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Mack Nuggets

Mack-Blackwell Rural Transportation Center

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Fall 2007

## Mack Nuggets, Fall 2007

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

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# Mack Nuggets

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## MBTC Named in Homeland Security Act



U.S. Senator Mark Pryor meets with Mack-Blackwell and others to discuss the Center's role in the Improving American's Security Act of 2007 at the Center for Training Transportation Professionals.

The Mack-Blackwell Rural Transportation Center (MBTC) is named as one of six transportation research centers that is authorized to share \$18 million annually for the next four years to study ways to protect the security of America's transportation system. The University of Arkansas research center is named as a member of the National Transportation Security Center of Excellence (NTSCOE) in the Improving America's Security Act of 2007, which President Bush signed on August 3, 2007. The purpose of the act is to put recommendations

of the 9-11 Commission into law and will protect the nation's transportation assets from terrorist attacks and natural disasters.

U.S. Senator Mark Pryor visited MBTC on August 21, 2007 to learn more about the Center's efforts in homeland security. MBTC leadership, Kevin Hall and Heather Nachtmann, led Senator Pryor, Chancellor John White, and other University officials on a tour of the Center spotlighting ongoing research in this area.

Arkansas contains thousands of miles of

highways, inland waterways, and rail lines. MBTC has funded multiple projects investigating transportation security and envisions vast opportunity for further research. One such project recently completed by Heather Nachtmann is MBTC-2085, Homeland Security for Rural Transportation Networks, which can be found on the MBTC website.

The other members of the NTSCOE are Rutgers University in New Brunswick, NJ, University of Connecticut, Texas Southern University, Tougaloo College, and Long Island University.

## Message from the Director



Heather Nachtmann, Ph.D.

We are excited to bring you our first issue of *Mack Nuggets*. I hope you enjoy reading the efforts of our communications director, Dana Ledbetter, as much as I did. We find ourselves working harder to give Dana material that is worthy of her writing talent! Thanks to the tremendous efforts of our accountant, Sandy Hancock, we have successfully transitioned to the new SAFETEA-LU grant.

This issue spotlights several ongoing MBTC initiatives including our exciting new designation as a member of the Department of Homeland

Security (DHS)'s National Transportation Security Center of Excellence, our distinguished lecturer series, and professional training efforts. Please take moment to look at the list of our recently completed projects. We are proud of these and all of our other research efforts which can be found on our website.

Much of this month was spent traveling for MBTC activities. In addition to a kickoff meeting at the DHS and a trip down the Arkansas River (see page 6), I recently returned from the TRB Research Issues in Freight Transportation conference in Washington

D.C. Serving on the conference planning committee gave me the opportunity to help shape this important meeting of UTC stakeholders. It was a successful gathering of academic, private, and public transportation professionals including our partners at US DOT's Research and Innovative Technology Administration.

On behalf of the entire MBTC team, I thank you for taking the time to read about MBTC. We are proud of our center efforts and thank the US DOT and our match partners for their continued support.

*"One potential advantage of tall oil is that glycerol is not produced during the esterification process."*



Brent Schulte, Dr. Hall, Dr. Clausen and Senator Mark Pryor

## Biodiesel Produced from Chicken Fat-Tall

Biodiesel is an alternative to conventional diesel fuel made from renewable resources such as animal fats and vegetable oils. The main impediment to widespread commercial development of biodiesel is its relatively high cost compared to traditional petroleum based diesel and the production of large quantities of glycerol byproduct. Attendant feedstock and output price fluctuations for raw materials, energy costs and glycerol byproduct marketability as well as access to supply change distribution channels present challenges to biodiesel as an alternative fuel that are partially addressed in this research. Although biodiesel is most often

produced from soybean oil in the U.S., other oil- and fat-containing raw materials such as animal fats (specifically chicken fat and beef tallow) may also serve as feedstocks and in turn reduce exposure to feedstock price risk. In Arkansas, one additional feedstock of interest is tall oil, a by-product of the paper mill industry. One potential advantage of tall oil is that glycerol is not produced during the esterification process. Therefore, to what extent a blended chicken fat/talloil feedstock is a technical and economic substitute for soybean oil in the production of biodiesel is an important consideration. Because this project utilizes

Arkansas materials as feedstocks and results in a fuel that can be readily employed for transportation by farmers and truckers, it fits well within the MBTC mission of improving the quality of U.S. rural life through transportation.

Robert E. Babcock, Ph.D., P.E., Ed Clausen, Ph.D., and Michael Popp, Ph.D. are the Principal Investigators for this project (MBTC-2092). They also have two students working with them on this project. W. Brent Schulte is a graduate student from Little Rock working on his Master's in Chemical Engineering and Joel Vincent is a Junior working on his Bachelor's in Chemical Engineering.

## Lecture Series

### “Evening with the Pros”

The MBTC and Arkansas Highway and Transportation Department hosted the 15<sup>th</sup> Annual Civil Engineering Career Orientation Program, “Evening with the Pros”, from 5:15 – 7:00 pm on September 13, 2007 in Combs Auditorium. Students and other interested parties were invited to attend and learn about “Civil Engineering in the Real World.”

This year’s emcee was Mike Marlar of Marlar Engineering of North Little Rock. The speakers for the evening were Kirby Rowland of Garver Engineers, Steve Beam of Crafton & Tull Engineers, Carl Bachelor of the Arkansas Highway and Transportation Department and Don Mosley of Wal-Mart. They all discussed what to expect during an interview, what types of questions to ask in an

interview, and how to prepare ahead of time for the interview and salary negotiations. As each company has different job openings, each gave an overview of what was expected to be open now and in the future.

Steve Beam gave useful information to the students as he is a recent graduate and explained what to expect in the first days on the job.

A question and answer session followed the lecture.

### “Distinguished Lecture Series”

Dean T. Kashiwagi, Ph.D., P.E., Director of the Performance Based Studies Research Group and Professor at Arizona State University, presented “The Best Value Model for Education: Can Everyone Win?” on October 11, 2007 in Combs Auditorium.

Arizona State University has discovered a “Best Value” model that allows all participants to win in an environment of efficiency, effectiveness, and measurement. Dr. Kashiwagi demonstrates if it isn’t a win-win, no one wins. The simple models show that performance measurements need to be simple, logical, and effective in motivating a change of behavior and a change of culture.

Professor Kashiwagi is a master at making the complex simple as he uses logic models to simplify the process of cultural change and continuous improvement. The presentation showed how a client/buyer can get vendors to think on their behalf by transferring both risk and control, without having to “trust” the vendor.



Don Mosley of Wal-Mart, Inc. at Evening with the Pros



Dean Kashiwagi, Ph.D., P.E.

## The Next Generation in Engineering

The summer has come and gone and the semester is almost halfway over. You still have projects that need your attention, students that need advising, and papers that need grading. Let’s look into the busy schedule of our new director, Heather Nachtmann.

She had two projects that were due on May 31,

2007 and was 9 months pregnant. What do you do?!?!?! She actually turned them in six days early! What a concept. But to add fuel to the fire, she goes and has her baby on the 31<sup>st</sup> of May which was also ahead of schedule.

Our new director has her hands full with learning the ropes as director along with motherhood.

Thankfully, she has had experience in both areas as she was our associate director and also has two other beautiful children, Tyler, age 13, and Julia, age 2.

Mack-Blackwell would like to congratulate Heather Nachtmann and her husband, Justin Chimka on their new arrival, Liam Robert Chimka, 6 lbs, 9 ounces and 19-1/4 inches.



Liam Robert Chimka



## Center for Training Transportation Professionals

By Frances Griffith



Frances Griffith, Carrie Pennington, Stacy Williams, Roselie Coney.

The Center for Training Transportation Professionals (CTTP), MBTC's training arm, began operating shortly after the Arkansas Highway and Transportation Department (AHTD) implemented its 1996 edition of Standard Specifications for Highway Construction. This new AHTD inspection system divided responsibility for quality assurance between contractors, who have primary responsibility; and AHTD personnel, who perform limited verification of the contractors' work. The Center works closely with AHTD, and about half of CTTP's students are AHTD personnel. Others are employees of more than 100 private construction firms involved in AHTD projects. The responsibility of CTTP involves training technicians on the correct techniques of running materials testing on aggregates, asphalt, concrete, and soil.



Mary Fleck

The basic format of the courses, developed by Professor and Head of the Civil Engineering Department, and Executive Director of MBTC, Kevin D. Hall, Ph.D., P.E., has been successful from the start. Classes are limited to 20

individuals to ensure adequate lab time for each student.

In the fall of 2004, CTTP moved to its new training facility. The facility was formally dedicated to Dan Flowers, Director of AHTD, on October 29 of that same year. The new classroom features an enhanced classroom format and complete multi-media capabilities.

CTTP lost Kevin Hall's directorship when he took the position of Department Head for the Department of Civil Engineering. Replacing Dr. Hall as director is Dr. Stacy Williams. Dr. Williams has worked closely with the CTTP program since receiving her Ph.D. in August 2001. Her duties included oversight of the Laboratory Certification program as well as primary instructor in both the Basic Aggregates and Soils/Aggregates programs. Under her direction, CTTP will be redesigning the CTTP website, which will incorporate extensive on-line training modules.

Frances Griffith is the administrator of the technician training program. Her chief responsibility has been ensuring that all training classes are presented per

agreement with the AHTD.

Development of new training has also become a major part of the program. Concrete Strength Testing, Construction Surveying, and Concrete Pavement Patching have recently been added as additional training courses. Roselie Conley joined CTTP in the spring of 2005. In addition to assisting with the training courses, her main function is to perform field laboratory inspections of one hundred laboratories performing field testing.

The most recent addition to the CTTP staff is Mary Fleck. As new classes have been added to the program, the need for an additional instructor became apparent. Mary came to CTTP from Delta Asphalt of Arkansas. She has over 18 years of experience in the construction industry. Mary will become the primary instructor for the basic materials courses and will take responsibility for maintaining AASHTO certification for the Civil Engineering laboratories.

For more information on CTTP or to see the listing of available courses, go to their website at [www.cttp.org](http://www.cttp.org).

## MBTC's Recently Completed Projects

Listed below are projects completed since the start of this new grant year. Full reports for these and all other completed MBTC projects are listed on our website at [www.mackblackwell.org/web/research/all-projects.htm](http://www.mackblackwell.org/web/research/all-projects.htm).

### JULY 2007

MBTC - 7015  
Assessment of Multimodal Transport of Baled Poultry Litter and Dewatered Biosolids from Northwest Arkansas

Principal Investigators:  
Harold L. Goodwin, Ph.D. and Kenneth B. Young, University of Arkansas

MBTC – 2080  
Effects of Not Wearing Safety Belts on Injury Severity

Principal Investigator:  
Sunanda Dissanayake, Ph.D., Kansas State University

MBTC – 2064  
Assisted Night Vision for Motorists in Highway Construction Zones: Phase II (Field Testing and Assessment)

Principal Investigator:  
Hirak C. Patangia, Ph.D., P.E., University of Arkansas at Little Rock

MBTC – 2072  
Roundabout Feasibility Study for West Memphis, Arkansas as a Prototype for Intersection Improvements

Principal Investigators:  
John V. Crone, Otto Loewer, Ph.D., and Carolyne Garcia, University of Arkansas,

### AUGUST 2007

MBTC – 2093  
Improved Traffic Signal Efficiency in Rural Areas Through the Use of Variable Maximum Green Time

Principal Investigator:  
Steven Click, Ph.D., P.E.

### SEPTEMBER 2007

MBTC – 2079  
A Safety Analysis of Driver Reaction to Alternative Traffic Control Devices at Rail-Highway Grade Crossings

Principal Investigators:  
Eugene R. Russell, Ph.D., P.E. and Margaret Rys, Ph.D., Kansas State University



Field Testing



At the CUTC Meeting in Madison, Wisconsin this summer, there were many sites to see but this one was the most unusual. What some Universities will do to be on the cutting edge of Transportation!!!

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DOT invests in the future of transportation through its University Transportation Centers Program, which awards grants to universities across the United States to advance the state-of-the-art in transportation research and develop the next generation of transportation professionals.



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.

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

Heather Nachtmann, Ph.D.  
Director

Jack Buffington, P.E., RADM (Ret.)  
Associate Director

Dana Ledbetter  
Communications Director

Sandy Hancock, CPS  
Accountant

**We're on the Web!**

See us at:

[www.mackblackwell.org](http://www.mackblackwell.org)

**Governor's Conference on Waterborne Transportation**

MBTC Director, Heather Nachtmann, addressed the Arkansas House and Senate Interim Committee's on Public Transportation of the Arkansas General Assembly on October 9, 2007 at the 12<sup>th</sup> Annual Arkansas Governors' Conference on Waterborne Transportation held in Little Rock, Arkansas at the Doubletree Hotel. Dr. Nachtmann presented aboard the U.S. Army Corps of Engineers' inspection barge named the Ted Cook.

The inland waterways of Arkansas were discussed along with the benefits of

water transportation such as fuel efficient, congestion reducing, and environmentally friendly. The direct and indirect impacts of water transportation on the Arkansas economy was presented including how each additional dollar earned in the water transportation industry contributes an additional dollar of revenue to the economy and how each new water transportation job adds three additional jobs to the State. The ancillary benefits of inland waterways (recreation and tourism, water supply, power generation, environmental) were

discussed through a case study conducted on the Ouachita River Navigation System.

While the group was aboard the Ted Cook, a tug boat passed by while pushing 15 barges down the Arkansas River. This served as a wonderful visual example of how the waterways can be very efficient in moving large amounts of goods on our rivers. This particular barge configuration was able to move approximately 900 truckloads (each barge can carry an estimated 60 truckloads) of goods in one trip.



15 barges being moved by a tug boat that was passing by the Ted Cook during the 12<sup>th</sup> Annual Governor's Conference in Little Rock, Arkansas

**About Mack-Blackwell...**

The Mack-Blackwell Rural Transportation Center is named in honor of State Senators Y.M. Mack of Moorefield, Arkansas and Lawrence Blackwell of Pine Bluff, Arkansas who co-sponsored the 1952 legislation creating the current structure of the Arkansas State Highway

Commission and the Arkansas State Highway and Transportation Department. Amendment 42 to the State Constitution was approved by the voters in November 1952 and is more commonly known as the Mack-Blackwell Amendment.

The AHTD is a major source of matching funds for the research conducted by MBTC, and in recognition of this, the University of Arkansas named the Center in honor of Senators Mack and Blackwell.