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Fall 2009

Mack Nuggets, Fall 2009

Mack-Blackwell National Rural Transportation Study Center (U.S.)

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Citation

Mack-Blackwell National Rural Transportation Study Center (U.S.). (2009). Mack Nuggets, Fall 2009. *Mack Nuggets.*, 1 (3) Retrieved from <https://scholarworks.uark.edu/mack-nuggets/5>

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E. Walter LeFevre MBTC Loses a Leader



Dr. E. Walter LeFevre, 77, of Springdale, Arkansas, died on Monday, November 23, 2009 after a lengthy illness.

In 1992, Walt, with the assistance of Congressman John Paul Hammerschmidt, established the Mack Blackwell National Rural Transportation Study Center (MBTC) and served as its Director for several years.

Walt set the standard for all engineers to emulate in his lifelong service to the engineering profession. He was the Past National President of the National Society of Professional Engineers (NSPE), Past National Vice President of the American Society of Civil Engineers (ASCE), former Dean of Engineering and Department Head of Civil Engineering as well as a faculty member for more than 40 years at the University of Arkansas, member of the National Accreditation Board for

Engineering and Technology (ABET), a delegate to the World Federation of Engineering Organizations and U.S. member of many other delegations to various foreign countries.

Additionally he is a member of the National Council of Examiners for Engineering and Surveying (NCEES), and is a Past President of the Arkansas State Board of Registration for Professional Engineers and Land Surveyors. He has presented engineering papers worldwide and been a consultant to a number of countries. He also found time to serve his community as a Past President of Rotary, Past District Chairman of the Boy Scouts of America and many other organizations. He has been recognized as a Distinguished Member, their most prestigious award, of ASCE for his lifetime of hard work for the engineering profession. Walt also served for more than 35 years as Senior Vice President of ESI, an engineering firm, in Springdale.

As a professor for over 45 years, he molded the lives of thousands of superb practicing engineers. He is held in the highest esteem by all who have benefited from his professorship. Walt

LeFevre is regarded by the national engineering community as the backbone of engineering ethics. He helped produce two films and ethics courses, which are used nationally by businesses as well as universities. Additionally he wrote over 200 refereed publications for the engineering industry. His national awards are too numerous to mention, but include Distinguished Service Awards from the American Society of Engineering Education, ASCE, NSPE, NCEES, AAES, Boy Scouts of America and a number of other engineering societies. He was recognized for his service at the University of Arkansas in 1971 by its highest distinction, "University Professor".

Among all of his accomplishments he was also a kind, gentle-hearted, compassionate gentleman, a very dear friend and will be missed very much by his colleagues and friends. The engineering profession has lost a great leader who has given his entire life to the advancement of the profession.

He is survived by his wife, Joyce, of 52 years, and two daughters, two sons, many grandchildren and one great-grandson.

Message from the Director



Dr. Heather Nachtmann

It is often at the passing of a colleague that you realize the full impact of his or her career. Dr. LeFevre was such a humble gentleman that you could never fully understand the impact that he had on MBTC, our College and the engineering field in general without reviewing his full biography or listening to someone else. It is an honor to serve as director of this Center that he began so many years ago.

We held our Annual Advisory Board meeting in October where we had the

opportunity to showcase our research and educational efforts of the year and to discuss our future plans for MBTC. We greatly appreciate the active participation of our board members. Their efforts enhance the value and impact of MBTC's efforts. Our fall semester was busy with our distinguished lecture series and participation in Arkansas' 2009 FIRST LEGO® League competition, "Smart Move."

Since our last newsletter, the best news I have to share as MBTC director is

announcing that Dr. Tish Pohl has joined our administration team. Dr. Pohl has fully immersed herself in assisting with administration and research efforts within MBTC's *National Transportation Security Center of Excellence* program. Given the challenges associated with starting up a new program, I consider myself very lucky that she is still with us and working hard six months later!

All of us at MBTC wish you a happy and healthy holiday season. Travel safely!

First Lego® League – Transforming Transportation

Robots and kids were running rampant in the Mountain Home High School gymnasium on Saturday, December 12, 2009, during the Arkansas State FIRST LEGO® League (FLL) Championship Tournament. FLL, an international program with over 100,000 children (ages 9-14) participating worldwide, is designed to inspire young people to be science and technology leaders. The FLL competition is comprised of two primary activities: building and programming a small robot to accomplish various challenges, and investigating a research topic and presenting findings at the tournament. The theme of this year's challenge is Smart Move – Transforming Transportation.

Twenty-three teams from Arkansas, Louisiana and Missouri competed in the Arkansas regional tournament. The recipient of the Champion's Award, a team from Hot Springs, AR that call themselves "We Like to Move it," will go on to the international tournament in Atlanta, GA next spring. The Champion's Award was awarded based on excellence in four areas: robot design, robot performance, project presentation and teamwork.

MBTC was a sponsor of the Arkansas tournament, and Assistant Director Tish Pohl and Professor Chase Rainwater (Industrial Engineering) represented MBTC as tournament judges. The Arkansas tournament organization honored MBTC's sponsorship by creating an MBTC Special

Recognition Award to be presented to the team whose research best represented the center's mission. The team winning the MBTC award was "High Flyers" from Batesville, AR. Their research project focused on the security of the bridge that spans the White River and connects Batesville and Southside. The team was concerned that in the event of a natural disaster or terrorist event, the loss of the bridge would create a dangerous situation for the community by impeding emergency evacuation and movement of emergency personnel between the two communities. They investigated several alternative solutions and proposed the purchase of a pontoon bridge to be used during emergency situations.



High Flyers members working on their robot during competition



Tish Pohl with the High Flyers team, winners of the MBTC Special Recognition Award

Distinguished Lecture Series

MBTC presented two exciting lectures this fall. Our first lecture was our "Evening with the Pros" presented in conjunction with the Arkansas State Highway and Transportation Department (AHTD). This program was held on September 10, 2009 in the Bell Engineering Center. Our emcee for this year was Bob Walters, AHTD Chief Engineer, (retired), who did a wonderful job introducing our speakers and keeping everyone on time. The speakers for the evening were Randy Hathaway, Ph.D., P.E., Deputy District Engineer for the U.S. Army Corps of Engineers; Emmanuel Banks, P.E., Assistant Chief Engineer-Operations with AHTD; Keith Tenclve, P.E., Project Manager for Garver USA and a recent graduate; Charles Zimmerman, P.E., Vice President of International Design and Construction, Wal-Mart Stores, Inc.; and James Engstrom, P.E. of H. James Engstrom & Associates, Inc. and a member of the Board of Licensure for Professional Engineers and Professional Surveyors. All of these professionals gave a great overview of workplace

issues such as working in a large government organization, how to progress in your career, mentoring (not only yourself but others), the global perspective of engineering, why licensure is important, and other issues to anticipate when entering the workforce.

Our second lecture was held on October 20, 2009, following our annual advisory board meeting. This year, Mr. Rod Diridon, Executive Director of the Norman Y. Mineta International Institute for Surface Transportation Policy Studies at San Jose State University, spoke on light rail systems. Mr. Diridon discussed how his community was years before light rail came to his area. He said they had not planned for the expansion of their community and lost some of the scenic beauty of the countryside. He stated that NW Arkansas should be looking to the future now as it takes over 10 years to put a light rail system in place. If we wait to start planning until we need light rail, we could be in the same situation as his community.

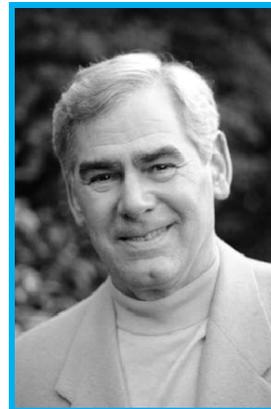
Mr. Diridon chaired the campaign for the first successful ½-cent sales tax for transit in California and subsequently chaired five successful transit master plan elections and tax measures. The historic Amtrak/Caltrain Station in San Jose was renamed the San Jose Diridon Station in honor of his many years of service.



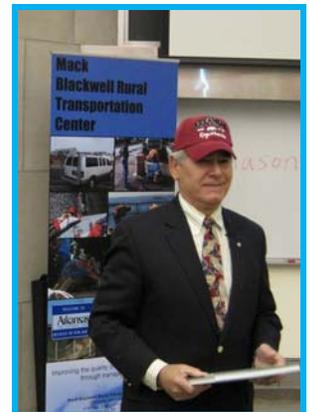
Charles Zimmerman, Harold Beaver and Kevin Hall



Bob Walters, James Engstrom and Emmanuel Banks



Rod Diridon



Rod Diridon with Razorback Cap

MBTC Director Heather Nachtmann and **Executive Director Kevin Hall** were recently appointed by Dan Flowers, Director of Arkansas State Highway and Transportation Department (AHTD), as members of the Department's Advisory Council for Transportation Research. The Advisory Council was created to assist the Transportation Research Committee by providing direction to the Department's research program and meets annually to review and propose areas of needed research.

Center for Training Transportation Professionals

The Center for Training Transportation Professionals has completed another year of furnishing training, certification, and laboratory inspection for the State of Arkansas. Along with the basic materials training courses, CTTTP has continued to offer more specialized training in other transportation areas. Approximately 500 participants received classroom instruction from CTTTP during 2009.

The CTTTP erosion and sediment control certification course (NPDES) is continuing to be offered. This course was developed to instruct students in the proper procedures for protecting the environment by preventing and/or controlling construction site pollution. The importance of using best practices for minimizing pollution runoff from construction sites cannot be understated. As agencies such as the Arkansas Department of Environmental Quality step up requirements for jobsite

compliance, this course seeks to instruct students on how to use and maintain the most effective pollution control measures as well as how to correctly document the entire construction site erosion control plan.

The American Concrete Institutes Associate Concrete Transportation Construction Inspector Seminar and Certification testing program was recently offered. This class focused on specifications particular to concrete construction and inspection. Based on feedback received from participants, it is anticipated that the program may be offered in the future with more emphasis placed on specifications that are unique to Arkansas.

Beginning January 1, 2010, the American Concrete Institute's Concrete Strength Testing Technician certification will be a required certification in the State of Arkansas. This course involves the specifications related to hardened concrete

strength. Technicians learn techniques to correctly prepare cylinders and beams for testing, using both bonded and unbonded capping systems and the steps to correctly complete compression testing.

CTTP also continues to co-sponsor seminars on specific topics of general interest. Recently, a seminar on mix and specifications of asphalt was conducted at the request of a local engineering firm. This one half day seminar provided an in-depth discussion of asphalt mixtures and specifications, and participants received both classroom and laboratory instruction. Another recent seminar "Post Earthquake Safety Evaluation of Buildings", presented procedures and documents to assist in the rating of earthquake-damaged buildings. Upon completion, participants could potentially participate as a team member in the inspection of earthquake damaged buildings.

Summer Transportation Institute

MBTC hosted a day of fun with 20 students from North Little Rock's Summer Transportation Institute (STI) which was sponsored by Arkansas State Highway and Transportation Department (AHTD).

During the 2009 STI program, students spent several weeks learning about materials, bridge design, html programming, and personal development.

On their field trip to the University of Arkansas in Fayetteville, they toured the CTTTP facility. Dr. Hall, MBTC Executive Director, showed the students the "shaker truck" giving a demonstration of how an actual earthquake would feel. He also explained that the truck was used for other testing methods to improve our roads in Arkansas.

The STI students then were given a challenge to

build a bridge on the computer. Once they had developed their design on the computer, the students were able to take the drawing from the computer to reality. The students were given K'Nex toy building materials to simulate the building of their designed bridge.

MBTC enjoyed hosting the STI students and looks forward to their visit next year.



Ms. Roselie Conley, Ms. Mary Fleck, Ms. Frances Griffith, Dr. Stacy Williams, Ms. Carrie Pennington



Training classes



MBTC's Recently Completed Projects

Listed below are projects completed since our Spring 2009 newsletter. Full reports for these and all other completed MBTC projects are listed on our website at www.mackblackwell.org/web/research/all-projects.htm.

JUNE 2009

MBTC DOT 2096/3007
Solar Powered Lighting for Overhead Highway Signs
Principal Investigator:
Hirak C. Patangia, Ph.D., P.E.
University of Arkansas at Little Rock

MBTC DOT 2091
Rural Transportation Emergency Preparedness Plans
Principal Investigators:
Heather Nachtmann, Ph.D. and Ed Pohl, Ph.D.
University of Arkansas

OCTOBER 2009

MBTC DOT 2090/3002
Performance Prediction of the Strong Company's Soft Ground Arrestor System using a Numerical Analysis
Principal Investigator:
Ernie Heymsfield, Ph.D., P.E.
University of Arkansas



JULY 2009

MBTC DOT 3010
A Cost-Driven Policy Approach for Development of On-Street and Off-Street Bicycle, Multi-Use and Single-Use Paths and Related Facilities
Principal Investigator:
John Crone
University of Arkansas

AUGUST 2009

MBTC DOT 2095/3004
Potential Application of Nanotechnology on Cement Based Material
Principal Investigators:
R. Panneer Selvam, Ph.D., P.E. and Kevin D. Hall, Ph.D., P.E.
University of Arkansas



MBTC's New Projects

MBTC DOT 3015

Rapid Condition Screening of Bridges by Falling Weight Deflectometer
Principal Investigator:
Kirk Grimmelman, Ph.D.
University of Arkansas

MBTC DOT 3017

Practical Recommendations for Evaluation and Mitigation of Soil Liquefaction in Arkansas
Principal Investigator:
Brady Cox, Ph.D.
University of Arkansas

MBTC DOT 3019

Network Design Analysis for Special Needs Students Services
Principal Investigators:
Scott Mason, Ph.D. and Ed Pohl, Ph.D.
University of Arkansas

MBTC DOT 3016

AHTD Cracking Protocol Application with Automated Distress Survey for Design and Management
Principal Investigators:
Kelvin C.P. Wang, Ph.D., P.E., and Kevin D. Hall, Ph.D., P.E.
University of Arkansas

MBTC DOT 3018

The Production of Butanol Fuel from Renewable Systems Using a Membrane Assisted Fermentation System
Principal Investigators:
Jamie A. Hestekin, Ph.D., Robert E. Babcock, Ph.D. and R.B. Beitle, Ph.D.
University of Arkansas

MBTC DOT 9312

Development of a Large-Scale Transportation Course
Principal Investigator:
Sarah Root, Ph.D.
University of Arkansas



MBTC Advisory Board Transitions for 2009

- Retired Board Members
 - Tom Dames, Ph.D., P.E., RADM (Ret.), Senior Vice President (Ret.), CH2M Hill
 - Pat Drennon, P.E., RADM (Ret.), Senior Vice President, Parson Brinckerhoff
- New Board Members
 - Harold Beaver, P.E., District Engineer for AHTD (Ret.)
 - Jack Buffington, P.E., RADM (Ret.), University of Arkansas, Research Professor (Ret.)

Mack-Blackwell Rural Transportation Center

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The Research and Innovative Technology Administration (RITA) coordinates the U.S. Department of Transportation's (DOT) research programs and is charged with advancing the deployment of cross-cutting technologies to improve our Nation's transportation system and Mack-Blackwell is proud to be a participating university.



The Department of Homeland Security's National Transportation Security Center of Excellence (NTSCOE) is developing new technologies, tools and advanced methods to defend, protect and increase the resilience of the nation's multi-modal transportation infrastructure and education and training base lines for transportation security geared towards transit employees and professionals.

Kevin Hall, Ph.D., P.E.
Executive Director

Heather Nachtmann, Ph.D.
Director

Letitia M. Pohl, Ph.D.
Assistant Director
NTSCOE Program

Dana Ledbetter
Communications Director

Sandra Hancock CPS
Fiscal Support Analyst

We're on the Web!

See us at:

www.mackblackwell.org

About Mack-Blackwell...

Dr. Letitia (Tish) Pohl has joined the Mack-Blackwell Transportation Center as the Assistant Director of its National Transportation Security Center of Excellence program. Dr. Pohl completed her Ph.D. in Industrial Engineering from the University of Arkansas in 2009. She has a M.S. in Systems Engineering from the Air Force Institute of Technology and a B.S. in Mechanical Engineering from Tulane University. Dr. Pohl served as an officer in the U.S. Air Force for eight years.

Tish stated, "I am delighted to be a part of

Mack-Blackwell and am looking forward to applying my research skills to the area of transportation. Transportation security, in particular, is critical to our overall national security, and I am happy to have an opportunity to contribute." She will work closely with other Center directors in project administration, external proposal writing and research execution related to NTSCOE.

Dr. Pohl previously worked on MBTC DOT 2087, A Model to Design a National High-Speed Network for Freight

Distribution with Drs. Russell Meller and Kevin Gue. She developed the initial project description and model formulation.

Everyone at MBTC welcomes Tish and is looking forward to working with her!



Letitia M. Pohl, Ph.D.

Annual Advisory Board & Student Poster Contest

MBTC hosted its Annual Advisory Board meeting on October 19 and 20, 2009. The meeting started with the Dean of the College of Engineering, giving a welcome address to those attending the meeting. Dr. Heather Nachtmann, MBTC Director, updated the advisory board on the events of the Center from the past year. Dr. Stacy Williams, CTPP Director, gave an overview of the classes taught and upcoming new courses that would be offered in the future. Several of our principal investigators gave updates on their projects. In the afternoon, a discussion with the

advisory board members regarding possible future research topics along with a wrap-up session concluded the meeting.

During the lunch break, we held our third annual Jack Buffington Student Poster with eleven poster entries. This year's winner was Andy Tackett, Examining the Effects of Mixer Type and Temperature on the Properties of Ultra-High Performance Concrete, who also won last year's contest.

Other students who participated in the poster contest were Nikki Lorenz, Kris White, Leily



Andy Tackett with his poster

Farrokhvar, Christina Trowler, Alex Font, Minghua Qiu, Christian McGuire, Jeremy Rawn, Tom Potts, Behrooz Kamali, Qingbiao (Mike) Ni, and Ryan Black.