The Innovative Engineer

"Innovative Engineering Against Hazards"

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From the Director

by Dr. Kevin C. Womack

This past December, Doyt Y. Bolling stepped down as Director of the Utah Local Technical Assistance Program (LTAP) after a tenure of 14 years in that position. Doyt is well known in LTAP circles and with the FHWA, having worked there for many years.

I will miss Doyt. He has done a tremendous job building up the Utah LTAP Center and his good work is much appreciated. I wish Doyt and his wife the best in the future as Doyt moves into retirement.

The change in LTAP Director here at Utah State University has provided the opportunity to fully move the Utah LTAP Center under the auspices of the Utah Transportation Center. We have been moving, somewhat slowly, in that direction since the implementation of the SAFETEA-LU legislation and the submittal of our strategic plan, but now we will be able to completely integrate the two Centers.

This move is strongly supported by the Utah Department of Transportation and will provide an opportunity to create efficiencies in the operation of the two Centers and develop a synergistic relationship between the faculty of the UTC and the experts in the LTAP Center. That partnership will further strengthen the mission of both Centers--serving local agencies with the latest in transportation research, and tapping into the research needs of local agencies that can be effectively served with faculty expertise.

I anticipate the announcement of a new Utah LTAP Center director by the end of April.

(See **DIRECTOR**, page 2)

Newest Transportation Faculty Member Successfully Completes Three Transit Projects for Local Transit Service

It hasn't taken long for the newest transportation faculty member at Utah State University (USU), Dr. Kevin Heaslip, to jump right into making a difference in transportation! In addition to keeping busy in the classroom, and acting as faculty liaison with the newly reorganized Utah LTAP Center, Dr. Heaslip has recently completed three successful transit studies for the Cache Valley Transit District (CVTD). Using an initial fund of $10,000 from CVTD, Dr. Heaslip was able to match that with $30,000 of USU Civil & Environmental Department funds to maximize the benefit of the projects for the greatest result.

(See **TRANSIT**, page 2)

DIRECTOR (continued from page 1)

I am extremely excited by the activities of our newest transportation faculty member, Dr. Kevin Heaslip. The accompanying article in this newsletter on Dr. Heaslip's work in the short time he has been here, shows him developing some very important relationships in the local transportation community.

It is also exciting to see how the UTC has branched out to other disciplines besides that of civil engineering. Dr. Patricia Cramer is part of the College of Natural Resources here at Utah State University, and the article on her work (see page 3) shows that a wide range of expertise is necessary to create a safe and functional transportation system. I am glad to have Patty as a UTC colleague.

The snow is melting, despite the seasonal snowstorms, and spring appears (hopefully) to be on the way here in Northern Utah. I look forward to the warmer weather and seeing all of you in Amherst at the summer CUTC meeting. See you then!!

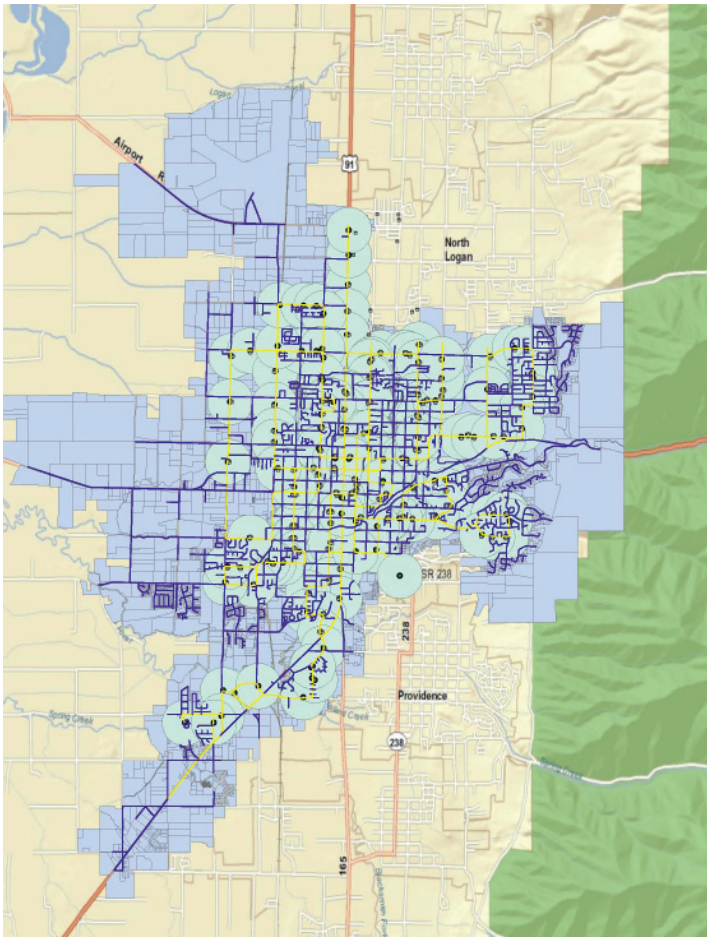
TRANSIT (continued from page 1)

The CVTD is a fare-free transit service, serving the Cache Valley Region of Northern Utah. This covers nearly 1,200 square miles and serves a population of more than 100,000. The mission of the CVTD is to be "the premier public transportation agency serving the Cache Valley Region, with excellence and the highest quality of service." To that end, the first of the UTC projects for the CVTD involved conducting a rider survey to gather information on the CVTD's level of service as perceived by the traveling public.

USU engineering students, under the direct supervision of Dr. Heaslip, surveyed more than 1,700 CVTD riders over the course of a week. The primary focus was to determine the overall satisfaction level of the riders of the CVTD, and also gathered pertinent demographic data to help the CVTD accomplish their service mission. The study showed that the overall satisfaction level of riders was high, with a desire for extended service hours and Sunday service (currently not provided) topping the list of things riders would like to see changed.

The second transit study conducted for the CVTD focused on bus visibility. Since the CVTD is a fare-free service, they are always looking for creative ways to extend their limited resources to provide greater service for their passengers and the community as a whole. With the primary source of funding coming from shrinking local, state and federal government funds, this has become a critical issue for CVTD.

To that end, the UTC conducted a bus visibility study to: (1) determine the overall visibility of CVTD buses, and (2) determine the specific visibility of each route (including time of day and day of the week data). The data gathered during this study is now available to for use by the CVTD in establishing on-vehicle advertising rates for interested business partners. With more than 117,000 overall vehicle views per day, the CVTD is able to approach local businesses with clear data on how they can benefit from on-bus advertising. The CVTD can also establish appropriate rates for advertisers based on their route choices.



GIS-based map of bus stop coverage on CVTD routes. (Circled areas represent each bus stop service radius.)

The third project conducted for the CVTD involved a GIS study. This included plotting each bus stop location in the service area for quick reference and decision-making application. With this data, the UTC was able to determine the .25 mile and .5 mile radius for each stop, and allowed the CVTD to determine the current coverage of each stop along each route. With that data, the CVTD can make adjustments for their routing system, to better serve the needs of their riders.

With the information gathered, and the methods developed and utilized for these projects, Dr. Heaslip hopes to see his student assistants go into the workforce able to capitalize on their practical experience. The relationships built while conducting these projects also help to foster future research opportunities in the transit arena for the Utah Transportation Center.

If you are interested in more information on these projects, please feel free to contact Dr. Heaslip by e-mail at [kevin.heaslip@usu.edu].

2009 Student of the Year: Scott Porter

Scott Porter was selected by the Utah Transportation Center to represent them as the 2009 Student of the Year for the Council of University Transportation Centers (CUTC). Scott grew up in Kearns, Utah. He lived in England from 2002-2004 while on a religious mission. After his return, Scott began his studies at Utah State University where he completed a BS degree in Civil Engineering and is currently completing an MS degree in Civil Engineering with an emphasis in structures. For his MS thesis (formally titled "Comparison of Precast ABC Bridge Deck Panel-to-Panel Connections") he is studying the connections between precast bridge deck panels. Part of this research is looking at a new way to post tension connections. Scott also worked as an intern for the Utah Department of Transportation during the summer of 2007. Dr. Marvin Halling served as Scott's faculty escort for the 12th Annual CUTC Reception & Banquet, held January 10, 2009 at the Omni Shoreham Hotel in Washington, D.C. Congratulations, Scott!

Natural Resource Faculty Partner Takes a Look at Wildlife "Road Users"

Dr. Patricia Cramer, Research Assistant Professor in the Department of Wildland Resources at Utah State University, is taking a look at an often overlooked road user... wildlife. Her prior work has uniquely qualified Dr. Cramer to conduct this research. Prior reports include: TRB-NCHRP Report 615, 'Evaluation of the Use and Effectiveness of Wildlife Crossings,' and a to-be published NCHRP research report on Ecological Surveys. She is also conducting the project 'Monitoring Wildlife Crossings in Montana on US 93 South.'

Dr. Cramer is working with the Utah Department of Transportation (UDOT) and Utah Division of Wildlife Resources with matching funds from the Utah Transportation Center in order to determine if deer, elk and other animals are willing to use wildlife crossings such as culverts, bridged underpasses, and overpasses, and how different crossing elements (i.e. passage size, etc.) impact wildlife use.

Using movement triggered cameras placed at strategic locations, Dr. Cramer hopes to determine the minimum and range of best dimensions for these structure in order to encourage the highest deer, elk, and moose use in an area so these animals do not attempt to go around the concurrent fences or attempt to push through them. A UTC graduate student will be helping conduct an experiment with varying the size of underpasses to learn at what point elk will not use the structures. The results of this study will help UDOT prevent additional wildlife-vehicle collisions, save money on new structures, and help wildlife move safely across their habitat.

For more information on this topic, you can visit the Web site developed with her colleague, John Bissonette [www.wildlifeandroads.org].

Photo courtesy of USU photographer, Donna Barry.

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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 Prestress 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.
- UTC 0901 "Long Term Bridge Performance Program Supplemental," Dr. Kevin Womack, PI. Funded by UTC.
- UTC 0902 "Transportation Correlation to Quality of Life," Dr. Kevin Heaslip, PI. Funded by the UTC.
- UTC 0903 "Travel Behavior Observation and Analysis," Dr. Kevin Heaslip, PI. Funded by the Cache Metropolitan Planning Organization (CMPO).
- UTC 0904 "Traveler Satisfaction & Efficiency Study," Dr. Kevin Heaslip, PI. Funded by the Cache Valley Transit District (CVTD).

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