The first half of 2012 has proven to be a busy and exciting time for the Gulf Coast Research Center for Evacuation and Transportation Resiliency (CETR) at both LSU and UNO. LSU student Jaworski Sartin was awarded a fellowship through the “Bridge to the Doctorate” project at LSU. Scott Parr of LSU was selected to receive the 2012 Clayton Ph.D. Assistantship Supplement Award and Max Williamson of UNO presented at the Transportation Research Board annual meeting in January on his research funded through the USDOT Eisenhower Transportation Fellowship.

In January, the Center received the exciting news that its bid for the 2012 USDOT University Transportation Center (UTC) funding as a member of the prestigious Southwest Region University Transportation Center was successful. Everyone associated with the CETR at LSU and UNO feels privileged to be part of an esteemed consortium that includes the Texas Transportation Institute at Texas A&M University, the University of Texas at Austin, and Texas Southern University. Following the announcement, our new partners began collaborating on the development and implementation of cutting edge research projects to continue and expand our mission.

From February 7-9, CETR co-hosted with the Stephenson Disaster Management Institute at LSU the Second Biennial National Evacuation Conference in New Orleans. The event brought together over 300 professionals representing the fields of academia, nonprofit and for-profit sectors, emergency management, government and transportation planning and engineering.

In May, CETR officially hit the airwaves with what has become a monthly radio show highlighting transportation topics of interest. You can find us on your radio dial at WDSO 990 AM on the first Saturday of every month at 9:00 a.m. or read the article in this newsletter summarizing the first three shows with links to the download of the podcasts.

Finally, in June 2012, just as Congress was in the final discussions of debating the new transportation bill, MAP-21, I had the opportunity to meet with a transportation planning champion in the Senate – Louisiana Senator Mary Landrieu – to discuss the importance of sustainable transport to the future of our nation and the Gulf Coast.

National Evacuation Conference 2012

The Center hosted the Second Biennial National Evacuation Conference in New Orleans on February 7th-9th. The conference was organized by the Stephenson Disaster Management Institute and CETR. This conference brought together the fields of transportation and emergency management to discuss evacuation
After extensive studies and modeling with TRANSIMS, a contraflow plan was established for Metropolitan New Orleans. In conclusion, it is evident that TRANSIMS can be an effective tool for evacuation modeling and planning.

Attendees included a wide array of professionals from academia, nonprofit and for-profit organizations, consulting firms, emergency management, government, and transportation planning. Dr. Stephen Flynn, Professor of Political Science and the Founding Co-Director of the George J. Costas Research Institute for Homeland Security at Northeastern University, gave the opening keynote address. Key topics of discussion included: (1) addressing the challenges faced by special needs populations during disasters; (2) improvements in evacuation planning and modeling; and (3) national evacuation policy development. In addition, the conference featured a special focus on evacuation issues surrounding the 2011 Japan disaster.

Full papers were made available as part of a conference compendium and were considered for publication in one of two special journal issues, The American Society of Civil Engineers’ Natural Hazards Review and The International Journal of Mass Emergencies and Disasters.

Dr. Wolshon presents at the National Hurricane Conference

Dr. Wolshon also made a presentation at the 2012 National Hurricane Conference in Orlando, Florida in March 2012. Dr. Wolshon was one of several speakers that led the session titled The New Realities of Hurricane Evacuations to discuss how the inundation potential, larger numbers of people, and changing population attributes are causing emergency management professionals to re-think their approaches to evacuation, with respect to timing, sheltering, communicating, and deciding who needs to leave. His presentation, Special Evacuation Challenges in the Florida Keys, highlighted an ongoing project in which the Florida Keys planners confront unique challenging issues with respect to evacuation. He also described the transportation analysis process and the emerging knowledge that can be applied to other locations.

Drs. Wolshon and Renne featured at seminar on evacuation planning

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Dr. Wolshon presents at American Council of Engineering Companies Meeting

In March, Dr. Wolshon spoke at the American Council of Engineering Companies (ACEC) chapter meeting in Baton Rouge, LA. His presentation titled Evacuation Practice and Research: Preparing for Natural and Man-made Major Events, discussed how evacuation planning in Louisiana has evolved over time. Problems were identified from the evacuation of Hurricane Ivan and solutions were proposed to enhance the evacuation plan.

On May 16, 2012, the American Society of Civil Engineers Transportation & Development Institute, Louisiana Chapter
sponsored a public seminar, *Evacuation Planning: Lessons Learned from Hurricanes Katrina and Gustav*, which featured Drs. Wolshon (LSU) and Renne (UNO)—two of America’s leading experts on evacuation planning, and founding organizers of the National Evacuation Conference.

Dr. Wolshon, who serves as Chair of the Transportation Research Board’s Emergency Evacuation Subcommittee, presented an overview and history of the general concepts and practices used for evacuation in the United States. His talk encompassed the history and development of the Louisiana evacuation plan, particularly how research conducted at LSU was able to support and improve the development of the New Orleans freeway contraflow plan. Dr. Wolshon also highlighted a recent U.S. DOT supported project to apply state-of-the-art traffic simulation modeling for future evacuation plan assessment and improvement. As part of this work, a regional multimodal model for the southeast Louisiana highway network was developed to replicate the temporal and spatial travel movements of metropolitan New Orleans prior to Hurricane Katrina.

Dr. Renne, a leading expert on the evacuation of carless and vulnerable populations, discussed the planning process and outcomes of the New Orleans City Assisted Evacuation, which was successfully deployed during Hurricane Gustav. It was noted that this was one of the first publicly-assisted evacuations in U.S. history that focused on carless and vulnerable populations, including tourists. His talk also made recommendations for the roles of various jurisdictions, including federal, state, metropolitan planning organizations, parish government and transit agencies.

The event was held at the University of New Orleans and co-sponsored by the Merritt C. Becker, Jr., University of New Orleans Transportation Institute (UNOTI).

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**Technology Transfer**

**Best Development Practices: Bridging the Gap Between Land Use and Transportation Symposium**

On April 10, 2012, the Gulf Coast Center for Evacuation and Transportation Resiliency (CETR) partnered with the UNO Transportation Institute (UNOTI), the New Orleans Regional Planning Commission (RPC) and the Louisiana Chapter of the American Planners Association to host the *Best Development Practices: Bridging the Gap Between Land Use and Transportation Symposium*. This event was part of the RPC’s 2012 Smart Growth Speaker Series.

UNO’s Dr. John Renne acted as moderator for the event which featured Dr. Reid Ewing, Professor of City and Metropolitan Planning at the University of Utah and Mr. Stephen Villavaso, Principal at Villavaso & Associates of New Orleans. Dr. Ewing opened the program with an overview of best development practices, the topic of his best-selling book, *Best Development Practices: Doing the Right Thing and Making Money at the Same Time*. Mr. Villavaso concluded the evening with a discussion of new plans in the Louisiana region that are working to promote best development practices.
Project Updates

Minimizing Driver Errors: Examining Factors Leading to Failed Target Tracking and Detection
Principal Investigator: Dr. Melissa Beck

The literature review was completed and serviced two main goals: (1) to demonstrate situations that are likely to outstrip attentional resources while driving and (2) to determine how these situations may influence driver performance. Using the literature review, the best study design and predicted results were devised. The study will be conducted in a Realtime Technologies Inc. driving simulator utilizing the SimVista driving simulator software. Four independent variables will be manipulated (i.e., number of vehicles to track, pedestrian expectation, pedestrian presence, and clutter), while measuring various factors of driving performance (e.g., proportion of vehicles accurately tracked, breaking, headway, lane deviations, verbal report of pedestrian detection) to determine the effect of these variables on driving performance.

The results of this study will help to determine the driving circumstances under which attention is taxed leading to driving errors. Specific hypothesis include: (1) When the roadway and surrounding areas are cluttered, fewer vehicles will be successfully tracked and fewer pedestrians will be detected, compared to an environment with low visual clutter; (2) Pedestrians will be detected more frequently when fewer vehicles are tracked, compared to when maintaining attention on more vehicles; (3) Cues (e.g., a crosswalk sign) should increase pedestrian detection and potentially decrease tracking performance; and (4) Driving situations under which attention is taxed (high tracking load and pedestrian expectation) will lead to more driving errors and/or one or more of the following: slower speed, more headway, and more lane changes.

Project Status: On-going. Currently, the driving simulator is being programmed in order to collect data.

Improving the self-healing properties of concrete materials by using composite action with fiber reinforced polymers and shape-memory alloys
Principal Investigators: Dr. Michele Barbato and Dr. Marwa Hassan

The main goal of this project is to generate and control specific parameters of an effective self-healing mechanism, which can be utilized for the self-healing of concrete bridges. The healing process that has been chosen for this analysis is microencapsulation. The self-healing mechanism is enhanced by using confinement with fiber reinforced polymers (FRPs). To achieve this goal, this project will meet the following objectives: (1) Control of specific parameters during microcapsules production; (2) Use of these microcapsules in unconfined and FRP-confined concrete samples; and (3) Evaluate the healing effectiveness of unconfined and FRP-confined concrete cylinders incorporating these microcapsules.

To date, the microcapsules have been developed in the laboratory and the size, morphology and shell thickness were controlled. The appropriate analytical models for
prediction of strength, stiffness, and ductility of FRP-confined concrete have been identified. The material constitutive models were extended to cyclic loading conditions and coded for nonlinear finite element analysis.

**Project Status:** On-going.

**Worker Accessibility in Post-Katrina New Orleans**
*Principal Investigator: Dr. Kate Lowe*

Providing access to employment opportunities is one of transportation’s most critical functions, but too often carless workers struggle to reach job opportunities. This study examines the resiliency of the transportation system for carless, low-income workers and their resilience through travel adaptations. For the field of transportation, findings will document mobility changes in an extreme case of transit service reduction, as well as the more general accessibility challenges posed by regionally fragmented transit and employment decentralization. For the region, findings will aid policy and programmatic efforts to enhance job accessibility.

Literature review on low-income worker accessibility was completed during the winter and analysis of ACS commute trends this spring. Trends in New Orleans were compared to several other medium-sized metropolitan areas, and the summary of the analysis is currently being finalized. Interviews have been completed with officials from the state, local and regional agencies. Interviews with workers are currently underway and scheduled to be completed by the end of June.

**Project Status:** On-going.

**Incorporating Lower Mississippi River Port Assets into Emergency Preparedness and Response Initiatives**
*Principal Investigator: James Amdal*

The Lower Mississippi River (LMR) and its 5 deep water ports are a significant national asset as well as a critical portion of a major transportation corridor from the heartland of the country to the Gulf of Mexico. The lower portion of the Mississippi River is particularly subject to major disruptions caused by both man-made and natural disasters. In light of recent events of national significance (Hurricane Katrina of 2005 and the Deepwater Horizon Oil Spill of 2010) researchers at UNOTI questioned: (1) what assets at the LMR ports are available to respond to these events; (2) what agreements either exist or are needed to access them during emergency or disaster situations.

UNOTI conducted extensive on-site interviews with port officials to determine what assets exist and their location. UNOTI also worked with USCG officials to determine if these assets are included within their various plans for emergency or disaster response. We determined that a variety of assets do exist but, to date, they are not an integral part of any regional or national response plan.

In times of disaster affecting the LMR all assets may be called into service. Depending on the magnitude of the event, regardless of the specific plans being utilized, contingency measures call into play all conventional and unconventional assets to deal with the after effects. This was the case in both Hurricane Katrina and the Deepwater Horizon Oil Spill. The responses to these events can be used to improve our ability to respond in a more comprehensive and “all hands - all assets - all responses” manner. UNOTI's UTC report provides the USCG and other organizations with a current inventory of port assets that can be incorporated into their emergency response plans, most specifically the Area Contingency Plan (ACP) and identifies what agreements currently exist to access these assets in times of disaster. *Incorporating Lower*
Mississippi River Port Assets into Emergency Preparedness and Response Initiatives is available at transportation.uno.edu/publications.

Project Status: Completed.

Assessing the Long-term Impact of Subsidence and Global Climate Change of Emergency Evacuation Routes in Coastal Louisiana
Principal Investigators: Dr. Roy Dokka and Dr. Joshua Kent

Findings from this research reveal that the majority of predicted susceptible roads are currently vulnerable. The differences change little between 2010 and 2025, suggesting that mitigating these vulnerable routes now can have long-term benefits to evacuation planning. This is especially true for the routes vulnerable to storm surge from hurricanes. The findings from this research are expected to have significant implications for transportation engineers and emergency planners who design the State’s highways and ensure the safety of the citizens of Louisiana, respectively. Because the findings from this research will have far-reaching implications, the elevation forecast model is expected to become a spring-board for research in related fields, including transportation modeling, coastal restoration and hazard mitigation, environmental sustainability studies, regional planning, etc. The Center for Geo Informatics (C4G) at LSU looks to collaborate with multiple disciplines (e.g., geologic/geomorphology, emergency management, coastal restoration) to further refine these road elevation forecast models and ensure applicability for future research.

Project Status: Completed.

Student Involvement Spotlight

LSU Student Awarded Clayton Ph.D. Assistantship Supplement Award

LSU graduate student, Scott Parr, was selected to receive the 2012 Clayton Ph.D. Assistantship Supplement Award. This award was established through an endowment by 1959 LSU graduates, Donald W. and Gloria Picchon Clayton, to support the College of Engineering in its quest for excellence. Parr was honored at the LSU College of Engineering Hall of Distinction Banquet on April 26th, 2012. The LSU College of Engineering is very proud of Parr for his academic accomplishments and representation of the student body.

LSU Student Awarded Fellowship

Jaworski Sartin, an LSU doctoral student specializing in the area of transportation systems engineering, was awarded a Fellowship through the “Bridge to the Doctorate” (BD) project at Louisiana State University. This LSU/BD award is made possible through the Louis Stokes – Louisiana Alliance for Minority Participation (LS-LAMP) funded by the National Science Foundation. The purpose of the LS-LAMP BD is to support and encourage students from underrepresented groups in pursuit of a PhD in the science, technology, engineering or mathematics fields.
UNO Graduate Student presented at the Transportation Research Board’s Annual Meeting

UNOTI Master of Urban and Regional Planning student Max Williamson presented at the Transportation Research Board’s Annual Meeting as part of the 19th Annual Dwight D. Eisenhower Transportation Fellowship Program (DDETFP) Research Showcase. Williamson was among 15 other DDETFP recipients, who presented on research on transportation, engineering, and planning. His presentation examined the sustainability of bicycle share systems in the U.S. and methods used to collect data on the systems.

Outreach

Student Outreach at St. Joseph’s Academy

As part of her outreach activities for the Center, Katie Spansel took part in the St. Joseph’s Academy (SJA) Career Day on March 14, 2012. SJA is an all-girls Catholic high school in Baton Rouge, LA, with high standards of excellence in its academic programs. The mission of SJA is to educate young women as responsible and unifying members of the world community.

During the event, Spansel explained the typical duties of a civil engineer and the requirements to achieve an engineering degree at LSU. She described the University Transportation Center and the interesting on-going research projects dealing with transportation, safety, and evacuation. The girls expressed interest through their thought provoking questions and inquiries.

“I am hopeful that these eleventh grade students have a new found interest in engineering as a potential career endeavor. With SJA having a strong math and science emphasis in the curriculum, I know the girls will be well prepared for any engineering field,” Spansel said.

Dr. Renne co-hosting local radio show on Transportation

On May 5, 2012, UNO’s Dr. Renne joined the airwaves as co-host with Kevin Fitzwilliam, host of All Things Local for the first of what will be a monthly hour-long radio show highlighting transportation topics of interest to the local and surrounding community. The show, which is held from 9:00 a.m. – 10:00 a.m. (CST) on the first Saturday of the month, is being sponsored by the Merritt C. Becker, Jr., UNO Transportation Institute in partnership with All Things Local. The show is carried on WGSO 990 AM radio.

Dr. Renne kicked off the May 5th show featuring a conversation with New Orleans City Councilmember Kristin Gisleson Palmer about sustainable transportation in New Orleans and the debate about tolls on the Crescent City Connection which support Mississippi River ferries. The bridge toll debate is a hot topic locally which will likely be put to a public referendum vote this fall. The show also in-
cluded a discussion with Bike Easy Executive Director, Jamie Wine, about the role of biking in New Orleans and the Bicycle Second Line event that was held on May 20th. You can listen to the podcast at http://transportation.uno.edu/news/listen-to-podcast-of-may-show-of-all-things-local-on-transportation-in-new-orleans

The show held on June 2nd was a heads up lesson on Hurricane Evacuation Preparedness in conjunction with the beginning of the Hurricane Season, which officially began on June 1st. Host Kevin Fitzwilliam and Dr. Renne discussed evacuation preparedness with national evacuation expert and CETR Director Dr. Brian Wolshon. Mr. Robert Fogarty, Founder and Board President of Evacuteer.org was also a guest on the show. You can listen to the podcast at http://transportation.uno.edu/news/kick-off-hurricane-season-by-listening-to-the-podcast-of-the-june-show-of-all-things-local-nola

The July show featured New Orleans Health Commissioner Dr. Karen DeSalvo for a discussion on the connections between health and transportation. The show also featured Matt Rufo and Kate Parker from Tulane’s Prevention Research Center in the School of Public Health to discuss connections between obesity, walking, bicycling and safe routes to school. You can listen to the podcast at http://transportation.uno.edu/news/public-health-obesity-and-how-transportation-can-make-a-difference-in-new-orleans-this-month-on-all-things-local

Publications

Refereed Journal Articles already in Print:

Book Chapters already published:

Book Chapters soon to be published:

Report for the NRC:

Refereed Journal Articles accepted, but yet to be printed:

Refereed Conference Proceeding/Papers:

Technical Reports: