

**CFIRE**

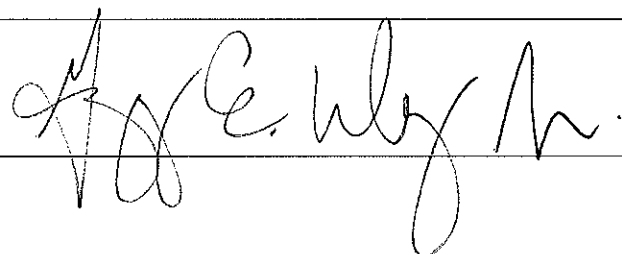
## **Program Progress Performance Report (PPPR): Jan. 1, 2013 to June 30, 2013**

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

**Principal Investigator:**

Teresa M. Adams, Ph.D.  
Directors, CFIRE  
Professor, Dept. of Civil & Environmental Engineering  
University of Wisconsin–Madison

Federal agency submitting to:	RITA, USDOT
Federal grant number:	DTRT12-G-UTC19
Program Director:	Teresa M. Adams, Ph.D. Executive Director, CFIRE Professor, CEE University of Wisconsin-Madison adams@engr.wisc.edu; 608-263-3175
Submitting official:	Greg Waidley Managing Director, CFIRE gwaidley@engr.wisc.edu; 608-262-2013
Submission date:	August 1, 2013
DUNS and EIN numbers:	DUNS: 161202122; EIN: 396006492
Recipient organization:	University of Wisconsin-Madison
Grant period:	January 1, 2012 to January 31, 2016
Reporting period end date:	June 30, 2013
Report term:	January 1, 2013 to June 30, 2013
Signature of submitting official:	



A handwritten signature in black ink, appearing to read 'Greg Waidley', is written over the signature line of the table. The signature is cursive and includes a period at the end.

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 January 1, 2013 to June 30, 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: September 30, 2013
  - Major activities:
    - Obtained and refined GIS data representing highway, rail and waterway networks
    - Identified attributes to include as routing criteria and impact measures
    - Continued collecting data to populate these attributes
    - Began development of web user interface
  - Major Objectives
    - Coordinate methodological development and software programming
  - Significant results:
    - A variety of sources provide relevant GIS data allowing for meaningful measures of efficiency, safety, security and environmental conditions to be represented
  - 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: December 31, 2013

- Major activities:
  - Survey/focus group instruments completed for residential stakeholders and draft instruments prepared for both industry and decision-maker group
- Major objectives:
  - After receiving IRB approval, begin collecting data from surveys and focus groups in order to identify differences and similarities in perceptions among stakeholders
- Significant results:
  - Established a table of metrics through the literature review
- Key outcomes:
  - Met with Livable Memphis, which has agreed to help facilitate community focus groups and survey events.
  - Several collaborative paper/presentation submissions have come out of the literature review
- **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: December 31, 2013

  - Major activities:
    - Acquired server for hosting expert system software and system files
    - Conducted training sessions on Expert System Software for research team
    - Compiled an information sheet for NDE methods
  - Major objectives:
    - Identified and assembled a team of experts on nondestructive methods in various transportation infrastructure areas to be responsible for the major areas of the pilot project demonstration
  - Significant results:
    - Installed the Expert Systems Software environment and provided training
    - Deployed the Knowledge Center used by team member to create a database of test methods and allowing for a wide range of operations in this implementation
  - Key outcomes:
    - Nothing to report.
- **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: December 31, 2013

  - Major activities:
    - Developed an SQL Server view in an ArcGIS SDE-compatible format and designed and developed a Silverlight web viewer to publish real-time AIS position data from receivers in Paducah, KY and Reserve, LA, that also incorporate weather and real-time lock performance data (USACE Corpslocks).
    - Made improvements in data transfer between Great Lakes and Seaway Shipping Online, Inc. (GLSS) antennas and the University of Toledo server including better transfer, storage and display.
  - Specific objectives:
    - Build a real-time spatial data viewer in GIS to display remote sensor data and weather and waterway information.
    - Explore the uses and capabilities of AIS for freight transportation and how to improve it.

- Significant results:
  - Matching AIS data to static USCG vessel data is only 40% accurate (due to matching on vessel name and call sign), but could be improved with manual data cleansing.
  - Identified errors in AIS data and gaps in coverage. Compensated for these when processing data stored in server.
  - Developed data reduction algorithms to be incorporated in continuous acquisition of GLSS AIS data.
  - St. Lawrence Seaway Development Corporation is using AIS to improve lock navigation allowing for deeper drafts.
  - Provides insight into the acquisition process for AIS data in wide areas such as the Great lakes that do not have complete antenna coverage.
- Key outcomes:
  - Implementation of normalized database design, development of real-time database view of AIS data, Silverlight GIS view and stops analysis.
  - Potential benefits for stop event detection, notifications of arrivals and departures, “re-playing” casualty events, examining pilot actions, and serving as a training tool.
- Changes:
  - Dr. Dobbins’ departure from Vanderbilt prevents the linking of SQL server databases between Vanderbilt University and the University of Toledo.
- **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: September 30, 2013
  - Major activities:
    - Collected and evaluated data on historic road closings
    - Evaluated the impacts of the May 2010 flood event in the Nashville, TN area using Hazus, local agency information, and surveys of effected households and businesses
    - Plotted severity of extreme precipitation events in the Southeast US using North American Regional Reanalysis (NARR) data and compared this data to local observations and the North American Regional Climate Change Assessment Program (NARCCAP)
    - Began development of a preliminary risk index that would link precipitation extremes 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 direct and indirect impacts of flooding on highway infrastructure
    - Define a risk index based on extreme weather threat and consequential impacts
  - 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
  - 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: December 31, 2013

- Major activities:
  - Literature review of the condition of the ports and the Panama Canal looking at factors affecting the decision process for containerized import cargo, including routes, cost, shipment frequency, port capacity, channel depth, customs clearance, and union disputes
  - Scenario analysis for capacity expansions on the Panama Canal and the Port of Prince Rupert using current container trade distribution within the United States
- Specific objectives:
  - Building an optimization model for current trade and the implications the two specific scenarios on national highway and rail networks
  - Preparing to begin an economic development feasibility analysis
- Significant results:
  - Major ports on the East/Gulf Coast are not yet prepared to handle large vessels that the Panama Canal expansion will accommodate, whereas West Coast ports are deep enough and already transship large amounts of trade goods to the Midwest
  - Once port enhancements on the Gulf Coast and the Panama Canal expansion are complete, container volume is modeled to shift from the West Coast to the Gulf
  - Expansion at the Port of Prince Rupert is not expected to significantly affect volume at U.S. ports.
- 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: October 31, 2013

  - Major activities:
    - Continued the extensive literature review using government, private sector and research documents to compare the variety of differing policies on the establishment of railway authorities, tax credits for scrapping and other laws that impact railroads within the CFIRE region and beyond
  - Specific objectives:
    - Developed data collection instruments
    - Scheduling interviews with short lines, costumers and state DOTs
  - Significant results:
    - Put in place a subcontract for using discounted REMI software for analysis
    - Traffic density, railroad size, commodity diversity and managements performance can either be beneficial or detrimental to a short line
    - Public subsidies may be reduced or even eliminated by working with organizations to building on strengths and improve weaknesses
    - Rail abandonment may have many indirect costs that are not immediately apparent and need to be considered when assessing the value of a short line
  - Key outcomes:
    - Nothing to report.
- **RI-8: Beneficial Reuse of Dredging Materials Summit**

USDOT Priorities: State of Good Repair  
Performing Institutions: University of Wisconsin-Madison, Milwaukee, and Superior.  
Start Date: August 1, 2012      End Date: April 30, 2013

  - Major activities:

- Held the “Summit on the Beneficial Use of Dredged Materials” to provide outreach and education to state DOTs not familiar with sustainable use of dredged materials
    - Prepared a draft report identifying the applications for beneficial use of DM in the transportation sector and relevant material characteristics and test methods
  - Specific objectives:
    - Explore the possibility of using dredged materials to produce geo-polymer materials in addition to Portland Cement Concretes
    - Perform chemical analysis of samples from the Milwaukee confined disposal facility to identify material properties, especially heavy metal content
  - Significant results:
    - Future research and outreach opportunities have been identified at the Summit and are being initiated, specifically in regards to geo-polymer materials
  - Key outcomes:
    - 8 Great lakes State DOT engineers as well as 12 other mid-western State DOT programs were introduced to the concept and availability of clean dredged material
  - Changes:
    - Data is being collected directly from Milwaukee CDF rather than using other channels and online sources. In order to accommodate a project extension is requested until December 30, 2013.
    - For the Survey on Use of Dredged materials, the feasibility of developing a complete new approach to beneficial utilization will be explored. This direction has greater potential and will not result in any cost or time overruns.
- 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:
      - Under certain circumstances delivery consolidation would reduce cost, energy consumption and PM2.5 emissions.
      - Street design can reduce the number of truck parking citations in Chicago even in areas with heavy truck activity.
    - 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
    - Specific objectives:
      - Develop more detailed logistics choices at the disaggregate level of individual decision makers and implement them in the FAME framework
    - Significant results:

- Literature review shows that mode and shipment size choice are strongly related and should be modeled together
      - 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 and prepared for analysis
    - Specific objectives:
      - To support government and industry activities around OSOW truck routing
    - Significant results:
      - Developed algorithm to identify the most used OSOW routes in Wisconsin
    - Key outcomes:
      - Nothing to report.
  - Economic Determinants of Urban Area Truck Volumes
 

Performing Institutions: University of Alabama - Huntsville

    - Major activities:
      - Research economic factors that influence freight truck activity to a community
    - Specific objectives:
      - Relate truck volumes to employment using NAICS codes.
    - Significant results:
      - Developed equations by commodity that can be used to predict truck volumes for an urban area, using only employment numbers by employment type.
    - Key outcomes:
      - Nothing to report
- iii. Education and Workforce Development- The following progress has been made on CFIRE’s commitments to education and workforce initiatives.
  - Michigan Technological University:
    - Held 3 workshops in March, April, and May for Urban Detroit Teachers which summarized different aspects of the transportation system and for which teachers received one graduate credit while sharing lesson plans and other materials
    - Following the Transportation Education Teacher Workshop Series, Detroit Public Schools has plans to purchase 35 maritime transportation chests and are offering a 3-day workshop using the maritime chest in summer 2013
    - Secured sponsorship from the Wisconsin Department of Transportation and the Milwaukee Port Authority to hold a Transportation Teacher Institute and another Transportation Workshop Series in summer 2014
    - Held a Family Transportation Night for K-6 students and hope to improve on the event in the future
  - University of Alabama – Huntsville
    - Worked to increase the number of DBE-qualified firms in Alabama and provided technical knowledge to increase the firms’ success in bidding on projects.
  - University of Memphis:
    - Hosted a Student Symposium bringing together 40 students from 14 universities to present research, connect with industry experts, network with peers, tour freight facilities and attend mock interviews. This will be an annual CFIRE event.
    - Began working to integrate researches across campuses who have a common interest in freight transportation.



- Hosted the Freight Workforce Summit to bring together private industry, the public sector and academic institutions to discuss growing workforce challenges and opportunities.
  - Hosted Technical Tours for the 2013 CUTC Summer Meeting to allow researchers a better opportunity to understand the operations of the nation's largest freight airport.
  - University of Southern Mississippi:
    - Hosted an information session at Camp Shelby Joint Forces Training Center April 18 to highlight training opportunities at the Center for Logistics, Trade and Transportation
    - Hosted the Industry Advisory Council Summit to promote common goals in logistics, trade and transportation on March 1
    - With the Gulf Region Intelligent Transportation Society, hosted the Spring 2013 Regional Workshop focusing on weight-in-motion technology and interagency coordination
    - Arranged a tour of the Port of Gulfport for the leadership of Camp Shelby
    - The American Society of Transportation and Logistics approved the Master of Science in Logistics, Trade and Transportation as a Certified in Transportation and Logistics (CTL) academic program
  - University of Toledo:
    - Hosted the Toledo Maritime Academy First K-12 Maritime Education Symposium for Industry Leaders and Education Professionals
    - Hosted the Great Lakes Maritime Transportation Teacher Workshop
  - University of Wisconsin – Madison:
    - Hosted the Mid-America Freight Coalition Annual Meeting in Louisville, KY.
    - CFIRE Scholarships for Engineering Professional Development Rail Short Courses
    - UW Transportation Management and Policy Program (Spring Colloquium and Practicum)
    - Sponsored "Best Freight Transportation Network" award for 2013 Future City Wisconsin Regional Competition
    - Hosted the Summit on Beneficial Use of Dredged Materials alongside the 2013 Mid-America freight Coalition Annual Meeting in Louisville, KY
  - University of Wisconsin – Milwaukee:
    - Provided graduate and undergraduate students education and training through freight short courses and symposia
  - University of Wisconsin – Superior:
    - Further development of "Certified in Transportation and Logistics Online Program" in collaboration with the American Society of Transportation and Logistics
    - Students engaged in an intermodal/supply chain research project with industry culminating in a report and presentation at a CFIRE symposium held February 5-6
    - Students attended Twin Cities Transportation Expo
    - Twenty students attended the Council of Supply Chain Management Seminar, March 8
    - Forty students toured Menard's Distribution Center and Martin Transport
    - In March, Dr. Mei Cao and Dr. Amit Mokashi Attended a course on Railroad Engineering and Operations in Chicago
  - Vanderbilt University
    - Held a GIS training workshop as part of a STEM program for high school teachers
  - All CFIRE partner institutions sent students to TRB Annual Meeting
- iv. Technology Transfer - The following progress has been made on CFIRE's commitments to T2:
- The Summit on the Beneficial Use of Dredge Materials provided an opportunity for researchers and industry to share new methods on the use of dredge materials and disseminate information on new technology using these advancements.
  - 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.

#### C. Dissemination of Results

- i. Hosted the Summit on the Beneficial Use of Dredge Materials – Louisville, KY, March 14-15, in conjunction with the Mid America Freight Coalition Annual Meeting. Summit summary and booklet based on results of RI-8 mailed to 27 Great Lakes State DOT chief material/construction engineers and 127 ports and harbors.

#### D. Next Reporting Period

- i. Research Initiatives: In the upcoming reporting period, all current research initiatives are scheduled to be completed.
- ii. Education and Workforce Development: Sponsoring of Railroad Engineering Courses and Camp Badger at UW-Madison; GEE and TREC and Univ. of Memphis; Lac Courte Oreilles Tribal Summer Transportation Institute with UW-Superior; UAH Summer Transportation Institute Program; Great Lakes Transportation Teacher Institute with MTU
- iii. Technology Transfer: Mid-Continent Transportation Research Forum in Ames, IA; Ohio Conference on Freight; Intermodal Freight Conference at Univ. of Memphis; participation in AASHTO/FHWA Freight Partnership

### 2. Products

#### A. Publications and conference papers:

- i. "The Beneficial Use of Dredged Material in the Great Lakes" by Gene Clark and Dave Knight, published by the Great Lakes Commission, 2013.
- ii. "Wisconsin and Minnesota State Dredge Permitting Processes: A Twin Ports Perspective" by Dr. Richard Stewart and Dr. Amit Mokashi, presented at the Summit on the Beneficial Use of Dredged Materials, Louisville, KY, March 13-15, 2013.
- iii. "Measuring a Port's Performance Using the Real Economic Value of Commodities", presented at TRB annual meeting, Zamira Simkins and R. Stewart, Funded by UW-Superior, GLMRI and CFIRE.
- iv. "Marine Highway Stakeholders and Their Relations", co-authored by Dr. Amit Mokashi with Dr. James J. Corbett presented at TRB annual meeting.
- v. "Supply Chain Sustainability Drivers, Practices and Outcomes", Dr. Mei Cao presented at the Production and Operations Management Society Annual Conference, May 3-6, 2013. Denver, CO.
- vi. "Transportation and Logistics in a Global Market" Presented by Richard D. Stewart to Duluth MN Chamber of Commerce Leadership Duluth Class April 10, 2012
- vii. "Export Container Availability in the Upper Midwest", Presented at the Access the Western Hemisphere Conference, Minneapolis, MN, April 2, 2013
- viii. Sarder, MD, Ziaul Adnan, and Chad Miller (2013). "Biomass Transportation Model for Intermodal Network," International Journal of Supply Chain Management 2(2).
- ix. Miller, Chad (2013). "The Use of Economic Modeling in Disaster Management of Transportation Disruptions," American Society of Public Administration (ASPA) Conference. March 7, New Orleans, LA.
- x. Miller, Chad (2013) "Job Creation Factors for Near Dock & Intermodal Facilities/Warehouse Job Creation." 2013 Intermodal Conference Multi-Modal Transport: Cornerstone of the Global Economy, Gulfport, MS. April 25.
- xi. Sarder, MD, "Bridging the Gap in Transition of Students from Community Colleges to Universities", Proceeding of the American Society of Engineering Education Conference (ASEE), Georgia, Atlanta, 2013.

- xii. Sarder, MD, "Designing STEM Curriculum for K12 Students", Proceeding of the American Society of Engineering Education Conference (ASEE), Georgia, Atlanta, 2013.
- xiii. Sarder, MD and Gazi Iqbal, "Healthcare Service Modeling to Minimize Disruptions due to Natural Disasters", Proceeding of the Annual Industrial & Systems Engineering Research Conference (ISERC), San Juan, Puerto Rico, 2013.
- xiv. Rahman, Mohammad, Faisal Mallum, MD Sarder, Chad Miller, and Tulio Sulbaran, "Transportation Mode Selection Tradeoffs between Green Transportation and Costs", Proceeding of the Annual Industrial & Systems Engineering Research Conference (ISERC), San Juan, Puerto Rico, 2013.
- xv. Sarder, MD, "Basics Concepts of Logistics Transportation", Handbook of Industrial and Systems Engineering, 2nd edition, CRC Press, New York, 2013 (ISBN 978 146651504 8).
- xvi. Kawamura, K. "Impacts of Compact Development on Freight Activities in U.S. Cities". In C. Wolmer (Ed.) Urban Freight for Livable Cities. Volvo Research and Educational Foundation. Gothenburg, Sweden. April 2013
- xvii. Surat, H., Kawamura, K., Sriraj, P.S., and Menninger, M. "Analyzing Freight Delivery Activities in the City of Chicago: Effects of Built Environment Features on Truck Parking" submitted for publication in ArcUser
- xviii. Li, Q., Y. Nie, S. Vallamsundar, J. Lin, and T. Homem-de-Mello (under re-review) Finding efficient and environmentally friendly paths for risk-averse freight carriers, submitted to Networks and Spatial Economics
- xix. Lin, J. Q. Chen, K. Kawamura (under re-review) Economic and Environmental Analyses of Urban Delivery Consolidation Strategies, submitted to Networks and Spatial Economics
- xx. Pourabdollahi, Z., Karimi, B., and Mohammadian, A. A Joint Model of Freight Mode and Shipment Size Choice , Transportation Research Records: Journal of the Transportation Research Board, Washington D.C., forthcoming
- xxi. Lin, J. Q. Chen, K. Kawamura. "Urban Consolidation Centers and their environmental impacts. Workshop on Urban Freight Transport: A Global Perspective". Indian Institute of Technology – Madras. Chennai, India. June 24, 2013
- xxii. Pourabdollahi, Z., Mohammadian, K., Samimi, A., and Kawamura K. "Behavioral Microsimulation in Freight: The FAME model Workshop on Urban Freight Transport: A Global Perspective". Indian Institute of Technology – Madras. Chennai, India. June 25, 2013
- xxiii. Pourabdollahi, Z., Mohammadian, K., Samimi, A., and Kawamura K. "A Behavioral Freight Transportation Modeling System". International Seminar of Committee of Infrastructure Planning and Management, Japanese Society of Civil Engineers. Kyoto University, June 27, 2013
- xxiv. Pourabdollahi, Z., Mohammadian, K. and Kawamura K., A Hierarchical Database Model of Shipping Chain Choice for Freight Transportation, Student Freight Symposium, The University of Memphis Intermodal Freight Transportation Institute, 4-6, February 2013.
- xxv. Pourabdollahi, Z., Karimi, B., Mohammadian, K. and Kawamura K., An Optimization Model of Warehouse Location and Retailer Allocation, Student Freight Symposium, The University of Memphis Intermodal Freight Transportation Institute, 4-6, February 2013.
- xxvi. Pourabdollahi, Z., Karimi, B., and Mohammadian, A. A Joint Model of Freight Mode and Shipment Size Choice : 92th Annual Transportation Research Board Meeting, Washington D.C. 12-18, January, 2013.
- xxvii. Pourabdollahi, Z., Javanmardi, M., Karimi, B., Mohammadian, A., and Kawamura, K. 2013. Mode and Shipment Size Choice Models in the FAME Simulation Framework: 92th Annual Transportation Research Board Meeting, Washington D.C. 12-18, January, 2013.
- xxviii. Sturm, K., Pourabdollahi, Z., Mohammadian, A., and Kawamura, K. Freight Vehicle Activities of a Major Grocery Chain in the Chicago Region: Analysis of GPS Data Collected and Drivers Diary Log: 92th Annual Transportation Research Board Meeting, Washington D.C. 12-18, January, 2013
- xxix. Kawamura, K., Sriraj, P.S. Surat, H., and Menninger, M., "Analysis of Built Environment Features and Their Effects on Freight Activities". 8th International Meeting of the Institute of City Logistics, Bali, Indonesia, June 17, 2013

- xxx. Li, Q., Y. Nie, S. Vallamsundar, J. Lin, and T. Homem-de-Mello (2013) Incorporating Environmental Measures into a Reliable Freight Routing Model, the 2013 Transportation Research Board Annual Meeting, Washington D.C., January, 2013, paper #13-4185
- xxxi. Lin, J., W. Zhou (2013) Urban Commercial Vehicle Trip-Chaining: Regional Comparison between Texas and Idaho, the 2013 Transportation Research Board Annual Meeting, Washington D.C., January, 2013, paper #13-3121
- xxxii. Li, Q., Y. Nie, J. Lin, and T. Homem-de-Mello (2013) Finding reliable and sustainable routes: an approach using risk constraints, TRISTAN 8 – Eighth Triennial Symposium on Transportation Analysis, San Pedro de Atacama, Chile, June 9 – 14, 2013
- xxxiii. Adams, T.M., A. Marach, and D. Kleinmaier. "Benefits and Costs of LCV Routes." Transportation Research: Part A Policy and Practice. Submitted.
- xxxiv. Hart, M., T.M. Adams and A. Schwartz. (2013). "Shifting Sands: Emerging Transportation Impacts of Frac Sand Mining and Shale Gas Drilling." #13-5245. TRB Annual Meeting. Washington DC. January 2013.
- xxxv. Homan, A., T.M. Adams and A. Marach. (2013). "A Statistical Analysis of Federal Discretionary Surface Transportation Funding: Awardees vis-à-vis Non-Awardees." Public Works Management and Policy. Forthcoming.
- xxxvi. Juni, E. and T.M. Adams. "Use of Comparative Efficiency analysis to Optimize Transportation Infrastructure Maintenance Strategies." #13-3732. 2013 TRB Annual Meeting and TRR. Submitted Aug. 2012.
- xxxvii. Puerto, S., A. Ghorbanpoor, T.M. Adams, S.M. Becker, and T. McDaniel. "Bridge Emergency Expert System." Computer Aided Civil and Infrastructure Engineering. Submitted.
- xxxviii. Adams, Teresa. "History of the Council of University Transportation Centers." RITA 25th Anniversary Celebration. 2013 TRB Annual Meeting, January 13-17, 2013.
- xxxix. Adams, Teresa. "Importance of Interdisciplinary Education for developing Freight transportation leaders." Student Freight Symposium & Freight Workforce Symposium (joint session). February 5, 2013.
- xl. Adams, Teresa. "NAFTANEXT: Demands of New Energy Sources on the North American Freight Network." Annual Meeting of the Coalition for America's Gateways & Trade Corridors. April 9, 2013.
- xli. Adams, Teresa. "Workforce Development" (moderated). 2013 TRB Annual Meeting, January 13-17, 2013.
- xlii. Doherty, Meghan. "Making Freight-Centric Communities More Livable: A Review of Metrics and Strategies for Application." Student Freight Symposium, Memphis, Tennessee, February 5-6, 2013.
- xliii. Hart, Maria and John Czaplewski. "Just-in-Time Spatial: Lightweight Acquisition, Storage, & Presentation of Dynamic Data." FOSS4G North America, May 22-24, 2013.
- xliv. Hart, Maria. Shifting Sands: Emerging Transportation Impacts of Frac Sand Mining and Shale Gas Drilling." 2013 TRB Annual Meeting, January 13-17, 2013.
- xlv. Perry, Ernie. "Freight Initiatives in MAP-21." Northwest Passage Working Group, January 29, 2013.
- xlvi. Perry, Ernie. "Importance of Freight Corridors and MAP-21 to Food Distribution." Networking Across the Supply Chain: Transportation Innovations in Local and Regional Food Systems, February 20-21, 2013.
- xlvii. Perry, Ernie. "MAFC Partnership Session: Research and Regional Needs." Mid-America Freight Coalition Annual Meeting, March 11-14, 2013.
- xlviii. Perry, Ernie. "MAP-21 and Freight Corridors: Aligning Transportation and the Economy for the Next Generation." Oshkosh Chamber of Commerce Transportation Committee, February 6, 2013.
- xliv. Perry, Ernie. "Paths to Prosperity: Why Freight Corridors." Mid-America Freight Coalition Annual Meeting, March 11-14, 2013.
- I. Perry, Ernie. "MAFC Update and MAP-21 Freight Provisions Status Report: Developing a State Agenda to Leverage Map-21." MAASTO STIC Committee Meeting, April 26, 2013.

- li. Perry, Ernie. "Regional Perspectives on Freight: A Multimodal Economic Network." The Canada-United States Transportation Borders Working Group, April 22-25, 2013.
  - lii. Rungjang, Kanisa. "Public investment model for developing port infrastructure." Student Freight Symposium, Memphis, Tennessee, February 5-6, 2013.
  - liiii. Zietlow, Ben. "The Economy in Motion: An Economic Competitiveness Perspective." Oshkosh Chamber of Commerce Transportation Committee, February 6, 2013.
  - liv. Zietlow, Ben. "Wisconsin Wood Pellets Transportation." Wisconsin Wood Pellets Meeting, Rhinelander, Wisconsin, April 18, 2013.
  - lv. Horowitz, Alan J.; Hussein, Mazen; Mei, Qinfen. 2013. "Establishing Values of Time for Freight Trucks to Better Understand the Impact of Toll Policies."
  - lvi. Chang, Gang-Len; Franz, Mark L; Liu, Yue; Lu, Yang (Carl); Tao, Ruihua. 2013. "Intelligent Transportation System Application: Design and Evaluation of Intelligent Dilemma-Zone Protection System for High-Speed Rural Intersections." Transportation Research Board 92nd Annual Meeting.
  - lvii. Effinger, Justin; Horowitz, Alan J.; Liu, Yue; Shaw, John. 2013. "Bluetooth Vehicle Reidentification for Analysis of Work Zone Diversion." Transportation Research Board 92nd Annual Meeting.
  - lviii. Ma, Wanjing; Xie, Hanzhou; Liu, Yue; Head, Larry; Luo, Zhenke. 2013. "Coordinated Optimization of Signal Timings for Intersection Approach with Pre-signals." Transportation Research Board 92nd Annual Meeting.
  - lix. Mao, Jing; Liu, Yue; Yu, Jie. 2013. "Dynamic Lane-Based Signal Merge Control Model for Freeway Work Zone Operations." Transportation Research Board 92nd Annual Meeting.
  - lx. Liu, Yue; Luo, Zhenke; Yu, Jie; Mao, Jing. 2013. "Optimal Planning of Signal Control and Uninterrupted Flow Strategies in a Dynamic Evacuation Network." Transportation Research Board 92nd Annual Meeting.
  - lxi. Ma, Wanjing; Liu, Yue; Head, Larry. 2013. "Optimization of Pedestrian Phase Patterns at Signalized Intersections: A Multiobjective Approach." Transportation Research Board 92nd Annual Meeting.
  - lxii. Liu, Y.\*; Yu, J., Mao, J., Wehner, K., Ma, W., "A Generalized Corridor Diversion Control Model for Freeway Incident Management," Computer-aided Civil and Infrastructure Engineering, accepted.
  - lxiii. Ma, W., Xie, H., Liu, Y., Head, L., Luo, Z., "Coordinated Optimization of Signal Timings for Intersection Approach with Pre-signals," Transportation Research Record, accepted.
  - lxiv. Chang, G., Franz, M., Liu, Y., Lu, Y., "Intelligent Transportation System Application: Design and Evaluation of Intelligent Dilemma-Zone Protection System for High-Speed Rural Intersection," Transportation Research Record, accepted.
  - lxv. Long, K., Liu, Y.\*, Han, D.L., "Impact of Countdown Timer on Driving Maneuvers during Yellow Phase at Signalized Intersection: An Empirical Study in Changsha, China," Safety Science, 50, pp. 8-16.
  - lxvi. Eloff, J.J., O.A. Smirnov, and P.S. Lindquist. 2013. Transportation Infrastructure, Industrial Productivity and Return on Investment: A Spatial Spillover Approach. Transportation Research Board 92nd Annual Meeting, 2013.
  - lxvii. Schafer, S.E., and P.S. Lindquist. 2013. A Decision Support System for Smart Growth Innovation in the Urban Midwest: A GIS Connection between Brownfield Site Redevelopment and Transportation. Transportation Research Board 92nd Annual Meeting, 2013.
  - lxviii. Wang, Q., J.J. Eloff, and P.S. Lindquist. 2012. "PathWorld"-A new software approach to vehicle routing on large Networks. Transportation Research Board 92nd Annual Meeting, 2013.
- B. Presentations – research was presented by CFIRE partners at the following conferences:
- i. Summit on the Beneficial Use of Dredged Materials, Louisville, KY, March 13-15
  - ii. World Conference on Disaster Management, Toronto, Canada, June 23-26
  - iii. International Conference on Community-based Adaptation, Dhaka, Bangladesh, April 18-25
  - iv. Annual Meeting of the Transportation Research Board, Washington, DC, January 13-17
  - v. North East Roundtable Council of Supply Chain Management Professionals, Green Bay, WI, April 2

- vi. Freight Rail Economic Development Peer Review Conference, Minnesota Department of Transportation and the Minnesota Department of Employment and Economic Development, Minneapolis, MN, April 15-17
  - vii. Access the Western Hemisphere Conference hosted by the Minnesota District Export Council, Minneapolis, MN, April 2
  - viii. Workshop on Urban Freight Transport, Indian Institute of Technology – Madras, Chennai, India, June 24-25
  - ix. 8<sup>th</sup> International Meeting of the Institute of City Logistics, Bali, Indonesia, June
- C. Websites (does not include the academic partner institution websites reported in the last PPPR):
- 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. 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/>
  - iii. 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>
  - iv. “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
  - v. 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.).
  - vi. 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.)
  - vii. 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.).
  - viii. “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.
- D. Newsletters:
- i. The USM CLTT produces a monthly e-newsletter for over 5000 subscribers
    - <http://www.usm.edu/logistics-trade-transportation/news-and-events>
- E. Technologies/Inventions/Other Products:
- i. Database of OSOW single permitted trucks in Wisconsin from 2007 to 2013 is available at UWM
  - ii. 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
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. American Association of State Highway and Transportation Officials; DC; in-kind support
- ii. American Society of Transportation and Logistics; Warrenton, VA; contributed to project
- iii. Bülent Ecevit University; Zonguldak, Turkey; collaborative research
- iv. Burlington Northern Santa Fe; Fort Worth, TX; in-kind, facilities
- v. Canadian National Railway; Memphis, TN; financial, in-kind support, facilities
- vi. Center for Science & Environmental Outreach, Michigan Technological University; Houghton, MI; in-kind support, facilities, personnel exchange
- vii. Center for Transportation Studies – University of Minnesota; personnel exchanges
- viii. City of Chicago; Chicago, IL; in-kind support
- ix. Duluth Seaway Port Authority; personnel exchanges
- x. Duluth Superior Transportation Association; Duluth, MN; in-kind
- xi. Enbridge; Calgary, Alberta; in-kind support, facilities
- xii. Experience Aviation, Inc.; Miami, FL; in-kind support
- xiii. Federal Emergency Management Agency; Washington, DC; in-kind
- xiv. Federal Highway Administration Kentucky Division Office; Frankfort, KY; partner
- xv. FedEx, Curt Heaslet; Memphis, TN; colloquium speaker
- xvi. Fraser Shipyard; Superior, WI; in-kind, facilities
- xvii. Great Lakes Commission, Ann Arbor, MI; in-kind support
- xviii. Great Lake Fleet; Superior, WI; in-kind, facilities
- xix. Great Lakes and Seaway Shipping Online, Inc.; Port Huron, MI; in-kind support
- xx. Great Lakes Maritime Research Institute; Superior, WI; collaborative research
- xxi. Halvor Trucking; Superior, WI; in-kind, facilities
- xxii. Illinois Department of Transportation; Springfield, IL; in-kind support
- xxiii. Indiana Department of Transportation; Indianapolis, IN; conference partner
- xxiv. Ingram Barge Company; Nashville, TN; financial, in-kind
- xxv. Institute for Trade and Transportation Studies; New Orleans, LA; in-kind support
- xxvi. Intermodal Association of North America (IANA) – financial, in kind
- xxvii. Intermodal Transportation Institute, University of Toledo; Toledo, OH; in-kind
- xxviii. Kentuckiana Regional Planning and Development Agency; Louseville, KY; in-kind
- xxix. Kentucky Transportation Cabinet; Frankfort, KY; conference partner
- xxx. Lake Carriers Association, Rocky River, OH; in-kind support, collaborative research
- xxxi. Lake Superior Railroad Museum, Superior, WI; in-kind support, facilities
- xxxii. LogicNets, Inc.; Washington, DC; consulting services
- xxxiii. Marten Transport; Mondovi, WI; in-kind support, facilities
- xxxiv. Mead & Hunt, Inc., Dawn Johnston; Madison, WI; colloquium speaker
- xxxv. Memphis City Schools; Memphis, TN; facilities, research, personnel
- xxxvi. Menards; Eau Claire, WI; Facilities and research support
- xxxvii. Metro Nashville Government; Nashville, TN; in-kind
- xxxviii. Metropolitan Interstate Council; Superior, WI; in-kind, research support
- xxxix. Metropolitan Nashville- Davidson County Government; Nashville, TN; In-kind
- xl. Metropolitan Transportation Support Initiative at the Urban Transportation Center, Univerity of Illinois – Chicago; Chicago, IL; in-kind support, personnel exchange
- xli. Michigan Department of Transportation; Lansing, MI; in-kind
- xlii. Michigan Tech Rail Program; Houghton, MI; personnel exchange
- xliii. Midwest Terminals; Maumee, OH; in-kind support
- xliv. Milwaukee Port Authority; Milwaukee, WI; in-kind support
- xlv. Mississippi Department of Transportation; Jackson, MS; in-kind support
- xlvi. Missouri Department of Transportation; Jefferson City, MO; Conference partner
- xlvii. National Association of Purchasing Managers (Lake Superior Chapter) - in kind, facilities

- xlvi. National Great Lakes Maritime Museum; Vermilion, OH; in-kind support
- xlvi. National Oceanic and Atmospheric Administration (NOAA); Washington, DC; in-kind support
  - l. Neel-Schaffer, Inc.; Jackson, MS; conference partner
  - li. North American Regional Climate change Assessment Program; Boulder, CO; in-kind
  - lii. North Carolina A&T State University; Greensboro, NC; memorandum of understanding
  - liii. Office of Naval Research; Arlington, VA; in-kind support
  - liv. Port of Toledo; Toledo, OH; in-kind support
  - lv. Schneider National, Max Peitsch; Green Bay, WI; colloquium speaker
  - lvi. St. Lawrence Seaway Development Corporation; Messena, NY; in-kind support
  - lvii. Temple, Inc.; Decatur, AL; conference partner
  - lviii. Tennessee Department of Transportation; Nashville, TN; financial support
  - lix. The Gateway to Wisconsin, Tom Rave; Milwaukee, WI; colloquium speaker
  - lx. The Maritime Academy of Toledo; Toledo, OH; in-kind support
  - lxi. Twin Cities Transportation Club; Minneapolis, MN; in-kind support
  - lxii. University of Southern Alabama; Mobile, AL; research support
  - lxiii. University of Minnesota – Duluth; Duluth, MN; personnel exchanges
  - lxiv. US Army Corps of Engineers; St. Paul, MN; in-kind support
  - lxv. US Coast Guard; Cleveland OH; in-kind support
  - lxvi. US Commercial Service; Washington, DC; conference partner
  - lxvii. US Environmental Protection Agency; Chicago, IL; in-kind support
  - lxviii. US Maritime Administration; Chicago, IL; in-kind support
  - lxix. UW-Madison Sea Grant Institute; Superior, WI; in-kind support
  - lxx. Wayne State University, Department of Civil and Environmental Engineering; Detroit, MI; in-kind support
  - lxxi. Wisconsin Economic Development Corporation, Kathy Heady; Madison, WI; speaker
  - lxxii. Wisconsin Department of National Resources; in-kind support
  - lxxiii. Wisconsin Department of Transportation; Madison, WI; financial support, in-kind
  - lxxiv. Wisconsin & Southern Railroad, Ken Lucht; Milwaukee, WI; colloquium speaker
  - lxxv. North Shore Scenic Railway; Duluth, MN; in-kind, facilities
  - lxxvi. Wuzi University Beijing China - in kind, facilities
  - lxxvii. International Maritime University of Panama; Panama City, Panama; collaborative research
  - lxxviii. Institute for Transportation, Iowa State University; Ames, IA; Donation
  - lxxix. American Transportation Research Institute; Atlanta, GA; in-kind support

4. Impacts

- A. Nothing to Report

5. Changes/Problems

- A. Dr. Jimmy Dobbins, one of the primary researchers at Vanderbilt University, is in the process of leaving Vanderbilt for another career opportunity. Dr. Dobbins has had key roles in research initiatives RI-1 and RI-4. Actions are being taken to ensure minimal disruption to the projects. There will be no budget modifications and, at this time, there is no anticipated extensions needed for the two subject research initiatives.