The 2010 Access Management Conference was designed for planners, engineers, non-profit organizations, and public officials interested in a sustainable approach to improving roadway safety and efficiency.

Focusing on the key to economic vitality, the conference offered a wide range of presentation topics that captured the broad realm of access management principles, state-of-the-art practices, policies, and state DOT/local government coordination.

The conference was organized from October 10 — 13, 2010 in Natchez, MS. Paul Forster, a junior Civil engineering student, made a poster presentation titled “greenWAY: Developing a Green Highway System in Mississippi”, which was awarded third place in the student poster competition. It was a great honor to receive this award. Mr. Forster is advised by Dr. Lin Li in the Department of Civil and Environmental Engineering and is working as a research assistant to Dr. Li’s IMTRANS project “Innovative Green Highway Construction Rating System in Mississippi”.

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This research serves to identify the extent and nature of demand for public transit and the related infrastructural barriers to transit system in Jackson Metropolitan Statistical Area.

There is a large variation within the US as to the extent of public transit options. The southern part of the country tends to have relatively lower density urban areas with much lower levels of available public transit. The Jackson Metropolitan Statistical Area (MSA) is almost the prototypical example of such an urban pattern of low density with little public transit. Most of the discussions on public transportation in Mississippi commit the fundamental attribution error in assigning too much importance to the supposedly insurmountable cultural barrier to a viable and thriving public transit system in the state in general and the Jackson MSA in particular. The theoretical argument that this proposal advances are two: A viable public transit system must be the best possible marriage of functionality (getting from point A to B in least possible time) and design (as extensions of civic spaces); the widely debated cultural barriers are merely euphemism for relative lack of infrastructure that could support a public transit system with levels of ridership sufficient enough to make the system sustainable.

This proposal tests the two aforementioned arguments through a well designed survey and based on the survey results recommends solutions in terms of planning scenarios that involve land use plans, urban spatial structure, and presence of civic spaces.
A sustainable or “green” highway is a roadway constructed per a relatively new concept in roadway design that integrates transportation functionality and ecological sustainability. An environmentally sound approach is used throughout the planning, design, and the construction.

With the funding support from Mississippi Department of Transportation and Institute for Multimodal Transportation at Jackson State University, Dr. Lin Li (PI) and Dr. Farshad Amini (Co-PI) are working closely with MDOT to develop a new green highway construction rating system for Mississippi greenway. The new rating system is based on the Greenroads and GreenLITES initiatives and modified for use in Mississippi.

This rating system would be beneficial to the design and construction of new surface transportation systems as well as the maintenance of existing transportation infrastructure. In addition, a computer tool will be developed for regulator, designer and contractors to assess the environmental sustainability of green highway.

The ultimate benefit of the rating system is more sustainable roadways. This means less impact on the environment, lower life cycle costs and more positive societal outcomes. It gives contractors a tool to measure the level of sustainability for highway construction projects.
Warranty contracting has been implemented in an attempt to reduce the amount of state highway agency resources required on a highway project, to reallocate performance risk, to increase contractor innovation, to increase the quality of constructed products, and ultimately to reduce the life-cycle cost of highway projects. It has been adopted by more and more state highway agencies in the past 20 years. Mississippi Department of Transportation (MDOT) implemented its pavement warranty program in 2000.

The currently used manual distress survey method and the associated deduct point-based pavement condition rating approach for warranty projects were developed in the 1990’s, the old deduct point curves and distress thresholds may not be suitable to evaluate the current warranty pavements due to the emergence of new pavement technology. Therefore, MDOT funded IMTrans to conduct a study on the evaluation of MDOT’s distress thresholds for maintained pavement projects.

To gather information on the pavement evaluation methods and threshold values for warranty projects of other states, a survey study is included in this research. A web-based survey was developed to facilitate the circulation of the survey questionnaire. After reviewing and testing,
the online survey is now ready to be sent out. In the meantime, the research team reviewed the pavement warranty program adopted by MDOT and summarized the warranty practice in MS. Beyond this point, the research team will continue to review literature to collect more information on pavement warranty programs and develop summary of warranty practices in other states. Moreover, the research team will analyze the historical distress data of warranty and non-warranty roads, develop the histograms based on the historical data, determine the reasonable percentile range for the distress thresholds, and make modifications of the deduct point curves if necessary.

Currently, the manual distress survey method and the associated deduct point-based pavement condition rating approach are used for warranty projects in MS, while the automated data collection technology and density-based rating method are used for the statewide network level pavement condition evaluation. There exists a need for MDOT to investigate the feasibility of extending the automated pavement condition evaluation method to the warrant pavements and to the project level data collection. Therefore, the research team will also perform analysis to compare the manual and automated methods in terms of accuracy, variability, efficiency, expense, etc. and to correlate the pavement rating outcomes from both methods to facilitate MDOT to make smooth transition from manual to automated method.
The software of Areal Locations of Hazardous Atmospheres (ALOHA) by U.S. Environmental Protection Agency (EPA) and National Oceanic and Atmospheric Administration (NOAA) was used to identify the threat zone for the chlorine spill.

The dynamic traffic assignment software DYNASMART-P did not have the computation capacity to handle all the 691 zones present in the network hence super zones (combining individual TAZ into zones of larger sizes) were employed. This created computational challenges in the form of memory size and speed, trip demand,
simulation duration and complexity of traffic management deployment.

To avoid the application of super zones in the network, 64-bit Dynus-T simulation program (a mesoscopic Dynamic Traffic Assignment program that adopts a macroscopic speed-density relationship to determine the vehicle speed based on the density in the speed influence region) was tested by running simulations with all the 691 TAZ. The advantage of using Dynus-T is that it accepts the same format of input files as DYNASMAST-P with the combined advantage of not requiring the necessity for using super zones.

Simulations were run using Dynus-T and congested locations were identified. Various traffic management strategies such as placing incidents, dynamic message signs and employing contra flow at strategic locations were utilized to mitigate traffic congestion. State St and Woodrow Wilson Avenue were some of the locations at which traffic management strategies were employed. Corrective measures were implemented for the error messages I identified in Dynus-T. The research team is currently working on finding a list of congested locations in the network for various simulation cases.
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