



UT-UTC UPDATE

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The Newsletter of The University of Toledo University Transportation Center

Director's Message: Regionalism



In a previous Director's Message, I noted that Northwest Ohio and the region surrounding it (Lake Erie West), is on the threshold of a period of opportunity and innovation unprecedented in our recent history. With its strategic geography and the convergence of major highway, rail, sea, air, and pipeline transportation assets, the area can emerge as an

international transportation, logistics, and distribution center. In addition to the region's physical assets...world class transportation expertise, numerous academic centers of excellence, and a critical mass of coordinated public, private, and legislative transportation stakeholders can be added to the inventory of resources.

The University of Toledo UTC passionately committed itself to work closely with stakeholders, the goal being to leverage Lake Erie West assets and drive economic development through regionalism strategies. Many of those strategies were outlined in an October 2008 Joint Intermodal Task Force Report prepared by the University of Toledo. The GDP of Lake Erie West (MSA's within a 100 mile radius of Toledo) is \$243.3 billion (BEA 2008 statistics). That ranks Lake Erie West in the top 20 MSA's in the U.S. I am proud to report that in 2010, the regionalism strategy is being embraced and gradually beginning to be put into practice with encouraging results. Significant public and private transportation related investments have recently been programmed, are now in construction or have been completed within the past two years. The total value of all projects is \$852.0 million. At 1,000 jobs per \$28 million spent (AASHTO, USDOT, APTA) that translated into 30,000 jobs. Specifically Lake

Erie West is constructing two major intermodal projects at a total construction cost of nearly \$190 million. ODOT and the UT-UTC are constructing Ohio's first major solar highway project. The Toledo Lucas County Port Authority is implementing infrastructure improvement projects at the seaport and airport valued at nearly \$35 million. Numerous distribution warehousing projects have also been completed.

While these results are exciting, building on their success will require redoubling our effort and commitment. Working in 'Silo Mode' no longer is an option in today's global economy. I continue to advocate a Regionalism approach. This strategy creates regional efficiency, promotes a region's competitive advantage, balances the priorities of the region's resources, and ultimately improves the human condition for all.

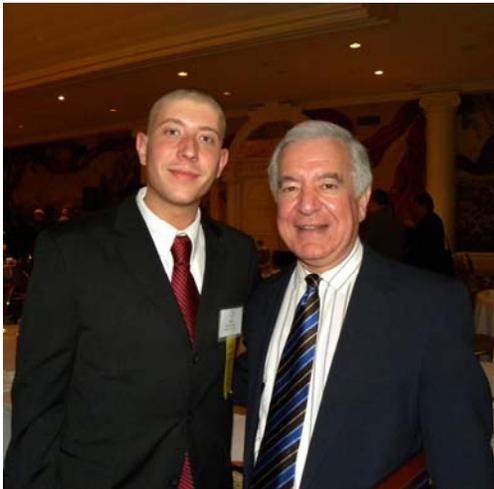
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*Transportation for Economic Security and Development:
Alternate Energy, Infrastructure Utilization, and Supply Chains*

Student of the Year - 2009

Walter Anderson, who is currently pursuing his master's degree in Mechanical Engineering from the University of Toledo, was named the UT-UTC Student of the Year 2009. Accompanied by his father, Gregg Anderson, he attended the Council of University Transportation Centers annual banquet in Washington, D.C. in January where he received his award. Along with fees and expenses for attending the Transportation Research Board conference, which began the day after the dinner, he received a check for \$1,000.



Walter proudly pictured with Congressman Rahall, (D-WV) Vice Chairman of the House Transportation & Infrastructure Committee

Walter graduated Cum Laude when receiving both his associate's degree and bachelor's degree in Mechanical Engineering. Currently, he is performing research related to magnetorheological (MR) fluids. More specifically he is researching a multi-axial MR mount for use in hybrid vehicles. The physics of the mount have been theoretically captured through a mathematical derivation of the equations of motion. These equations have been programmed and simulated. A fluid-structure interaction (FSI) simulation is being constructed to help verify the mathematical derivation through a numerical solution. The simulation numerically solves Newton's second law and the Navier-Stokes equations simultaneously.

Walter enjoys collaborating in multi-disciplinary work groups and takes a results oriented approach to

engineering problems. In his spare time he enjoys multi-cultural experiences, working on his car and learning different languages. He speaks French and is attempting to learn others. He is a member of the American Society of Mechanical Engineers (ASME) and enjoys participating in their activities.

Following the granting of his Master's this May, he will begin work on a Ph.D. in engineering at UT.



Gregg Anderson, proud father of UT-UTC Student of the Year, Walter Anderson, at the awards dinner in Washington, DC.

Student of the Year Award and the Transportation Research Board Conference:

Their Impact on My Life

By Walter Anderson, UT-UTC Student of the Year 2009

(Note: Walter was invited to write about his experience winning the Student of the Year Award and what it meant to him. Here are his thoughts in his own words.)

When I was told that I won the Student of the Year award I was ecstatic. I am happy to have been awarded this prestigious accolade. Words cannot describe the feeling that I have towards the University Transportation Center program. This program provided funding for my research which is integral to my ability to obtain my graduate degree. That being said, I thank all the people who are involved with this program; it really has made a significant difference in my life.

I was also very excited to learn that I had a chance to attend the TRB conference in Washington, D.C. As a graduate student, I had been to conferences before,

but none of them were like this. To begin, the sheer size of the conference was breathtaking. Some 11,000 experts in the field gather in the nation's capital to discuss their research, share ideas, and talk about the upcoming transportation issues. I was able to meet with many of my friends whom I had met at other University Transportation Center functions.

I was also able to meet many other researchers and had the opportunity to discuss my own research and hear their input. This is where I was introduced to a term that I really enjoy: cross-pollination (thank you Dr. Leroy Hulsey). Cross-pollination is the primary purpose of these conferences. Cross-pollination is the sharing of thoughts and ideas among peers. Being able to meet with the people who research in similar areas and being exposed to their ideas and feedback is the purpose of these gatherings. This is a paramount feature of novel research. A fresh set of eyes from the vantage point of someone who isn't buried in your problem can offer insights to ideas or challenges that one was oblivious to.

Another important facet of the conference is the wide breadth of the transportation issues that were covered. I was able to attend presentations ranging from the noise and vibration analysis of different pavement treatments to the effect of nuclear power in transportation. Also, the amount of knowledge gained from such an experience is appreciable. I was able to hear from distinguished individuals in the field about back-casting, mobile phone/automobile interfacing, and rail issues, just to name a few. I should also say that many of the topics covered at this conference I didn't know existed. For this reason, I am especially grateful to have won the award. As an engineer, it is a great thing to have a big "bag of tricks." If one is familiar with other areas of engineering, then one is aware of the tools and resources that that field brings. This is an import asset because many times a problem (or a very similar one) that arose in one field has already been solved in another.

Aside from the scholastic and professional perspective, I was also able to do some sightseeing. I had never been to Washington, D.C. before and it was an excellent experience to be able to visit all of the historical venues D.C. has to offer. It was awe-inspiring to be in the presence of the Constitution, the Declaration of Independence, and the Bill of Rights. The city has so much historical significance. I was walking some of the same paths as those who have made this nation great. I had an immense feeling of

pride as I toured the city. In short, winning this award afforded me an unequivocal opportunity to network, cross-pollinate and learn. For this, I will be forever grateful.

Graduate Students Present Poster at TRB

The Great Lakes Maritime Information Delivery System: A Resource for Intermodal Freight Transportation Planning and Analysis in the Upper Midwest Region

The UT-UTC along with CFIRE, the UTC at the University of Wisconsin–Madison, the Great Lakes Maritime Research Institute (GLMRI) and the Army Corps of Engineers have funded the development of The Great Lakes Maritime Information Delivery System (GLMIDS). This year the graduate students who worked on the System were able to attend the Transportation Research Board conference in Washington, D.C. in January and participate in a poster session describing this extensive data base.



Dr. Peter Lindquist, Chair of the UT Department of Geography & Planning with his graduate students (from the left) Sarah Schafer, Xi Lu, Rosanna Violi, Kelly Rowand, Krithica Kantharaj, and Jeff Eloff in front of their poster at the TRB conference

GLMIDS is a comprehensive data repository and information resource designed to provide a central focus for studying freight movements in the Great Lakes and St. Lawrence Seaway regions. When fully implemented this resource is envisioned to provide a regional perspective in reporting on the condition of the freight infrastructure among all modes and will provide a vehicle to bring together a diversity of organizations and professionals including port authorities,

government agencies, MPOs, shippers, carriers, freight analysts and researchers. The system will ultimately provide a single repository for regional data with convenient secure access to a comprehensive database relating:

- Economic activity (all sectors);
- Regional population patterns;
- Import and export flows;
- Intra-regional flows;
- System capacity among all modes; and
- Intermodal connectivity.

GLMIDS features a web based delivery system which houses a fully operable customized online GIS and data repository with a multitude of network data (highway, rail, water, air), intermodal connections, commodity flow data, and population/economic data from a variety of sources. All data in the system have been georeferenced and registered for compatibility in the GIS. As the system undergoes further development, a wider variety and a greater volume of data will be added. In addition, the GLMIDS will feature modeling, econometric and simulation tools for studying freight movements, optimizing freight flows, site selection, econometric analysis and forecasting, economic impact analysis, economic development and evaluation of investment decisions for improving the freight infrastructure.

Final Research Reports

The following final reports have been received by the UT-UTC:

- Regional Freight Information Resources for Market Opportunities in the Great Lakes Maritime Transportation System: Phase II (Available at http://www.utoledo.edu/research/ututc/docs/UTCLi ndquist_Phase_II_Final.pdf) See article above.
- Reducing Noise and Vibration of Hydraulic Hybrid and Plug-In Hybrid Electric Vehicles – Phase II
- Value of ITS Information for Congestion Avoidance in Inter-Modal Transportation Systems – Phase II (Note this report is pending final review.)

Toledo Technology Academy Alternative Energy Team

Extra curricular activities at The Toledo Technology Academy, a magnet Toledo Public high school focusing on manufacturing technologies, include an Alternative Energy Team. With alternate energy one of the three focus areas in the strategic plan of the UT-UTC, working with this TTA team seemed a natural fit. And the timing was perfect. Because of state budget cuts, the teams did not have the funding they had been granted in previous years.

Last September two proposals for team projects were submitted and both were funded: one to automate the production of biodiesel fuel and the other to build a tribrid vehicle. They are both making great progress as related in the articles below.

Automating a Biodiesel Processor



Senior team members on the biodiesel project are Ariana Newton, Will Scharer, Ken Miller and Tim Matthews

The objective of the biodiesel project at the Toledo Technology Academy funded by the UT-UTC is to automate a manually operated biodiesel processor. Along with the UTC funding for materials and supplies, industrial mentors from Libbey Glass, BP Refinery and the Center for Innovative Food Technology are helping the students with the project. On April 16th and 17th, the team will compete in the Society of Manufacturing Engineers national robotics challenge in Marion Ohio as part of the work cell robotics category which includes automated systems.

UT-UTC UPDATE

Bob Sintobin, TTA instructor and team advisor, offered that the UTC support has enabled them to buy the proper parts to build their system which has enhanced the learning experience.

Good luck to the team as they compete against other high schools and universities in Marion!



A student works on the building of the support frame for the automated biodiesel processor.

Building a Tribrid Vehicle

The Tribrid Vehicle project funded by the UT-UTC will enable students from grades 9 – 12 to design, build, trouble-shoot and complete a solar/biodiesel/electric tribrid vehicle. Starting with an all electric 1996 model Club Car golf cart donated by the Bay View Retirees Golf Course, the students will add a diesel engine /alternator set and solar panels to extend the driving range and provide built-in charging. Knowledge gained from the project could be applied to another fuel conversion project or could lead to conversion of a full sized vehicle.



Golf cart to morph into solar/biodiesel/electric tribrid vehicle through the efforts of members of the TTA Alternative Energy Team

The vehicle was displayed at the Toledo Auto Show January 28th – 31st. It was observed by thousands of spectators and was discussed at length with many interested show patrons. Muddy and Mudonna, Toledo Mud Hens baseball team mascots, even took the time to hear the TTA Tribrid story.



Muddy, Toledo Mud Hens baseball team mascot, tries out TTA's Tribrid vehicle at the Toledo Auto Show

After the Auto Show, the team added brake lights and turn signals to the vehicle to make it more road worthy. The solar panel array was removed and the support frame was modified to increase stability. Then the array was reassembled and is ready to be re-installed. A cowl for the diesel motor was fabricated and will be installed. The rear solar panel supports will be re-attached when the cowl is completed allowing the solar array to be re-attached. The biodiesel charging unit control circuitry is also being installed by team members.

The students will meet the public again this summer when they take the tribrid to local parades. They are preparing handouts to help the viewers understand more about their project.

UT-UTC Helps Mentor FIRST LEGO League Teams

Director Martinko help mentor local *First* LEGO League (FLL) teams by organizing a transportation summit event at UT. The 2009 Challenge is titled Smart Move: Transforming Transportation. He was joined by senior transportation leaders from the Ohio Department of Transportation, Toledo Metropolitan Area Council of Governments, the Toledo-Lucas County Port Authority, and Midwest Terminals to give the students an overview of all things transportation in our region.

UT-UTC UPDATE

The *First* LEGO League creates a challenge on a real world issue by engaging experts in the field. In the two-part program, the students are involved in research and science to complete the first part, and engineering and engineering and technology to master the mission of the robotics required in the second part.

Director Meets with New Mayor for Intermodal Update



*New Toledo Mayor Mike Bell on the evening of his election.
Picture from FOXToledo.com*

At his invitation, Director Martinko along with the Chairman of the Joint Intermodal Task Force, Jim Tuschman, and others met with the new mayor of the City of Toledo, Mike Bell, his deputy mayors and other members of his team. Discussions included an update on the Norfolk Southern Airline Yard intermodal expansion in Toledo, regionalism, and economic data provided by Director Martinko showing that the City is losing out to its neighbors and the practice of working in silos is not moving the region forward.

The Mayor is a staunch supporter of cooperating with suburban partners to ensure economic vitality for the entire region.

Director Among Volunteers at MATHCOUNTS

On Saturday, February 6th in the midst of a snow storm that caused a two hour delay, 130 middle school student from 17 public and private schools gathered at the University of Toledo College of Engineering to participate in the annual MathCounts competition. The event, sponsored by the Toledo Society of Professional

Engineers, challenges students in math, critical thinking and creative problem solving. Director Martinko was among the volunteers who made the competition possible.



4th Supply Chain Management Symposium & Workshop in Madrid This September

The fourth International Supply Chain Management Symposium and Workshop (IGSCC) will be held in Madrid, Spain on the campus of the IE Business School on September 23-24, 2010. The theme of this symposium is "Challenges and Opportunities for Supply Chains in Turbulent Times." The conference is part of the UT-UTC Network of Scholars project. For further information: <http://symposiumscm2010.ie.edu/>

In the Next Issue

The University of Toledo UTC has been awarded two research projects by the Ohio Department of Transportation, both related to the Veterans' Glass City Skyway bridge. In the next issue of UT-UTC Update the projects will be discussed.

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