



# The Innovative Engineer

*“Innovative Engineering Against Hazards”*

Vol. 3, No. 2

Fall 2009

## From the Director

by Dr. Kevin C. Womack

Events at the Utah Transportation Center continue to become more and more exciting with time, and this past summer and fall have been no exception. In June, the Utah Transportation Center (UTC) held its annual Advisory Board Meeting on the campus of Utah State University. The work of the past year was discussed, presentations made by researchers, and good news shared. That includes the fact that the UTC continues to increase its ability to leverage its Tier II funding at a rate of \$2.71 external dollars for every \$1 of federal university transportation center funding. (See related article on page 3.)

In August, RITA program manager, Robin Kline, and her colleagues, Amy Stearns and Lydia Mercado, came for a site visit. It was a real privilege to host them and we had an excellent day of discussion on the progress and accomplishments of the UTC as a Tier II center. The comments and suggestions of these very experienced managers will be invaluable to the continued progress of our Center. We extend our thanks to them for their time! (See related article on page 2.)

September brought another red-letter day for the UTC, with the dedication of a new structural testing laboratory known as the SMASH Lab. Federal, state and university representatives were all in attendance as speeches were made, the ribbon cut and the test of a full scale bridge girder conducted. (See related article, right.)

Last, but certainly not least, the Utah Department of Transportation (UDOT) has announced that it will work with the UTC, and Utah State University, to place

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## Structural Testing

## SMASH Lab Dedicated

*excerpts: College of Engineering news release*

*[<http://www.engineering.usu.edu/htm/news/articleID=3631>]*

In a special dual ceremony, two new labs, the Hydraulics Modeling Laboratory and the College of Engineering Structural Testing “SMASH” Laboratory, were dedicated on Thursday, September 24, 2009.

Utah Lieutenant Governor Gregory S. Bell was on hand for the dedication of the labs and congratulated those involved in all aspects of the projects, in particular Dr. Mac McKee, and Dr. Kevin Womack. Both professors of civil and environmental engineering. McKee is also Director of the UWRL, and Womack is Director of the Utah Transportation Center at USU. Lieutenant Governor Bell also commented on how impressed he was with ongoing research at USU, especially the in-



*(L-R) USU President Stan Albrecht, UTC Director Dr. Kevin Womack, UWRL Director Dr. Mac McKee and College of Engineering Dean Scott Hinton take part in the dual ribbon cutting ceremony September 24, 2009. picture courtesy of Jennifer Carroll, College of Engineering*

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## DIRECTOR (continued from page 1)

a traffic operations center on the university campus, within the College of Engineering. This will involve running a fiber optic line to the university (connecting to the UDOT traffic operations center in Salt Lake City), and the set-up of the center on campus. This center will not only serve UDOT as an operations center but will function as a teaching and research laboratory for transportation-focused students. This state-of-the-art facility, will be a real boon to the UTC. The estimated value of the work that UDOT will execute to bring this center on line is \$6 million. Our thanks go to our partner, the Utah Department of Transportation.

As the Director of the Utah Transportation Center, my job is made all the more exciting by the accomplishments of my Center colleagues, who make great things come to pass. They are hard working, accomplished, and extremely competent. I extend my heartfelt thanks to them for all they do. My hat is off to all my colleagues here at the Utah Transportation Center!

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## DEDICATION (continued from page 1)

clusion of undergraduates in research projects. Also on the program were Utah State University President Stan Albrecht, and Scott Hinton, Dean, College of Engineering.

The College of Engineering Structural Testing Laboratory provides much needed space to conduct research and testing for the Long-Term Bridge Performance Program, a national study on bridge durability. Dr. Marv Halling, principal investigator on the project, and his co-investigators, Dr. Paul Barr and Dr. Kevin Womack, will utilize the lab to study the performance of bridges in the Western United States. They will look at typical overpass bridges that commuters use everyday. The high-quality quantitative data collected from research and testing completed in the new 5,000 square foot lab will enable engineers to develop new and improved bridge designs.

Engineers of tomorrow will need to better understand factors that contribute to structural deterioration and collapse as well as ensure tools necessary for improved maintenance and repair are available. The two new labs provide the space needed to do so.

# Center Hosts RITA Program Manager Visit

On August 18 the Utah Transportation Center (UTC) was visited by RITA program managers, Robin Kline, Amy Stearns and Lydia Mercado. The meeting was held in the new Long Term Bridge Performance Laboratory in the Sant Engineering Research Building at Utah State University.

The day-long visit began with a presentation given by UTC Director, Dr. Kevin Womack. Dr. Womack's presentation focused on the progress and accomplishments of the Center through its first three years of existence as a Tier II Center. Following Dr. Womack's remarks research project presentations were made by researchers associated with the Center: Dr. Marvin Halling, Utah Transportation Center Associate Director—Long Term Bridge Performance Program; Dr. Paul Barr—accelerated bridge construction research being performed for the Utah Department of Transportation (UDOT); Dr. Scott Budge—LADAR Passenger Counting research for the Utah Transit Authority (UTA); Dr. Kevin Womack (on behalf of Dr. Patty Cramer)—UDOT Wildlife Highway Crossing project; and Drs. Anthony Chen and Kevin Heaslip—additional transportation research begin conducted for UDOT and local agencies.

After lunch, Jim McMinimee, UDOT Director of Project Development and member of the UTC Advisory Board, visited with the RITA program managers, discussing the view of the Advisory Board on UTC activities. Mr. McMinimee's discussion was followed by a meeting with the support staff of the Center. The visit ended with a tour of the new structures testing laboratory (SMASH Lab) that is designed for the testing of full scale bridge elements (see accompanying article on page 1).

The Center welcomed the visit by Robin, Amy and Lydia as an opportunity to tell the Utah Transportation Center story and receive input from this experienced group of program managers who have seen many other centers. It was a great opportunity to receive valuable feedback for the Utah Transportation Center and our research programs.

# Advisory Board Members Applaud Project Diversity & Tour New Lab During Annual Meeting

The Utah Transportation Center (UTC) was pleased to host its annual advisory board meeting on June 22, 2009 in the Long Term Bridge Performance (LTBP) Lab on the Utah State University campus in Logan, Utah. Those in attendance included Dr. Kevin Womack (UTC Director), Dr. Marvin Halling (UTC Associate Director), and board members Dr. Bill Rahmeyer (Utah State University), Russell Robertson (Federal Highway Administration), Clair Fiet (Utah Transit Authority), Jim McMinimee (Utah Department of Transportation), and Benjamin Tang (Oregon Department of Transportation).

Dr. Womack provided a review of FY2009 activities, including funding levels and research projects being conducted. The board was especially pleased to find that the Center was able to leverage the base federal funding at a 2.71:1 ratio.

Following the fiscal review, four UTC colleagues presented their research work to the board:

- Dr. Marvin Halling, (Civil & Environmental Engineering)—Long Term Bridge Performance project
- Dr. Scott Budge (Electrical & Computer Engineering)—“Investigation of the Use of Texel Cameras for Counting Passengers on Public Transportation” project funded by the Utah Transit Authority
- Dr. Patricia Cramer (Wildland Resources)—highway wildlife crossings project funded by the Utah Department of Transportation (UDOT)
- Dr. Anthony Chen (Civil and Environmental Engineering)—Development of a Decision Support Tool for Assessing Vulnerability of Transportation Networks” funded by the Utah Department of Transportation and the Utah Transportation Center.

With this diverse overview of Center projects, the response of the Advisory Board was very positive, noting the positive potential for expanded research opportunities and variety in funding sources.

Dr. Womack presented the Advisory Board with the proposed budget for fiscal year 2010. This included a

second year of supplemental funding provided by the UTC for the Long Term Bridge Performance Program research, funding for two new projects, and funding for two ongoing projects. The two new projects were ranked highly in the UDOT research project review process. These projects include one focusing on work zone safety control and another forecasting network traffic for small communities in Utah. The other two projects that are underway and will be receiving UTC funding are the highway wildlife crossing project (Dr. Patricia Cramer) and continued work on the passenger counting project of Dr. Scott Budge.

The meeting concluded with a tour of the newly constructed large scale structural testing laboratory at USU (see related article on page 1).

## Center Director Named as ASCE At-Large Director

Kevin C. Womack, Ph.D, P.E., professor of civil and environmental engineering and director of the Utah Transportation Center at Utah State University, was recently elected as at-large director of the American Society of Civil Engineers (ASCE). Dr. Womack was installed October 30, 2009 during the business meeting at ASCE’s Annual Civil Engineering Conference in Kansas City, Missouri.

Dr. Womack has been actively involved with ASCE for many years. In 2001, Dr. Womack was selected to be ASCE’s Congressional Fellow, and in that position he served with the Senate Committee on Environment and Public Works. He also chaired ASCE’s National Transportation Policy Committee and served on the Advisory Council for the 2009 *Report Card on America’s Infrastructure*.

Congratulations to Dr. Womack!

*excerpt: ASCE September 2009 press release (Leikny Johnson)*



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## Center Projects in Progress

- UTC0703 “Strong Motion Instrumentation Plan for UDOT Bridges: Array Design, Typical Details, and Specifications,” Dr. Marvin Halling, PI. Co-funded by UDOT and UTC.
- UTC0704 “Failure Modes Analysis of UDOT’s MSE Wall Inventory,” Dr. James Bay, PI. Co-funded by UDOT and UTC.
- UTC0801 “Development of a Decision Support Tool for Assessing Vulnerability of Transportation Networks,” Dr. Anthony Chen, PI. Co-funded by UDOT and UTC.
- UTC0802 “Synthesis Study and Field Evaluation of In-Situ Culvert Rehabilitation in Utah,” Dr. Blake Tullis, PI. Co-funded by UDOT and UTC.
- UTC0803 “ABC Deck Connections, Laboratory Testing and Evaluation,” Dr. Marvin Halling, PI. Co-funded by UDOT and UTC.
- UTC0805 “Shear Capacity of Pre-stressed Girders,” Dr. Paul Barr, PI. Co-funded by UDOT and UTC.
- UTC0904 “Quality of Life in Cache Valley Study,” Dr. Kevin Heaslip, PI. Funded by UTC.
- UTC1001 “Work Zone Design Evaluation,” Dr. Kevin Heaslip, PI. Co-funded by UDOT and UTC.
- UTC1002 “Forecasting Network Traffic for Small Communities in Utah,” Dr. Anthony Chen, PI. Funded by UTC.
- UTC1003 “Highway Wildlife Crossing Design Study,” Dr. Patricia Cramer, PI. Funded by UTC.
- UTC1004 “Investigation of the Use of Texel Cameras for Counting Passengers on Public Transportation, Phase II,” Dr. Scott Budge, PI. Funded by UTC.
- UTC1005 “Long Term Bridge Performance Program, Supplemental Funding, Year 2,” Dr. Marvin Halling, PI. Funded by UTC and FHWA.

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Clair Fiet ..... UTA  
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