



**CFIRE**

# Program Progress Performance Report (PPPR): July 1, 2013 to December 31, 2013

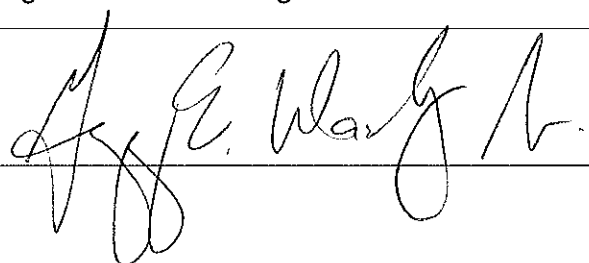
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National Center for Freight & Infrastructure Research & Education  
Department of Civil and Environmental Engineering  
College of Engineering  
University of Wisconsin–Madison

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This report covers CFIRE's efforts to collaboratively address research, education, workforce development, and technology transfer under DTRT12- G-UTC19 during the reporting period of July 1, 2013 to December 31, 2013.

1. Accomplishments

A. CFIRE's Goals

- i. **Research:** Through the strategic planning process, CFIRE is continuing its efforts with eight research initiatives that support the USDOT Strategic Goals and advance the state of practice in freight and freight infrastructure systems.
- ii. **Education and Workforce Development:** The partner institutions of CFIRE are actively engaged in education and workforce development at the local, state, and national levels. CFIRE has built upon established successful programs and continues support new collaborative initiatives. Our proposed education and workforce activities for university students and practicing professionals will develop skills and knowledge in multimodal freight transportation systems that reinforce our Center's theme.
- iii. **Technology Transfer:** Technology transfer is the process of transferring discoveries or innovations derived from university research into products and services that benefit the profession. CFIRE will engage the freight community in a cross-section of technology transfer initiatives. These will include both traditional and innovative approaches to disseminating information.
- iv. **Collaboration:** The CFIRE team has taken advantage of regional expertise by establishing both northern and southern hubs to help coordinate proposed education, training, and technology transfer efforts. The CFIRE team brings a wealth of experience and a history of collaborative work. We will leverage these assets to further develop relationships across a spectrum of initiatives that include both state and national-level collaborations.

B. Accomplishments under CFIRE's goals

i. Research Initiatives:

- **RI-1: A Multi-Modal Freight Safety, Security, and Environmental Routing Tool**  
USDOT Priorities: Safety/Sustainability  
Performing Institutions: University of Wisconsin – Milwaukee, University of Wisconsin - Superior, University of Alabama - Huntsville, and University of Southern Mississippi.  
Start Date: July 1, 2012      End Date: March 31, 2014
  - Major activities:
    - populated GIS networks representing highway, rail and waterway transport with attributes enabling the use of various criteria (e.g., travel time, trip distance, population exposure, etc.) to identify preferred routes
    - continued developing feature layers describing land uses and assets in proximity to transport routes
    - began coding to implement system design, including web user interface and analytical functions
  - Specific objectives
    - Coordinate methodological development and software programming
  - Significant results:
    - multiple freight transportation stakeholders will have access to a tool that allows for making more informed routing decisions taking into consideration impacts associated with efficiency, safety, security and environmental protection
  - Key outcomes or other achievements
    - Increased confidence that a comprehensive and practical decision-support tool can be implemented
  - Changes
    - Emphasis of research changed to entire continental US rather than just CFIRE states

- **RI-2: Making Freight-Centric Communities More Livable: Measuring the Impact of Advanced Technologies**  
USDOT Priorities: Livability/Economic Competitiveness  
Performing Institutions: University of Memphis, University of Wisconsin-Madison, and University of Toledo.  
Start Date: July 1, 2012      End Date: June 30, 2014
  - Major activities:
    - Final version of residential stakeholder questionnaires (AHP and Focus Group) developed; IRB applications submitted and approved in Memphis and Toledo; First residential stakeholder survey event held in Memphis in October 2013.
  - Specific objectives:
    - Residential stakeholder instruments are designed to determine participants' definition of livability, perception regarding factors affecting livability, and the impact of the community transportation system on livability. The first survey event was used as a venue for pilot testing the residential stakeholder instruments as well as the format of the event itself.
    - Industry survey is designed to identify perceptions related to the impact of freight operations, and to identify any strategies/technologies currently used by freight operators to reduce negative externalities.
  - Significant results:
    - The first survey event yielded very useful information, not only by informing survey re-design to better achieve goals, but also in terms of identifying factors influencing perceptions of livability. Items on both the AHP and focus group instruments were identified where wording choices proved confusing to participants. These items will be reworded before use in future events. In terms of livability, personal safety (not traffic related) was most frequently identified by respondents as the factor making a community livable. While congestion due to freight traffic was reported by many respondents, the link between congestion and livability (and rarely any transportation related factor) was not frequently identified.
  - Key outcomes:
    - Papers and presentations (referenced later in the document)
  
- **RI-3: Non-Destructive Technologies for Monitoring and Condition Assessment to Support Safety, Maintenance Programming, and Cost Allocation**  
USDOT Priorities: State of Good Repair  
Performing Institutions: University of Wisconsin-Madison; University of Wisconsin - Milwaukee  
Start Date: July 1, 2012      End Date: June 30, 2014
  - Major activities:
    - Software is designed now so that we can save and handle the information collected from the users to make up a database of past user cases.
    - Currently working on layout sheet and domain framework working. Connecting the Knowledge Center to the Logicnet (web-based db) through the cause node.
  - Specific objectives:
    - The results of this investigation will provide local, state, and federal agencies with information sources and non-destructive tools for structural health monitoring, developing risk management systems, upgrading design standards, and assessing and allocating costs associated with deterioration and structural damage.
  - Significant results:
    - Software development and modification

- Development of non-destructive technologies database
  - Key outcomes:
    - Presentation (referenced later in document)
- **RI-4: Mining Automatic Identification Systems (AIS) Data for Improved Vessel Trip Analysis Capabilities**

USDOT Priorities: Economic Competitiveness

Performing Institutions: Vanderbilt, University of Toledo, and University of Wisconsin-Superior.

Start Date: July 1, 2012      End Date: March 31, 2014

  - Major activities:
    - Survey conducted of AIS data providers
    - Paper based on the literature review was submitted and accepted for the Logistics, Trade and Transportation Symposium Conference
    - Developed algorithms to reduce AIS data record counts and to find the number of vessel calls made at a dock
  - Specific objectives:
    - Review literature on use of AIS for Great Lakes, Oceans and Inland routes
    - Prepare write up on why AIS was developed and original intended uses
    - Prepare case studies of current uses of AIS
    - Conduct exploratory analysis of AIS data to find key attributes needed for developing algorithms to reduce AIS data record counts
  - Significant results:
    - First, AIS and its uses have come a long way from its original intended purpose of collision avoidance and VTS tool. Further, as AIS systems are refined and mass produced the unit cost should go down. A lower price may allow for vessels that are currently not required to have the system to cost effectively adopt them. The expanded AIS user base could mitigate incidents that currently occur between equipped and unequipped vessels. Second, the algorithm procedure written to reduce AIS data records provides a 98% reduction in AIS data record count. This is expected to help the future facilitation and handling of these large data sets to improve effective usage of the systems.
  - Key outcomes:
    - Developed an understanding of the strengths and weaknesses of the AIS system leading to inferences on possible future trends in implementation of this technology.
- **RI-5: Estimating the Effects of Extreme Weather on Transportation Infrastructure**

USDOT Priorities: Sustainability

Performing Institutions: Vanderbilt University and University of Wisconsin-Madison.

Start Date: July 1, 2012      End Date: March 31, 2014

  - Major activities:
    - Identified key freight corridors/locations in the CFIRE region of interest using FAF07 data. Key freight areas were determined as having FAF07 values greater than 10,000.
    - Continued evaluation of the impacts associated with the May 2010 flood event that occurred in the Nashville, TN area using Hazus, data from local agencies (including new data on roadway surface repairs from Metro Nashville Public Works), and analysis of the Nashville post-flood household survey results.
    - Queried both the North American Regional Reanalysis (NARR) archive and North American Regional Climate Change Assessment Program (NARCCAP) models to identify “hot spots” for extreme precipitation events in the Eastern

- U.S. both historically and in the years between 2041 and 2070 (from NARCCAP) using a threshold of 2" average daily precipitation.
      - Continued development of a preliminary risk index that would link precipitation extremities to highway infrastructure damages and delays.
  - Specific objectives:
    - Develop and pilot test a methodology for identifying highway infrastructure which is threatened by flooding events.
    - Estimate the actual damage due to flooding to the highway infrastructure itself and related indirect effects (e.g., delays in shipments, increased travel times and fuel costs).
    - Define a risk index based on extreme weather threat and consequential impact on transportation infrastructure and operations.
  - Significant Results:
    - Hazus estimates a significantly greater amount of economic damage due to flooding than has traditionally been reported, and still fails to consider all negative impacts to infrastructure and mobility
    - Road closures do not appear to be an effective proxy measure for representing damage to highway infrastructure due to major precipitation events
    - Hazus is best used as a screening-level tool to identify highly vulnerable areas and then a more refined hydrologic model is better suited to evaluate depth and extent of flooding in areas of specific transportation assets.
    - NARCCAP model outputs are not easily integrated into GIS due to differing coordinate systems of the six main models used and coordinate system/projection anomalies. Additionally, NARCCAP data uses an unusual longitude convention (i.e., from 0 - 360 degrees East). NARR uses -180 West to 180 degrees East longitude.
    - Using our criterion for "key precipitation events", tropical areas had 24-hour daily precipitation averages of over 30".
  - Key outcomes:
    - Nothing to report
- **RI-6: Realigning Multimodal Freight Networks in Response to International Capacity Expansion**

USDOT Priorities: Economic Competitiveness

Performing Institutions: University of Southern Mississippi, University of Alabama - Huntsville, University of Memphis, University of Illinois - Chicago, and University of Wisconsin - Superior.

Start Date: July 1, 2012      End Date: June 30, 2014

  - Major activities:
    - Literature review about the economic impact of Panama Canal expansion
    - Completed the networks and routing for all the difference assignments requested for the project
    - Conducted GIS modeling of various scenarios developed in task 3 and task 4
    - Revisions on the report of 'Task 3: Scenario Analysis'
    - Developed web based tool for scenarios display for stakeholders
  - Specific objectives:
    - Develop transportation networks
    - Include new subject port – Gulfport, MS.
    - Develop network models for all scenarios
    - Develop a set of 60 + maps
    - Conduct economic development feasibility analysis
  - Significant results:
    - Optimized distribution models from three coastal ports to CFIRE regions.

- What-if scenario analysis models for freight flows among 13 US ports and two major markets (Chicago & Memphis).
        - Models were developed for FAF regions and whole US.
        - Port Level Scenarios – 9 maps.
        - US Interior Optimized Scenarios – 36 maps.
        - Sensitivity Analysis Scenarios – 12 maps.
        - GIS models were developed for all network models and potential intermodal locations were identified.
        - Imported containerized freight shipment flows through the port, Gulfport, MS, to its vicinities were observed.
        - Even though the observed little flow from Houston, TX may not describe current status, overall flows from each coast to states are believed to be easily interpretable with total flow numbers at coasts.
      - Key outcomes:
        - None to report.
    - **RI-7: Enhancing Rail Connectivity to Underserved Rural Communities**  
USDOT Priorities: Livability/Economic Competitiveness  
Performing Institutions: University of Memphis, University of Wisconsin-Superior and Madison, University of Alabama in Huntsville, and University of Southern Mississippi.  
Start Date: July 1, 2012      End Date: June 30, 2014
      - Major activities:
        - The survey of state DOTs and state rail associations to identify locations within states where issues affecting provision of rail service and economic viability of communities or industries have been completed.
      - Specific objectives:
        - This research will identify the actions, practices, and policies needed to continue or expand adequate short line or Class 1 and regional rail service to rural communities.
      - Significant results:
        - Based on the results of the surveys, 10-15 locations were selected for further study geographically distributed in Mississippi, Alabama, Tennessee, and Wisconsin. These stakeholders were surveyed either by phone or email on the various perspectives on the nature of the problem, the views on the community efforts, programs, policies and investments that are necessary to attract, retain or improve operations for rail access.
      - Key outcomes:
        - Nothing to report.
- ii. Other Research
  - Evaluation of the Urban Freight Strategies (a consolidation of *Economic and Environmental Analyses of Urban Delivery Consolidation Strategies* and *Incorporating Environmental Measures into a Reliable Freight Routing Model*, which were listed as separate projects in the last PPPR):  
Performing Institutions: University of Illinois – Chicago
    - Major activities:
      - Investigating the feasibility of delivery cooperation using consolidation centers in US cities to reduce the negative impacts of “last mile” movement of freight.
      - Examining the relationship between the urban built environment and frequency and severity of conflicts between delivery trucks and other road and sidewalk users.
    - Specific objectives:
      - Developing a logistics cost model to quantify economic and environmental impacts.
      - Examine design and land use factors that affect congestion and safety of deliveries.
    - Significant results:

- Urban Consolidation Center Study: It is found that the potential logistics and environmental benefits of UCC could come from either improving the utilization of the vehicle capacity through consolidation, or shifting the more expensive storage cost from customers in the city center to the less expensive UCC rent cost.
  - Study of built environment effects on delivery vehicle activities:
    - We have found that 40% of truck parking tickets in Chicago are attributed to the parking regulations are designed to exclude trucks from certain areas.
    - About 30% of the tickets are attributed to no parking zone violation and expired parking meters.
  - Dynamic Pollution Routing Study: preliminary results show the noticeable (joint) effects of vehicle payload, vehicle speed, and dwell time on urban commercial vehicle PM2.5 emissions and energy consumption. Thus vehicle payload and speed could affect the visiting order of a distribution tour if minimizing the energy consumption or emissions is the objective.
  - Environmental Impact and Health Exposure of Highway Freight Vehicles: A preliminary case study of Gold Coast region which is one of most densely populated regions in Chicago shows a substantial heterogeneity in the exposure levels within the modeling domain. The intake at outdoors, indoors and in vehicles accounts for 8%, 82% and 10% respectively of the total intake. Seniors, adults and children intake 28%, 68% and 3% respectively of the total intake.
- Key outcomes:
  - Nothing to report.
- Behavioral Micro-simulation Model of Multimodal Freight Movement:
 

Performing Institutions: University of Illinois – Chicago

  - Major activities:
    - Expanding the large-scale freight activity-based model, FAME, by improving modeling components of the framework and implementing new components
    - Developed a mathematical optimization model for the supplier selection problem.
  - Specific objectives:
    - Develop more detailed logistics choices at the disaggregate level of individual decision makers and implement them in the FAME framework
  - Significant results:
    - Developed a model to determine suitability scores for each potential supplier
    - Developed a decision tree model for identifying characteristics of the “shipping chain” for different shipments
  - Key outcomes:
    - Nothing to report.
- Ultra-heavy Truck Study:
 

Performing Institutions: University of Wisconsin – Milwaukee

  - Major activities:
    - Developed oversize overweight (OSOW) truck database for Wisconsin and Iowa and prepared for analysis, including a truck cost model.
  - Specific objectives:
    - To support government and industry activities around OSOW truck routing and permitting.
  - Significant results:
    - Using the CFIRE Truck Cost Model, a calculation of direct cost savings to the trucking industry that could be anticipated with ultra-heavy trucks, may be performed. A subsequent report will evaluate the economic benefits of implementing ultra-heavy truck policy in Wisconsin by using the HEAT business attraction model.
  - Key outcomes:





- helped them learn how to better solve problems; 76% are more likely to major in transportation engineering because of TREC.
- Again this summer, we had a full class of students in both the GEE and TREC week long programs. With 48 students participated in the on campus session with another 20 participating at a satellite location at a local high school. The last day of the week, both programs were on campus to have a friendly competition on the work they had completed over the week. This was the first year we had a satellite camp.
  - We also held two parent workshops to help communicate the opportunity for students who receive a degree in transportation engineering.
- University of Southern Mississippi:
    - The MS LTT has awarded 13 Masters Degrees
    - The MS LTT has delivered 7 courses online
    - The MS LTT had 3 practitioners as supporting instructors to support the inclusion of practical relevant interdisciplinary knowledge in the courses
    - MSLTT students competed and placed in five competitions
  - University of Toledo:
    - A freight demand analysis was conducted in the Great Lakes region as part of the “PathWorld” project. Through this effort major congestion areas on highway links were determined. Solutions for this project were proposed to alleviate the most problematic areas of congestion.
  - University of Wisconsin – Madison:
    - CFIRE Scholarships for Engineering Professional Development Rail Short Courses
    - UW Transportation Management and Policy Program - Conducted fall colloquium on the topic of automated and connected vehicle technologies. Hosted national level-speakers from California to New Jersey.
    - Sponsored CFIRE’s Outstanding Student of the Year for 2013 – Virginia Anne Wise, University of Memphis.
    - The 2013 Camp Badger Exploring Engineering™ Summer Program welcomed 250 students to two University of Wisconsin campuses, including UW-Madison. CFIRE supported Camp Badger by funding scholarships. CFIRE staff and students also organized a freight engineering presentation that included a field trip to the Tenney Park Locks on Lake Mendota.
    - Provided leadership to transportation students in setting up a local chapter of the American Railway Engineering and Maintenance-of-Way Association (AREMA) and provided funding for five students to travel to the AREMA’s annual conference.
  - University of Wisconsin – Milwaukee:
    - Provided graduate and undergraduate students education and training through freight short courses and symposia
  - University of Wisconsin – Superior:
    - Richard Stewart provided expert advice to Douglas County, the City of Superior and the Duluth Economic Development Association on transportation and supply chain options for new industries.
    - Zamira Simkins is working with regional universities, agencies and industry to develop and publish an annual economic status report that will include the region’s transportation cluster.
    - Amit Mokashi, Richard Stewart and Mei Cao taught online modules for Certified in Transportation and Logistics (CTL) program at University of Wisconsin-Superior on transportation economics and general management.
    - Amit Mokashi, Richard Stewart and Mei Cao taught courses on campus on transportation economics, international & intermodal logistics, port & terminal management and land transportation (pipelines, railroad and trucking).

- Mei Cao led her Advanced Supply Chain class to attend “Superior’s Manufacturers Revealed Registration” organized by Superior Chamber of Commerce, October 2, 2013.
  - Richard Stewart attended with five students at the Intermodal Association of North America (IANA) annual EXPO in Houston, Texas. IANA funded the students’ registration costs.
  - Richard Stewart attended with two students at the Council of Supply Chain Management (CSCMP) Annual meeting in Denver, CO. The students’ expenses were funded by the North East Wisconsin and Twin Cities CSCMP roundtables.
- iv. Technology Transfer - The following progress has been made on CFIRE’s commitments to T2:
- University of Memphis: IFTI hosted the 7th Annual Freight Intermodal Conference on September 24, 2013 at the FedEx Institute of Technology on the University of Memphis campus. The conference featured world-class presentations by industry experts, government officials, and transportation professors. Several IFTI students were recognized for excelling in transportation research and for their contributions to the transportation industry. The conference is the annual Tech Transfer activity for the Southern Hub. Over 150 practitioners from the public and private sector gather to hear from researchers, politicians and industry professionals on the state of the industry. This activity is always well received by the community. It is also become a significant way of communication for the TDOT commissioner to the local leaders in freight transportation.
  - University of Wisconsin-Madison: The Mid-America Freight Coalition (MAFC) sponsored travel for one official from each state DOT in the MAFC region to the AASHTO-FHWA Freight Partnership in Washington, D.C. (July 31 – August 2)
  - University of Wisconsin-Madison: Assisted with the planning and upfront operations of the MAASTO SCOHT annual meeting in Milwaukee, WI (July 2013)
  - A University of Toledo student developing an intermodal routing system with an accompanying graphical user interface for the GIS data called PathWorld which can work with very large network datasets and should be commercialized and used by intermodal shippers once it is completed.
    - A freight demand analysis of the Great Lakes region using this software identified major congestion areas on highway links and proposed solutions to alleviate these problems.
  - A University of Toledo student developed a new MidWest FreightView DataViewer which allows the dissemination of a wide range of data to users.
  - The University of Southern Mississippi’s CLTT hosted the Industry Advisory Council Summit for industry professionals looking to promote common goals in logistics, trade and transportation. The roundtable was held at the USM Hattiesburg main campus in August.
  - University of Wisconsin-Madison: The Department of Engineering Professional Development continues to provide railroad engineering short courses to practicing professionals. CFIRE provides funding in the form of scholarships. Courses offered during the fall of 2013 included:
    - Highway-Rail Grade Crossing Safety (September 2013)
    - Maintaining and Inspecting Railroad Track (September 2013)
    - Fundamentals of Railway Train Control and Signaling (November 2013)

C. Dissemination of Results

- i. Nothing to Report

D. Next Reporting Period

- i. Research Initiatives: In the upcoming reporting period, all current research initiatives are scheduled to be completed and will be presented at the 2014 MidContinent Transportation Research Symposium in August 2013 among others.
- ii. Education and Workforce Development:

- UW-Madison: Sponsoring of Railroad Engineering Short Courses; Milwaukee Regional Future City Competition in January
  - UAH: Summer Transportation Institute Program
  - MTU: Family Transportation Activity Night at Ocean Springs Elementary School
  - University of Memphis: Freight Transportation Leadership Academy in February
- iii. Technology Transfer:
- All partners: will be attending TRB's 93<sup>rd</sup> Annual Meeting in January.
  - UW-Madison: Mid-America Freight Coalition (C-hosted with NAFTAEXT) in Chicago in April.
  - University of Southern Mississippi: Logistics, Trade, and Transportation Symposium, February 2014.

## 2. Products

### A. Publications and conference papers:

#### Publications:

- I. Camp, J., M. Abkowitz, G. Hornberger, L. Benneyworth, J. Banks. Climate Change and Freight Transportation Infrastructure: Current Challenges for Adaptation. ASCE Journal of Infrastructure Systems. December, 2013.
- II. Cao, Mei, "Effects of Power Symmetry in Supply Chain Communication: An Empirical Examination", proceedings of 2013 International Conference on Logistics, Informatics and Services, Reading, UK, August 21-24, 2013
- III. Doherty, M., V.A. Wise, M.V. Hart, S.S. Ivey, and T.M. Adams. (2013). "Defining Livability for Freight Centric Communities: Identifying Priorities of Residents of the Lamar Avenue Corridor in Memphis, TN." In Proceedings, 2nd Conference on Green Streets, Highways, and Development. Austin, TX. ASCE Transportation & Development Institute. Pages 398-409
- IV. Homan, A., T.M. Adams and A. Marach. (2014). "A Statistical Analysis of the Role of Benefit-Cost Analysis in Awarding TIGER Grants." Public Works Management and Policy. 19(1):37-50.
- V. Mallum, Faisal (2013) Economic Viability and Environmental Benefit of the Next generation Inland Navigation Vessel on the Tennessee –Tombigbee Water Way. Prepared for the Rahall Transportation Institute. Center for Logistics, Trade, and Transportation at the University of Southern Mississippi: Hattiesburg, MS.
- VI. Mallum, Faisal (2013) "Oil and Gas Transportation Infrastructure" Southwest Mississippi Oil & Gas Industry Cluster Analysis Prepared for the Southwest Mississippi Partnership. Trent Lott National Center for Excellence in Economic Development and Entrepreneurship: Hattiesburg, MS.
- VII. Miao, Q., B.X. Wang and T.M. Adams. (2013). "Assessing the Value of Delay to Short-Haul Carriers." In Proceedings, International Congress on Logistics and Supply Chain (CiLOG). October 24-25 Sanfandila, Quertaro Mexico. <http://www.mexico-logistico.org/CiLOG/>
- VIII. Miller, Chad and Bethany Stich (2013). "Realizing the Economic Development Benefits of Short-line Railroads: The Case of Mississippi," Regional Science Policy & Practice 2 (2); doi: 10.1111/rsp3.12029
- IX. Monk, Tami and MD Sarder (2014) "Quantifying Factors Applicable to the Health Impact Assessment of Freight Centric Communities," Proceedings of the 2014 Logistics, Trade, and Transportation Symposium. Gulfport, MS. February, 26-27.
- X. Nakka, R., & Sarder, MD. (2013). Healthcare Service Improvement through Lean and Six Sigma Implementation, Proceeding of the Engineering Lean Six Sigma Conference (ELSS), Atlanta, Georgia.
- XI. Nakka, Rajitha, Tami Monk, and MD Sarder, (2014) "Understanding Supply Chain Dynamics of Pharmaceutical Industries," Proceedings of the 2014 Logistics, Trade, and Transportation Symposium. Gulfport, MS. February, 26-27.
- XII. Nay, J., M. Abkowitz, E. Chu, D. Gallagher and H. Wright, A Review of Decision-Support tools for Adaptation to Climate Change in the Context of Development, Climate and Development, in press.
- XIII. Puerto, S., A. Ghorbanpoor, T.M. Adams, S.M. Becker, and T. McDaniel. "Bridge Emergency Expert System." Computer Aided Civil and Infrastructure Engineering. Submitted.

- XIV. Rahman, M., Mallum, F., Sarder, MD., Miller, C., & Sulbaran, T. (2013). Transportation Mode Selection Tradeoffs between Green Transportation and Costs, Proceeding of the Annual Industrial & Systems Engineering Research Conference (ISERC), San Juan, Puerto Rico.
- XV. Sarder, MD., & Nakka, R. (2013). Implementing Lean in Energy Sector, Proceeding of the Engineering Lean Six Sigma Conference (ELSS), Atlanta, Georgia.
- XVI. Sarder, MD, Ziaul Adnan, and Chad Miller (2013). "Biomass Transportation Model for Intermodal Network," International Journal of Supply Chain Management 2(2).

Presentations:

- I. Bogdanov, Aleksei and Zamira Simkins "Economic and environmental impacts of the Gogebic Taconite mine" presented at the 2013 Wisconsin Economic Association Annual Meeting, November 8-9, 2013.
- II. Camp, J. Bridging the Gap Between Coursework and STEM Careers. STEM Think Tank and Conference, Harpeth Hall School for Girls, Nashville, TN, July 19, 2013.
- III. Camp, J. Utilizing Geospatial Technologies (GT) to Support K12 STEM Education. Invited presentation. Vanderbilt University's GIS Day Conference, Nashville, Tennessee, November 20, 2013.
- IV. Doherty, Meghan, Maria Hart, Teresa Adams, Virginia Wise, and Stephanie Ivey. Defining Livability for Freight-Centric Communities: Identifying Priorities of Residents of the Lamar Avenue Corridor in Memphis, TN. 2nd T&DI Green Streets, Highways and Development Conference. November 3-6, 2013.
- V. Hart, Maria. An Analytical Hierarchy Process (AHP) Approach to Quantifying Perceptions of Livability. 2013 Mid-Continent Transportation Research Symposium. August 15-16, 2013.
- VI. Holloway, Tracey. Freight From Space. American Geophysical Union. December 9-13, 2013.
- VII. Langsdon, L. and J. Camp. Use of Damage Assessment Models and "Real World" Data to Predict the "True Cost" of the May 2010 Flood in Nashville. Poster Session, ESRI International User Conference, San Diego, CA, July, 2013.
- VIII. Lindquist, P.S. 2013. "Freight Data Resources for the St. Lawrence / Great Lakes Region," Highway H2O Annual Meeting, Toronto, ON, November 13, 2013.
- IX. Marach, Alex. 2013, Benefit-Cost Analysis Preparation Guidelines for TIGER Grant Applications. 2013 Mid-Continent Transportation Research Symposium, August 15-16, 2013.
- X. Marach, Alex. Data: Sources, Limitations, and Opportunities. Indiana Logistics Summit. October 9, 2013.
- XI. Marach, Alex. MAFC Corridors from a Primary Freight Network Perspective Indiana DOT Freight and Multimodal Working Session. July 30, 2013.
- XII. Marach, Alex. Transportation Policy: Goals, Uncertainty, and Unintended Consequences. UW Transportation Management and Policy Colloquium. September 10, 2013.
- XIII. Perry, Ernest. From Policy to Practice: Implementing the Freight Initiatives in MAP-21 in the MAFC Region. MAASTO Annual Meeting. July 15-19, 2013.
- XIV. Perry, Ernest. MAFC Corridor Workshop: Defining the Region's Significant Freight Corridors and Connections. AASHTO/FHWA Freight Partnership Meeting. Washington DC. August 1-2, 2013.
- XV. Perry, Ernest. Freight Performance Measures and Freight Data: Freight Corridors and MAP-21 Freight Initiatives. AASHTO/FHWA Freight Partnership Meeting. August 1-2, 2013.
- XVI. Perry, Ernest. The Mid-America Freight Coalition Regional Freight Study: Leveraging MAP-21 Freight Initiatives. 2013 Mid-Continent Transportation Research Symposium. August 15-16, 2013
- XVII. Perry, Ernest. The Mid-America Freight Coalition Regional Freight Study: Leveraging MAP-21 Freight Initiatives. Ohio Conference on Freight. September 11-13, 2013.
- XVIII. Perry, Ernest. Freight Planning Components of MAP-21 in the MAFC Region: The MAFC Regional Freight Study. Wisconsin MPO/RPC Annual Planning Meeting. September 18-19, 2013.
- XIX. Perry, Ernest. The Mid-America Freight Coalition Regional Freight Study: Leveraging MAP-21 Freight Initiatives. Illinois Annual Statewide Planning Conference. September 25-27, 2013.
- XX. Perry, Ernest. The Primary Freight Network in the MAFC Region. Strategic Transportation Implementation Committee Session, MAASTO Executive Board. Webinar. November 22, 2013.
- XXI. Perry, Ernest. The Wisconsin Commercial Ports strategic Development Initiative. Association of Wisconsin Regional Planning Commissions Director's Meeting. December 11, 2013

- XXII. Perry, Ernest. Panel Summary of MAFC Best Practice Series: State Innovation to Advance MAP-21 Freight Initiatives. MAFC and Freight Partners Webinar. December 13, 2013.
- XXIII. Perry, E.B., TM. Adams, B. Zietlow and A. Marach. Moving Ahead with Freight: Integrating State and Regional Freight Development in a National Freight Planning Context. 2013 Mid-Continent Transportation Research Symposium. August 15-16, 2013.
- XXIV. Sanghyeon Ko, Behzad Karimi, Kazuya Kawamura and Kouros Mohammadian. Analysis of Imported Containerized Shipment Distribution to the Midwest Regions with Expected Capacity Expansion Projects. I-NUF, Long Beach, CA. October 8-10, 2013.
- XXV. Schaffer, Sarah. The IT Highway: Relating Public and Private Investments in Intelligent Transportation Systems to Supply Chain Performance and Livability. Global Supply Chain Conference, Dearborn, MI. September 2013.
- XXVI. Schafer, S.E. 2013. "Latest uses of GIS in Transportation Sector Research," Canadian Transportation Research Forum Semi-Annual Conference, Ottawa, ON, November, 20, 2013.
- XXVII. Titi, Hani. Transportation Infrastructure Health Monitoring. American Society for Nondestructive Testing, Las Vegas, NV. November 4-7, 2013.
- XXVIII. Zietlow, Ben. Talking Freight-Wisconsin Economic Future Study. July 24, 2013.
- XXIX. Zietlow, Ben. Notes from a Geoeconomist's Desk. Indiana Logistics Summit. October 9, 2013.

B. Websites (does not include the academic partner institution websites reported in the Fall 2012 PPR):

- i. UW CFIRE (<http://www.wistrans.org/cfire/>) will highlight transportation education programs for K-12 students, and transportation lessons, professional development, and resource materials for teachers.
- ii. A video was created by a teacher/media specialist attending the Maritime Transportation & Ship-Building Teacher Institute and is posted on YouTube for public viewing where it will raise awareness of maritime and transportation careers:  
<http://www.youtube.com/watch?v=XGGYcmzphdY&feature=youtu.be>
- iii. Beneficial Use Summit (RI-8): Includes a project summary, list of the steering committee members, draft Summit details and the current draft version of the Summit agenda  
<http://www.wistrans.org/cfire/events/dredging/>
- iv. CLTT "Special Studies and Applied Research" webpage is a repository for freight transportation research. <http://www.usm.edu/logistics-trade-transportation/special-studies-applied-research>
- v. "Certified in Transportation and Logistics Online Program", in collaboration with the American Society of Transportation and Logistics. [www.uwsuper.edu/ctl](http://www.uwsuper.edu/ctl) CFIRE provided matching support for the beta testing of two modules
- vi. 2013 Mid-America Freight Coalition Annual Meeting (<http://midamericafreight.org/events/2013am/>) contains an archive of the agenda, presentations, and other materials from this event. Disseminated via the CFIRE and MAFC blogs, as well as multiple social media channels (mass email, Twitter, Facebook, etc.).
- vii. Summit on the Beneficial Use of Dredged Materials (<http://www.wistrans.org/cfire/events/dredging/>) contains an archive of the agenda, presentations, and other materials from this event. Disseminated via the CFIRE blog, as well as multiple social media channels (mass email, Twitter, Facebook, etc.)
- viii. CFIRE Scholarships for EPD Rail Short Courses are listed on the CFIRE website (<http://www.wistrans.org/cfire/education/epd-rail/>). Applicants apply for these scholarships via a webform, when scholarships for upcoming courses are available. Notifications of availability are disseminated via the CFIRE blog, as well as multiple social media channels (mass email, Twitter, Facebook, etc.).
- ix. University of Memphis, TREC Website
  - [http://www.memphis.edu/herff/trec/trec\\_about.php](http://www.memphis.edu/herff/trec/trec_about.php)
- x. University of Memphis - IFTI hosted the 7th Annual Freight Intermodal Conference
  - [http://www.memphis.edu/ifti/events\\_pages/intermodal\\_conference.php](http://www.memphis.edu/ifti/events_pages/intermodal_conference.php)
- xi. RI-6 dynamic web page:

- <https://www.usm.edu/logistics-trade-transportation/ri-6-run-scenarios>
- xii. “Real-time Inland Marine Transportation Information.”  
<http://transp40.vuse.vanderbilt.edu/slapps/realtimeinlandinfo/>
- Username: aisuser; Password/Ingram
  - This site contains the AIS data from Paducah and Reserve, real-time weather data, lock performance data and means to query all data layers. Note that since Dr. Dobbins is leaving Vanderbilt, the data feed from Reserve and Paducah has been cut off.
- C. Newsletters:
- i. The USM CLTT produces a monthly e-newsletter for over 5000 subscribers
    - <http://www.usm.edu/logistics-trade-transportation/news-and-events>
- D. Technologies/Inventions/Other Products:
- i. UW-Milwaukee: Database of OSOW single permitted trucks in Wisconsin from 2007 to 2013 is available.
  - ii. University of Toledo: The MidWest FreightView DataViewer runs on a Citrix server on the GISAG lab at the University of Toledo. Interested parties can obtain a unique login to gain access. Another piece of software was developed – "PathWorld." During the PathWorld project, specialized methods were used to create efficient navigation software on very large network datasets. It is envisioned that this software will be commercialized for use by intermodal shippers once it is in its final phase.
  - iii. GTAC public opinion survey data, graphs, and analysis publicly disseminated through regional mass media, including The Capital Times, Duluth News Tribune, Ashland Daily Press, Wisconsin Public Radio, UWS website, etc.
  - iv. Richard Stewart moderated a panel on “Boosting Economic Growth: Addressing Risks to Ports, Trade, and Supply Chains,” June 6, 2013 for the Capitol Hill Ocean Week in Washington, DC.
3. Collaboration - The following progress has been made on CFIRE’s commitments to collaboration.
- A. UW-Madison Course IES/CEE 970 Colloquium in Transportation Management and Policy. Thematic area for Spring 2013 semester was Transportation and Economic Competitiveness. A partial list of the speakers included Dennis Leong of WisDOT, Kathy Heady of the Wisconsin Economic Development Corporation, Max Pietsch of Schneider National, Tom Rave of Gateway to Milwaukee, Ken Lucht of the Wisconsin and Southern Railroad, and Curt Heaslet of FedEx.
- B. Collaborating Organizations
- i. Ace Marine
  - ii. American Association of State Highway and Transportation Officials; DC; in-kind support
  - iii. American Society of Transportation and Logistics; Warrenton, VA; contributed to project
  - iv. American Transportation Research Institute; Atlanta, GA; in-kind support
  - v. Ashland Daily Press – in-kind support
  - vi. Bay Ship Building Company
  - vii. Bülent Ecevit University; Zonguldak, Turkey; collaborative research
  - viii. Burlington Northern Santa Fe; Fort Worth, TX; in-kind, facilities
  - ix. Canadian National Railway; Memphis, TN; financial, in-kind support, facilities
  - x. Center for Science & Environmental Outreach, Michigan Technological University; Houghton, MI; in-kind support, facilities, personnel exchange
  - xi. Center for Transportation Studies – University of Minnesota; personnel exchanges
  - xii. City of Chicago; Chicago, IL; in-kind support
  - xiii. Council of Supply Chain Management Professionals (Twin Cities and Northeast Wisconsin Roundtable) - in-kind support, presentations
  - xiv. Door County Maritime Museum
  - xv. Duluth Seaway Port Authority; personnel exchanges
  - xvi. Duluth Superior Transportation Association; Duluth, MN: in-kind

- xvii. Enbridge; Calgary, Alberta; in-kind support, facilities
- xviii. Experience Aviation, Inc.; Miami, FL; in-kind support
- xix. Federal Emergency Management Agency; Washington, DC; in-kind
- xx. Federal Highway Administration Kentucky Division Office; Frankfort, KY; partner
- xxi. FedEx, Curt Heaslet; Memphis, TN; colloquium speaker
- xxii. Fraser Shipyard; Superior, WI; in-kind, facilities
- xxiii. Great Lakes Commission, Ann Arbor, MI; in-kind support
- xxiv. Great Lake Fleet; Superior, WI; in-kind, facilities
- xxv. Great Lakes and Seaway Shipping Online, Inc.; Port Huron, MI; in-kind support
- xxvi. Great Lakes Maritime Research Institute; Superior, WI; collaborative research
- xxvii. Halvor Trucking; Superior, WI; in-kind, facilities
- xxviii. Illinois Department of Transportation; Springfield, IL; in-kind support
- xxix. Indiana Department of Transportation; Indianapolis, IN; conference partner
- xxx. Ingram Barge Company; Nashville, TN; financial, in-kind
- xxxi. Institute for Trade and Transportation Studies; New Orleans, LA; in-kind support
- xxxii. Institute for Transportation, Iowa State University; Ames, IA; Donation
- xxxiii. Intermodal Association of North America (IANA) – financial, in kind
- xxxiv. Intermodal Transportation Institute, University of Toledo; Toledo, OH; in-kind
- xxxv. International Maritime University of Panama; Panama City, Panama; collaborative research
- xxxvi. Kentuckiana Regional Planning and Development Agency; Louisville, KY; in-kind
- xxxvii. Kentucky Transportation Cabinet; Frankfort, KY; conference partner
- xxxviii. Lake Carriers Association, Rocky River, OH; in-kind support, collaborative research
- xxxix. Lake Superior Railroad Museum, Superior, WI; in-kind support, facilities
- xl. Livable Memphis
- xli. LogicNets, Inc.; Washington, DC; consulting services
- xl.ii. Marinette Marine
- xl.iii. Marquis Yachts
- xl.iiii. Marten Transport; Mondovi, WI; in-kind support, facilities
- xl.v. Mead & Hunt, Inc., Dawn Johnston; Madison, WI; colloquium speaker
- xl.vi. Memphis City Schools; Memphis, TN; facilities, research, personnel
- xl.vii. Menards; Eau Claire, WI; Facilities and research support
- xl.viii. Metro Nashville Government; Nashville, TN; in-kind
- xl.ix. Metropolitan Interstate Council; Superior, WI; in-kind, research support
- l. Metropolitan Nashville- Davidson County Government; Nashville, TN; In-kind
- li. Metropolitan Transportation Support Initiative at the Urban Transportation Center, University of Illinois – Chicago; Chicago, IL; in-kind support, personnel exchange
- lii. Michigan Department of Transportation; Lansing, MI; in-kind
- lii.iii. Michigan Tech Rail Program; Houghton, MI; personnel exchange
- li.v. Midwest Terminals; Maumee, OH; in-kind support
- li.v. Milwaukee Port Authority; Milwaukee, WI; in-kind support
- li.vi. Mississippi Department of Transportation; Jackson, MS; in-kind support
- li.vii. Missouri Department of Transportation; Jefferson City, MO; Conference partner
- li.viii. National Association of Purchasing Managers (Lake Superior Chapter) - in kind, facilities
- li.x. National Great Lakes Maritime Museum; Vermilion, OH; in-kind support
- li.x. National Oceanic and Atmospheric Administration (NOAA); Washington, DC; in-kind
- li.xi. Neel-Schaffer, Inc.; Jackson, MS; conference partner
- li.xii. Norfolk Southern Railroad
- li.xiii. North American Regional Climate change Assessment Program; Boulder, CO; in-kind
- li.xiv. North Carolina A&T State University; Greensboro, NC; memorandum of understanding
- li.xv. North Coast Training Center – facilities; in-kind support
- li.xvi. North Coast Marine Manufacturing Alliance
- li.xvii. North Shore Scenic Railway; Duluth, MN; in-kind, facilities



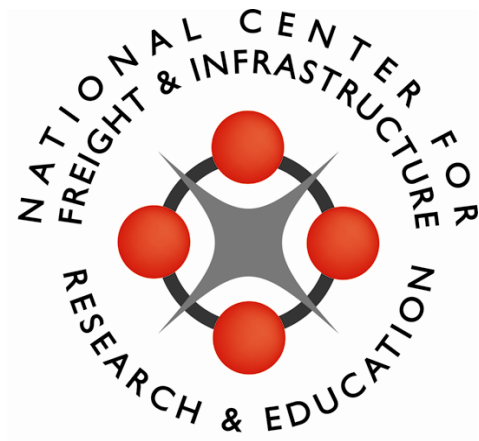
- lxviii. Northeast Wisconsin Technical College: in-kind support
- lxix. Office of Naval Research; Arlington, VA; in-kind support
- lxx. Port of Green Bay
- lxxi. Port of Toledo; Toledo, OH; in-kind support
- lxxii. Prime Focus, LLC
- lxxiii. Schneider National, Max Peitsch; Green Bay, WI; colloquium speaker
- lxxiv. Schools (8)/School Districts (7) in Wisconsin
- lxxv. St. Lawrence Seaway Development Corporation; Messena, NY; in-kind support
- lxxvi. Temple, Inc.; Decatur, AL; conference partner
- lxxvii. Tennessee Department of Transportation; Nashville, TN; financial support
- lxxviii. The Gateway to Wisconsin, Tom Rave; Milwaukee, WI; colloquium speaker
- lxxix. The Maritime Academy of Toledo; Toledo, OH; in-kind support
- lxxx. Twin Cities Transportation Club; Minneapolis, MN; in-kind support
- lxxxi. University of Southern Alabama; Mobile, AL; research support
- lxxxii. University of Minnesota – Duluth; Duluth, MN; personnel exchanges
- lxxxiii. US Army Corps of Engineers; St. Paul, MN; in-kind support
- lxxxiv. US Coast Guard; Cleveland OH; in-kind support
- lxxxv. US Commercial Service; Washington, DC; conference partner
- lxxxvi. US Environmental Protection Agency; Chicago, IL; in-kind support
- lxxxvii. US Maritime Administration; Chicago, IL; in-kind support
- lxxxviii. UW-Madison Sea Grant Institute; Superior, WI; in-kind support
- lxxxix. Wayne State University, Department of Civil and Environmental Engineering; Detroit, MI; in-kind support
  - xc. Wisconsin Economic Development Corporation, Kathy Heady; Madison, WI; speaker
  - xci. Wisconsin Department of National Resources; in-kind support
  - xcii. Wisconsin Department of Transportation; Madison, WI; financial support, in-kind
  - xciii. Wisconsin Maritime Museum
  - xciv. Wisconsin & Southern Railroad, Ken Lucht; Milwaukee, WI; colloquium speaker
  - xcv. Women’s Foundation for a Greater Memphis
  - xcvi. Wuzi University Beijing China - in kind, facilities

4. Impacts

- A. Nothing to Report

5. Changes/Problems

- A. Nothing to Report



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