INTERMODAL IMPACT

CIFTS
The Center for Intermodal Freight Transportation Studies

Issue 6 - WINTER 2010

TDOT and CIFTS Continue to Work Together

The Tennessee Department of Transportation (TDOT) will continue its partnership with the Center for Intermodal Freight Transportation Studies by providing matching funding for a new round of research. A cooperative relationship and long term commitment from their state DOT is critical to the success of any University Transportation Center. With both the researchers and the department of transportation striving to offer safe, efficient and practical transportation options to their citizens, the two parties can work together in a way that benefits everyone.

"We are delighted to be partnering with the University of Memphis and Vanderbilt University as we continue improving Tennessee's transportation system through value-added research." Sandi Hoff, Manager, Transportation Research & Policy Office.

The University of Memphis, along with our partners at Vanderbilt University, will begin working on the following projects that have been suggested by TDOT:

- **Economic Feasibility of Public Investment in Freight Rail Operations in Tennessee.** The focus of this project will be to identify the benefits that have accrued as a result of the TDOT program supporting short line rail operations in Tennessee.
- **Network Analysis of Freight Diversion and Capacity Issues in Tennessee.** The objective of this study will be to use the existing intermodal freight GIS network and to test alternative truck routes and examine network vulnerability issues.
- **Two short courses on specialized topics will be developed for TDOT personnel.** These courses will also be made available to MPO's and engineers and planners around the state. The two courses are: (1) Cost Benefit Analysis Procedures for Transportation Projects, and (2) Freight Terminal Design and Operation.

"We really enjoy our relationship with TDOT", said Dr. Martin Lipinski, Director of CIFTS. "Both organizations share a passion for transportation and for finding the best solutions to today's transportation problems."

Final reports from these and other projects can be found under the completed research projects section of our web site, *www.memphis.edu/cifts.*

THE UNIVERSITY OF MEMPHIS
Dreamers. Thinkers. Doers.

VANDERBILT UNIVERSITY

A MESSAGE FROM THE DIRECTOR

With a career in academics that spans over 30 years, I am always looking for ways that give our students an advantage over their counterparts at other universities. These opportunities normally occur outside the class room. With the creation of our research center, I am seeing this opportunities present themselves in ways never before seen at the University of Memphis.

The Center gives our students obvious opportunities to practice their education with real world problems as we work on research projects. While these projects have an incredible value to our students and the community, I am most excited about the opportunities that come about as the community embraces the Center and our students. You will read about some of these opportunities within this newsletter, but I want to highlight a few that I think are significant.

I want to thank Dallas Sharp of Detail Distribution. Dallas invited our students and faculty out to his warehouse to show us some of the work he is doing. Dallas took a great deal of time to share his knowledge of the freight industry and current problems facing the industry. He gave us a tour of his facility and allowed us to get a real hands on look at the different box cars that are delivering freight to the country.

Craig Philip of Ingram Barge has been a supporter of our work from the beginning, but he is always looking for ways to help. This fall he invited our students to tour the Patricia I. Hart tow boat. This boat is the 'greenest' tow boat currently in service in the US. Our students were able to tour the boat and talk to the engineers that worked on converting this boat into a more efficient vessel.

Another example was provided by our friend Bruce Lambert of the Institute for Trade and Transportation Studies. We had worked last year with Bruce and TDOT to host "Freight in the Southeast". The conference was a huge success, but it also created a great friendship. This fall Bruce included our Institute on a tour of the United States of visiting researcher Jason Monios PhD. Jason works at the Transportation Research Institute at Edinburgh Napier University. During Jason's visit to Memphis, he was able to give our students an international view of current freight issues.

The Memphis area has always provided great resources to our students, but I am thrilled to see just how well we are now integrating these resources into the education we are providing to the next generation of transportation engineers.

Dr. Martin E. Lipinski

Jeffery Karafa chosen to receive two awards

Jeffery Karafa, received his undergraduate degree from the University of Memphis Civil Engineering department, and began his graduate studies in January. Based on his recent research work, he was awarded the 2010 Trucking Industry Defense Association Scholarship and chosen as the Student of the Year for CIFTS at the University of Memphis. Jeffrey received his Student of the Year award at the Annual Transportation Research Board Meeting in Washington, DC this past January.

Jeffery Karafa has authored two papers that received the first and third place in the 2009 Southern District ITE and 2010 TN Section ITE student paper competition respectively. He also co-authored two papers in the area of intermodal freight transportation that are currently under review. Part of his work was presented at the 2010 INFORMS Annual Meeting and at the 2011 TRB Annual Meeting. His recent research work includes optimization of container terminal and drayage operations; operational strategies to relieve truck traffic related externalities; and operational network improvements to increase transportation efficiency. He is participating as a research assistant on a number of projects, to identify and improve the freight industry's practices regarding productivity and infrastructure limitations.

TIDF President Lee Piovarcy presents Jeffery Karafa with his check.

CIFTS partners with CFIRE to Address Industry Challenges

As part of the University Transportation Center (UTC) program sponsored by the US Department of Transportation, the University of Memphis has the opportunity to collaborate with universities across the country. The National Center for Freight & Infrastructure Research and Education (CFIRE) at the University of Wisconsin has partnered with University of Memphis and the University of Wisconsin, Superior, to conduct a project entitled "Simulating the Effect of Gate Strategies in Emissions Reduction".

Dr. Mihalis Golias is serving as the primary investigator at the University of Memphis. Dr. Golias described the research this way, "Intermodal Marine Container Terminals are experiencing consistent growth in container volumes. Forecasts are that freight volumes will continue to increase and result in substantial increases in roadway congestion. This in turn will result in an increase of emissions produced by trucks that have been linked to health conditions including asthma, cancer and heart disease." Different solutions have been proposed to address the issue and reduce the amount of air pollution from drayage operations including new technologies, operational strategies and financial mechanisms. There is an ongoing discussion concerning the implementation of different operational strategies (e.g. gate appointment systems, extended hours of operations for terminal gates, and advanced technologies for gates and terminals) that may relieve the effects of congestion and hopefully help improve air quality. Dr. Golias said, "We are working to develop a simulation model capable of implementing different gate strategies at an intermodal marine container terminal and evaluate their efficiency in reducing the amount of drayage related emissions."

The collaboration available through the UTC program provides the freight community in the Memphis area the ability to reach out and partner with some of the premier researchers across the United States. To find out more about the research being conducted by UTC's at universities all across the United States, please visit their web site *www.utc.dot.gov.*

Enterprise Risk Management: A New Methodology for a Truly Holistic Approach

Establishing the current status and future direction of an organization's enterprise risk management (ERM) practices requires an ability to benchmark its existing risk portfolio and prioritize where risk mitigation actions are warranted. Unfortunately, while many organizations desire for ERM to be an integral part of their daily operations, the term "enterprise" has often been applied only to a new acquisition, merger, or beginning of a new initiative.

Through the Intermodal Freight Transportation Institute (IFTI), researchers at Vanderbilt University are developing a methodology and tools to assist organizations in performing a truly holistic, enterprise-wide approach to risk management. This approach is based on the creation of an all-inclusive framework for identifying enterprise risks, and then defining corresponding scenarios that are considered "reasonably foreseeable".

For each of these scenarios, a risk assessment is performed to determine its likelihood and consequence. Consequences include loss and/or damage to property and assets, as well as the impacts to human health in terms of injuries and fatalities. An economic risk measure, referred to as an overall annual risk cost, can then be derived. The risk cost associated with every scenario can then be plotted on the same graph to determine which scenarios and risk categories warrant priority attention in terms of allocating risk mitigation resources.

This ERM methodology is currently being evaluated in a pilot test with a large marine transport company. This study consists of two parallel activities; one considers the enterprise to be all information technology risks throughout the organization, while the other views the enterprise as all risks associated with a geographical area that is considered to be of strategic importance to the company. Preliminary results are promising in demonstrating the value of this ERM approach.

The next phase of the research project is to develop a complementary approach for the "backend" of an ERM program, namely identifying and evaluating the benefits and costs of candidate risk mitigation strategies. It would be expected that a company would implement this part of the methodology when considering how best to control those scenarios and risk categories that were found to be especially problematic. Plans call for this approach to also be pilot tested.

It is anticipated that, once this project is completed, any freight transportation organization interested in applying ERM principles will have a valuable set of tools available for their consideration. Utilizing these tools will enable the organization to gain confidence that they have an ERM approach in place that will truly be representative of all risks that could potentially threaten the organization's viability.

Annual Fall Conference and Trucking Industry Roundtable continue to be great resource for the community

On October 29, 2010 we held our fourth annual conference. Instead of focusing on one issue, we looked at several issues affecting the freight industry. We titled the conference,"Critical Issues Facing the Transportation Industry". We had another great list of speakers:

Ken Ericksen, Vice President, Informa Economics, Inc.

Randy Resor, Policy Analyst, Office of the Secretary US Department of Transportation

Randy Butler, Transportation Specialist, Office of Freight Management US Department of Transportation

Brad Morris, Vice President, AAA Cooper Transportation

Craig Harper, Chief Operating Officer, JB Hunt Transport

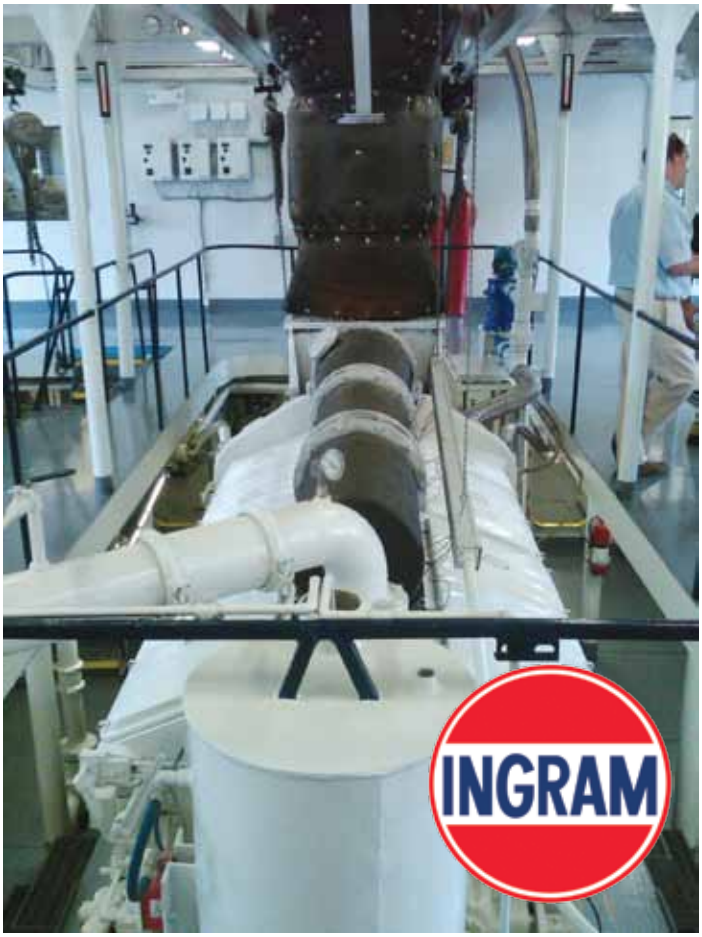
Rep. Steve Cohen, US Congressman, 9th District – Tennessee

These conferences have quickly become a "must attend" event for anyone involved in transportation for this region as current issues are addressed. We were happy to partner again this last year with the Greater Memphis Chamber – Logistics Council in presenting the conference.

The other fall event that has become an important part of our work is the Trucking Industry Roundtable. Tag Trucking Center again sponsored the event that draws top executives of trucking companies across the Mid-South to discuss critical issues affecting the industry. Michael C. Robinson, director of legislative affairs for the American Trucking Associations, was one of the speakers for the roundtable. He was able to give an update of the industry and policies that affect it. The roundtable also presented some best practices from the FedEx Ground division and legal pitfalls to avoid.

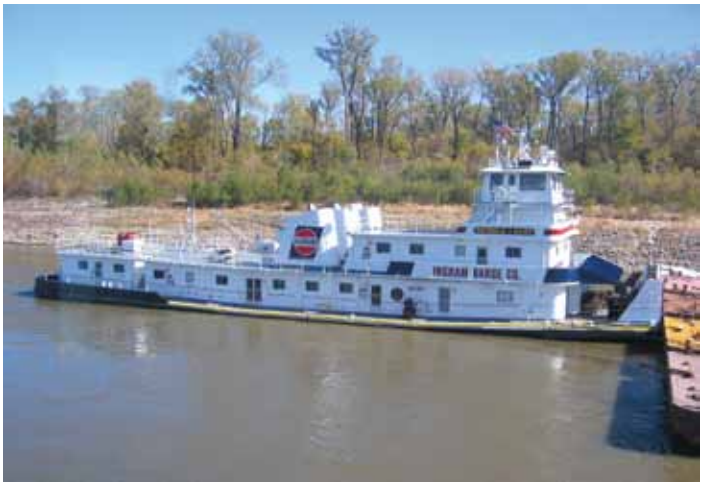
Patricia I. Hart - 'Greenest' Towboat in Operation

Intermodal Freight Transportation Institute students were invited to visit the Patricia I. Hart, an innovative towboat in the fleet of Ingram Barge Company, which was available for public inspection at Mud Island River Park on September 24, 2010. The Patricia I. Hart has been retrofitted, along with five sibling vessels in the Ingram fleet, with diesel oxidation catalyst (DOC) units and closed crank case emission control system in an effort to reduce the amount of pollution. Representatives



The DOC above one of three 3,000hp motors aboard the Patricia I. Hart.

reported average particulate matter reduction of more than 40 percent and carbon monoxide and hydrocarbon reductions of more than 60 percent. Ingram's efforts in the Environmental Protection Agencies (EPAs) Clean Diesel Emerging Technologies Program are part of the company's overall commitment to environmental sustainability. The students appreciated the great opportunity to see innovative technology at work in the industry.



Unique Opportunities for U of M students

The graduate students at the University of Memphis were given a unique opportunity to have a class jointly taught by Dr. Mihalis Golias, a faculty member, and Curt Heaslet, an engineer with FedEx. The class on 'simulation modeling and analysis' used state of the art software from Arena, FlexSim and Synchro that combined class room instruction with current freight industry examples. This course provided an introduction to computer simulation of discrete event dynamic systems with a focus in the field of transportation, logistics and supply chain management.

Ethan Skaggs, a current masters student in civil engineering said, "The opportunity to combine knowledge and academic experience, with current industry applications, enhances our preparation and skill sets as future professionals in the field of transportation engineering."

When asked about the class, Mr. Heaslet said, "Being given the opportunity to work with the Undergraduate, and Graduate students at the Intermodal Freight Transportation Institute has been extremely rewarding. They are well prepared to transition skills acquired at the University to meet real work challenges in industry. This opportunity has expanded upon a collaboration between industry and academia that both prepares the student for what challenges he or she will face in the workplace, while also building the resident technical/ professional experience at the University of Memphis that will be a valued resource to the community. Specifically, our work with Dr. Mihalis Golias in the application of simulation and modeling techniques has shown the impacts of future capital infrastructure projects on the transportation network in our city, and highlights key bottlenecks existing in our cities roads. Strategically located in the heart of America's distribution network, at the intersection of 5 class 1 railroads, the Mississippi River, and an interstate road network makes the University of Memphis the natural location for building this expertise."

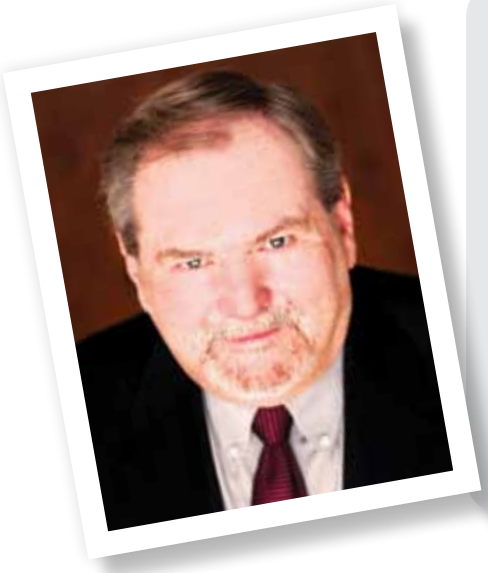
With the great success of the first course, Mr. Heaslet will be teaching a follow up course in the fall of 2011. Dr. Golias said, "This is one of the great advantages the University of Memphis can offer students looking for a career in transportation. There are only a hand full of universities where you can be taught by a top engineer at one of the premier companies in the freight industry."

Can Quiet Zones Improve Property Values?

The Intermodal Freight and Transportation Institute is currently conducting an interdisciplinary research study in conjunction with the Sparks Bureau of Business and Economic Research (SBBER) at the University of Memphis, investigating the impact of train horn noise on the surrounding community. The goals of this research are: (1) to evaluate the potential economic impact on properties which are in close proximity to highway-rail grade crossings; and (2) to identify the potential for train horn elimination strategies, both audibly and economically. Transportation and environmental noise and air quality specialists, Bowlby and Associates, Inc., were sub-contracted to conduct a horn noise sound study. With help from environmental engineer Clay Patton, of Bowlby and Associates, IFTI graduate and doctoral students collected in-situ sound data of train noise at highway-rail grade crossings in the City of Memphis. Using Geographic Information Systems (GIS), this data along with historical real estate market data for the study area and the results of surveys of residents and businesses in the corridor will be used to develop models of the impacts of horn noise. This study is localized to particular sections of rail corridor, but it has application for all highway-rail grade crossings. The study is scheduled for completion this Spring.

Recording Device Measures Sound Levels as Train Passes

Leaders in Intermodal Freight



Name:
Randy Butler

BS Engineering Technology – University of Memphis - '78

Title:
Transportation Specialist – Technology and Operations Team
Federal Highway Administration, US Department of
Transportation, Washington, DC

Company:
Federal Highway Administration, US Department
Transportation,Washington, DC

Years with company:
7 years

Where has your career taken you since leaving the University of Memphis?
I completed my BS in Engineering Technology in 1977 while I was working for Missouri Pacific Railroad in Memphis, TN. After the merger of Missouri Pacific and Union Pacific Railroads, I continued my career in the railroad industry for a total of 30 years of service in several senior management positions. These positions included Division Engineer, Assistant District Engineer, Superintendent of Transportation, General Director National Customer Service Center, and Assistant Vice President Reengineering.

Describe your current job and the work you are doing?
The key responsibilities of my current position centers on the management of research projects related to freight intelligent transportation systems. Currently I am managing the Electronic Freight Management Initiative, Cross Town Improvement Project, Freight Advanced Traveler Information System, and the Dynamic Mobility Open Source Portal.

How has having your degree helped you advance your career?
Completing a degree gave me the necessary skills to jumpstart my career. Several of the skills I attained through the degree attainment process included the ability to manage financial business objectives, analyze business problems, develop solutions to those problems, develop project management plans, execute those plans within a budget, and motivate and manage people effectively. Everyday management of business issues requires the use of these skills to attain goals and provide leadership for the organization. Without the formal training received through a structured degree program, a manager may fall short of making the best decisions for their organization.

How has the industry changed since you began your career?
The advancements in technology by far is the major change that I have experienced since I began work. An example of how much the industry has changed since I began my employment at the Missouri Pacific Railroad in 1971 is illustrated in the advancement of communication technology. I was trained to communicate shipment information with a hand written list and a teletype machine to transmit information from one railroad station to another. Today the transportation industry uses wireless communications to monitor and track shipments along with sophisticated logistics planning systems to develop the best alternatives that economize costs and deliver the best possible service.

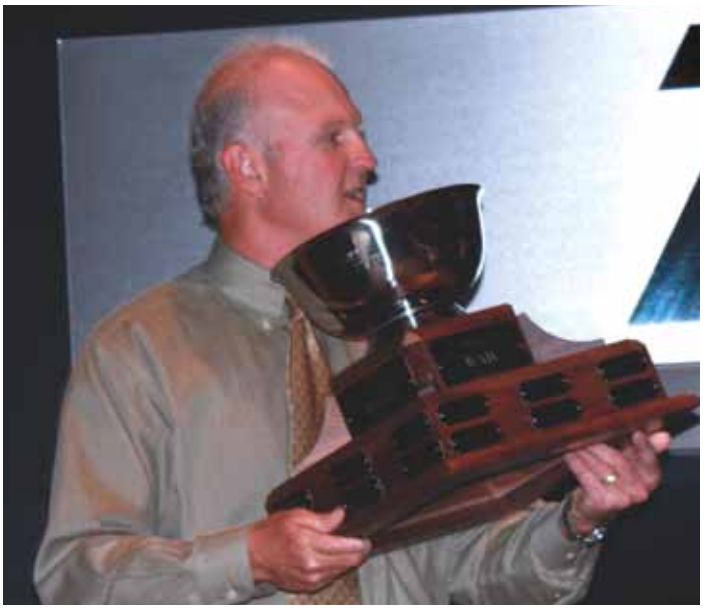
What advice would you give to current students contemplating a career in the Transportation industry?
The best advice I can give to any student is to continue the learning process. I advocate this with my children as being an asset to insure their future. I completed my first Masters degree at the age of 53 and have continually pursued graduate classes. As business situations change, there is always a possibility that jobs may be eliminated. Completing a formal education equips an individual with the knowledge and skills that will make them a valuable asset to any organization.

What cooperative efforts are underway between government and the private sector to improve the efficiency of our nation's freight transportation system?
The USDOT's Cross Town Improvement Project's (C-TIP) objective of minimizing unproductive truck moves is a good example of an effort underway between government and the private sector to improve the efficiency of the transportation network. The C-TIP project is a public-private partnership that involves the Class 1 railroads in Kansas City, local drayage operators, both State DOTs (MO & KS), the regional MPO, Kansas City Smartport, and FHWA . This project deploys an information sharing/transfer capability that enables the coordination of moves between parties to maximize loaded moves and minimize unproductive moves.

The Friends of IFTI make two Award Presentations

This year the Friends of IFTI presented two awards at the Annual Fall Conference. The first award was the "Friend of the Year" award give to Jason Stewart of Tag Truck Center. Jason is the first recipient of what is planned to be an annual award. Jason has worked the last two years in the production of the Annual Trucking Industry Roundtable. The work Jason does in securing speakers and recruiting guests has made the event highly sought after in our community. This year TAG Truck Center also sponsored the lunch for all the participants. We are glad to have Jason Stewart and TAG Truck Center as Friends of IFTI.

The trophy for the winner of this year's Fight for the Freight Cup was also presented at the annual conference. The winning team was put together by the CN – Ground Division. The event was a great success and we hope to add more teams to this year's tournament. The tournament is scheduled for September 22nd at the Windyke Country Club and proceeds go to support the graduate students and work being completed by the Intermodal Freight Transportation Institute. To register your team for this year Fight for the Freight Cup, please contact Sean Ellis at (901) 678-2837.



Derek Caraway Received the Fight for the Freight Cup Trophy at this year's Annual Fall Conference