

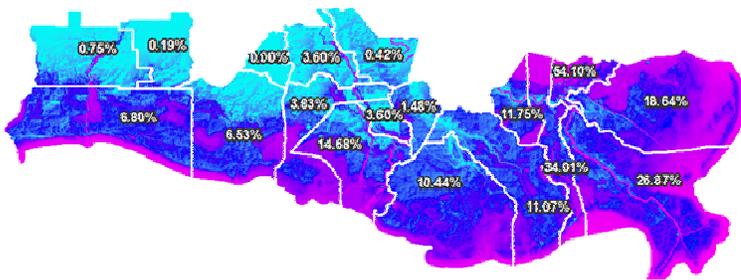


The Gulf Coast Center for Evacuation & Transportation Resiliency

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Assessing the long-term impact of subsidence and global climate change on emergency evacuation routes in coastal Louisiana



Proportion of land below sea level by parish, illustrated on a 2008 Digital Elevation Model of Louisiana

Research has revealed that Louisiana's coastal zone (LCZ) has experienced subsidence at rates as great as 40mm per year during the 20th century. Many natural and anthropogenic processes have been shown to result in subsidence. Combined with the effects of global climate change, our subsiding coastal plain will present significant design challenges for the State's emergency evacuation plans, including the potential inundation of previously unflooded lands, sea level rise (eustasy), deeper penetration of storm surge into the coastal zone, and the continued retreat of low-lying coastal wetlands. Indeed, these consequences are visible today. An assessment of benchmarks located along LA Highway 1, a hurricane evacuation route, revealed that the road subsided approximately 1 foot (~30.5 cm) between 1982 and 2002. This example foreshadows the long-term

implications for the LCZ that will undoubtedly complicate existing evacuation strategies. By leverage the state-of-the-art technological resources of the Center for GeoInformatics (C4G) at Louisiana State University, researchers Joshua Kent and Roy Dokka with the support of the Gulf Coast Center for Evacuation and Transportation Resiliency will use the highly accurate positioning capabilities of the Center's GULFNet* real time network to develop a subsidence forecast model to estimating changes in road elevations in 2025, 2050, and 2100. Subsidence rate estimates will be applied to a digital elevation model (DEM) of coastal Louisiana and used to identify those emergency evacuation routes that are vulnerable to inundation. The threshold for assessing this vulnerability will be made using regional flood maps, storm surge models, and the eustatic changes anticipated through the century. The information gained from this project will provide transportation engineers and emergency managers with insights that were previously unavailable yet instrumental for evacuation modeling, hazard mitigation strategies, sustainability research, and more.



Dr. Roy Doakka and Dr. Joshua Kent





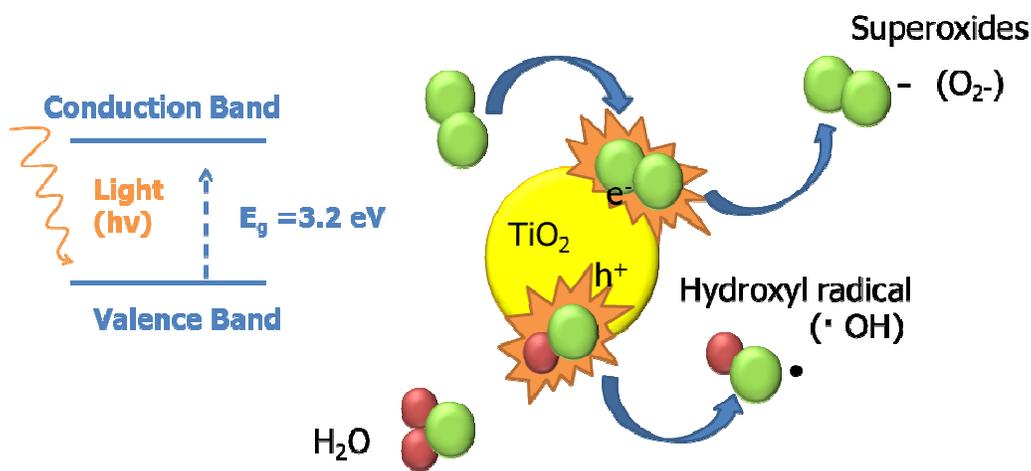
Field and Laboratory Investigation of Photocatalytic Pavements



Dr. Marwa Hassan

The US faces a significant challenge in controlling air pollution resulting from transportation activities and the growing population density. A number of regions in the US including in Louisiana have been designated by the EPA as nonattainment areas in which air pollution levels persistently exceed national air quality standards. Despite attempts are made to lower vehicle emission standards, a method is needed to remove these pollutants once they are emitted to the atmosphere. The potential of titanium dioxide (TiO₂) as an air purifier in urban and metropolitan areas, which suffer from high concentration of air pollutants, has been widely

recognized and is receiving considerable attention. However, current applications of this technology are limited to building facades and gateway elements of bridges not subjected to traffic as in the case of the I-35W Bridge over the Mississippi River in downtown Minneapolis. Expanding the technology to pavements requires creating a new generation of pavements that have photocatalytic capabilities, are durable, safe and cost effective. This project aims to create the first generation of photocatalytic asphalt and concrete pavements. These pavements will have the capability of producing hydroxyl radical intermediates, which are effective oxidizing agents of environmental contaminants including VOC, SO_x and NO_x as shown in Figure 1. Based on this heterogeneous photocatalytic oxidation process, nitrogen oxides are oxidized into water-soluble nitrates while sulfur dioxide is oxidized into water-soluble sulfate; these substances can be washed away by rainfall. In addition, the project will test the long-term durability and safety of the technology.



Mechanism of Photocatalytic Reaction





Resilient Transportation Systems in a Post-Disaster Environment: A Case Study of Opportunities Realized and Missed in the Greater New Orleans Region

Mr. James Amdal Director of the UNO Transportation Institute and Mr. Stanley Swigart used the New Orleans Region as a case study to assess transportation resiliency both pre and post- Katrina, the devastating storm of 2005. Using the Katrina experience as a point of reference, the objective of this research was to better recognize how the New Orleans region has progressed in terms of transportation resiliency. In order to review the system as a whole, the study focused on pre-storm transportation and policy composition, the failures that resulted from the event, and what policy changes have strengthened the post-storm transportation system. Researchers assessed key transportation assets and systems before, during and after this horrific event using key stakeholder interviews. “Lessons learned” and key policies in both the public and private sector post-disaster are highlighted. Transportation leaders in both passenger and freight modes were interviewed to assess their pre-storm preparations and their post-storm recovery efforts. Inputs from planning and government officials were also used to identify policy and procedural changes that affected both evacuation and disaster response. Key conclusions drawn from the research findings include:

- Pre-existing agreements, Memorandums of Understanding and contracts now exist that allow for timely and efficient utilization of needed assets by local and state officials.
- Metropolitan Planning Organizations are now recognized as a key resource and facilitator to all levels of government.
- Greater cooperation and collaboration exists in both the public and private sector.
- Achieving transportation resiliency is an ongoing and incremental process.
- The degree of resiliency varies by mode.
- Overall, the communication network and its coordination between and among modes still requires improvement

This research demonstrates that New Orleans is now, almost 5 years after Katrina, a more resilient city. Both policies and procedures within the transportation network have been improved to address disaster evacuation and response. New Orleans no longer relies solely on the flood protection systems for its safety and security. Evacuation plans are now designed to move people and assets out of “harm’s way” as opposed to vertical evacuation or on-site storage of transportation assets. Air, marine, public transit and rail transportation assets proved invaluable in Post-Katrina New Orleans and all are now being incorporated into pre-evacuation and post-response planning and execution. This case study demonstrates the value of resiliency as an operative framework for decision making at all levels of government and across all modes of transportation.





Walk & Roll Louisiana 2010, Families, Advocates and Policymakers to Promote Active Transportation and Physical Activity



The Gulf Coast Center for Evacuation and Transportation Resiliency, along with other member of the KidsWalk Coalition, are joining together for *Walk & Roll Louisiana 2010*.

Walk & Roll Louisiana is a day-

long summit that will raise awareness of the benefits of walkable, bikeable neighborhoods. The event will take place from 9am-3pm on Saturday, November 13 at the Sojourner Truth Neighborhood Center at Lafitte and N. Galvez Streets in the Faubourg Tremé. It will feature bicycle safety trainings, helmet giveaways and other physical activities for kids, panels on local advocacy efforts and infrastructure accomplishments, and an announcement of the results of the KidsWalk Coalition's school audit, information on the Safe Routes to School program and more. After a free lunch for attendees and a keynote address, we'll conclude the day with a moderated forum on local, state and federal non-motorized transportation policy sponsored by the Gulf Coast Center for Evacuation and Transportation Resiliency.

Announcement for Student Scholarships

Student scholarships for graduate and undergraduate students are being awarded by the Gulf Coast Center for Evacuation and Transportation Resiliency. The application package is available on the website: www.evaccenter.lsu.edu. The deadline for application is December 10th, 2010. For any questions please contact Dr. Vinayak Dixit, email: Vinayak@lsu.edu, phone: 225-578-6698.

Talk by Dr. Anthony Perl-Planning for Post-Carbon Mobility: How to Make the Most of Coming Transport Revolutions

In the transition to a post-carbon future, North America's transportation systems will change more during the next ten years than they have over the past 40 years. The mode of change will depart from the incremental adaptation that current planning and policy frameworks were designed



to facilitate. Moving beyond the oil fueled internal combustion engine will require introducing new types of transport infrastructure such as high-speed rail lines and roads that can support grid-connected vehicles. It will also call for either down-scaling or redesigning the infrastructure that was designed to serve only oil fueled transportation, such as most airports and Interstate highways. This presentation will introduce an anticipatory planning framework that could facilitate such a transition. Since there is no single substitute that can replace oil's ubiquitous role as a transport fuel, electric mobility offers the best option to blend energy sources and accommodate an incremental shift from non-renewable to renewable energy sources. If the United States is to adapt successfully, there will be a critical need for energy-first transportation planning, along with policy instruments that can support the shift to sustainable transportation. The talk is scheduled on December 13, 2010 at University of New Orleans

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