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Annual Report

Mack-Blackwell Rural Transportation Center

2011

Annual Report, 2010-2011

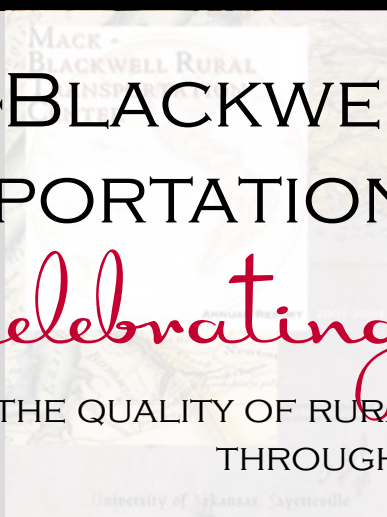
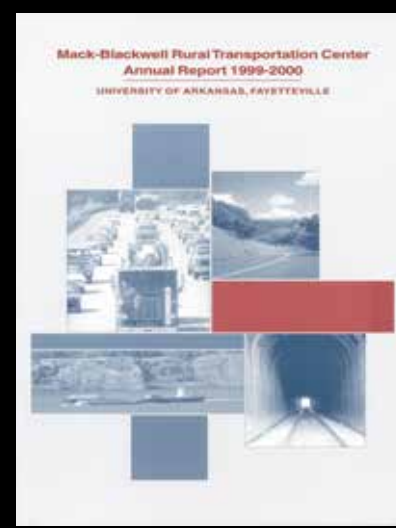
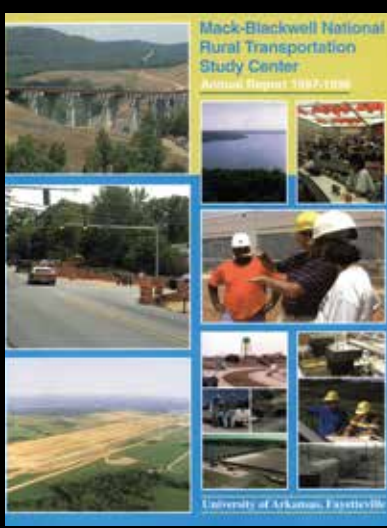
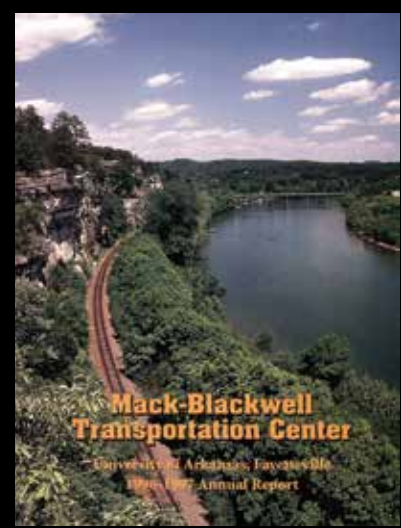
Mack-Blackwell National Rural Transportation Study Center (U.S.)

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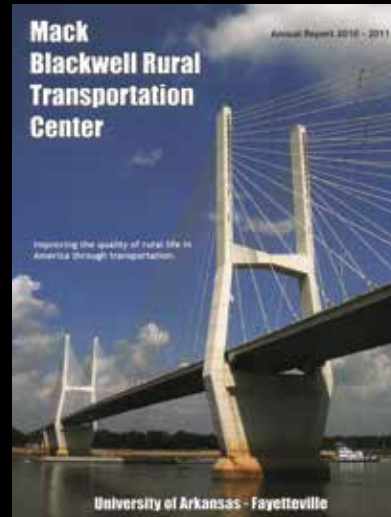
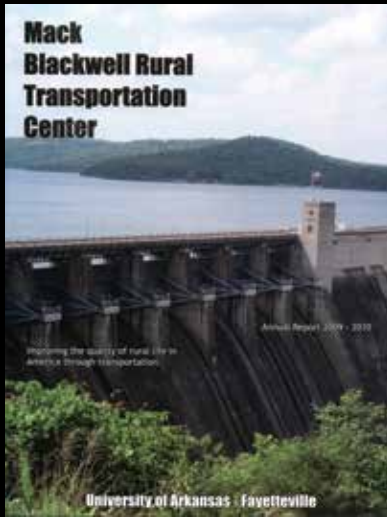
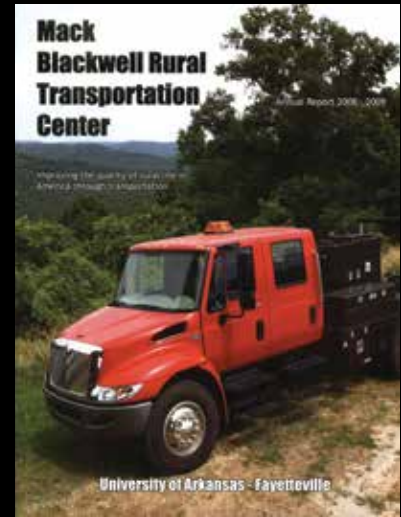
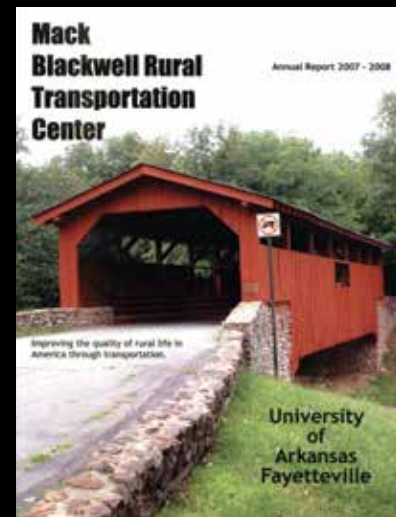
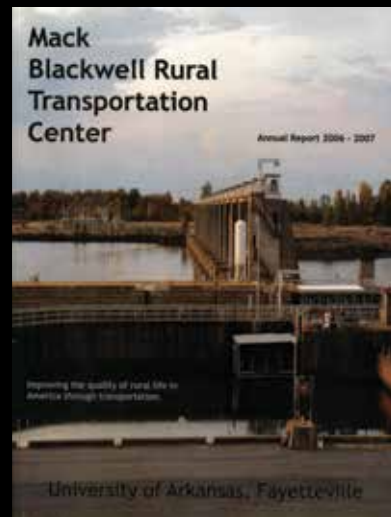
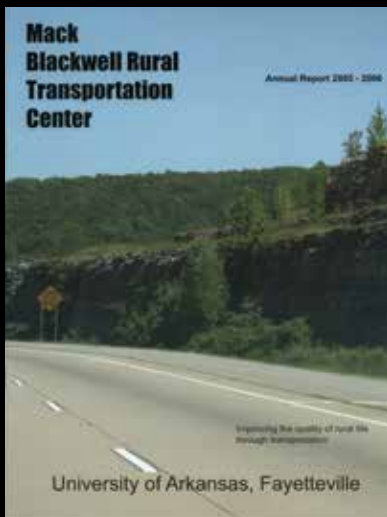
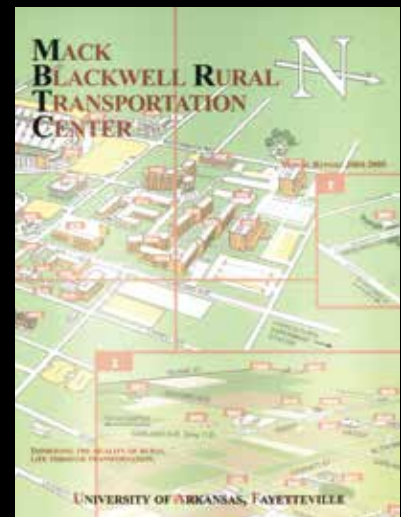


MACK-BLACKWELL RURAL TRANSPORTATION CENTER

celebrating 20 years

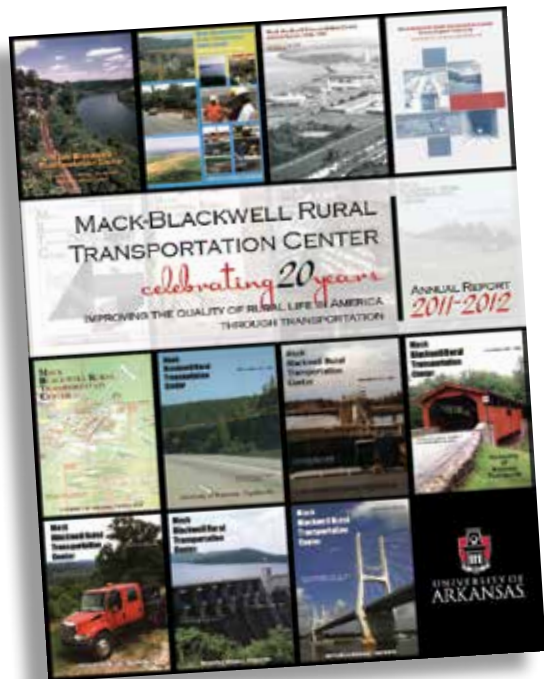
IMPROVING THE QUALITY OF RURAL LIFE IN AMERICA THROUGH TRANSPORTATION

ANNUAL REPORT *2011-2012*



UNIVERSITY OF ARKANSAS

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MESSAGE *from the* DIRECTOR

Heather Nachtmann, Ph.D.
Mack-Blackwell Rural Transportation Center

To celebrate Mack-Blackwell's twentieth year, we developed a three-fold vision for this year's annual report. We wanted to document the rich history of the Mack-Blackwell Rural Transportation Center (MBTC), describe the significant impact that MBTC has made to the transportation community, and provide an overview of the past year's activities. To achieve this, we needed the input of many people who have been involved with MBTC since it began operations in 1991. Even though we spend our days observing the contributions made through the center, we were touched and impressed with the heartfelt responses we received from students, faculty, administrators, and external stakeholders whose lives had been positively impacted by MBTC. The path described by Mr. Scott Bennett from MBTC's 1995 Outstanding Student of the Year to the current Director of the Arkansas State Highway and Transportation (AHTD) department is the epitome of this impact. We are grateful to all of you who shared your MBTC stories with us.

As described in our 20 Year Retrospective, MBTC has made tremendous accomplishments towards the USDOT's University Transportation Center program goal to improve transportation research and education in the United States by advancing technology and expertise across multiple modes of transportation and addressing vital workforce needs for the next generation of transportation leaders. From our research overview to our look into where our outstanding students are now, you can easily gain an appreciation for the technology and workforce development accomplishments of the center.

We have had another great year filled with research accomplishments ranging from rail transportation planning for rural communities to sustainable power generation, extensive workforce development activities through CTFP, and excellent speakers in our Dan Flowers Distinguished Lecture Series. In the words of retired AHTD Director Dan Flowers himself, "with the significant support of the AHTD and the Highway Commission, the Mack-Blackwell Rural Transportation Center was established and has been successful in involving universities from around the state and the nation in a collaborative approach to specific research projects, taking advantage of certain regional and national expertise in specific research areas."

Kind Regards,

Heather Nachtmann

20 YEAR *retrospective*

IN THE *beginning...*



Bob Elliott
Department of Civil Engineering



Don Pederson
Vice Chancellor for Finance & Administration University of Arkansas



Rick Malstrom
Department of Industrial Engineering



John Ozment
Walton College of Business

The Mack-Blackwell Rural Transportation Center (MBTC) has been serving the state of Arkansas and the nation for 20 years by providing state-of-the-art research, high-quality transportation education and technology transfer. To celebrate our 20th anniversary, we will explore how the center began and the people who were key players in its formation and vision for the future.

In 1987, Congress authorized the University Transportation Center (UTC) program, which led to the establishment of ten regional UTCs, one in each of the ten federal regions. The UTC program was designed to improve transportation research and education in the US by advancing technology and expertise across multiple modes of transportation and addressing vital workforce needs for the next generation of transportation leaders.

In the spring of 1991, Congress was hard at work developing a new transportation bill that would provide a major change to transportation planning and policy. Professor **Bob Elliott**, soon to become the head of the Department of Civil Engineering at the University of Arkansas (the U of A), recalls that then Vice Chancellor for Academic Affairs **Don Pederson** had word that

there would be funding in the new bill for additional UTCs. He called a meeting of those across the U of A campus with an interest in transportation. Among those attending were Elliott, Professor **Rick Malstrom** from the Department of

Industrial Engineering and Professor **John Ozment** from the College of Business Administration. Vice Chancellor Pederson instructed them to begin preparing a proposal to compete to become one of the new centers and asked engineering to take the lead. Elliott developed the proposal, with input and critiques from Malstrom and Ozment. This multi-disciplinary approach to transportation for which MBTC has been known was intentional from the start. Dr. Elliott stated, “We wanted to be more than just asphalt and concrete.” Since its inception, the MBTC Executive Board has been comprised of the head of the Department of Civil Engineering, the head of the Department of Industrial Engineering, a representative from the College of Business, and the Associate Vice Chancellor for Research (currently Vice Provost for Research & Economic Development).

In early summer of 1991, the draft proposal found its way into the hands of **John Paul Hammerschmidt**, the US Representative from the 3rd District of Arkansas. Congressman Hammerschmidt was then the ranking minority member of the House Transportation Infrastructure Committee, and a co-author of the transportation bill under development. Dr. Elliott recalls that those returning from the meeting with Hammerschmidt described his reaction as something like, “Well the bill currently calls for two new centers that are named in the bill. I guess we need to add a third.”

The news that the bill would name centers, rather than establish a competition, impacted the planning process at the U of A. Over the summer, the team continued to refine the proposal, now receiving input from Hammerschmidt’s office. As he worked to get the center named in the bill, Hammerschmidt identified aspects that would help sell the center and relayed that information to the proposal-writing team through his staff. He also used the evolving proposal in his discussions with other legislators developing the transportation bill. In response to direction from Hammerschmidt’s staff to identify a focus for the center, the proposal team decided that the natural focus should be on rural transportation. The center was named in the Intermodal Surface Transportation Efficiency Act of 1991, which was signed into law on December 18, 1991 by President George H. W. Bush. Bob Elliott coined the center name cited in the bill – the National Rural Transportation Study Center.

20 YEAR *retrospective*



THE FIRST CENTER DIRECTOR

The center had federal funding, now it needed a director. Professor **Walt LeFevre**, senior faculty member and former head of the civil engineering department, agreed to take on the job. In

Dr. Elliott's words, "Walt was the ideal person for the job, particularly during the early days when a lot of dealing with USDOT was needed." Dr. LeFevre's national-level leadership experience and communication skills allowed him to deal effectively with both state and federal agencies. Under his leadership, the vision for the center was refined, the Executive Board and Professional Advisory Board were established, and the procedures for soliciting and selecting research projects were developed. The structure and processes established under Dr. LeFevre became a model that other UTCs have used for setting up their own administrative functions.



PARTNERING WITH THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

A close collaboration with the Arkansas State Highway and

Transportation Department (AHTD) was essential for the success of the new transportation center. According to Dr. Kevin Hall, current MBTC Executive Director, "AHTD whole-heartedly supported the center from the earliest days. They committed to the University of Arkansas, which cemented an already strong relationship." AHTD supported the center with research funding, by sending employees to the University as graduate students, by establishing the Center for Training Transportation Professionals (CTTP), and through participation in the Professional Advisory Board. At the annual meeting of the Transportation Research Board



John Paul Hammerschmidt, a native of Harrison, AR, was elected to Congress in 1966 and served the nation and the state of Arkansas for 26 years (1967-1992). His most significant achievements include securing the Buffalo River's

designation as the first national river and funding for Interstate 540.

Upon Hammerschmidt's retirement in 1993, former Congressman, Commerce and Transportation Secretary Norman Mineta said: "There is no individual in the House who is more loved and respected than John Paul Hammerschmidt. His honesty, gentleness, decency and integrity are second to none. Don't be swayed by his quiet manner, because underneath is a man with strong convictions, a sense of purpose and a keen desire to get things done." In honor of his 90th birthday, U.S. Senators Mark Pryor and John Boozman paid tribute to Hammerschmidt on the senate floor on May 14, 2012.

Source: Comments by U.S. Senator Mark Pryor, May 14, 2012.

in January 1992, **Dan Flowers**, then Deputy Director of AHTD, assured Bob Elliott that he would do all he could to help with the new center. "He certainly did live up to that promise," stated Elliott. During his 17-year tenure as the Director of AHTD (1994-2011), Director Flowers was a staunch supporter of MBTC and the University of Arkansas.

"Over the past 20 years, the Highway Commission has approved millions of dollars in support of the center and to conduct numerous research projects related to highway development and engineering," said Flowers. "Emphasis has been placed on research that has practical application – using the research findings to improve methods and to address immediate problems and/or needs. MBTC has become well known nationally for its excellence and its contribution to transportation research, training and technology transfer. The U of A, the AHTD and the State of Arkansas have received a significant benefit, and will benefit in the future, from the continuation of the work of MBTC."

20 YEAR *retrospective*

MACK-BLACKWELL

A 1992 presentation by Walt LeFevre and Bob Elliott to the **Arkansas Highway Commission** resulted in the first approved state funds and a new name for the center. The commission approved the funding request and asked that the center do something to honor the two state legislators who authored the bill establishing the Arkansas State Highway Commission in 1952. The center was renamed as the Mack-Blackwell National Rural Transportation Study Center, in honor of Arkansas state senators Y.M. Mack and Lawrence Blackwell. This designation was later shortened to the Mack-Blackwell Rural Transportation Center (MBTC). This year is not only the 20th anniversary of MBTC, it is also the 60th anniversary of the passage of the Mack-Blackwell Amendment and the 100th anniversary of the Arkansas State Highway and Transportation Department.



REAR ADMIRAL
JACK BUFFINGTON
DIRECTOR 1996-1999,
ASSOCIATE AND ACTING
DIRECTOR 1999-2009

An indirect benefit that came from MBTC is that it gave Bob Elliott and Walt LeFevre something with which to lure **Jack Buffington** home to the U of A. Rear Admiral Buffington retired from the U.S. Navy in 1995, after serving 34 years and rising to the position of Chief of Engineers and Commander of the Naval Facilities Engineering Command. Buffington had committed to working for a large international construction company upon retirement, but later found that he had to wait two years to avoid an industry/government conflict of interest. In the meantime, he was helping his recently widowed mother on their family farm in Westville, OK. As Admiral Buffington recalls, “I was knee deep in cow manure when Walt called to offer me the job, and I replied, ‘I think I can be there by noon!’” His initial two-year commitment extended to 13 years (until 2009) as he served as the director and later associate director of MBTC and research professor in the

Department of Civil Engineering – while still finding time to consult on large construction projects. His personal charisma, connections around the nation, work ethic and willingness to serve wherever there was a need endeared him – and by association, MBTC – to USDOT and state officials, other center directors, faculty and students alike. During his tenure with MBTC, Buffington served in multiple national-level leadership positions, including the Executive Committee of the Transportation Research Board and the National Academy of Engineering. To this day, when MBTC staff travels around the country, they are often asked, “How’s the Admiral?”



MELISSA TOOLEY
DIRECTOR 1999-2006

Former MBTC Director **Melissa Tooley** is a strong advocate for the UTC program and its value to the nation. She describes herself as “the poster child for the UTC program,” since she was supported by UTC funds

as a graduate student at the U of A and has spent much of her academic career working in UTC programs as a researcher and director. As a graduate student, she assisted Dr. LeFevre in setting up MBTC during its initial years and was selected as the first MBTC Outstanding Student of the Year in 1994. After earning her doctorate, Tooley accepted a teaching position at the University of Florida. She returned to Arkansas in 1999 as an assistant professor of civil engineering and became director of MBTC a year later. The center continued to prosper under her leadership, funding research in multiple colleges at the U of A and in multiple states and universities, and successfully competing in 2002 for continued federal funding. During her tenure as MBTC Director, Dr. Tooley served as the president of the Council for University Transportation Centers (CUTC), a national non-profit organization dedicated to promoting university-based research programs in transportation. Since 2006, Dr. Tooley has been the director of the University Transportation Center for Mobility at the Texas Transportation Institute (TTI), Texas A&M University.

20 YEAR *retrospective* SCOTT BENNETT

FROM STUDENT TO AHTD DIRECTOR



In 1995, the MBTC chose Scott Bennett as its Outstanding Student, and in 2011, this Outstanding Student was named the Director of the Arkansas State Highway and Transportation Department. Bennett explained his career path and

shared his thoughts on the AHTD/MBTC collaboration.

1. WHERE HAVE YOU GONE AND WHAT HAVE YOU DONE SINCE GRADUATING FROM U OF A?

After graduating from the U of A with a BSCE in 1989, I began my full-time career with the AHTD. I came back to the U of A in the fall of 1993 as the first employee selected for the Transportation Research Assistantship Program. After earning my MSCE in 1994, I returned to Little Rock and progressed through the ranks. I was named Director of AHTD in 2011. I have been actively involved with several national committees related to transportation planning and highway financing. I received the College of Engineering's Young Alumni Award in 2005 and was inducted into the Arkansas Academy of Civil Engineers in 2010. I am a Registered Professional Engineer in Arkansas.

2. TELL US ABOUT YOUR JOB.

As you can tell, everything I do is related to transportation. We have a staff of approximately 3,600, and with between 250 and 300 engineers (mostly civil engineers), we are the largest employer of engineers in the State. We are responsible for planning, design, construction, and maintenance of almost 16,400 miles of state highway.

3. WHAT DO YOU SEE AS THE BENEFITS OF THE AHTD/MBTC COLLABORATION OVER THE LAST 20 YEARS?

In the area of research: The AHTD has participated with MBTC in 71 research projects. Many of the cutting edge research projects would never have been funded through our normal research program. However, by partnering with MBTC, we were able to fund basic research that led to more research, that in turn led to

implementation by the AHTD. One of the most widely used tools in the Department, the Multimedia Highway Information System (MMHIS) became a reality through MBTC/AHTD collaboration. Also, the implementation of Superpave asphalt mixes and automated cracking detection methodologies may not have become a reality without research collaboration.

In the area of education: First, MBTC funding allowed the U of A to hire and develop civil engineering staff with expertise in the transportation field. The 71 research projects above helped finance more than 100 graduate students with expertise in the transportation field. Furthermore, 15 department engineers were allowed to continue their education by participating in a joint education program with MBTC through the Transportation Research Assistantship Program. Overall, the quality of civil engineers starting their careers with the Department has improved significantly over the years thanks to our collaboration with the MBTC and the U of A.

In the area of technology transfer: The Center for Training Transportation Professionals (CTTP) would not have been established without the collaborative effort between the Department and MBTC. Since CTTP was established, well over 3,000 Department and contractor personnel have been certified and trained in construction, maintenance and materials areas. There is no doubt that this has led to better quality construction that benefits all Arkansans.

4. WHAT'S YOUR FAVORITE MEMORY ABOUT YOUR MBTC RESEARCH EXPERIENCE OR THE PERSONAL RELATIONSHIPS FORMED DURING YOUR INVOLVEMENT WITH MBTC?

First, my research experience provided me with the opportunity to learn research from the University side. Second, personal relationships are always important. The relationships that I formed with other students and the faculty continue today, and I believe that they have helped the AHTD be successful in recruiting engineers. My favorite memory, though, involves the late Dr. Walt LeFevre. I passed the PE exam while I was in graduate school. Upon learning that, I will never forget Dr. LeFevre informing me that I was now minimally competent!

20 YEAR *retrospective*



HEATHER
NACHTMANN
DIRECTOR 2007-PRESENT

Heather Nachtmann, Associate Professor of Industrial Engineering, took over from Acting Director Jack Buffington in 2007, bringing a new perspective to the administration of MBTC.

The designation of MBTC as a member of the Department of Homeland Security (DHS) National Transportation Center of Excellence (NTSCOE) provided an opportunity for MBTC to build on existing expertise in the areas of supply chain security, inland waterways security, emergency preparedness, and transportation infrastructure protection. Dr. Nachtmann's expertise in inland waterways research expanded the multi-modal emphasis of MBTC. In addition to the strong ties already existing in the highway and trucking industry, MBTC developed new relationships with the U.S. Coast Guard and U.S. Army Corps of Engineers.



transportation research programs, course development and increased numbers and quality of graduates entering the transportation field. MBTC has also attracted outstanding graduate students through fellowships, assistantships and center-funded research projects.

Every MBTC research project has an educational component, where student researchers are supported financially and gain expertise and experience in relevant transportation issues. MBTC has directly funded over 300 undergraduate and graduate students through projects, fellowships, assistantships and scholarships. Students supported by MBTC have gone on to careers in academia and with organizations such as AHTD, J.B. Hunt Transportation Services, Inc., ABF Freight Systems, Inc., Union Pacific Railroad and Walmart Stores, Inc. Student researchers have been honored with numerous national-level awards, including Eno Fellowships, Eisenhower Fellowships and outstanding research paper awards. Some of our best student researchers are our MBTC Outstanding Students of the Year, and are featured in the article on page 7.

Joint MBTC-AHTD programs such as the SASHTO (Southeastern Association of State Highway and Transportation Officials) Scholarship Program and the AHTD Transportation Research Assistantship Program have been particularly successful in attracting and retaining high-quality engineers in the transportation field. The AHTD assistantship program allows AHTD employees to attend the U of A full-time to work towards a Master of Science degree in Civil Engineering. The SASHTO scholarships are awarded

(continued on page 8)

education



MBTC has impacted the quality of transportation education at the U of A in lasting ways. By providing initial funding for engineering faculty positions and built-in transportation research funding, the U of A has been able to attract top-notch faculty members in the area of transportation. This has led to expanded

20 YEAR *retrospective*

MBTC OUTSTANDING STUDENTS OF THE YEAR

where are they now?

2012: ROYCE FLOYD

Assistant Professor, School of Civil Engineering & Environmental Science. University of Oklahoma
"The experience I had working on the MBTC project really fueled my interest and desire in pursuing an academic career and continuing in research."

2011: SHAWN GRIFFITHS
Graduate Assistant. University of Texas

"MBTC research really opened my eyes to the inter-relationship between structural, transportation, geotechnical and industrial engineers, and how they work together to solve complex problems."

2010: ANDREW TACKETT
Civil Engineer, Construction Division. Arkansas State Highway and Transportation Department

"I remember the great personal relationships that were established through my work with MBTC."

2009: HUGH MEDAL
Assistant Professor, Industrial and Systems Engineering
Mississippi State University

"Working for MBTC gave me experience in working on transportation problems, which was pivotal in helping me obtain my current job."

2008: JENNIFER PAZOUR
Assistant Professor, Industrial Engineering and Management Systems. University of Central Florida

"I continue to conduct research on transportation and logistics topics."

2007: BRIAN MATTINGLY
Project Engineer. AP Innovations

"I was first introduced to biodiesel and renewable energy through a biodiesel research project funded by MBTC, and I have continued to be involved with renewable energy through my professional career."

2006: MINH LE

Research Engineer, Research and Implementation Division. Texas Transportation Institute
"MBTC allowed me the opportunity to advance my education and career within transportation planning/engineering."

2005: JULIA FOREMAN
Civil Engineer. McClelland Consulting Engineers, Inc.

2004: JESSIE JONES
Assistant Division Head, Planning and Research Division. Arkansas Highway and Transportation Department
"Through the partnership between the AHTD and MBTC, I was able to take advantage of the excellent educational experience and research facility at the U of A."

2003: STEPHAN DURHAM
Associate Professor, College of Engineering. University of Georgia

"It was a rewarding experience working with Stacy Williams, Frances Griffith, Dr. Hale, Mark Kuss, Dr. Heymsfield, Dr. Dennis, Dr. Hall, and the many other students working in the laboratory at the ERC."

2002: TERRY ESPER
Associate Professor of Logistics.
The University of Tennessee

2001: FRANCES GRIFFITH
Program Administrator, Center for Training Transportation Professionals. University of Arkansas
"I am honored to be included in a group of such outstanding people!"

2000: MIA PETRE (BURNS)

1999: KRISTEN TRUSTY (BILLINGSLEY)

Director of Operations. Hebco, Inc.
"As part of the research team, I was able to travel to Memphis and Pittsburgh to present my thesis. I believe it was that trip that started my love of travel and exploration."

1998: STACY GOAD (WILLIAMS)

Associate Research Professor and Director of Center for Training Transportation Professionals. University of Arkansas
"MBTC afforded me opportunities to travel to conferences where I gained a sense of the 'greater scope' of the transportation industry."

1997: TIMOTHY S. MEINERT
Colorado Springs, CO

1996: QUINTIN WATKINS

1995: SCOTT BENNETT
Director. Arkansas Highway and Transportation Department
"I would not be where I am today without the MBTC and the U of A."

1994: MELISSA TOOLEY
Center Director, University Transportation Center for Mobility
Texas A&M University

20 YEAR *retrospective*

to undergraduate (junior and above) and graduate students who are working on AHTD-sponsored research projects. “The 71 research projects that AHTD has participated in with MBTC helped finance more than 100 graduate students with expertise in the transportation field and 15 Department engineers continued their education through these programs,” stated AHTD Director Scott Bennett. “Overall, the quality of civil engineers starting their careers with the department has improved significantly over the years thanks to our collaboration with MBTC and the U of A.”

Attracting students to the transportation engineering field has been an important MBTC goal from the start. MBTC activities targeting K-12 students include sponsoring and hosting students from the Summer Transportation Institute, participating in Construction Career Day, co-sponsoring the Arkansas State FIRST LEGO League Championship Tournament, and hosting activities in the U of A College of Engineering Summer Camps.

research



MBTC’s research program, while very strong in traditional transportation engineering, is also diverse in approach, addressing the socioeconomic and business issues of rural transportation. From the earliest proposal, the center’s focus has been on rural transportation from an interdisciplinary (engineering, business, economics,

agriculture, landscape architecture) and intermodal perspective (highways, waterways, railways and trucking). MBTC has administered over \$16 million of federal funds and has raised and administered over \$20 million in matching funds for research projects at fourteen universities in nine states. MBTC has funded and managed over 200 research projects. Examples of impactful work include:

- **Pavement Management.** The Multi-Media Highway Information System (MMHIS) developed through MBTC is an integrated database system combining traditional highway engineering site data with visual graphic and roadway videos. MMHIS, which revolutionized highway pavement management in the state of Arkansas, is fully implemented at AHTD and is being marketed worldwide.
- **Pavement Design.** The Mechanistic-Empirical Pavement Design Guide (MEPDG) developed by NCHRP and released to state highway agencies in 2004 provided a new pavement design and analysis tool. MBTC researchers have led the way in implementing the MEPDG both nationally and in the state of Arkansas through extensive calibration of flexible and rigid pavement models for Arkansas. The calibration takes into consideration local conditions, including climate, material properties, traffic patterns, and construction and maintenance activities.
- **Pavement Materials.** MBTC has conducted award-winning research in pavement materials. The results have been implemented in Arkansas and recognized at the national level. Topics include the implementation of Superpave mixture design in Arkansas, 4.75mm asphalt mixtures, pavement skid resistance, warm mix asphalt and recycled asphalt shingles.
- **Work Zone Safety.** Highway safety in work zones is an issue of national, state and local importance. MBTC partnered with AHTD to develop a series of instructional videos for inspectors and highway construction workers. This work was acknowledged by the American Road & Transportation Builders Association and the National Safety Council when AHTD and MBTC received the 2005 Roadway Work Zone Safety Awareness Award in the safety training category.
- **Geotechnical Engineering.** Bridge design specifications require that the potential for earthquake-induced soil liquefaction be considered in bridge foundation design,

20 YEAR *retrospective*

but little guidance is provided on how to do that. MBTC geotechnical researchers developed procedures to facilitate the design and construction of deep foundations in the New Madrid Seismic Zone. These spreadsheet-based tools are routinely used by AHTD in their soil liquefaction analyses for bridge foundations in Northeast Arkansas.

- **GIS Technology.** MBTC projects have developed new and innovative uses for GIS technology, including preventing slope failures, managing hazardous waste spills, emergency evacuation planning, decision support for emergency management following natural or manmade disasters, and analysis of supply chain security issues.
- **Inland Waterways.** MBTC research includes economic impact studies of the benefits of Arkansas' inland waterway transportation system, feasibility studies on using barges for emergency response, and the development of a decision support tool to respond to closures of the inland waterway transportation system following catastrophic events.
- **School Bus Routing.** MBTC researchers worked with the public school districts of Springdale, AR and Fort Smith, AR to develop solutions to forced transfer busing and special needs busing problems in their cities.
- **Roundabouts.** In 1999 and 2001, MBTC funded research to model traffic flows on roundabouts. This

research showed that roundabouts are safer and more efficient than other types of conventional traffic control, and led to the design and construction of roundabouts by the Kansas Department of Transportation as well as several cities.

- **Highway Speed Differentials.** Speed limits on rural highways have always been contentious. This research documents the opinions of stakeholders, looks at the actual speeds of trucks and cars on rural interstates and includes a cost-benefit analysis to address financial issues. This study will help state regulatory agencies and trucking companies to establish policies related to speed limits and speed differentials.
- **Biofuel Production.** Biofuel production has been investigated in multiple MBTC-funded projects, including those that investigated biofuels produced from beef tallow, chicken fat and tall oils; economic analysis of biofuel production; and innovative methods for making butanol from algae. MBTC researcher Jamie Hestekin was selected by Planet Forward as the Innovator of the Year for 2011 for his work that began as an MBTC project.

technology transfer

At the Center for Training Transportation Professionals



CTTP instructor Mary Fleck demonstrates one method of dividing an aggregate sample for testing.

In a civil engineering laboratory at the University of Arkansas Engineering Research Center, several groups of men and women stand around piles of rock and gravel. Their assignment is to separate these piles into smaller piles for analysis, but there's a catch. Each smaller pile must be a representative sample of the larger pile; it must contain the same proportion of rock, gravel, sand and dirt as the original pile. In order to do this, they mix the rocks thoroughly and carefully divide the original pile into four parts, using a broom to keep every piece of sand and dust in the correct pile. Then, they discard two of the piles and mix the remaining two together. Finally, they weigh the sample. If it is still too large to be tested, they will repeat the process.

These are not college students; they are highway department employees and contractors whose jobs will involve quality control testing on the state's highway construction projects. In order to ensure that our roads are

20 YEAR *retrospective*



safe and sturdy, highway department officials and contractors conduct many different types of tests. Aggregate, the gravel or crushed stone that provides structure to concrete and asphalt, must be tested to make sure it has the proper gradation and density for each project. Officials must also test the strength and other qualities of concrete and asphalt, and perform tests on the soil under roadways.

The two and a half day course these students are taking is over aggregates. After they get the right sample size, they will learn how to use special sieves to separate the sample into coarse and fine material so they can make sure the aggregate contains the right proportion of each.

In 1996, a new federal regulation required that states use “qualified sampling and testing personnel” for projects involving federal money. In most states, the local transportation department trains its own employees and contractors to perform this testing, but in Arkansas, the University of Arkansas Center for Training Transportation Professionals performs all of this training and certification, providing the state with the security of having a third-party certifying these important professionals. The center trains around four or five hundred students a year.

In addition to certifying these employees, the CTTTP also provides laboratory certification, visiting labs where the testing is conducted to make sure all the equipment and procedures are correct.

Stacy Williams, director of the CTTTP, explained why certification is so important. “Part of the issue of quality is consistency,” she said. “There are test methods out there, but

people don’t always do it right. Variations get passed down.” At the CTTTP, all inspectors, engineers and contractors receive the same training and take the same tests.

Ralph Hall, who was the Assistant Chief Engineer for Operations at the AHTD in 1996, recalls that involving the University of Arkansas in this project was an obvious choice. Dan Flowers, the director of the AHTD at the time, was already working closely with civil engineering professors Walter LeFevre and Kevin Hall through the MBTC. “Dr. Hall was very interested and instrumental in showing us what the university could do,” said Ralph Hall, who is now the assistant to the AHTD director. “It seemed to all fit together right at the time.”

Having this training and testing associated with a university has several additional benefits. Civil engineering students can serve as test proctors, which gives them hands-on experience, as well as opportunities to network with highway department professionals and transportation contractors. This provides an important link between the University of Arkansas civil engineering department and the industry that it serves.

Another benefit is the effect this link has on research. Williams, whose research involves developing standards for the testing of new asphalt materials, finds the contacts she makes through the CTTTP program to be invaluable. “We’re part of the community,” she said.

Working closely with the CTTTP and AHTD staff, who are also responsible for inspecting and “spot checking” contractors’ labs, can also give the contractors a new perspective on inspections and bridge the gap between these groups.

“They can ask their inspectors questions,” Williams explained. “And when people challenge the inspection protocol, they can explain the reasons why these specifications are in place.”

As director of the CTTTP, Williams has seen a lot of changes. Lately, she has noticed more new contractors coming in for certification, which she sees as a sign that the economic downturn, which caused a decrease in enrollment several years ago, is easing. She also noticed that with the downturn, small businesses began selling out to larger companies, making the industry more consolidated.

The CTTTP is changing, as well. Recently, it developed online modules that give students an opportunity to get a head start on skills before the classes begin. In addition, an online refresher for the aggregates class, which doesn’t require any re-certification, ensures that inspectors and contractors stay up to date on the latest information.

DISTINGUISHED *lecture* SERIES

EVENING WITH THE PROS

As part of our career orientation program, MBTC held the annual “Evening with the Pros,” in conjunction with the Arkansas State Highway and Transportation Department. The lecture was held on September 29, 2011 on the U of A campus, with **Bob Walters**, AHTD Chief Engineer (retired), moderating the event.

The quality of the presentations was outstanding! Many considered it the best Evening with the Pros to date. **Matt Crafton**, president and CEO of Crafton Tull, addressed the importance of skills such as leadership, teamwork, consensus building, and social and business networking.

Mike Griffin, director of aviation for Garver Engineers, gave tips for preparing a resume and making a positive impression during an interview. He stated that students



Matt Crafton, Bob Walters, Grady Harvell, Ralph Hall and Mike Griffin

always have a sound bite prepared for the media.

Grady Harvell, president of AFCO Steel, encouraged students to give back after graduation. When addressing the importance of being a philanthropist, he stated, “(Your school) can give you the technical background, but they cannot give you the heart to give back; you must have this already.”

The students had many questions for our speakers regarding the correct length of a resume, who to contact for help in creating their resume and whether time or money was best when giving back.

should be able to converse with enthusiasm.

Ralph Hall, assistant to the director of AHTD, discussed communicating effectively with non-technical, public and political audiences. His suggestions included: know the audience, use analogies and metaphors to get your point across, and

DAN FLOWERS DISTINGUISHED LECTURE SERIES

In 2011, the MBTC Distinguished Lecture Series was renamed in honor of retiring AHTD Director Dan Flowers. The first speaker in the newly-renamed series was **Ami Spivey**, Vice President of Innovations, Engineering and Global Processes for Sam’s Club. The lecture was held on April 23, 2012 at the U of A, and the topic was “Transportation Engineering at Walmart.”

Originally from Fayetteville, Ms. Spivey is a member of the Arkansas Academy of Industrial Engineering, and a faithful Razorback fan. During her 18 years at Walmart, she has led both distribution center and transportation operations.

In Walmart Transportation, Ms. Spivey built and led an engineering team focused on offsetting the rising cost of fuel and leveraging efficiencies to create a more sustainable



Tish Pohl, Ami Spivey and Heather Nachtmann

Private Fleet. She discussed how high fuel prices have significantly changed operations, performance measures and working relationships between suppliers and retailers.

Ms. Spivey described her time managing Walmart’s Private Fleet drivers as the most challenging leadership role she’s had, but also the job where she saw the most personal and professional growth.

She stated that as a manager you have to listen to what your employees have to say – the best ideas come from the people performing the job each day.

The lecture was well received, and generated a number of questions from students. Ms. Spivey is a knowledgeable and enthusiastic speaker and we look forward to more great lectures from her.

CENTER FOR TRAINING

transportation professionals



L to R - Frances Griffith, Diane Allen, Charles Steelman Stacy Williams, Anna McFarland, Mary Fleck, and Roselie Conley.

During the past year, the Center for Training Transportation Professionals (CTTP) completed its fifth 3-year Agreement with the Arkansas Highway and Transportation Department (AHTD), and has begun its 16th year of training and certification activities. The beginning of 2012 proved to be a busy time, completing almost 70 percent of the required contract courses during the first half of the year! The team is also pleased to welcome a new Administrative Specialist, Diane Allen. Diane joined CTTP in April 2012, during an extremely busy portion of the spring training season. We are excited that she was able to quickly become an integrated member of our daily operations, and look forward to learning more about her many talents during the months ahead.

Enrollment in CTTP courses has increased again, with most scheduled courses operating at or near capacity. It is anticipated that extra courses (in addition to those required by contract) will be scheduled later this year in order to meet the increasing need for recertification. So far this year, the Basic Aggregates courses, which is a pre-requisite for the other primary materials courses, has shown steady enrollment with each course filling to at or near maximum capacity. Because this certification does not expire and does not require re-certification, this is a clear indication that the industry is seeing an increase in active new employees.

Although the Basic Aggregates certification does not expire, an online refresher course is required for all CTTP certified technicians, and this refresher must be successfully completed by January 1, 2013. This refresher training includes a review of several modules covering pertinent

aggregate test methods, knowledge checks for each test method, and a final quiz. This refresher training is provided by CTTP at no cost to certified technicians. A 'view only' mode is also available at no charge for those desiring to prepare for the in-house Basic Aggregates course, or simply to 'brush up' on test methods. So far this year, more than 350 certified technicians have completed the Online Basic Aggregates Refresher.

In addition to the online course module development, upgrades and modifications are continually being made to the CTTP website. While not all of these changes are visible to the public, new tracking systems and database applications have been implemented in order to better monitor the progress of online training activities.

CTTP's primary and 'request only' courses have also been in demand, particularly the Concrete Field Testing and Hot Mix Asphalt courses. Two offsite courses have been conducted, and another is scheduled to be held in Little Rock in September. In the spring of 2012, a course in Concrete Pavement Patching was held, and the course received great reviews. In this course, a number of technicians currently performing concrete patching were able to discuss current issues with industry experts. Several topics were addressed in the classroom, and additional training involved a field demonstration. Participants found it beneficial, and additional course offerings will likely be requested in the near future.

Laboratory certification has again displayed steady enrollment, with approximately 100 participating laboratories. July 1, 2012 marked the beginning of the

(continued on page 13)

OUTSTANDING *student* OF THE *year*

Royce Floyd was selected as the 2011 Mack-Blackwell Rural Transportation Center (MBTC) Outstanding Student of the Year for his research efforts that will have direct impact on the construction and design of prestressed concrete bridge girders. Royce traveled to the 15th Annual Council of University Transportation Centers Awards Banquet held in Washington, D.C. on January 21, 2012.

He was nominated by Dr. Micah Hale, who said, "Royce is a rarity among students, combining exceptional academic ability, a strong work ethic, and a remarkable sense of 'real world practicality' regarding his graduate work. He is easily among the top one percent of all graduate students at the College of Engineering; he was the first engineering student to move directly from his undergraduate program to a Ph.D. program and win the highly competitive Distinguished Doctoral Fellowship (DDF) at the University of Arkansas." Royce has been working on MBTC project "Strand Bond in Lightweight Self-Consolidating Concrete."

Royce has also taken on the role of instructor-of-record, not just in introductory courses, but senior-level design courses in his department. Students in his courses praised his practical approach, availability, and problem-solving abilities as an



Royce Floyd with Greg Winfree RITA Administrator

instructor. A prolific writer, Royce has amassed a publication record worthy of a tenure-track faculty member during his doctoral program. By any metric, Royce Floyd is a truly outstanding student and the Mack-Blackwell Transportation Center is proud to recognize him with this honor.

We congratulate Dr. Floyd on completing his Ph.D. this year and wish him success in his new position as an Assistant Professor in the School of Civil Engineering and Environmental Science at the University of Oklahoma.

CENTER FOR TRAINING *transportation professionals* CONTINUED...

seventh inspection tour. During this tour, a number of inspection and reporting processes are being completed electronically. This step represents a significant improvement in convenience and efficiency for laboratories during the laboratory inspection process.

Members of the CTTTP team have also devoted significant attention to other activities, including the development of a weather web page for AHTD employees to access the latest weather information and real-time videos of critical situations

during winter weather events. Other items have included participation in the development of course content for technology transfer activities associated with the Local Technical Assistance Program (LTAP), active participation in national training and specification development committees, and hosting professional development seminars for the Arkansas Ready Mixed Concrete Association (ARMCA) and the Arkansas Department of Emergency Management (ADEM).

NEW projects

DOT UNIVERSITY TRANSPORTATION CENTER PROJECTS

MBTC DOT 3028: Models for Disaster Relief Shelter Location and Supply Routing

Ashlea Bennett Milburn, Ph.D.

Chase Rainwater, Ph.D.

Industrial Engineering, University of Arkansas

This research focuses on creating disaster relief planning models that can be used both pre- and post-disaster to specify locations for shelters and routing plans for relief supplies. While this research focuses specifically on a large magnitude New Madrid earthquake scenario, the models developed will be general enough to be useful in any event or disaster requiring emergency shelters to be located and supplies to be available. The pre-disaster planning models created will rely on probabilistic information regarding expected infrastructure damage. Because these models are used for strategic planning, significant computation time can be dedicated to obtaining solutions expected to be of high quality for numerous likely scenarios. Post-disaster planning models will use real-time infrastructure status information to specify recourse actions necessary to convert pre-disaster plans to feasible solutions. Response time is critical in saving lives after a disaster, so approximate solution approaches will be developed to obtain good solutions quickly.



MBTC DOT 3029: Economic Evaluation of Arkansas Inland Waterways and Potential Disruption Impacts

Heather Nachtmann, Ph.D.

Industrial Engineering, University of Arkansas

Arkansas is one of twenty-four states with an inland waterway transportation system. Over one thousand miles of Arkansas navigable waterways have the potential to attract industries by offering low-cost transportation in a strategic location with links to domestic markets including Chicago, Houston, and Pittsburgh and coastal ports in the Gulf of Mexico. A decade ago, prior research indicated that Arkansas ports directly and indirectly contributed to the economic growth of this state including economic value, earnings, and employment. There is a need for current information on the economic impacts of Arkansas' inland waterway transportation system and what impact disruptions to the this system may have. This information may spur investment in port development, which can in turn increase Arkansas' competitive advantage over neighboring states while continuing to offer social and environmental transportation benefits.

MBTC DOT 3030: Performance of Prestressed Girders Cast With Lightweight Self-Consolidating Concrete

Micah Hale, Ph.D., P.E.

Civil Engineering, University of Arkansas

The use of lightweight self-consolidating concrete (LWSCC) is growing in the precast/prestressed concrete industry but there is little guidance from industry regarding the design and analysis of LWSCC members. This program will investigate the prestress losses in members cast with LWSCC. The loss or gain in prestress force has little effect on the flexural capacity of the member. Accurately predicting prestress losses is key to good performance. The AASHTO LRFD Bridge Specifications provides guidelines for estimating losses in conventional and high strength conventional concrete, but are those guidelines applicable to LWSCC? The proposed research program will address that question.

NEW projects



MBTC DOT 3031: Identification of Expansive Soils Using Remote Sensing and In-Situ Field Measurements - Phase 1

*Richard A. Coffman, Ph.D., P.E.
Civil Engineering, University of Arkansas*

The volume change characteristic of clay soils from Northwest Arkansas (with and without bentonite amendment) will be determined by combining knowledge gathered from emerging ground based remote sensing platforms (visible, infrared, and microwave spectra), and geotechnical field investigations (volumetric moisture content, soil temperature, soil suction, infiltration, evaporation). The proposed work seeks to demonstrate and test the efficacy of remote sensing (specifically using a ground based radar) as a new approach for in-situ classification, characterization, and heave prediction of expansive soils.

MBTC DOT 3032: Site-Specific Ground Motion Analyses for Transportation Infrastructure in the New Madrid Seismic Zone

*Brady Cox, Ph.D., P.E.
Civil Engineering, University of Arkansas*

Only a few states in the nation have areas with higher earthquake design ground motions than northeast Arkansas. These extreme seismic forces directly control the exceedingly high costs for bridges, retaining walls, and pile

foundations in this area. The main objective of this study is to develop guidelines that design engineers can use to perform high-quality, site-specific ground motion response analyses for transportation infrastructure in the New Madrid Seismic Zone (NMSZ). This research will focus on developing guidelines for conducting nonlinear, effective stress analyses with particular attention given to providing recommendations for: (1) proper dynamic soil properties (i.e., small-strain shear wave velocity profiles, and strain-dependent modulus and damping curves) for typical NMSZ soils, (2) selecting and scaling ground motion time histories, and (3) appropriate, cheap or freely-available software to conduct the analyses. This research has the potential to benefit not only those involved in the design and construction of transportation infrastructure in the state of Arkansas, but also those from other states within the NMSZ (e.g., Tennessee, Missouri, Kentucky).

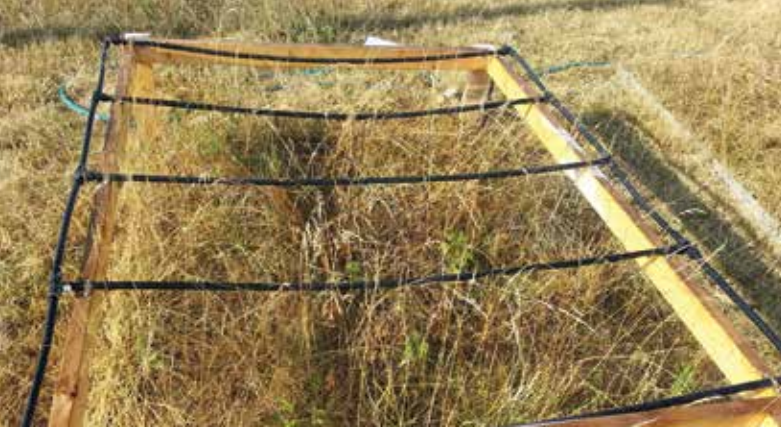


MBTC DOT 3033: Exploring Different Forms of Base Stabilization

*Andrew Braham, Ph.D., P.E.
Civil Engineering, University of Arkansas*

Over time, the structural capacity of low-volume roads becomes inadequate. A relatively quick and sustainable solution to increase the structural capacity is to perform a base stabilization rehabilitation. There are three main types of base stabilization: cement, asphalt emulsion, and asphalt foam. While there has been some research performed

NEW projects



on both the mix design and laboratory performance of these three techniques, there is little consensus on the best methods. This research will synthesize existing literature and compile full mix design procedures for cement, asphalt emulsion, and asphalt foam base stabilization technologies. Two types of laboratory performance tests, torture and cracking, will be performed after establishing the mix design procedures. In addition, local contractors and government officials will be consulted to determine present and future needs for base stabilization.

MBTC DOT 3034: Biodiesel Waste Products as Soil Amendments - Field Study and Runoff Impacts

*Tom Soerens, Ph.D., P.E.
Civil Engineering, University of Arkansas*

In biodiesel production, the waste product glycerol, commonly called glycerin, is produced and must be disposed. The mass of glycerin produced is about ten percent of the biodiesel mass produced. Application of glycerin to soil for dust control or as a beneficial soil amendment in transportation projects is a disposal alternative that has possible advantages. Recycling the nutrients and carbon in the biomass to the soil sequesters carbon in the soil, can enhance soil quality by increasing soil organic matter, and lessens the overall life cycle impact of biodiesel production. A current MBTC research project is using laboratory studies to evaluate the effects of glycerin on soil microbial activity, biological systems, and plants. Another possible negative impact of glycerin application to soil is runoff of glycerin to streams,

leading to toxicity or eutrophication in the streams. This new project expands the ongoing research to the field study phase by applying glycerin to small experimental field plots. There have been a few laboratory studies on glycerin impacts on plant growth and nutrient uptake in soils. Published field studies, however, are lacking. If the results of the study indicate that glycerin application is harmless or beneficial to landscape plants and that runoff risks are negligible or can be controlled, then using biodiesel waste as a soil amendment could become a preferred disposal method.

DHS NATIONAL TRANSPORTATION SECURITY CENTER OF EXCELLENCE

MBTC DHS 1111: Communicating and Implementing the Results from MBTC DHS 1102 - Simulating Large-Scale Evacuation Scenarios in Commercial Shopping Districts - Methodologies and Case Study

*Manuel Rossetti, Ph.D., P.E.
Industrial Engineering, University of Arkansas*

The NTSCOE-funded project entitled “Simulating Large-Scale Evacuation Scenarios in Commercial Shopping Districts - Methodologies and Case Study,” which was completed in December 2010, provided an exploratory case study of the modeling methodologies and a state-of-the-art review of the modeling techniques required to simulate the large-scale evacuation of a commercial shopping district. A microscopic simulation model was developed and validated, evacuation scenarios were developed, and the performance of vehicles attempting to evacuate the areas was captured in an evacuation risk profile. The project identified two key mitigation strategies: 1) traffic intervention (diverting or stopping incoming traffic) and 2) optimally assigning parking lots to safe zones that can significantly reduce the time to evacuate. The purpose of this follow-on project is threefold: 1) to investigate the realities of these simulated mitigation strategies with the local emergency planning authorities, 2) to better disseminate the findings of the project both locally and nationally, and 3) to develop a follow-on research agenda to improve the state of the art in this area.

ONGOING *projects*



DHS NATIONAL TRANSPORTATION SECURITY CENTER OF EXCELLENCE PROJECTS

MBTC DHS 1104: Structural Health Monitoring and Assessment of Critical Intermodal Transportation Infrastructure Elements

Kirk A. Grimmelsman, Ph.D.

Brady R. Cox, Ph.D., P.E.

Ernest P. Heymsfield, Ph.D. P.E.

University of Arkansas

MBTC DHS 1109: Mitigating Dynamic Risk in Multi-Modal Perishable Commodity Supply Chain Networks

Edward A. Pohl, Ph.D.

Ashlea Bennett Milburn, Ph.D.

Chase Rainwater, Ph.D.

University of Arkansas

Scott J. Mason, Ph.D.

Clemson University

MBTC DHS 1110: Supporting Secure and Resilient Inland Waterways

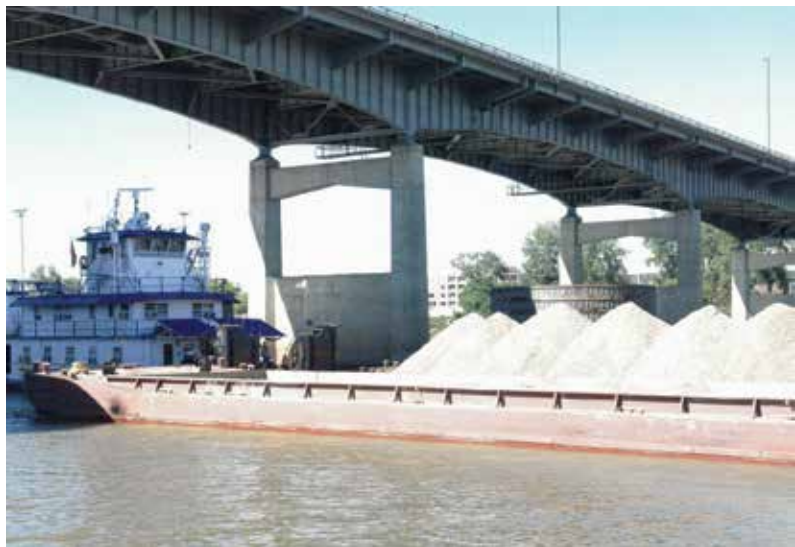
Heather Nachtmann, Ph.D.

Justin R. Chimka, Ph.D.

Edward A. Pohl, Ph.D.

Letitia M. Pohl, Ph.D.

University of Arkansas



DOT UNIVERSITY TRANSPORTATION CENTER PROJECTS

MBTC DOT 3014: A Prototype Remote Structural Health and Security Monitoring System for Bridges

Kirk A. Grimmelsman, Ph.D.

University of Arkansas

MBTC DOT 3015: Rapid Condition Screening of Bridges by Falling Weight Deflectometer

Kirk A. Grimmelsman, Ph.D.

University of Arkansas

MBTC DOT 3021: Performance of Prestressed Girders Cast with Lightweight Self-Consolidating Concrete

Micah Hale, Ph.D., P.E.

University of Arkansas

MBTC DOT 3022: Nanotechnology-Based Improvements for Portland Cement Concrete - Phase I

R. Panneer Selvam, Ph.D., P.E.

University of Arkansas

COMPLETED *projects*

DOT UNIVERSITY TRANSPORTATION CENTER PROJECTS

MBTC DOT 3020: Performance of Flexible Pavement Systems Containing Geosynthetic Separators

*Richard Coffman, Ph.D., P.E.
Civil Engineering, University of Arkansas*

Base course drainage, strength, and modulus are important parameters that must be considered in the design of a roadway system. Pavement service life is maintained if the base course is permeable, strong, and rigid. Two recent MBTC projects have focused primarily on the rigidity of pavement systems. MBTC Project 2027 focused on the strength, permeability, and rigidity of quarry obtained, preplaced, Class 7 base course using laboratory tests; while MBTC Project 3013 is investigating the effects of geosynthetic separators, geosynthetic reinforcement, and base course thickness on pavement system rigidity. To tie both projects together, the base course at the Marked Tree test site was analyzed (permeability, strength, grain size, Atterberg limits) to determine if geosynthetic separators have prevented plastic “clayey” fines from migrating into the base layer from the prepared subsoil. The in-situ fines content at the Marked Tree site was also compared with the preplaced quarry obtained fines content to determine if additional fines are created during transportation, placement, and use of the roadway base.

MBTC DOT 3023: Automated Survey of Pavement Distress Based on 2D and 3D Laser Images

*Kelvin Wang, Ph.D., P.E.
Civil Engineering, University of Arkansas*

Despite numerous efforts in recent decades, currently most information on pavement surface distresses cannot be obtained automatically, at high-speed, and at acceptable precision and bias levels. This research provided seed funding to produce a functional prototype developed by the research team with line lasers and 3D cameras that overcame many existing limitations, with the capability



of obtaining 3D pavement surface models at true 1mm resolution with full-lane coverage, and conducting real-time analysis on rutting and cracking. In addition to the project funding, WayLink Systems Co. provided needed resources in hardware and other support to complete the research.

MBTC DOT 3024: Rail Transportation Models for Rural Populations

*Chase Rainwater, Ph.D.
Ashlea Bennett Milburn, Ph.D.
Industrial Engineering, University of Arkansas*

Population growth in rural areas has led to new interest in rail transportation. Planning a passenger rail system involves numerous difficult decisions, most representing a trade-off between customer service and cost. In this work, we attempt to integrate many of these planning decisions. We consider strategic decisions such as station location and vehicle procurement, as well as tactical issues that include vehicle scheduling. Our integrated model exploits the linear network structure that best suits many rural American communities, including Northwest Arkansas. Due to the intractability of the integrated rail planning problem, we have developed a customized heuristic approach to solve real world instances. In our case study, we have applied our model and solution methodology to study the possibility

COMPLETED *projects*



photo courtesy of the Arkansas Highway and Transportation Department

of implementing a passenger rail system in Northwest Arkansas. Our work represents the first steps in a passenger rail feasibility study for Northwest Arkansas, while providing new mathematical modeling and solution methodology contributions to the area of transportation research.

MBTC DOT 3025: Biodiesel Waste Products as Soil Amendments - Evaluation of Microbial, Biological, and Plant Toxicity

Thomas Soerens, Ph.D., P.E.

Civil Engineering, University of Arkansas

During biodiesel production, about 200 pounds of glycerol, commonly called glycerin, is produced for every one ton of biodiesel. As the biodiesel industry grows, so does the need to dispose of this waste product. Application of glycerin to soil for dust control or as a beneficial soil amendment is an alternative that has advantages. The objectives of this research project were to evaluate the toxicity and growth effects of methanol-stripped glycerol from biodiesel waste on microbial, biological, and plant systems in soils. Three tests were used: 1) Activated sludge respiration inhibition test, 2) Earthworm toxicity and 3) Plant toxicity. Results of the respirometry studies

suggest that there is no microbial inhibition due to the glycerol. Microbial activity was observed in a wide range of glycerol amounts applied to soils. In plant studies, there was inhibition of growth and germination with glycerol quantities above 1% by weight. Lower levels of glycerol did not appear to inhibit plant germination or growth and in fact appeared to be beneficial to growth. In worm assays, glycerol concentrations above 1% were fatal on contact with earthworms due to the glycerol absorbing water and desiccating the worms. Worms survived when exposed to glycerol in lower concentrations.

MBTC DOT 3026: Relative Advantages and Disadvantages of Independent Contractor Status: A Survey of Owner-Operators' Opinions and Rationale

Steven L. Johnson, Ph.D.

Industrial Engineering, University of Arkansas

Commercial truck drivers range from company drivers that are employees of a carrier to independent owner-operators that operate under their own authority. From the driver's perspective, there are both benefits and drawbacks of being an independent contract driver. The objective of this effort was to develop, administer and analyze a comprehensive survey to provide reliable, valid and useful information as to why drivers choose or do not choose to be an independent contractor. In addition to the advantages and disadvantages, the survey investigated the methods that independent contractors use to capitalize on the benefits and accomplish the responsibilities associated with being independent. A combination of face-to-face interviews (at 19 truck stops from California to Connecticut) and a web-based survey were used to obtain and validate the opinions. Thirteen organizations (including trucking companies and trade organizations) provided telephone and email contact information for participants. The results and conclusions of the study provide valuable information related to the driver's opinions as to the advantages and challenges of being an independent contractor, as well as the rationale behind those opinions. The information can be used to both understand and improve the experience of both independent contract drivers and the carriers for whom they drive.

COMPLETED *projects*



MBTC DOT 3027: The Development of Novel and Non-Invasive Germplasm Selections Native to Arkansas for Highway Re-vegetation Projects

Garry V. McDonald, Ph.D.

Horticulture Department, University of Arkansas

Re-vegetation strategies and programs for highway rights of way in both rural and urban areas are an important component of any highway construction project. The objective of this proposed research was to develop novel plant germplasm that is regionally native, adapted, and non-invasive and useful for rural and urban highway re-vegetation projects. Another major objective of this proposed research was to develop science-based best management practices guidelines for using native plants in Arkansas for re-vegetation projects by investigating best methods for transplanting and establishment along simulated roadsides. Twenty seven perennial plant species native to the Ozark physiographic area were identified as having potential for highway re-vegetation projects. Plant species selection criteria were based on germplasm of known Ozark provenance, ease of transplant establishment, survivability, and aesthetic worth in a constructed landscape. In addition, plants were exposed to an acute dose of ozone gas to evaluate tolerance to ozone atmospheric pollution. All 27 perennial species were found to have satisfactory transplant survival rates and were found to be winter hardy and tolerant of extreme summer temperatures and moderate drought conditions.

MBTC DOT 9312: Development of a Large-Scale Transportation Optimization Course

Sarah Root, Ph.D.

Industrial Engineering, University of Arkansas

In this project, a course was developed to introduce transportation and logistics applications of large-scale optimization to graduate students. The final report details what similar courses exist in other universities, and the methodology used to gather literature for course. Details about the learning objectives and structure of the course are given, as well as lessons learned from the initial offering of this course in Fall 2009. Course feedback and outcomes as well as suggestions for future offerings of the course are discussed.

DHS NATIONAL TRANSPORTATION SECURITY CENTER OF EXCELLENCE PROJECTS

MBTC DHS 1101: Designing Resilient and Sustainable Supply Networks

Edward A. Pohl, Ph.D.

Chase Rainwater, Ph.D.

Industrial Engineering, University of Arkansas

Scott J. Mason, Ph.D.

Clemson University

This project produced three main deliverables: a survey of the literature on networks subject to disruptions, a series of papers on locating facilities that are vulnerable to disruptions, and a case study on disruptions in the coal supply network. The survey paper reviews the literature on designing new networks that are subject to disruptions and reducing the risk of existing networks that are subject to disruptions. This review organizes a wide-ranging body of literature into a classification that should be useful to future researchers. The series of papers focuses on designing distribution networks that are subject to disruptions. Models are developed to mitigate against the worst case disruption scenario and system performance is measured as the maximum distance from a demand point to its closest facility after failures. Finally, a case study is presented that examines vulnerabilities in the rail infrastructure used to

COMPLETED *projects*

transport coal in the United States. A model is presented that identifies the most critical components of the rail infrastructure.

MBTC DHS 1106: Emergency Response via Inland Waterways

Heather Nachtmann, Ph.D.

Edward A. Pohl, Ph.D.

Industrial Engineering, University of Arkansas

Each catastrophic disaster has its own damage characteristics and emergency response requirements. Emergency planning involving transportation resources requires thorough contingency planning due to potential route destruction and excessive equipment demands. Incorporating multiple transportation modes into emergency operations plans is an obvious contingency action. Inland waterway transportation has the potential to provide emergency response services to a large geographic area of the United States. The research provides a methodology to quantify the potential of communities to benefit from inland waterway emergency response through the development of a Waterway Emergency Services index and provides decision support to help emergency planners design an effective and efficient inland waterway-based emergency response system that will enhance their county-level emergency operations plans. The resulting methodology is implemented on a case study of a four state region along the lower Mississippi river region.

MBTC DHS 1107: Development of an Interactive Petrochemical Incident Location System (PILS)

Kelvin C.P. Wang, Ph.D., P.E.

Civil Engineering, University of Arkansas

The University of Arkansas team was responsible for investigating practices of hazardous material transportation in the private sector and was a sub-contractor to the project “Petrochemical Transportation Security, Development of an Interactive Petrochemical Incident Location System (PILS), DH-08-ST-061-004” with the primary institution being Texas Southern University, National Transportation Security Center of Excellence. The project report presents a synthesis



Newt Graham Lock and Dam (L&D #18) near Tulsa, OK

of research activities in the relevant area and overview of technologies used by J.B. Hunt Transport.

MBTC DHS 1108: Sustaining Resilient Inland Waterways via Renewable Energy

Heather Nachtmann, Ph.D.

Letitia M. Pohl, Ph.D.

Industrial Engineering, University of Arkansas

Inland waterways play an important role in the nation’s sustainability effort. Water transportation has environmental and economic benefits, existing capacity, and low energy consumption. The inland waterway system of the United States includes more than 25,000 miles of navigable rivers and canals, with approximately 12,000 of these miles being utilized for commercial purposes. These inland and intracoastal waterways directly serve 38 states and carry approximately 16% of the total domestic intercity freight, as measured by tonnage shipped. The Department of Homeland Security, Borders and Maritime Security Division (BMD) of the Science and Technology Directorate, recognizes that power management and renewable energy sources can help achieve system efficiency, effectiveness, and resiliency. In line with BMD’s interest in this area, the final report explores how renewable energy sources can be utilized to support inland waterway security and operations. The Mack Blackwell Rural Transportation Center was partnered with the National Renewable Energy Laboratory to explore the feasibility of renewable energy usage within the nation’s inland waterway system. The project objectives include identifying the most critical system components with potential renewable energy applications.

PUBLICATIONS *available*

AT WWW.MACKBLACKWELL.ORG

DOT UNIVERSITY TRANSPORTATION CENTER PROJECTS

RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION (RITA)

Transportation Planning and Policy Research

2012

MBTC DOT 3024: Rail Transportation Models for Rural Populations. *Rainwater, Chase*

2010

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. *Crone, John V.*

2008

MBTC DOT 2034: Community Impact of Regional Transportation Infrastructure: Revisited After Completion of Airport and Major Highway. *Miller, Will*

MBTC DOT 2078 - Evaluation of Economic Impacts of NAFTA on the Transportation System/Sector of Selected Southern States. *Hamilton, Gregory L.*

2007

MBTC DOT 2081: A Study of Rural Transit Operations in the Arkansas Delta. *Tooley, Melissa S.*

MBTC DOT 2082: Ancillary Benefits of the Ouachita River Navigation System. *Nachtmann, Heather*

2005

MBTC DOT 2038: Physical, Economic, and Political Feasibility for Trade of U.S. Grain for Russian Oil. *Asfahl, C. Ray*

MBTC DOT 2068: Northwest Arkansas Regional ITS Architecture. *Tooley, Melissa S.*

2004

MBTC DOT 2018: Environmental Technology Verification Report of the Low-Cost Stormwater BMP Study. *Edwards, Findlay G.*

MBTC DOT 9206: Update and Modification of the Kansas Low-Volume Roads Handbook and the Handbook of Traffic Engineering Practices for Small Cities. *Russell, Eugene R.*

2003

MBTC DOT 2002: Ingredients in Planning Successful Rural Transportation Services for Welfare Reform. *Wedel, Kenneth R. and Richard S. Marshment*

MBTC DOT 2009: Regional Mobility Plan: Development of Technical Scope of Services. *Tooley, Melissa S.*

MBTC DOT 2012: Modeling and Analysis of Transportation Flows Created by E-Commerce Transactions. *Kutanoglu, Erhan, Michael H. Cole and Michael Bartolacci*

MBTC DOT 2022: Development of a Strategic Plan for Statewide Deployment of Intelligent Transportation Systems in Arkansas. *Tooley, Melissa S.*

2002

MBTC DOT 9208: Economic Evaluation of the Impact of Waterways on the State of Arkansas – Phase II. *Nachtmann, Heather*

2001

MBTC DOT 2001: Quick Response Community Planning. *Russell, Eugene R., E. Dean Landman and Avijit Mukherjee*

Systems Performance Research

2004

MBTC DOT 9210: Training and Course Materials of Stormwater Pollution Prevention. *Edwards, Findlay G. and Steven J. Burian*

2003

MBTC DOT 2015: Online Benchmarking Database for Transportation Providers. *Rossetti, Manuel D. and Terry Collins*

Human Factors Research and Applications

2009

MBTC DOT 2083: Human Factors Study of Driver Assistance Systems to Reduce Lane Departures and Side Collision Accidents. *Johnson, Steven L.*

2008

MBTC DOT 2100: Evaluation of the Role of Driver's Knowledge of Who Has the Right-Of-Way Contributes to Interstate On-Ramp Crashes. *Eustace, Deogratias*

PUBLICATIONS *available*

AT WWW.MACKBLACKWELL.ORG

2007

MBTC DOT 2040: Supplemental Signing for Stop Signs - Phase 2. *Gattis, James L.*

MBTC DOT 9202: Supplemental Materials for Use with Educational Videotapes. *Griffith, Frances*

MBTC DOT 9204: Development of a Construction Surveying Certification Course. *Williams, Rodney D. and Kevin D. Hall*

2004

MBTC DOT 2043: A Model for Predicting Tractor-Trailer Truck Drivers' Job Performance Related to Highway Safety. *Nafukho, Fredrick Ma. and Barbara E. Hinton*

Transport, Logistics and Infrastructure Research

2011

MBTC DOT 3017: Practical Recommendations for Evaluation and Mitigation of Soil Liquefaction in Arkansas. *Cox, Brady R.*

MBTC DOT 3019: Network Design Analysis for Special Needs Student Services. *Mason, Scott J. and Edward A. Pohl*

2010

MBTC DOT 3011: Analysis of Transportation Network Design Strategies for Forced Transfer Busing. *Mason, Scott J. and Edward A. Pohl*

2009

MBTC DOT 2056: Applicability of Microelectronic and Mechanical Systems (MEMS) for Transportation Infrastructure Management. *Wang, Kelvin, C.P.*

MBTC DOT 2086: Routing Models for Rural Networks with Time-Varying Constraints. *Mason, Scott, J., Russell D. Meller and Edward A. Pohl*

MBTC DOT 2087/3001: A Model to Design a National High-Speed Network for Freight Distribution. *Meller, Russell D. and Kevin R. Gue*

MBTC DOT 2094/3003: Acceleration Lane Design for Higher Truck Volumes. *Gattis, James L.*

2008

MBTC DOT 2072: Roundabout Feasibility Study for West Memphis. *Crone, John V., Otto Loewer and Carolyne Garcia*

MBTC DOT 2073: Effects of Frontage Road Conversion. *Gattis, James L.*

MBTC DOT 7015: Assessment of Multimodal Transport of Baled Poultry Litter and Dewatered Biosolids from Northwest Arkansas. *Goodwin, Harold and Kenneth B. Young*

2005

MBTC DOT 2035: WebShipCost – Quantifying Risk in Intermodal Transportation. *Nachtmann, Heather and Manuel D. Rossetti*

2004

MBTC DOT 2024: WebShipCost – Intermodal Transportation Linkage Cost Assessment Via the WWW. *Rossetti, Manuel D. and Heather Nachtmann*

MBTC DOT 2041: Integrated Analysis of Transportation and Inventory In Intermodal Distribution Networks. *Mason, Scott J. and Erhan Kutanoglu*

2003

MBTC DOT 2003: Empty Container Management for Container-on-Barge (COB) Transportation: Planning Horizon Effects on Empty Container Management in a Multi-Modal Transportation Network. *Cole, Michael H. and Erhan Kutanoglu*

MBTC DOT 2016: Further Study of Roundabouts. *Russell, Eugene R. and Margaret J. Rys*

MBTC DOT 2019: Designing Horizontal Curves for Low-Speed Environments. *Gattis, James L.*

2002

MBTC DOT 2013: Efficient Timing of Pickup and Delivery Assignment Decisions Through Simulation and Optimization. *Kutanoglu, Erhan and G. Don Taylor*

2001

MBTC DOT 2004: Efficient Dispatching in a Terminal City Network. *Kutanoglu, Erhan and G. Don Taylor*

Materials Research

2012

MBTC DOT 3020: Performance of Flexible Pavement Systems Containing Geosynthetic Separators. *Coffman, Richard*

PUBLICATIONS *available*

AT WWW.MACKBLACKWELL.ORG

MBTC DOT 3023: Automated Survey of Pavement Distress Based on 2D and 3D Laser Images. *Wang, Kelvin*

MBTC DOT 3025: Biodiesel Waste Products as Soil Amendments - Evaluation of Microbial, Biological, and Plant Toxicity. *Soerens, Thomas*

MBTC DOT 3027: The Development of Novel and Non-Invasive Germplasm Selections Native to Arkansas for Highway Re-Vegetation Projects. *McDonald, Garry*

2011

MBTC DOT 3012: Examining the Effects of Mixer Type and Temperature on the Properties of Ultra-High Performance Concrete. *Hale, W. Micah and Kirk A. Grimmelman*

MBTC DOT 3016: Arkansas Highway and Transportation Department (AHTD) Cracking Protocol Application with Automated Distress Survey for Design and Management. *Wang, Kelvin C.P. and Kevin D. Hall*

MBTC DOT 3018: The Production of Butanol Fuel from Renewable Systems Using a Membrane Assisted Fermentation System. *Hestekin, Jamie A., Robert E. Babcock and Robert B. Beitle*

2010

MBTC DOT 2090/3002: Performance Prediction of the Strong Company's Soft Ground Arrestor System Using a Numerical Analysis. *Heymsfield, Ernest P.*

MBTC DOT 2095/3004: Potential Application of Nanotechnology on Cement Based Materials. *Selvam, R. Panneer and Kevin D. Hall*

MBTC DOT 3009: Economic Issues Related to Continuous Supercritical Biodiesel Production. *Babcock, Robert E., Edgar C. Clausen and Michael P. Popp*

MBTC DOT 3013: Accelerated Characterization of Full-Scale Flexible Pavements Using a Vibroses. *Cox, Brady R. and John S. McCartney*

2009

MBTC DOT 2071: Prestress Losses in Prestressed Bridge Girders Cast with Self-Consolidating Concrete. *Hale, W. Micah*

MBTC DOT 2089: Development of a Soft Ground Arrestor System. *Hale, W. Micah and Ernest P. Heymsfield*

2008

MBTC DOT 2066: Surface Friction Measurements of Fine-Graded Asphalt Mixtures. *Williams, Stacy G.*

MBTC DOT 2075: Non-Nuclear Methods for Density Measurements. *Williams, Stacy G.*

MBTC DOT 2092: Yield Characteristics of Biodiesel Produced from Chicken Fat-Tall Oil Blended Feedstocks. *Babcock, Robert E., Edgar C. Clausen and Michael P. Popp*

2007

MBTC DOT 2027: Investigation of the affect of Fines on Base Course Performance. *Dennis, Norman D., Richard M. Welcher and John H. Lawrence*

MBTC DOT 2030: Development of 4.75 MM Superpave Mixes. *Williams, Stacy G. and Kevin D. Hall*

MBTC DOT 2053: Development of an In Situ Permeability for Concrete Structures. *Hale, W. Micah and Mark L. Kuss*

MBTC DOT 2054: A Comprehensive Study of Field Permeability Using the Vacuum Permeator. *Williams, Stacy G. and Mark L. Kuss*

MBTC DOT 2058: Biodiesel Production from Varying Grades of Beef Tallow and Chicken Fat. *Babcock, Robert E., Edgar C. Clausen and Michael P. Popp*

MBTC DOT 2076: Physical and Chemical Characteristics of Superpave Binders Containing Air Blown Asphalt from Two Different Feedstocks. *Hardee, John*

2006

MBTC DOT 2032: Development of Testing Protocol and Correlations for Resilient Modulus of Subgrade Soils. *Dennis, Norman D.*

2005

MBTC DOT 2039: Life Cycle Economic Comparison of Common Sign Post Materials and Types. *Rys, Margaret J. and Eugene R. Russell*

MBTC DOT 2049: A Study of Physical and Chemical Characteristics of Superpave Binders Containing Air Blown Asphalt. *Hardee, John R.*

2004

MBTC DOT 2033: Repair of Damaged Concrete Structures

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Using Prepreg Composites. *Li, Guoqiang*

MBTC DOT 2052: Comparative Esterification of Agricultural Oils for Biodiesel Blending. *Babcock, Robert E.*

MBTC DOT 9201: Development of Superpave Training Materials for Local Agencies. *Hall, Kevin D.*

2003

MBTC DOT 2014: Development of a Simplified Asphalt Concrete Stiffness/Fatigue Device. *Tran, Nam and Kevin D. Hall*

Vehicles Systems Research

2007

MBTC DOT 2008: Automation of Pavement Surface Distress Survey Through Parallel Processing. *Wang, Kelvin C.P.*

MBTC DOT 2042: Automated Survey and Visual Database Development for Airport and Local Highway Pavements. *Wang, Kelvin C.P.*

2004

MBTC DOT 9205: Application and Advancement of the Next Generation Highway Data Vehicle. *Wang, Kelvin C.P.*

2002

MBTC DOT 2017: Determining Optimal Trailer Duty as a Function of Use and Age. *Nutter, Darin W. and C. Richard Cassady*

2001

MBTC DOT 2005: Quantifying the Impact of Refrigerated Unit Failures. *Nutter, Darin W., C. Richard Cassady, John R. English, Don Taylor and Chet Tuck Wong*

CNS/Traffic Management/Command and Control

2009

MBTC DOT 2088: Applications of GIS and Operations Research Logistics Planning Methods for Arkansas Rural Transportation Emergency Planning. *Rossetti, Manuel D., Edward A. Pohl and Fred Limp*

2008

MBTC DOT 2047: WebShipCostGIS in Inter-modal Transportation. *Rossetti, Manuel D. and Heather Nachtmann*

MBTC DOT 2077: Networked Sensor System for Automated Data Collection and Analysis. *Wang, Kelvin C.P.*

MBTC DOT 2084: Development of an Intermodal Container Load Status and Security Monitoring System. *McCann, Roy A.*

MBTC DOT 2097: Automated Inventory and Analysis of Highway Assets: Phase II. *Wang, Kelvin C.P.*

2007

MBTC DOT 2065: Automated Inventory and Analysis of Highway Assets. *Wang, Kelvin C.P.*

2006

MBTC DOT 2044: Cost Efficient Management Tools for Assessing Cultural Resources. *Sabo, George and Lela Donat*

MBTC DOT 9209: Training and Course Materials for Transportation Applications of GIS. *Rossetti, Manuel D.*

2005

MBTC DOT 2031: GIS-Based BMP Planning Tool for Stormwater Quality Management. *Edwards, Findlay G. and Steven J. Burian*

2003

MBTC DOT 2023: Impact of Wireless Data Systems on the Transportation Systems of the Future. *Mason, Scott J. and Erhan Kutanoğlu*

MBTC DOT 2025: Evaluation of Automated Work Zone Information Systems. *Tooley, Melissa S. and James L. Gattis*

2002

MBTC DOT 2020: Design of a Mobility Information Management System (MIMS). *Anderson, Michael*

Safety Analysis and Risk Management

2010

MBTC DOT 2055: Roadway Median Treatments - Phase 1. *Gattis, James L.*

MBTC DOT 2067: Roadway Median Treatments - Phase 2. *Gattis, James L.*

MBTC DOT 2091: Rural Transportation Emergency Preparedness Plans. *Nachtmann, Heather and Edward A. Pohl*

MBTC DOT 3008: Emergency Medical Response via Inland Waterways. *Nachtmann, Heather and Edward A. Pohl*

PUBLICATIONS *available*

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2009

MBTC DOT 2098/3005: A Model-Based Risk Map for Roadway Traffic Crashes. *Nam, Chang S. and Joon J. Song*

MBTC DOT 2099/3006: Identification and Analysis of High Crash Segments on Interstate, US, and State Highway Systems of Arkansas. *Bham, Ghulam H.*

MBTC DOT 2096/3007: Solar Powered Lighting for Overhead Highway Signs. *Patangia, Hirak C.*

2008

MBTC DOT 2061: Risk Modeling, Assessment and Management. *Pohl, Edward A.*

MBTC DOT 2063: Highway Collision Warning Technology: Determination of Criteria for Detecting and Logging Hazardous Events in Tractor-Trailer Safety and Training Programs. *McCann, Roy L. and Steven L. Johnson*

MBTC DOT 2064: Assisted Night Vision for Motorists in Highway Construction Zones: Phase II. *Patangia, Hirak C. and John M. Faucett*

MBTC DOT 2079: Study Drivers' Behavior at Passive Railroad-Highway Grade Crossings. *Russell, Eugene R. and Margaret J. Rys*

MBTC DOT 2080: Effectiveness of Seat Belts in Reducing Injuries. *Dissanayake, Sunanda*

MBTC DOT 2093: Improved Traffic Signal Efficiency in Rural Areas Through the Use of Variable Maximum Green Time. *Click, Steven M.*

2007

MBTC DOT 2062: Development of a Human Performance Simulation Model to Evaluate In-Vehicle Information and Control Systems in Commercial Trucking Operations. *Johnson, Steven L. and Chang S. Nam*

MBTC DOT 2085: Homeland Security for Rural Transportation Networks. *Nachtmann, Heather, Edward A. Pohl and C. Richard Cassidy*

2005

MBTC DOT 2048: Total System Cost/Benefit Assessment of Heavy Truck-Automobile Speed Differentials on Rural Highways. *Johnson, Steven L.*

MBTC DOT 2050: Assisted Night Vision for Motorists in Highway Construction Zones: Phase I. *Patangia, Hirak C.*

MBTC DOT 2051: Identification of Countermeasures to Reduce Severity of Rural Highway Crashes. *Dissanayake, Sunanda*

2004

MBTC DOT 9211: Video Tapes/DVD's: "Driving in Orange." *Gattis, James L.*

2001

MBTC DOT 9203-A: Video Tapes/DVD's: "Lane Closures." *Gattis, James L.*

MBTC DOT 9203-B: Video Tapes/DVD's: "Pavement Markings." *Gattis, James L.*

DHS NATIONAL TRANSPORTATION SECURITY

Center of Excellence Projects

2012

MBTC DHS 1101: Designing Resilient and Sustainable Supply Networks. *Pohl, Edward A., Scott Mason, and Chase Rainwater*

MBTC DHS 1106: Emergency Response via Inland Waterways. *Nachtmann, Heather and Edward A. Pohl*

MBTC DHS 1107: Practices and Technologies in Hazardous Material Transportation and Security. *Wang, Kelvin*

MBTC DHS 1108: Sustaining Resilient Inland Waterways via Renewable Energy. *Nachtmann, Heather and Letitia M. Pohl*

2011

MBTC DHS 1105: Information Enhancement Among Aviation Security Partners. *Chimka, Justin R.*

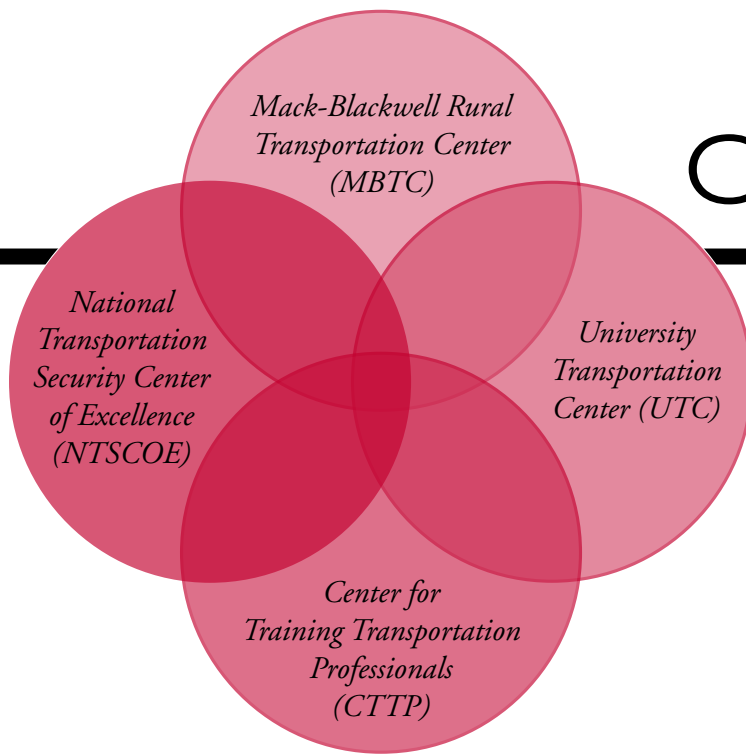
2010

MBTC DHS 1102: Simulating Large-Scale Evacuation Scenarios in Commercial Shopping Districts - Methodologies and Case Study. *Rossetti, Manuel D.*

MBTC DHS 1103: Applicability of Microelectronic and Mechanical Systems (MEMS) for Transportation Infrastructure Management. *Wang, Kelvin C.P.*

OUR *team*

ORGANIZATIONAL CHART



MBTC *personnel*

MBTC *staff*



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



Heather L. Nachtmann,
Ph.D.
MBTC Director



Letitia M. Pohl,
Ph.D.
Assistant Director



Stacy G. Williams,
Ph.D., P.E.
Director, CTTP



Sandra Hancock,
CAP, M.S.
Fiscal Support Analyst

CTTP *staff*



Frances Griffith, M.S.
*Administrator for
Technician Training*



Rosalie Conley
Research Technologist



Mary Fleck
Instructor



Charles Steelman
Online Products Specialist



Diane Allen
Administrative Assistant III

FINANCIAL *report*

GRANT YEAR: JULY 1, 2011 – JUNE 30, 2012

DOT FEDERAL SHARE: \$383,793

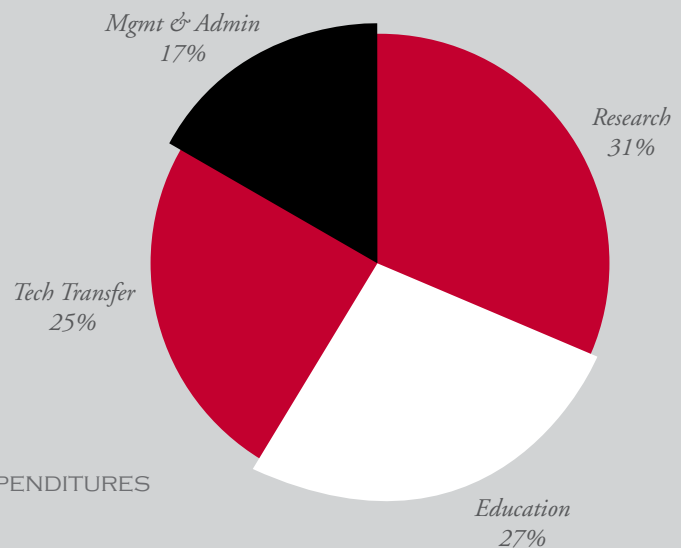
DOT MATCHING SHARE: \$1,084.802

TOTAL: \$1,468,595

MBTC EXPENDITURE DISTRIBUTION

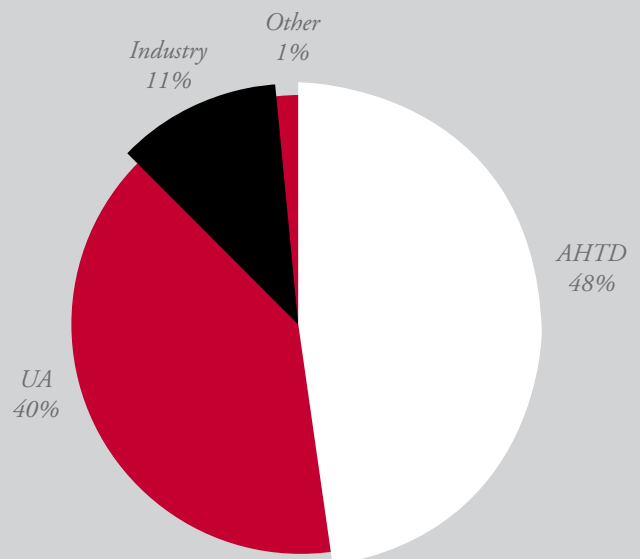
july 2011 - june 2012

*30.1% OF MANAGEMENT AND ADMINISTRATIVE EXPENDITURES
COME FROM MATCH SOURCES



MBTC MATCH SCORES

july 2011 - june 2012



THE SPIRIT OF *mack-blackwell*



SANDRA HANCOCK, CAP, M.S.

MBTC is fortunate to have had Sandy Hancock as a full-time employee for its entire history. She has been described as “the glue that binds everything together.” Her position was originally designated as “bookkeeper,” then “accountant,” and

now “fiscal support analyst.” Whatever you call her, she is the person who manages the money. For 20 years, Sandy has worked effectively with faculty, students, university offices, and program administrators at the Department of Transportation and the Department of Homeland Security.

Sandy has three degrees from the U of A – a B.S.B.A. in Office Systems Management, a B.S.B.A. in Accounting and a M.S. in Operations Management. She is a Certified Administrative Professional, and is active in the International

Association of Administrative Professionals, holding leadership positions in both the local chapter and the Arkansas/Oklahoma Division. In her leisure time, Sandy enjoys international folk dancing and is very active in her church, serving as the worship dance leader. She is married to Jeff Hancock and lives near Prairie Grove, Arkansas.

Sandy has found her work with MBTC to be a great learning experience. She believes that her interactions with so many different people have improved her interpersonal skills and enabled her to meet people around campus and across the country. One of her fondest memories with MBTC is attending her first Council of University Transportation Centers annual meeting at the University of Montana, where she was able to fulfill her goal of visiting Yellowstone National Park.

As described by our current director Heather Nachtmann, “Sandy embodies the spirit of MBTC, U of A, and Arkansas. She is extremely smart, has a can-do attitude, and is always pleasant to be around. Sandy is 100% dedicated to the success of MBTC and everyone who works with our center. We would be lost without her.”

UPCOMING EVENT:

Annual Advisory Board Dinner and Meeting

Dinner – November 26, 2012 - The Chancellor Hotel, Fayetteville, AR

Meeting – November 27, 2012 - 700 Research Center Blvd, Fayetteville, AR

professional advisory board

Harold D. Beaver, P.E.

District Engineer (Ret.)
Arkansas State Highway and
Transportation Department

Scott Bennett, P.E.

Director
Arkansas State Highway and
Transportation Department

Rebecca M. Brewster

President and Chief Operating
Officer
American Transportation Research
Institute

Jack Buffington, P.E.

RADM, USN (Ret.)
MBTC Director (Ret.)
University of Arkansas

Robert Crawford

Transportation Security
Administration, Little Rock
U.S. Department of Homeland
Security

Dan Flowers, P.E.

Director (Ret.)
Arkansas State Highway and
Transportation Department

Keith Garrison

Executive Director
Arkansas Waterways Commission

Ann Gilbert

Executive Director
Arkansas Transit Association

Randy Hathaway, Ph.D., P.E.

Deputy District Engineer for
Project Management

Little Rock District
U.S. Army Corps of Engineers

Michael (Mike) R. Johnson, P.E. RADM, CEC, USN (Ret.)

Associate Vice Chancellor for
Facilities
University of Arkansas

Wesley Kemp

President & Chief Executive Officer
ABF Freight System, Inc.

Lane Kidd

President
Arkansas Trucking Association

Sandy Otto, P.E.

Division Administrator
U.S. Department of Transportation
Federal Highway Administration

Paul Revis, P.E.

BGEN, US Army (Ret.)
Executive Director
Ouachita River Valley Association

Michael J. Right

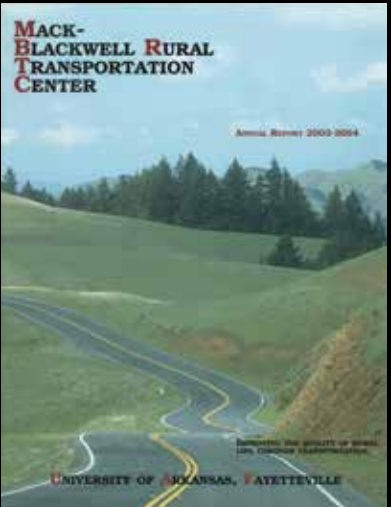
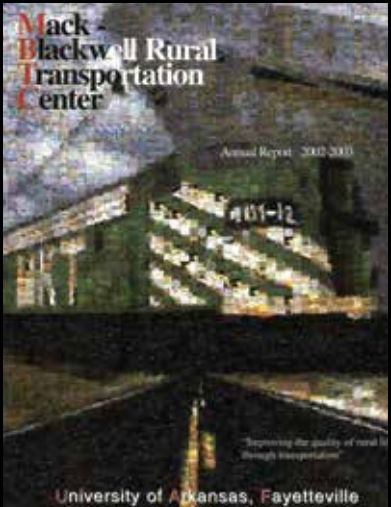
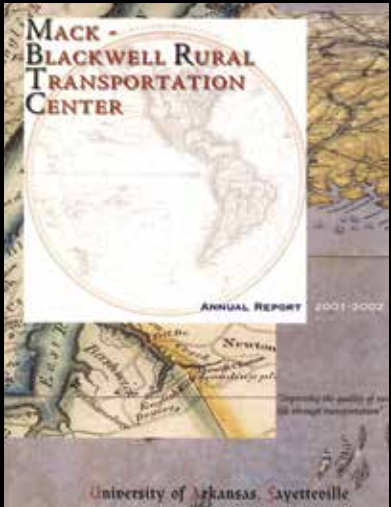
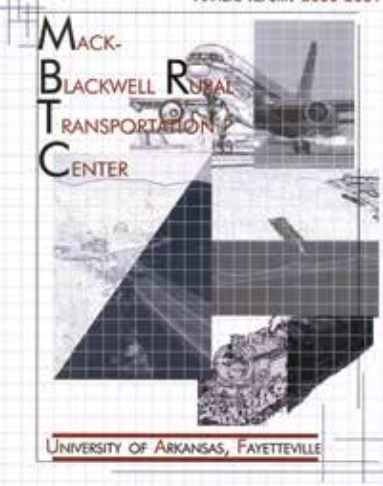
Vice President - Public Affairs
American Automobile Association

Barbara Sisson, P.E., SES

Director of Logistics, Installations
and Mission Support
Headquarters Air Education and
Training Command
United States Air Force

Gary Whicker

Senior Vice President for
Engineering Services
J.B. Hunt Transport



Y.M. "MILTON" MACK, DIST. 18



LAWRENCE BLACKWELL, DIST. 20

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4190 BELL ENGINEERING CENTER
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FAX: 479.575.7168
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UNIVERSITY OF
ARKANSAS
COLLEGE OF
ENGINEERING