CIFTS
The Center for Intermodal Freight Transportation Studies
Issue 8 - Fall 2012

INTERMODAL IMPACT

RESEARCH. EDUCATION. OUTREACH.

IFTI's 20/20 Vision:
Research, Education, Outreach

The Intermodal Freight Transportation Institute staff kicked off 2012 by outlining the Institute's future goals and activities. The staff created a plan that reinforces the University of Memphis's strategic direction of becoming a great Metropolitan research university. The tag line for the University is Dreamers. Thinkers. Doers. IFTI's adaptation to this phrase is Research. Education. Outreach. Research allows our professors to dream big and find real world solutions to industry needs. Education stimulates minds to explore, question and find answers. Outreach transfers the identified solutions into workshops, classes, conferences and forums so that our partners can move forward and do great things.

IFTI's 20/20 Vision is to be a nationally recognized leader in linking people to solutions in freight and logistics through research, education and technology transfer activities. The plan will guide IFTI as it transitions into the future.

IFTI's strategic plan sets forth a series of goals in the three key result areas listed to the right for the years 2012, 2015, and 2020. It contains supporting information regarding the resources needed to achieve these goals, the potential sources for these resources, and it identifies IFTI personnel responsible for meeting these goals. A complete version of the strategic plan is available at ***www.memphis.edu/ifti***.

Snapshot of IFTI's Strategic Plan

Key Result Area: Education

Objectives:

- Foster the educational and professional development of K-12 learners; university undergraduate and graduate students and practicing transportation professionals
- Provide a focus on educational pathways to satisfy industry needs

Key Result Area: Research

Objectives:

- Perform cutting-edge freight transportation research of regional and national significance
- Establish cooperative research programs with other leading universities
- Concentrate transportation and transportation related research to policy, modeling, simulation, green technologies and sustainability
- Support private sector research initiatives

Key Result Area: Outreach

Objectives:

- Educate and engage constituents through significant technology transfer activities and transportation workforce development activities
- Use technology transfer activities to enhance career pathways

THE UNIVERSITY OF MEMPHIS
Dreamers. Thinkers. Doers.
VANDERBILT UNIVERSITY

A MESSAGE FROM THE DIRECTOR

Effective June 30, 2012, I stepped down as Director of IFTI and 'officially' retired from the University of Memphis. This was a difficult decision as I continue to love my job – I simply have reached a point in my career that I would like to reduce my involvement and spend time with my family and especially my grandkids. I plan to continue to be active with IFTI on a part-time basis as an advisor and working on research projects.

The last six years have been the most challenging and rewarding of my 35+ years at the University of Memphis. IFTI has grown from a white paper concept for a center focusing on studying freight transportation issues to a full-fledged nationally-recognized transportation institute. From a one-man operation we have grown to a research center composed of over a dozen faculty and staff. We have conducted over $7 million in research, education, and outreach programs. We began with a productive relationship with Vanderbilt University that now encompasses our consortium with CFIRE at the University of Wisconsin-Madison, and 9 other universities. Next year we will be hosting the national meeting of the Council of University Transportation Centers. We have established strong partnerships with our community, especially the CN Railway, Ingram Barge Company, the Dehart Group, and TDOT that have provided financial support for our activities. In addition, we have worked closely with the Greater Memphis Chamber and the MPO to sponsor events of interest to the freight community.

We have a great leadership team in place. Dan Pallme will serve as the IFTI Interim Director. Dan is heading our successful Freight Transportation Leadership Academy and brings his extensive experience with the private sector in both the rail and trucking industries to the job. Sean Ellis will continue as Associate Director. Sean not only handles all the financial aspects of IFTI but is instrumental in developing new programs and forging strong relationships with government and the private sector. Kimberly Grantham, our Marketing and Communications Director, will continue to oversee our web pages, social media, and electronic and hard copy newsletters. Her work has drawn outstanding comments both within the University and from our external constituents.

As we move forward to the next stage in IFTI's development, I look forward to contributing as we become the sustainable outstanding freight transportation center envisioned when we began this journey in 2006.

Marty

Dr. Martin E. Lipinski

Congressman Steve Cohen & Secretary Ray LaHood with IFTI Students

IFTI Director Emeritus Dr. Martin Lipinski, HUD Secretary Shaun Donovan, University of Memphis President Shirley Raines, & Congressman Steve Cohen

IFTI Plays Key Role in Two US Secretaries' Visits

The Intermodal Freight Transportation Institute (IFTI) welcomed not one, but two members of the President's cabinet to the University of Memphis campus in one week!

On Monday, April 9th, approximately 75 local elected officials and business professionals arrived on the University of Memphis campus to attend "The Aerotropolis University" where they learned about the Aerotropolis concept directly from Dr. John Kasarda, the man who coined the phrase. After the Aerotropolis University meeting, IFTI invited a small group of legislative aides and other "friends of IFTI" to learn more about the transportation industry in Memphis. The group toured IDEXX Laboratories, the CN Hump Yard and the BSNF Intermodal Yard.

On Tuesday, April 10th, IFTI welcomed 300 people to the university for the Mid-South Aerotropolis Conference co-hosted by IFTI and the Greater Memphis Chamber. Participants included local and national elected officials and business professionals from the Memphis area. Dr. Shirley Raines, president of the University of Memphis, opened up the conference by greeting this exceptional group. The speakers for this event were outstanding and included Secretary Shaun Donovan – the Secretary of the US Department of Housing and Urban Development, TN Senator Lamar Alexander, TN Representative Steve Cohen, TN Representative Jimmy Duncan, Jr., AR Representative Rick Crawford, Memphis City Mayor AC Wharton, Jr., Shelby County Mayor Mark Luttrell, Jr., CEO of FedEx Fred Smith, and Airport Authority Director Larry Cox – to name a few. The conference explored the Aerotropolis Economic Development Strategy and how it has been applied in airport cities around the world. It reviewed the Memphis Model for Aerotropolis, its leadership and results to date. Finally, there was a discussion on how Memphis can capitalize on its transportation infrastructure to move the needle forward for jobs, capital investment and neighborhood revitalization.

At the request of TN Congressman Steve Cohen, Secretary Ray LaHood, the US Secretary of Transportation visited the University of Memphis on Friday, April 13th. IFTI hosted the Secretary and a select group of business leaders for lunch in the U of M University Center. IFTI Director Emeritus, Dr. Martin Lipinski, welcomed the visitors to campus and provided an overview of the Institute's accomplishments as a USDOT University Transportation Center. Secretary LaHood and Congressman Steve Cohen participated in a question/answer session. Secretary LaHood took a few minutes to meet and talk with IFTI student researchers. While in Memphis, Secretary LaHood and Congressman Cohen toured the FedEx Hub, the new traffic control tower at the Memphis International Airport and the BNSF Intermodal Yard.

Meet our Fall 2012 Industry Experts

Keith Reardon, Rail
Keith Reardon was appointed Vice-President, Intermodal Services for CN Railway in May 2012, based in Toronto. Reardon oversees all aspects of the company's intermodal activities.

Ted Prince, River
Ted Prince is Principal, T. Prince & Associates, LLC, based in Richmond, Virginia. He has provided consulting services for a wide variety of surface freight transportation stakeholders.

Billy G. Willard Jr., Runway
As managing director of Global Human Resources and Development for FedEx Trade Networks, Inc., a subsidiary of FedEx Corporation based in Memphis, Tenn., Bill Willard is responsible for domestic and international human resources, compensation, employee relations, safety, training, leadership development and facilities management.

Joel Henry, Road
Joel Henry is the President of Intermodal Cartage (IMCG). He joined IMCG in 2005 as the VP of Sales & Marketing and moved into his current leadership role in 2008. Before joining the IMCG team, Joel was with Comtrak Logistics for about 15 years.

The only executive leadership program that requires a hard hat!

While others sit behind a monitor reading about freight, Academy participants come to the University of Memphis and learn how to keep their businesses moving.

The Freight Transportation Leadership Academy at the University of Memphis fills an important industry need. The Academy is a concise, affordable primer that equips mid-upper level executives with fundamental leadership skills, a foundation of knowledge in the four transportation modes, offers hands-on experience and allows participants to gain an understanding of the freight transportation network.

The Academy offers a unique collaboration between academic and industry experts that insures participants receive the most up-to-date information on critical issues facing the transportation industry. Read about our fall 2012 industry experts on the left.

Academy students learning from Hunter Harrison

Rail class field trip to the CN Machine Shop

River class field trip taking a tour of the Mississippi River on the Lucy Wepfer

Participants learn in a state-of-the-art executive leadership classroom. After participants hear about the industry, they put on their hard hats and take "field trips" to see each mode in action. Located in "North America's Distribution Center," Memphis is one of the greatest working freight laboratories in the world with access to every transportation mode. By seeing and understanding the interaction between the modes, participants can further their knowledge of the freight network and improve their value to their company.

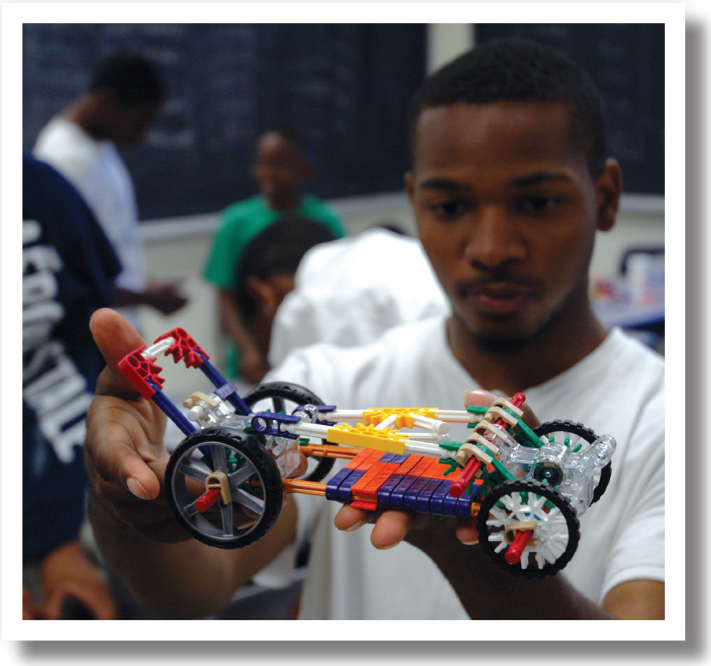
What Participants are Saying

The Academy graduated its first class in June. The experience was a complete success.

"Attending the class provided me a better background on how the industry ties into all modes of transportation. It was a valuable experience learning from the professors and industry leaders." *Spring 2012 Participant*

Students exploring an 18-wheeler during the TAG Trucking hands-on demonstration for the Road class

Memphis City Schools in Partnership with the University of Memphis Selected for Garrett A. Morgan Grant



The Department of Transportation Federal Highway Administration (FHWA) awarded the Garrett A. Morgan Technology and Transportation Education Program (GAMTTEP) grant to Wooddale High School in partnership with the Intermodal Freight Transportation Institute (IFTI) at the University of Memphis for their proposed Memphis TRansportation Engineering Careers (TREC) project.

The GAMTTEP grant is funded through the FHWA in honor of Garrett Augustus Morgan, Sr., an African-American inventor and entrepreneur. Born in 1877, Morgan blazed a trail for African-American innovators with his patents for an automated traffic light, a gas mask and a hair straightening method.

The TREC project, based within the Aviation Magnet Program at Wooddale High School is designed to address GAMTTEP's goal "to improve the preparation of students, particularly women and minorities, in science, technology, engineering, and mathematics through curriculum development and other transportation related activities."

The Wooddale High School/U of M partnership will increase the number of students pursuing careers in transportation engineering by offering high school students an opportunity to increase their awareness and interest levels regarding existing and potential opportunities in the field. Secondarily, the combined project seeks to create a broader impact by providing high school science and math teachers with new pedagogical methods and tools for use in their classrooms and by providing undergraduate students leadership training and practice opportunities through peer mentoring. Finally, the project seeks to pilot a sustainable and scalable model for delivery of its first two goals for other institutions to use.

Highlights of this program include:

- 8 academic year meetings of the TREC after school club facilitated by project partners, including U of M faculty, U of M student societies (such as the student chapters of the Institute of Transportation Engineers, Society of Women Engineers, and National Society of Black Engineers), and transportation industry leaders
- One-week TREC program delivered by Wooddale faculty and U of M student mentors in Summer 2013 at Wooddale High School
- Program evaluation and comparison to traditional summer-only outreach programs offered through the U of M Herff College of Engineering.

Dr. Stephanie Ivey, Associate Professor and IFTI researcher says, "We are thrilled to expand the TREC Program by working with the same group of high school students all year long. This project will have positive impacts on the U of M TREC week as it will allow IFTI researchers to identify differences in outcomes between summer-only and year-round outreach initiatives. We will be in a position to define best practices and to design a sustainable and scalable plan for project success."

Jeff Holmes, Wooddale High School teachers says, "The TREC program falls in line with Wooddale's mission of designing real-life applications of engineering content through hands-on, interactive design challenges based on a series of increasingly complex variables in team settings." He is looking forward to participating in multiple aspects of transportation engineering to facilitate introduction of transportation problems in their classrooms and to help them present career opportunities to their students.

THE UNIVERSITY OF MEMPHIS
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More information about the TREC Program is available online at **www.Memphis.edu/Herff/Trec/Index.php.**

More information about the Intermodal Freight Transportation Institute is available online at **www.Memphis.edu/IFTI.**

Leaders in Transportation Freight

Name:
Steve Barkley

BS Civil Engineering – University of Memphis '79

Title:
Vice President for Harriman Dispatching Center and Network Operations

Company:
Union Pacific Railroad

Years with company:
40 years (Illinois Central RR – 8 years) (Union Pacific RR – 32 years)

Describe your work with Union Pacific.
The majority of my career has been spent in Operations Management. I enjoyed two assignments in Marketing in the areas of Customer Service and Service Design / Business Development. My operations management positions originally focused in the area of Transportation. After advancing to more senior level general management positions my operations responsibilities also expanded into Mechanical and Engineering Maintenance. During the last 16 years of my career I spent 6 years in Houston, TX as the VP of Operations for UP's Southern Region and 10 years as VP of the Harriman Dispatching Center (HDC) & Network Operations. The HDC is the operations control center for the entire Union Pacific network and is responsible for execution of the transportation plan and management of the five critical network resources (locomotives, crews, main tracks, freight cars, and terminal capacity).

How has the industry changed since you began your career?
There is almost no area of the rail industry that hasn't changed in the last 40 years. Let's start with changes in equipment. Diesel locomotives have changed: higher horsepower, AC vs. DC traction, on board computer control systems, improved emissions, improved crashworthy and air conditioned cab compartments, smart start systems, and better fuel economy are just a few of the changes. The modern day freight car has also undergone substantial changes: wheels have changed from straight plate to curved plate, roller axle bearings replaced brass bearing journal boxes, and steerable trucks were developed to improve curving performance. Intermodal equipment changes were dramatic with the introduction of "Double Stack" container operations and the change of ramp configurations from "Circus Style" loading to the "Packer" and "Straddle Crane" ramp operations. Engineering maintenance practices and equipment have advanced from small work gangs using mostly manual labor into large highly mechanized work gangs. Computer technology advancement, including the introduction of the personal computer, has mostly taken place in the last 40 years which has changed the operational and financial control of railroad companies.

How did your experience at the University of Memphis help shape your career?
Having been fortunate enough to begin my railroad career prior to starting my studies at the University of Memphis, I was able to consult with the Civil Engineering Department staff to tailor my education to meet the knowledge requirements for success in the rail industry. I was able to center my core class schedule around studies of structures, transportation, and operations. Beyond the classroom the University in general and the College of Engineering specifically offered leadership development opportunities in many organizations.

What advice would you give current students contemplating a career in the transportation industry?
A career in transportation can be one the most challenging and rewarding careers a person can choose. It is a career that will be everlasting – as transportation will always be an important part of society. As an example, the Union Pacific Railroad is celebrating their 150th anniversary this year having been formed by President Lincoln in 1862. There is also some general advice I always give to college students and young professionals in the business environment. As a matter of philosophy and work ethic I remind them "you never get paid more for what you are doing until you are doing more than what you are being paid for."

How are you spending your retirement?
After about four months of retirement my time continues to be consumed by the many interest I have after working for 40 years. Hobbies like golf, boating and model railroading are some of my interests. Public service and volunteer work has gotten more attention now that I have more time to devote to these important areas of my life. And recently my wife, Susan, and I have gotten to travel a little since my retirement and look to do more as the months and years pass. Lastly, spending time with family and friends remains a priority for us.

Intermodal Freight Transportation Institute: Leader in UTC

The Intermodal Freight Transportation Institute (IFTI), in a consortia partnership with the University of Wisconsin - Madison, competed for and was awarded a coveted Tier 1 University Transportation Center (UTC). Of the 63 UTC applications received, RITA awarded a total of 22 grants, each worth $3.5 million dollars. Forty-six of the applications competed for one of the ten Tier 1 UTC Centers that our consortium received.

The University of Memphis/University of Wisconsin-Madison consortium is called CFIRE (National Center for Freight and Infrastructure Research and Education) and is composed of 10 universities. The consortium encompasses a geographical area that serves the majority of freight traffic in the United States.

The University of Memphis is coordinating the "southern hub" which includes Vanderbilt University, the University of Alabama-Huntsville, and the University of Southern Mississippi. The University of Wisconsin - Madison serves as the lead institute of CFIRE and is leading the "northern hub."

The CFIRE team takes advantage of regional expertise developed over years of prior activities by using northern and southern hubs to coordinate education, training, and technology transfer efforts. Research is done collaboratively across both regions, but dissemination is managed by the hub institutions.

The consortium's winning proposal, Making Multimodal Freight Systems Work for Economic Recovery and Quality of Life, detailed research, education, and technology transfer activities that will maximize the effectiveness of multimodal and intermodal development in our region and in the nation to move products efficiently from border to border and abroad, which creates an unprecedented opportunity for job creation and sustained growth.

IFTI's Research Focus

As the lead institution for the southern hub, the University of Memphis is responsible for many administrative and conference planning related tasks. This leadership role includes managing subcontracts for the three southern hub partner institutions, coordinating workforce development activities, and hosting meetings and conferences.

The southern hub will also be participating in a number of research projects outlined in the original research proposal submitted by CFIRE. IFTI will lead the research for these projects:

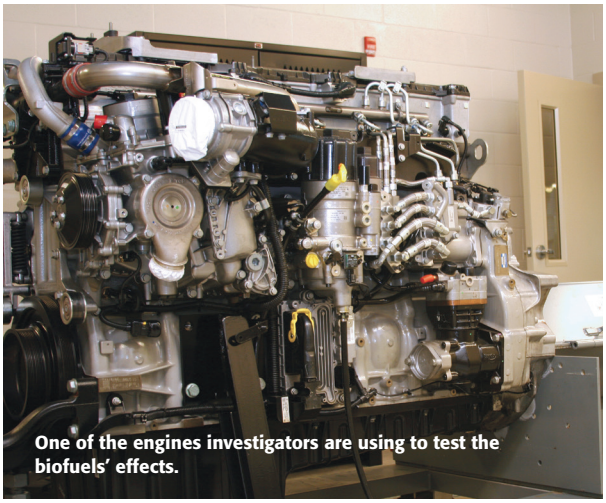
Livability Issues in a Freight Community
Effects of the Panama Canal on Freight Flows
The Effects of Rail on Rural Communities

Read more about these projects online at ***www.Memphis.edu/IFTI/research.php***.

Dr. Srikant Gir, U of M professor and developer of micro-refinery, explaining how the system works.

Biodiesel micro-refinery housed in 40 ft. container

Close-up view of the micro-refinery



One of the engines investigators are using to test the biofuels' effects.

Exploring Renewable Fuels

The Mid-South BioFuel Feasibility Study

The Mid-South BioFuel Feasibility study represents a partnership across educational institutions. By leveraging the existing biofuel research efforts at the University of Memphis and the diesel technology program at the Mid-South Community College, IFTI has funded a collaborative effort to explore a specific piece of the biofuel supply chain: biofuel adoption by the transportation industry.

The Energy Independence and Security Act (EISA, 2007) renewable fuels mandate of 36 billion gallons by 2022 requires biofuel production rise from the current 12 billion gallons to 36 billion gallons with 21 billion gallons to come from advanced biofuels. To contribute to this industry goal, faculty and students from both institutions are working diligently to make the greener solutions readily available, to increase the cost competitiveness of biofuel as an alternate source of energy and to improve engine performance in terms of injector and filter degradation.

To that end, faculty and students from the University of Memphis have developed a biodiesel micro-refinery that is capable of producing biodiesel fuel from different feedstocks on a continuous basis. The Mid-South Community College has the capacity, in terms of faculty and facilities, to test the effects of biofuels on large diesel engines. The portable micro-refinery is housed in a 40 ft. container on the Mid-South Community College campus for the duration of this endeavor. The investigators are utilizing biofuels produced by the micro-refinery to systematically test their effects on a sequence of engines. Researchers are examining the effects of the fuel on an ascending magnitude of the engines' horsepower and model year of the engines.

To date, the outcomes are promising. Investigators are finalizing the initial stages of this study with the plans to duplicate the smaller scale micro-refinery into larger scale models to better meet the needs of the transportation industry. Visit the IFTI website for project updates. ***www.Memphis.edu/IFTI***

Collaborating with ATRI:
Analyzing Truck Data

Dr. Mihalis Golias is partnering with the American Transportation Research Institute (ATRI) and Vanderbilt University to develop tools for analyzing trucking data that will increase understanding of the information and ultimately improve freight transportation time in Tennessee.

Since 2002 ATRI, working closely with the Federal Highway Administration, has led the Freight Performance Measures (FPM) program which evaluates the effectiveness of the highway system to facilitate fast, efficient goods movement. Performance measurements are produced for this program through the use of real, anonymous, private sector truck data sourced through unique industry partnerships. The truck data is available online through the Freight Performance Measures Web-Based (FPMWeb) tool. The FPMweb tool measures operating speeds for trucks at any given place and point in time along 25 interstate highways that are considered significant freight routes.

While data available on the web consists mainly of processed average speed information, Dr. Golias is performing this research using some of the raw GPS data. The raw data consists of truck GPS positions recorded once every 5-15 minutes with a unique ID number for the truck, a timestamp and speed. Dr. Golias explains, "The unique ID numbers may be linked together to identify the route(s) taken by a given truck on a given day. There are approximately 350,000 positions in this graph, with significant position overlap in the major urban areas and along the interstate corridors."

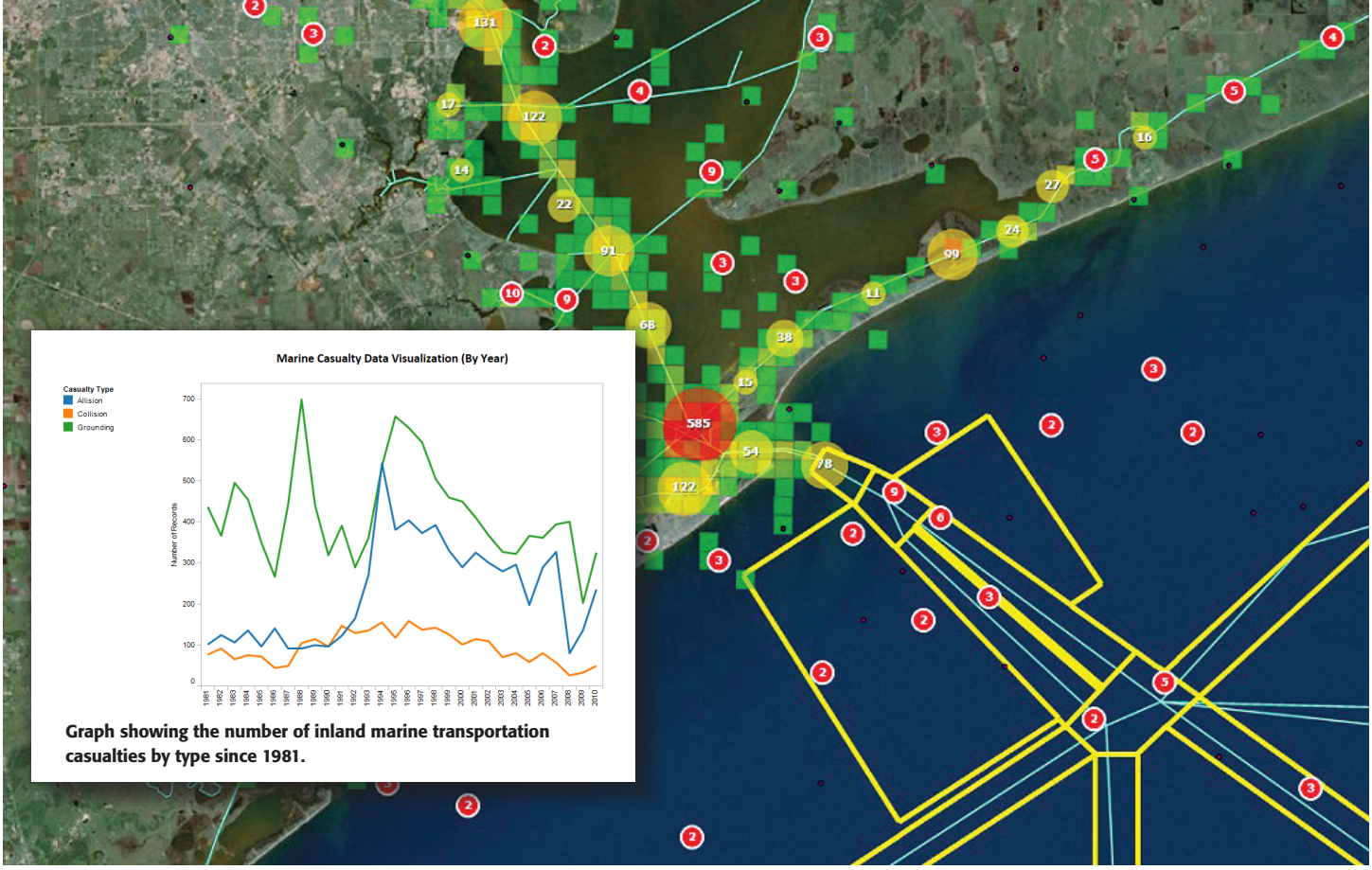
As a result, Dr. Golias is able provide key indicators of performance for freight intermodal terminals in Memphis TN. Dr. Golias shares, "Some of the key indicators we've produced include travel times per time of day between intermodal freight terminals, recurring and non-recurring congestion points, truck turn time distributions per time of day. As an added benefit the data used to develop these indicators (e.g. travel times on links per time of day) can be used to calibrate regional travel demand models."

He has also applied the raw data to create several visual instruments. Dr. Golias created maps illustrating the travel times and flows for intercity truck traffic. In addition, Dr. Golias is developing a model to predict turn-around times at these terminals based on the demand, type of movement, and terminal features among others. The proposed measures of performance and model can be used to capture with increased accuracy the different operational strategies that reduce congestion in the vicinity of freight terminals. Our ARTI partner determined Tennessee's primary truck freight trading partners in the U.S. by zip code, along with the primary corridors that support these linkages. They also analyzed the Tennessee truck corridors with a particular focus on travel times, flows and intracity truck traffic. Our Vanderbilt partner, Dr. Jimmy Dobbins, performed truck rest area analysis and validation of truck-prohibitive geometrics.

Once this project is complete, Dr. Golias hopes to reproduce the tools for other states.

Meet our Researcher:
Dr. Mihalis Golias

Mihalis M. Golias is an Assistant Professor with the Department of Civil Engineering at the University of Memphis. He is also a faculty associate with IFTI at the University of Memphis, and an affiliated faculty of the Center for Advanced Infrastructure and Transportation at Rutgers University. His core research lies in the field of logistics and supply chain management with a focus on freight transportation. His recent research work concentrated on the modeling of intermodal freight terminals (IFTs), as they are critical parts of the transportation system network, and their efficiency, affects significantly the entire intermodal freight transport chain. In his work he has developed mathematical models and solution algorithms to tackle operational problems at IFTs. The novelty of these models is that they capture real world environments and provide robust solutions against the uncertainty that every day operations entail. Recently, the focus of his research has been on market based mechanisms and their applicability in operational problems at IFTs. In addition to his outstanding research, Dr. Golias teaches transportation courses at both the undergraduate and graduate levels in the department of Civil Engineering. Dr. Golias holds a Diploma in Civil Engineering from Aristotle University, and a M.Sc. in Civil and Environmental Engineering and a Ph.D. in Transportation Engineering from Rutgers University.



Graph showing the number of inland marine transportation casualties by type since 1981.

Screenshot satellite image of marine casualties occurring near the intersection of the Gulf Intracoastal Waterway West and the Houston Ship Channel.

Vanderbilt Inland Marine Casualty Research Presented to AWO, USCG, NTSB

Sponsored research funded by the Center for Advanced Intermodal Technologies (CAIT) has attracted a great deal of attention from marine transportation safety agencies. Dr. James Dobbins, a Research Associate Professor at Vanderbilt University, has collected marine accident data that dates back to 1981. He recently completed a research project funded by CAIT where he used a geographic information system (GIS) to locate clusters, or hot spots, on the US navigable waterway system. The idea is to identify areas on the inland waterway system that have an extraordinarily high accident rate for closer examination and potential mitigation. Another research outcome is the use of data visualization tools that clearly and effectively convey trends and information.

The U.S. Coast Guard (USCG) is responsible for collecting, maintaining and disseminating marine casualty data. For the purposes of this research, marine casualties were limited to allisions (when moving objects hit fixed objects, like bridges, terminals or locks), collisions and groundings. The case study database contains 50,323 casualties, 27,163 of them occurring on the inland waterways from 1981 through 2010. Findings from the research were limited to identifying high casualty frequency locations, as there is no reliable source of publicly available waterway trip data. Additionally, the property damage resulting from these casualties is included in the database, enabling locations with a history of more severe accidents to be discovered. These locations were presented to USCG officials and industry professionals at the Ingram Barge Company, where the locations were roundly confirmed by several river pilots, captains and marine safety officers. The research was published in the Transportation Research Record in September 2011. Later, Dr. Dobbins made a formal presentation at the American Waterways Operators (AWO) annual meeting in January 2012. The National Transportation Safety Board (NTSB) has invited Dr. Dobbins to speak at a public hearing on best practices in the use of GIS for accident analysis in Washington, DC.

Dr. Dobbins is currently conducting research (also funded by CAIT) where he is determining the weather (wind speed, visibility, severe weather events) and river conditions (e.g., high water) at the time of all 27,163 accidents in the database. It is anticipated that this analysis will shed light on the effect of weather and river conditions on inland marine transportation safety. The results of this work will be presented at the NTSB public hearing and published in the conference proceedings.

Work Force Summit

February 5 & 6, 2013
University of Memphis

Industry professionals will come together to discuss business needs and how universities can better prepare the upcoming workforce.

To find out more and register to participate contact
Sean Ellis (901) 678-2837 scellis1@memphis.edu

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