rehabilitation in Utah,” Dr. Paul Tullis, PI. Co-funded by UDOT.
- UTC0802 “Development of a Decision Support Tool for Assessing Vulnerability of Transportation Networks,” Dr. Anthony Chen, PI. Co-funded by UDOT.
- UTC 0803 “Evaluation and Laboratory Testing of Pre-Cast Decks for ABC Construction,” Dr. Marvin Halling, PI. Co-funded by UDOT.
- UTC 0804 “Investigation of the Use of Texel Sensors and Signal Process for High Accuracy Passenger Counting,” Dr. Scott Budge, PI. Funded by UTA.

## About the Utah Transportation Center

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