

Center for Transportation Infrastructure and Safety
NUTC NEWS
at Missouri University of Science & Technology



**NATIONAL
UNIVERSITY
TRANSPORTATION
CENTER**

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A MESSAGE FROM THE DIRECTOR — JOHN J. MYERS

The New Year has brought some changes to the Center for Transportation Infrastructure and Safety. Not only did we officially welcome our new University name on January 1, 2008: Missouri University of Science & Technology (formally University of Missouri-Rolla), but we have had to say farewell to some of our Center personnel.

Dr. Nestore Galati (Center Research Engineer) relocated with his wife, Silvia Rocca, and their newborn daughter after accepting a position with a consulting firm on the East Coast. Silvia recently completed her Ph.D. at Missouri S&T in the area of infrastructure engineering. Congratulations Silvia! And thank you, Nestore, for all that you have meant to our transportation center. They will be missed, but we know they will carry the Miner spirit and Missouri S&T flag with them east of the Mississippi.

Prior to Christmas, we also saw the departure of Ms. Rebekah Massmann (Center Editorial Assistant) for the warmer climates of California. Her husband accepted a position there after completing his graduate degree here at Missouri S&T. Thank you, Rebekah, for your outstanding contributions to our NUTC over the years!

Though we are sad to see them go, we will look forward to welcoming new personnel in the coming months. We are also looking forward to welcoming visitors to both the Center and Missouri S&T. Later this month, we will host RITA Administrator Paul Brubaker and in April we will host RITA UTC Program Specialists Robin Kline and Amy Stearns for a Site Visit. Look for more information in our spring newsletter.

For now, please enjoy our winter newsletter. We have highlighted some of our projects and the people that make the Center for Transportation Infrastructure and Safety a center of excellence.

Warm Regards, John

INSIDE...

KARST ACTIVITIES ALONG MISSOURI'S ROADWAYS	2	ENO TRANSPORTATION FOUNDATION STUDENT	4
DR. RONALDO LUNA, P.E., F.ASCE	3	MISSOURI LTAP PROGRAM	5

**UPCOMING
EVENTS**

GeoMO 2008

May 2, 2008
Rolla, MO

**6th National
Seismic
Conference
on Bridges &
Highways**

July 27-30, 2008
Charleston, SC

**6th International
Conference on
Case Histories
in Geotechnical
Engineering**

August 11-16, 2008
Arlington, VA

**New Madrid
Seismic Zone
Conference**

August 12-14, 2008
Rolla, Missouri

Visit <http://utc.mst.edu/events/index.html> for more information.

CENTER FOR TRANSPORTATION INFRASTRUCTURE AND SAFETY

A NATIONAL UNIVERSITY TRANSPORTATION CENTER
AT MISSOURI UNIVERSITY OF SCIENCE & TECHNOLOGY

220 ENGINEERING RESEARCH LABORATORY
ROLLA, MO 65409

P: 573.341.7848
F: 573.341.6215

CTIS@MST.EDU
[HTTP://UTC.MST.EDU](http://UTC.MST.EDU)

**MISSOURI
S&T**



KARST ACTIVITIES ALONG MISSOURI'S ROADWAYS

Missouri is well known for its caves, springs and other geological wonders which make the region a "Karst Wonderland," according to the Missouri Department of Natural Resources website. "The most typical features of karst landscapes are caves, springs and sinkholes."

Caves, often found in limestone and dolomite bedrock, are formed when mildly acidic water dissolves rock as it moves through joints, crevices and fractures in the bedrock, creating an air-filled opening. By this system, a single cave can form or a vast network of connected caves can develop.

When a cave collapses within a matter of minutes it can form a sinkhole, which can be large enough to easily swallow cars or structures. Because of the potential danger and disturbance caused by such an occurrence, the Missouri Department of Transportation (MoDOT) will often consider karst activity before constructing new roadways and intersections.



Aerial photograph of the Jefferson County site, prior to the "emptying" of the sinkhole. The approximate location of the sinkhole has been superposed on the photograph with an "x."



Close-up photograph of the walls of the emptied sinkhole, taken from a location immediately south of the feature.

Dr. Neil Anderson of Missouri S&T, and his team of researchers, recently conducted such testing at two construction sites in the State. Both test sites, one in Greene County, near Springfield and the other in Jefferson County, near St. Louis, already had sink holes present in the area.

Using an electrical resistivity method, which measures the resistance of a substance to an electrical current, the researchers were able to produce images of the sub-surface at the construction sites and determine the level of risk posed by potential karst activity.

The imaging produced at the two test sites not only allowed researchers to determine if there were more air-filled cavities in the area or below existing sinkholes waiting to collapse, but to identify the topographic

composition of the sub-surface. Certain materials filling inactive sinkholes, clay for instance, can densify over time, creating roadway settlement and damage.



DR. RONALDO LUNA, P.E., F.ASCE

Dr. Ronaldo Luna, associate professor of civil and geotechnical engineering at Missouri University of Science & Technology, has been named a Fellow by the American Society of Civil Engineers. Fellows are nominated and selected by their peers and must be a distinguished educator, leader or practitioner within their area of engineering expertise.

Dr. Luna specializes in geotechnical engineering, earthquake engineering, hazard modeling and information systems. He has received more than \$2 million in funding for his research and the development of systems and methodologies which can help to lessen the impact of an earthquake. Some of the agencies which Dr. Luna has received funding from include the National Science Foundation, U.S. Geological Survey, Missouri Department of Transportation, U.S. Bureau of Reclamation and the Association of State Dam Safety Officials.

In 1999, after teaching and conducting research at Tulane University, Dr. Luna came to Missouri S&T where he helped

to establish a soil dynamics laboratory in 2003. He has held previous positions as a professional engineer at Hart Crowser, Inc. in Seattle and Bechtel Corporation in San Francisco.



In 2005, Dr. Luna traveled to his home country of Guatemala for eight months as a Fulbright Scholar delivering lectures on landslides resulting from earthquakes and heavy rain. He also delivered the keynote lecture to the graduating class at the Universidad del Valle de Guatemala. Surviving the 1976 Guatemala earthquake, resulting in 23,000 fatalities, was largely what led Dr. Luna to become

an expert in geotechnical and earthquake engineering.

Dr. Luna was awarded a Ph.D. in civil/geotechnical engineering from the Georgia Institute of Technology in 1995. He holds a master's degree in civil/geotechnical engineering from Purdue University and a bachelor's degree in civil engineering from the University of Maryland.



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**MARY KATHRYN MASTERSON:
ENO TRANSPORTATION
FOUNDATION STUDENT**

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Mary Kathryn Masterson has been selected by the Board of Regents of the Eno Transportation Foundation to participate in the 16th Annual Eno Leadership Development Conference in Washington, DC, May 19-22, 2008. Each year, the Eno Foundation selects 20 of the nation's top graduate students in transportation to attend the conference, which provides a first-hand look at how transportation policy is developed and implemented. Masterson will meet with top government officials, leaders of associations and members of Congress and their staff to explore how the nation's transportation policies are debated, shaped, formed and ultimately adopted and applied.

Masterson earned a B.S. degree in Civil Engineering with Summa Cum Laude honors from the University of Missouri – Columbia in May 2007. During her undergraduate career, Masterson was a member of the MU chapters of the American Society of Civil Engineers (ASCE), Tau Beta Pi National Engineering Honor Society and Chi Epsilon, the National Civil Engineering Honor Society. She was also a member of the Steel Bridge team in 2006 and a starting catcher for the University of Missouri Softball Team during the entirety of her undergraduate career. During the 2006-2007 season, she was a co-captain of the team.

Additionally, during her academic career, Masterson received several awards for excellence and participated in a number of service activities. A few of her activities included: working with Habitat for Humanity in her home city of St. Louis; tutoring elementary school children in mathematics and coaching softball clinics for young girls.

As a graduate student under the advisement of Dr. Glenn Washer, Masterson is conducting research on the long-term monitoring of highway bridges under the project entitled “Long-Term Remote Sensing System for Bridge Piers.” This project is funded by the National Cooperative Highway Research Program (NCHRP) and the Center for Transportation Infrastructure and Safety (CTIS-NUTC) at Missouri S&T.

Masterson anticipates graduating from the University of Missouri – Columbia with a M.S. in Civil Engineering in December 2008 and plans to work as a bridge design engineer.

To learn more about the Eno Transportation Foundation, visit www.enotrans.com.



CURRENT NUTC STAFF

Myers, John
Interim Center Director
jmyers@mst.edu

Sheffield, John
Associate Director
sheffld@mst.edu

Spitzmiller, Gayle
Administrative Assistant
spitz@mst.edu

Sherman, Abigayle
Senior Secretary
abigayle@mst.edu

Geisler, Cheryl Ann
Secretary
geislerc@mst.edu

Cox, Jason
Sr. Research Specialist
coxjn@mst.edu

**Hernandez, Travis
Martin**
Lab/Research Technician
travi@mst.edu

MISSOURI LOCAL TECHNICAL ASSISTANCE PROGRAM (LTAP)

BACKGROUND

In 1982, the Federal Highway Administration (FHWA) answered a pressing need for training and technical information at the local level by creating the Local Technical Assistance Program (LTAP). Each state in the U.S. operates a LTAP center. Most of the centers are located at state universities and many are co-located with University Transportation Centers (UTCs).

LTAP's mission is to foster a safe, efficient, and environmentally sound surface transportation system by improving skills and increasing knowledge of the transportation workforce and decision makers. The national focus areas for the work of LTAP are safety, workforce development, infrastructure management and organizational excellence.

LTAP brings transportation technology and training products and services to local road agencies, public works agencies, public officials, county and municipal engineers, local and state governments, law enforcement agencies, transportation contractors, state departments of transportation and many others.

MISSOURI LTAP

The Missouri LTAP provides technical assistance, affordable workshops and training sessions to improve safety and meet specific local needs. There are over 70 trainings scheduled for 2008 in topics such as: roadway and workplace safety, pavement and gravel road maintenance, heavy equipment training, bridge inspection, bridge maintenance, roadway signing and marking, workforce development, surveying, winter maintenance operations and project management. The program also shares information through websites, quarterly newsletters, technical publications and training materials.

In addition to the FHWA, the Missouri LTAP program is sponsored by the Missouri Department of Transportation (MODOT) and the Center for Transportation Infrastructure and Safety (CTIS-NUTC) at Missouri S&T.

For more information, visit www.campus.mst.edu/moltap.