



# The Innovative Engineer

*“Innovative Engineering Against Hazards”*

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## From the Director

by Dr. Kevin C. Womack

In January I had the opportunity to participate in one of five American Society of Civil Engineers (ASCE) Infrastructure Roundtable discussions. The group that I joined were tasked with discussing life cycle costs and on-going maintenance. Among those in this group were U.S. Congressman Earl Blumenauer of Oregon, Admiral Michael Loose (Deputy Chief of Naval Operations for Fleet Readiness), and Alex Herrgott of the Senate Environment and Public Works Committee staff. The discussion topics for the five roundtable groups were based on the five solutions developed in the most recent ASCE Report Card for America’s Infrastructure (see related article, next column).

The main point to come out of all these roundtable discussions is that there is no national infrastructure strategic plan, and so there is just not a vision out there for the country to rally around. In the past, we have had such plans—the Interstate Highway System, the race to the moon, and the Clean Water Acts. But now, this country has no such vision.

With respect to the surface transportation infrastructure, we as civil engineers need to look beyond the next bridge, or the next section of highway, or even the next authorization bill. We need to imagine what the surface transportation system will look like in 40 or 50 years, and then begin now to prepare for it. What type of energy will the vehicles be using? Will they be electric? What type of automobile controls will exist? Will automobiles be automated? Can we improve throughput on our roads, in particular the urban Interstates, to relieve congestion without building more lane miles, thereby reducing the carbon footprint of the infrastructure?

(See **DIRECTOR**, page 2)

## ASCE Infrastructure Roundtables Highlight Need for National Vision

In mid-January the American Society of Civil Engineers (ASCE) held five roundtable discussions on the state of this nation’s infrastructure. As a member of the ASCE Board of Directors, UTC Director Dr. Kevin Womack was invited to participate in one of the five events. Among the other roundtable participants were Congressmen LaTourette (Ohio) and Blumenauer (Oregon), Victor Mendez (FHWA Administrator), Vice-Admiral Michael Loose (Naval Operations), retired Lt. General Hank Hatch (Army Corps), Rick Capka (former FHWA Administrator), Peter Ruane (CEO of ARTBA), and Mort Downey (former USDOT under-Secretary), and James O’Keeffe, Alex Herrgott, Angie Giancarlo, Jim Tymon, Jim Kolb, all of Congressional Staff.

These roundtables were an outgrowth of the most recent ASCE Report Card on America’s Infrastructure, and each roundtable focused on one of the five principals contained in the report card: (1) increased federal leadership in infrastructure to address the crisis; (2) promote sustainability and resilience in the nation’s infrastructure; (3) develop federal, regional and state infrastructure plans that complement a national vision; (4) address life-cycle costs and ongoing maintenance to meet the needs of users; and, (5) increase and improve the infrastructure investment from all stakeholders.

The major conclusion of the roundtables, and the main impediment to the renewal of the Nation’s infrastructure, is that there is no national vision or strategic plan. To learn more, check out the April 2010 Civil Engineering Magazine, which is devoted entirely to these roundtables, without advertising.

These, and many other questions I will leave to your imagination, are what we need to be asking ourselves. If we don't, we will, at best, maintain the status quo of the system and the revolutionary change we need in our infrastructure system will never take place. As teachers and researchers at major universities, we need to lead this long-term vision because we are the ones that will have to perform the research necessary to develop and enact the system of the future, one that will be cleaner, more efficient, safer, and longer lasting.

The need is out there to develop a National Infrastructure Renewal Plan, if ASCE decides to be the leader in this effort I will be glad to be a participant!

## **Utah Transportation Center Part of Ground-breaking Research through \$2 million DOE Grant**

The Utah Transportation Center, in collaboration with the Energy Dynamics Lab (EDL) at Utah State University has received a \$2 million grant from the U.S. Department of Energy to study the electrification of the nation's roadways and automation of the vehicles that run on that roadway (see related article on page 4). This is a one year grant that will initiate a major ground-breaking research effort with the objective of creating an entirely new surface transportation system.

The UTC and EDL are part of a consortium known as the Partnership for Roadway Electrification and Automation (PREA). Other partners in the group include the Oak Ridge National Laboratory, the University of Auckland and the National Renewable Energy Lab. The objective of the partnership is to secure funding for and conduct research that will lead to the implementation of a system of automated, electric powered vehicles running on the National Highway System which is providing continuous electric power to the vehicles through an inductive process.

## **Utah Transportation Center Colleagues Attend ITS/JPO Research Workshop in Washington DC**

On April 28-29, 2010 Utah Transportation Center colleagues Dr. Kevin Heaslip and Dr. Kevin Womack attended a research workshop held in Washington, D.C. at the USDOT headquarters building. The workshop was sponsored by the Intelligent Transportation Systems Joint Program Office (ITS/JPO) of the Research and Innovative Technology Administration (RITA).

The purpose of this workshop was to familiarize university transportation center directors and researchers with the Strategic Research Plan that has been developed by ITS/JPO and to discuss how university transportation centers can collaborate with the ITS/JPO on critical areas of research.

The meeting began with a plenary speech by Dr. Rob Bertini, the RITA Deputy Administrator. Dr. Bertini expressed his pleasure at the fact that the workshop was put together and that so many were in attendance. Following Dr. Bertini's remarks, the workshop proceeded into presentations grouped by subject matter.

The focus of the presentations made by JPO project managers and staff was the IntelliDrive program and all of the impacts that this program can have on safety, the environment, policy, etc. IntelliDrive is the dedicated short-range communications (DSRC)-based vehicle to vehicle (V2V) communications program that is currently the main emphasis of the JPO.

Within each subject session presentations were made by JPO personnel, followed by university researchers who discussed their research efforts in areas relating to Intelligent Transportation Systems (ITS).

The workshop ended with a discussion on how more university transportation centers may become involved in ITS research and collaborate with JPO on research projects derived from the Strategic Research Plan.

## **New UDOT Advisory Board Member, Ahmad Jaber, Makes Site Visits to UTC**



On Friday, March 5, Ahmad Jaber, P.E. (Director, Systems Planning and Programming) and Blaine Leonard, P.E. (Senior Research Project Manager) of the Utah Department of Transportation (UDOT) visited the Utah Transportation Center and Department of Civil and Environmental Engineering at Utah State University. The purpose of the visit was to introduce Mr. Jaber to UTC and department researchers, to review the progress of the LTAP Center, and to discuss current UDOT research projects being conducted by UTC colleagues.

After a series of meetings and lunch, Mr. Jaber and Mr. Leonard were taken on tours of the new structural testing and hydraulics research laboratories (see Utah Transportation Center Annual Report, 2008-09).

Mr. Jaber has just recently taken over the management of the entire UDOT research program as a result of an internal UDOT reorganization. Mr. Jim McMinimee has retired from UDOT, but will remain on the UTC advisory board as a consulting engineer, and UDOT management decided to move the Research and Development Division from the Project Development area to the Program Development area, which Mr. Jaber heads. Mr. Jaber will also be joining the UTC advisory board as the new UDOT representative.

It was a pleasure to have Mr. Jaber visit the UTC and we look forward to having him on our advisory board!

## **Utah Transportation Center Names Student of the Year: *Steven Petroff***



The Utah Transportation Center is pleased to announce that Steven Petroff has been selected as their Student of the Year. Steven is a graduate student at Utah State University working to complete an MS degree in Civil Engineering. He is working with Dr. Marvin Halling on the FHWA Long Term Bridge Performance (LTBP) Program and is responsible for developing an instrumentation plan for the Utah pilot bridge and conducting preliminary testing. He is also heavily involved with the logistics of additional testing and instrumentation of the California and Minnesota pilot bridges. Steven has been responsible for procuring bids and quotes on various instruments as well as processing the purchasing orders. He organizes weekly coordination meetings with the USU research team as well as participates in meetings involving additional LTBP research teams across the country.

Steven was raised in Richmond, Utah and attended Sky View High School in Smithfield, Utah. After graduating from high school, he lived in various parts of Portugal while serving a two year religious mission for The Church of Jesus Christ of Latter Day Saints. Upon returning from Portugal, Steven immediately began college at USU in the spring of 2006, married Anarie White a year later, and completed his BS degree in the spring of 2009.

Congratulations to Steven!

# UTC & EDL Cohost AET Research Workshop

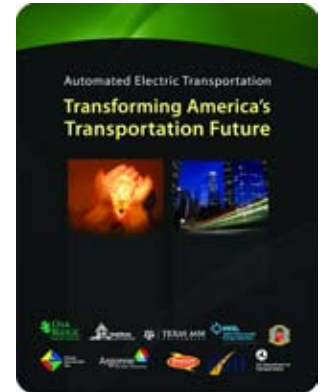
On March 15-16 the Utah Transportation Center (UTC) and Energy Dynamics Laboratory (EDL), at Utah State University, hosted a research workshop on Automated Electric Transportation (AET) in response to the receipt of a \$2 million dollar research grant from the U.S. Department of Energy (see article on page 2).

This grant will cover research efforts from May 2010 to May of 2011, and the workshop was intended to outline the details of that research effort at Utah State University and by its research colleagues and sub-contractors.

In attendance at the workshop were Will Charles and Dr. John Boys of the University of Auckland where advanced work is being done on wireless energy transfer, which is a key component of AET, and with whom the UTC and EDL are forming a collaborative effort which will include a written cooperative agreement between the groups.

Other attendees at the conference included UTC Director Dr. Kevin Womack, EDL Director and Deputy Director Doug Lemon and Jeff Muhs, Aaron Broker of the National Renewable Energy Lab, and UTC colleagues Drs. Kevin Heaslip, Anthony Chen and YangQuan Chen.

Goals set within the workshop include: (1) having a demonstration of wireless power transfer from induction plates in a roadway to a full-size vehicle, and (2) a demonstration of vehicular automation control in a group of scale model vehicles. These steps, once achieved, will be groundbreaking in the effort to improve the nation's transportation network and safeguard the environment for now and in the future.



## 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.
- UTC0803 "ABC Deck Connections, Laboratory Testing and Evaluation," Dr. Marvin Halling, PI. Co-funded by UDOT and 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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