



Michigan Ohio University Transportation Center

Alternate energy and system mobility to stimulate economic development

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Sustainable Detroit: “Riding Trains, Boats and Planes to Urban Vitality”

The Michigan Ohio University Transportation Center joined the University of Detroit Mercy College of Engineering and Science and School of Architecture to conduct the Designing Sustainable Detroit Symposium on September 30, 2010 in the UDM Student Center. The keynote speaker, David Bing, City of Detroit Mayor, emphasized the importance of transportation as a catalyst for

city growth. Additional speakers were Matt Cullen, a UDM alumnus and president of the Board of the M1 Rail Project; David Tyler, deputy director for the Economic Development Growth Engine of Wayne County; and Melissa Roy, senior director of Transportation Policy and Government Relations, Detroit Regional Chamber.

An audience composed of friends, alumni, students and faculty heard the presentations on how the opportunities for southeast Michigan could potentially be exploited to foster regional economic development. Presentations were followed by a question and answer session which provided the panelists an opportunity to expand on regional employment and economic growth implications potentially resulting from light rail mass



Above: At the 2010 Designing Sustainable Detroit Symposium, from left: Leo Hanifin, dean of the College of Engineering & Science; David Tyler, deputy director for Wayne County's Economic Development Growth Engine; Matt Cullen, president of the Board of the M1 Rail Project; and Melissa Roy, senior director of Transportation Policy and Government Relations, Detroit Regional Chamber.



transit, the aerotropolis project, and TranslinkeD which is an initiative to develop a supply chain hub uniting southwest Ontario, southeast Michigan, and Northwest Ohio.

Right: City of Detroit Mayor, Dave Bing provided the keynote speech for the Designing Sustainable Detroit Symposium.

MIOH UTC

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See Annual Report Year 4 on the MIOH UTC website for project result updates. <http://mioh-utc.udmercy.edu>

Below left to right: Dr. Utpal Dutta, UDM, Student of the Year Eric Tenazas, UDM graduate civil engineering student, and Dean Leo E. Hanifin, Director MIOH UTC in Washington DC.





The power of collaboration

The articles, events and research featured in this MIOH UTC newsletter amply demonstrate the extraordinary power of collaboration that has been harnessed by the MIOH UTC.

- MIOH UTC universities met during the past summer and fall with representatives from MDOT, ODOT, TMACOG and SEMCOG to discuss their research needs. This included a workshop last fall in Toledo that led directly to the initiation of three new research projects focused on modeling of logistics and traffic in our regions (p. 3).
- Of the seven new research projects selected for year-five funding, four involve collaboration of two university partners, and all of them involve direct participation of companies or transit agencies that can apply the research results to improve their operations. These projects address all three of the MIOH strategic focal areas: transportation efficiencies, intelligent transportation systems and alternative fuels.
- On September 30, 2010, UDM hosted a major symposium of leaders of Metro Detroit's top three transportation initiatives (cover story), kicked off by Detroit Mayor Dave Bing. The initiatives were the M-1 Rail Project, TranslinkeD logistics strategy and the Detroit Aerotropolis initiative.
- The K12 Outreach programs involve many K-12 schools, professional presenters from industry and transit agencies, and university students, professors and staff.

All of these effective collaborations promise to yield great benefits to our regions and the nation as the research results, the educational programs and the new transportation professionals contribute to better and smarter transportation systems and fuels.

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Seven New Research Projects Fund for 2010-11

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"From Phyto-Remediation to Phyto-Mining: A Means of Maximizing Value In Producing Bio-diesel From Pennycress"

led by Dr. Mark Benvenuto, UDM.

This research uses pennycress as both a feedstock for the production of bio-diesel and as a soil remediator for lead and other heavy metals. The plant matter in which the heavy metals are taken up will be pyrolyzed and the metals extracted from the ashed materials with strong, oxidizing acids. This form of "phyto-mining" removes the metals from the plant remediators and allows the metal to be captured as a usable, commercial product. The goal of the project is to determine the feasibility of using pennycress on brown-field areas in Detroit, to determine whether or not such areas can be cleaned effectively, yet inexpensively. The end result would be an inexpensive feedstock for bio-diesel, a second, marketable product adding value to the bio-diesel production enterprise, and a biological method to clean polluted soil.

"Innovative Contracting Methods and Construction Traffic Congestion"

led by Dr. Utpal Dutta, UDM.

Innovative contracting techniques are being used and increasingly reported in studies related to mitigating the adverse effect of construction on traffic flow. State DOTs use innovative techniques such as cost plus time (A+B) and Incentive/Disincentive (I/D) to address construction related traffic delay; however, there are not standard guidelines to adopt innovative contracting techniques. At the same time thousands of dollars have been spent as a part of construction incentives. This study will develop a model to determine the functional relationship between project cost and duration where innovative contracting techniques are used.

"A Multi Dimensional Model for Vehicle Impact on Traffic Safety, Congestion, and Environment"

led by Dr. Nizar Al-Holou, UDM, and Dr. Syed Mahmud, WSU.

The original vision of VII was to provide major improvements in safety and mobility. This vision was adapted by the new IntelliDrive initiative, which added a third goal; decreasing transportation impact on the environment. This project will address use of technology to create a safe, efficient and greener environment. It will evaluate different traffic control strategies/

protocols that are based on wireless communication between vehicles (OBU) and traffic light controllers (RSU) to enhance safety, increase efficiency and reduce CO2 emissions. In this system, vehicles communicate with other vehicles (V2V) in the vicinity and vehicles with traffic light controllers (V2I) using DSRC technology. The adaptive signal control application proposed in this research is targeted to achieve two objectives: 1.) Enhancing traffic flow and decreasing traffic density, hence reducing fuel consumption and emissions. 2.) Improving traffic safety at intersections by developing a new protocol for MAC layer.

"Pavement Distress Evaluation Using 3D Depth Information from Stereo Vision"

led by Dr. Ezzatollah Salari, UT, and Dr. James Lynch, UDM.

Extreme heat and cold temperatures throughout the year result in a high rate of expansion and contraction of pavement surfaces leading to extensive road surface anomalies such as cracking and potholes. In cases of a high level of transport load traveling across roadways, rapid destruction of road surfaces is inevitable. Pavement inspection and maintenance becomes a very important part Federal and state spending. Also, poor road conditions are often a major sources of automobile damage. Therefore, an automatic surface condition evaluation system is a necessity for our extensive national roadway system.

The performance of most existing image processing based pavement inspection systems is heavily dependent on parameters affected by shadows and variations in lighting conditions among other factors. Recent advances in stereoscopic imaging offer the potential for road surface quality assessment in 3-Dimensional space. This project uses 3D depth information taken from road surfaces to complement the existing inspection algorithms. The 3D surface profile generated from stereo images can provide a depth map of a road surface which is viable information needed for the detection and measurement of the potholes and other surface anomalies.



2010 MIOH UTC Outstanding Student of the Year, Eric John Tenazas, receives a US DOT award at the annual Washington D.C. banquet. Left to right: John D. Pocari, Deputy Secretary of Transportation; Eric Tenazas, UDM student, Stephen Albert, President of the Council of University Transportation Centers; and Peter Appel, Administrator, Research and Innovative Technology Administration, US DOT.

2010 Outstanding Student of the Year

Eric Tenazas is a graduate student in civil engineering at the University of Detroit Mercy (UDM) pursuing a Master of Engineering degree. Eric has been involved in three transportation projects funded by the Michigan Ohio University Transportation Center. As a graduate Research Assistant, Eric collected and analyzed key data for these projects. Eric's efforts have resulted in the completion of tasks instrumental to the objectives of the research.

One of the MIOH UTC funded projects Eric contributed to was a collaborative project with two team members from Wayne State University that studied the implementation of transit-oriented development at two selected station sites along a proposed light-rail transit system on Woodward Avenue; one station in the city of Detroit and one in a northern suburb. Eric was the project representative

to both cities where the stations would be located. He enthusiastically embraced the opportunity for involvement in a project that has potential to foster some economic revitalization in Detroit.

As a result of his work on the Transit-Oriented Development study, Eric was invited to present the findings of this study during the Intelligent Transportation Society of Michigan's 2010 Annual Meeting. This project, as well as others that Eric worked on, received support from the U.S. Department of Transportation, the Michigan Department of Transportation, Wayne State University and the University of Detroit Mercy. Previously Eric has been employed as a co-op intern for Tyme Engineering based in Livonia, Michigan and for Charles Pankow Builders in Los Angeles, California.

New Research for 2010-11

(cont. from page 2)

In summer and fall of 2010, MIOH UTC convened representatives from the Michigan Department of Transportation (MDOT), the Ohio Department of Transportation (ODOT), the Toledo Metropolitan Area Council of Governments (TMACOG), the Southeast Michigan Council of Governments (SEMCOG) and the partner universities to share information that would inform researchers of the scope of research needs around the general topic of "Predicting the Traffic and Economic Impact of Multiple Major Transportation Projects in the Detroit-Toledo-Windsor Region." During a fall Workshop MDOT, ODOT, TMACOG and SEMCOG presented models currently existing and also unmet modeling needs. Subsequent to these meetings the following three projects were funded.

"Developing TranslinkeD Corridor Investment Strategies and Assessing their Socio-Economic Impacts on the Detroit Metropolitan Area and the Northwest Ohio Regional Community" led by Dr. Hokey Min, BGSU, and Dr. Utpal Dutta, UDM.

"Enhancing JIT Freight Logistics Impacted By Transportation System Projects Under ITS" led by Dr. Ratna Chinnam and Dr. Alper Murat, WSU.

"Traffic Simulation in Regional Modeling: Concepts and Demonstration"

Below: Presentation by ODOT representative on existing models and modeling needs.



MIOH UTC to issue RFP in May 2011 for research year 2011-2012

Submission deadline June 20, 2011. For an electronic copy contact Pat Martinico at martinpa@udmercy.edu or 313-993-1510 or visit the MIOH UTC web site at <http://mioh-utc.udmercy.edu>.



Alternate energy and system mobility to stimulate economic development.



STEPS Camp dates: June 19-24, 2011

For: 9th-11th grades in 2010-2011

(Science Technology and Engineering Preview Summer) is an opportunity for girls to learn more about what engineers do. Program participants build and program a robot, while gaining an understanding of manufacturing techniques, transportation systems, robotic control systems, circuits and sensors. It is open to female high school students currently in the 9th through 11th graders. A Minimum 2.0 GPA is required. Enrollment is limited. Please inquire about scholarships.



TRANSIT Camp dates: July 25-29, 2011

For: 9th-11th grades in 2010-2011

TRANSIT is a one week commuter camp for high school students, currently in 9th-11th grades, who want to learn about the world of transportation, a field of study within Civil Engineering. Activities include: impact of transportation on communities; smart cars and how they communicate with smart highways; traffic simulation software used to make intersections safer; and how transit systems can bring us together in southeast Michigan.

Detroit Area Pre-College Engineering Program will support a limited number of full scholarships for the summer 2011 camps.

For more information or to request a brochure/application, please contact Pre-College Program Director Pamela Todd at precollegeprograms@udmercy.edu

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