

# CFIRE

NATIONAL CENTER FOR  
FREIGHT & INFRASTRUCTURE  
RESEARCH & EDUCATION

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CFIRE student Kevin White (center) is winner of the 2009 Muzi Fellowship Award, given annually to a TMP student with an interest in bicycling and planning and design of bicycle transportation infrastructure.

Dr. Teresa Adams (right) and Gregg Mitman, director of the Gaylord Nelson Institute of Environmental Studies at the University of Wisconsin-Madison presented the award.

## From the Director



Teresa M. Adams, Director

Back in the 1950s, the solution to a growing transportation network came about almost by accident. The Interstate Highway system's original purpose was to provide a national defense road network for evacuation in the event of a nuclear attack. It became a coast-to-coast roadway connecting California to the New York islands, as songwriter Woody Guthrie might have put it. The Interstate increased the gross national product (GNP) tenfold and provided trucks with excellent freight routes that two-lane roads could not.

Today, however, freight demand is increasing and expected to double by 2035. Building a second Interstate is not an option. The 21<sup>st</sup> century Continental Republic needs a safe, efficient intermodal freight system that takes advantage of technology transfer. Technology - assisted freight tracking, truck-only lanes, modernized freight rail systems, rapid bridge

construction, freight traveler's clearinghouses, and GPS/GIS mapping give new life to a transportation network in a mid-life crisis.

All of these ideas involve research, planning, and public-private partnerships that generate solutions for the future.

One way to advance our agenda is to remind decision makers of our past. In the 1840s, the telegraph transformed communication into a forerunner of instant messaging. Telegraph and railroad lines followed the same maps across the country, advancing the art of mapmaking. The major mode of long-distance travel was forever linked to communication technology. In the 1950s, the Interstate system began in conjunction with development of satellite

communication known as GPS. Satellites were vital to national security and to the space race that symbolized the Cold War and prompted construction of the Interstate for national defense. Satellite applications have since proved vital to freight transportation development and efficiency.

In fact, technology will be the capacity builder for this century. With limited space and rising costs, simply adding more roads is not the answer. Rather, all of our transportation modes must play key roles in maximizing freight capacity and mobility through intermodal connections that use applied technology born in the 1950s and reaching maturity today. Research and investment will provide instant

See Adams, continued on page 5

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Join the Transportation Center Ning Social Network @ <http://uwcfire.ning.com/>

For videos and conference proceedings, see our YouTube channel  
<http://www.youtube.com/user/UWCFIRE>

# NEWSLETTER

## 2009 Mississippi Valley Freight Coalition Annual Meeting

The Mississippi Valley Freight Coalition (MVFC) welcomed nearly 70 transportation professionals and researchers to its annual meeting and conference held April 14-16, 2009 at the Hampton Inn & Suites Kansas City-Country Club Plaza in Kansas City, Missouri.

CFIRE cosponsored the event, which was hosted by the Kansas and Missouri Departments of Transportation.

CFIRE director Dr. Teresa M. Adams gave the opening welcome for the conference.

Keynote speakers included Kansas DOT Secretary Deb Miller, BNSF Railway Assistant Vice-President Paul Nowicki, and KC Smartport President Chris Gutierrez.

MVFC facilitator Ernie Wittwer led a workshop entitled, *Multistate Performance Management*, that included a discussion of FreightView, a University of Toledo project to provide all freight modes with real-time information for improving freight efficiency in the Great Lakes region.



Kansas DOT Secretary Deb Miller (left) speaks to the audience at the MVFC Annual Meeting. Miller gave the keynote address on April 15 prior to a panel discussion of area shippers and carriers.



CFIRE researcher Ravi Pavuluri presented a prototype on the MVFC Freight Traveler's Clearinghouse project. CFIRE researchers Praveen Srivastava and Andrew Obernesser reviewed the latest findings for the MVFC truck parking and freight bottlenecks projects, designed to develop strategies for developing more truck parking sites and alleviating freight bottlenecks at key locations.

Leo Penne of the American Association of State Highway & Transportation Officials (AASHTO) updated attendees on the federal transportation funding authorization up for renewal Oct. 1, 2009.

Other speakers discussed state freight planning initiatives and the importance of waterways as freight resources. For more information on the MVFC annual meeting or specific presentations and podcasts, please visit <http://www.mississippivalleyfreight.org>.



Read MVFC Freight Notes for further information



CFIRE researcher Ravi Pavuluri explained the MVFC freight traveler's clearinghouse project



Ernie Perry of Missouri DOT addresses MVFC annual meeting on regional freight transportation

The MVFC 2009-2010 agenda covers the entire freight landscape and waterfront. Freight performance measures (FPM) is a Coalition priority because of their importance to cost-efficient mobility that also saves on travel time and fuel usage.

Federal authorization provides funding for 60 university transportation centers (UTCs), including the University of Wisconsin-Madison center that houses CFIRE and MVFC.

"The success of the annual meeting and conference and the progress in our transportation research efforts are two selling points for what we do," Wittwer said. "We also received excellent positive feedback from private sector attendees who have asked to be included on our mailing lists so they can stay current on our projects.

"It's vital that we have private stakeholders actively participate in freight research and policy. "That will benefit the regional freight industry and the economy as a whole," Wittwer concluded.



MVFC facilitator Ernie Wittwer (far right) leads a workshop at the Coalition's annual meeting and conference. The Wisconsin Transportation Center display is at the left. The three-day event drew nearly 70 attendees.

### Freight Performance Measurement (FPM) Perspectives from MVFC Annual Meeting

Ernie Wittwer led a discussion on the MVFC Freight Performance Measures and Impacts Project. Some highlighted discussions included a look at how Minnesota DOT uses a regional planning approach that considers the percent of the state's gross domestic product (GDP) devoted to transportation, the cost of moving Minnesota products to markets, and the time requirements involved in those movements. Other examples include the Washington State DOT efforts to consider different types of freight based on port connections, the cost and reliability of moving Washington products to state and global markets, and the use of real-time technology. The MVFC project will aim to address regional freight impacts.



# N E W S L E T T E R

## CFIRE Traffic Management Study Enters Second Year

Construction work zones have become the rule rather than the exception on highways today. Work zones are a major contributor to traffic delays experienced by motorists. Meanwhile traffic volume has grown and more trucks travel at faster rates of speed than overall vehicle travel, a trend that's expected to continue.

To develop effective traffic management strategies for work zones, CFIRE researchers have been analyzing truck drivers' behavior and response to real-time travel information such as advanced traveler information systems (ATIS) that could be used to manage demand and capacity in work zones and to mitigate mobility impacts such as accidents or other safety hazards.



CFIRE Associate Director Dr. David Noyce



A pre-installed GPS truck routing map. Source: www.roadtrucker.com

zone warnings or barriers.

The research process includes driver studies, a survey of company policies, field data collection and analyses, a comparison of stated and revealed preferences, development of traffic management guidelines and issuing a final report by August 31, 2010.

For more information, please visit the CFIRE Web site at <http://www.wistrans.cfire.org/Research>, or contact Dr. David Noyce at [noyce@engr.wisc.edu](mailto:noyce@engr.wisc.edu).

A two-year CFIRE study, *Traffic Management of Heavy Vehicles in Work Zones*, focuses on understanding truck drivers' diversion behavior, decision making, and reactions when provided with real-time information tools. Designing an effective ATIS, however, requires an understanding of the truck driver's perception and understanding of the information provided so they can make safety-conscious decisions such as choosing alternative routes, reducing speed, or observing work



Increased and proper use of real-time information could prevent mishaps like the one shown above. (Source: Van Reenen Truck)

## ATRI Probes Solutions for Work Zone Safety

An American Transportation Research Institute (ATRI) study, *Safety By Design: Optimizing Highway Safety in Work Zones*, says that large trucks are involved in proportionately more fatal work zone crashes than other types of vehicles. Moreover, the frequency of large truck crashes involving multiple vehicles occurs nearly twice as often in work zones as in other locations.

ATRI researchers say uniform data is needed on underlying causes of large truck accidents in work zones to develop prevention strategies.

Data from the Fatality Analysis Reporting System and the Motor Carriers Management Information System indicate that the number of fatal and injury crashes involving large trucks stayed about the same or declined slightly from 2005-2007. Several Midwestern states are promoting traffic safety and enforcement measures to reduce the number of accidents involving vehicles in work zones

Another ATRI study recommends the use of on-board trucking information systems for cost-efficient crash prevention. The study says the return on investment (ROI) for forward - collision warning, roll-stability control, and lane-departure warning systems ranged from \$1.33 to \$9.36 for every \$1 invested, over a period of 6 months to 3 years.

# SLOW DOWN

Our mom works here.



Work zones present accident risks for drivers, passengers and construction workers. Source: worksafe.com Web images



## REGISTER NOW!

WHAT: Mid-Continent Transportation Research Symposium, .

WHERE: Iowa State University at Ames, Iowa.

WHO: Co-sponsors include CFIRE and the Wisconsin & Iowa DOTs.

Hosted by the Center for Transportation Research and Education

WHEN: Aug. 20-21, 2009

For information or registration, visit <http://www.intrans.iastate.edu/events/midcon2009/index.htm>



SUMMER 2009

# N E W S L E T T E R

## Beloit-Hudson Resiliency Study

Whatever the season, transportation network resiliency faces constant challenges, from heavy congestion to weather conditions.

A CFIRE study, *Operational Resilience of the I-90/94 Corridor*, is addressing those challenges to keep traffic moving along a major corridor from Hudson in northwest Wisconsin to Beloit at the Wisconsin state line and to maintain normal pass through for the entire corridor.

Researchers have been collecting information to make recommendation on areas in need of enhancement and strategies for alternative routes. The research process includes examining throughput capacity during road construction, traffic incidents, and severe weather, identifying potential bottlenecks, and determining the impact of satisfactory alternative routes



The Interstate 90 backup stranded thousands of people in February 2008. Source: Channel 3000

for passenger and commercial vehicles on urban, suburban, and rural areas. Researchers will incorporate information on road weight limits, heights of overhead structures, and regulations for transporting hazardous materials in identifying alternative routes that will be ranked according to the enhancement needs of the corridor.

“Many of us vividly recall the 13-inch snow and ice storm on February 6, 2008, that resulted in more than 1,000 vehicles and their passengers left stranded on the Interstate for more than eight hours,” CFIRE director Dr. Teresa M. Adams said. “The event demonstrated the importance of understanding the corridor. The study is developing a systematic view of this corridor to prevent future economic and capacity losses from unexpected or severe conditions that create unsafe disruptions.”

The Beloit-Hudson Corridor project addresses a reduction in congestion speeds from 58 mph to 11 mph from an expected doubling of the traffic volume to capacity ratio if nothing is done, and an anticipated increase in delay hours from 5,331 in 2002 to 686,026 by 2035 that will cost an estimated \$8 billion based on a \$32.15 hourly wage rate.

Truck traffic is also expected to double along the first 100 miles of the corridor, with an anticipated doubling of exports and tripling of imports along the freight corridor by 2035.



## Freight rail could improve air quality

Expanded use of rail freight transport could play a key beneficial role in climate change and air quality.

A CFIRE study, *Sustainable Freight Infrastructure to Meet Climate and Air Quality*, builds on Midwest Regional Rail Initiative (MWRRI) rail routes targeted for high-speed passenger rail service that could be applied to increased freight rail transport in the Upper Midwest region, according to CFIRE associate director Tracey Holloway.

CFIRE researchers will evaluate the potential of expanded rail routes to reduce freight transport by truck. The evaluation will consider current and future freight demand, costs of rail-based freight transport, and the impact of broader rail use on harmful fuel emissions. Researchers will base their cost-benefit analysis on the proposed MWRRI improvements, Freight Analysis Framework (FAF) data and projections through 2020, and U. S. Environmental Protection Agency (EPA) emissions models. The study will consider distributed air quality impacts of emission changes related to greenhouse gases, ozone, and particulates that enter the atmosphere.

Throughout the two-year project, CFIRE will collaborate with the Nelson Institute Center for Sustainable And Global Environment (SAGE) researchers and scientists and freight transport stakeholders to develop realistic and relevant scenarios for long-term freight planning.



Dr. Tracey Holloway

## Capitol Ideas:

## CFIRE Projects on Display in Rotunda



The University of Wisconsin-Superior Transportation & Logistics Center recently had six posters in the Wisconsin Capitol Rotunda for Undergraduate Research Day. CFIRE partially funded two projects. ABOVE: Brad Peot (left), 2008 CFIRE Student of the Year, and Andy Bach present a research project on Optimization of Log Superyards in the Upper Midwest. BELOW: Seth Reda (left) and Sandrin Omog-Samnick developed a Transit Pilot Study.



# N E W S L E T T E R

## CFIRE is Integrating Efforts -- Register Now!

**C**FIRE is hosting the *Freight Research at University Transportation Centers: Integrating Efforts* workshop, along with the Mississippi Valley Freight Coalition (MVFC) and National Center for Metropolitan Transportation Research (METRANS) at the University of Southern California and California State University-Long Beach.

The invitation-only national workshop and forum will set the groundwork for a national freight transportation research framework, using a combination of networking, facilitated discussions, and presentations.

National leaders from the freight community and from educational institutions will get updates on research activities, explore collaborative research opportunities, define challenges for freight research & outreach, learn private sector priorities, and consider future needs.

For information or registration, contact Jason Bittner, CFIRE deputy director at (608) 262-7246, or visit <http://www.wistrans.org/cfire/IntegratingEfforts/>

### SAVE THE DATE



#### Agenda Highlights:

- National Research Activity Updates
- Speed Networking for Freight Research
- Luncheon Keynote Address
- Defining Gaps, Opportunities, and Future Research Priorities
- Enhancing the Breadth of University-based Research
- Promoting the Contributions of University-based Freight Research

[www.wistrans.org/cfire/IntegratingEfforts/](http://www.wistrans.org/cfire/IntegratingEfforts/)



### Freight Research at University Transportation Centers: Integrating Efforts

*A National Workshop*

October 20, 2009

Held in conjunction with the 3rd National Urban Freight Conference October 21-23, 2009

Hotel Maya  
Long Beach, California

Arranged by:  
National Center for Freight and Infrastructure Research and Education at the University of Wisconsin (CFIRE)

Supported by:  
USDOT Federal Highway Administration  
USDOT Research and Innovative Technologies Administration  
USDOT Federal Rail Administration  
Metropolitan Transportation Center (METRANS)



## Adams continued from page 1

communication on freight movement across modes. Mapping technologies reach out to everyone from truckers to stakeholders, helping us gather real-time information and create new innovations.

James Oberstar's proposal to restructure the USDOT around intermodalism is right on track. His reauthorization draft creates formula-driven programs in critical asset preservation, highway safety improvement, surface transportation, congestion mitigation and air quality.

Perhaps we could also rename our national freight transportation network an Intermodal Freight Transport System to reflect its multimodal character and the increasing use of new technologies and concepts that will meet freight challenges in the years ahead.

**T**he 3rd Annual METRANS National Urban Freight Conference October 21-23, 2009 will examine the impacts of goods movement and international trade in metropolitan areas. Presentations will cover trends in intermodal transport, supply chain and logistics, operational analysis, efficiency, urban freight movement policies, and security issues affecting goods movement infrastructure.

Papers to be presented at the 2009 National Urban Freight Conference will address the following general topics:

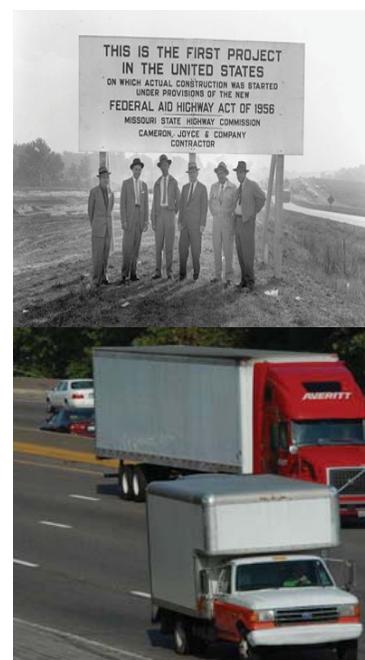
- Models for Transportation, Port, Air, Intermodal Operations, Impact Analysis
- Port Operations and Productivity
- Trucking/Air/Rail Economics and Logistics, Productivity, Labor Issues
- Policy and Institutional Issues in Urban Goods Movement
- Security/Vulnerability of Goods Movement Infrastructure
- Best Practices/Lessons Learned

**The deadline for submitting abstracts:  
has been extended to  
July 15, 2009**



**Early Registration is available through October 1, 2009.**

To register early, go to <http://www.metrans.org/nuf/2009/registration.html>.



Times have changed. The opening of Missouri Interstate 70 (above) was big news in 1956. Now it's a critical commerce corridor for Midwest multimodal freight movement (below).  
Photos courtesy of the Missouri DOT

## 2009 Mid-Continent Nears

CFIRE will join a group of six major sponsors at the 2009 Mid-Continent Transportation Research Symposium August 20-21 at Iowa State University in Ames, Iowa.

CFIRE, the Wisconsin Department of Transportation, Iowa State University, the University of Iowa, the University of Northern Iowa, and the Iowa Department of Transportation are the cosponsors of this year's symposium, hosted by the Center for Transportation Research and Education (CTRE) on the Iowa State campus.

CFIRE director Dr. Teresa M. Adams and deputy director Jason Bittner have been serving on the symposium planning committee. The committee has more than 50 members, including academic from university transportation centers (UTCs) and researchers and policy officers and directors from state departments of transportation (DOTs).

CFIRE hosted the 2008 Mid-Continent event at Madison, Wisconsin.

"We are pleased to take an active role in this year's Mid-Continent Symposium," Adams said. "The Center for Transportation Research and Education at Iowa State University has done an excellent job taking the lead for the 2008 event, bringing together experts who will share ideas to meet the current and future challenges of freight transportation."

Professional networking is vital to forming public-private partnerships that share ideas and resources to develop workable solutions to freight transportation problems and issues, Adams added. The symposium has called for abstracts on transportation research papers that address transportation problems and solutions at the national, regional and local levels. The deadline for submission of abstracts was March 13, 2009.

"We were especially interested in implementable solutions for challenges experienced by federal and state departments of transportation, cities, and counties," intrans director Shashi Nambisan said.

National issues include infrastructure development and financing; emergency preparedness and response; emerging technologies; vehicle infrastructure integration; transportation security; transportation energy use and the environment; transportation workforce development; data needs, integration, and management, and climate change and transportation.

Other topics solicited for research included all modes of transportation; bridges and structures; accelerated bridge construction (ABC); traffic safety, engineering, and operations; travel behavior modeling; land use; asset management; freight corridors; road design and specifications; and pavement materials and design.

For more information or registration, please visit:

<http://www.intrans.iastate.edu/events/midcon2009/index.htm>

The next MidContinent event will be held in Madison, Wisconsin in August 2010. Save the date!

## Gollnik Joins CFIRE Staff

Bob W. Gollnik, Jr., has joined the CFIRE staff as an associate researcher, bringing with him a wealth of transportation-related experience and education.

Before joining CFIRE, Gollnik served as a senior transportation analyst for Cambridge Systematics in its Chicago, Illinois and Ft. Lauderdale, Florida offices. Gollnik participated in rail access, goods movement and truck corridor analysis studies.

In 2006, Gollnik earned his M.S. degree in Urban & Regional Planning at the Gaylord Nelson Institute of Environmental Studies on the University of Wisconsin-Madison campus in 2006. While a graduate project assistant at the Midwest Regional University Transportation Center (MRUTC), Gollnik earned a certificate in the Transportation Management & Policy (TMP) graduate certificate program for students with particular transportation research interests.

More recently, Gollnik has been an analyst on CFIRE's Truck Size & Weight Study, a cooperative research effort with the Wisconsin Department of Transportation (WisDOT). The CFIRE study analyzes commodity freight movement to determine if Wisconsin could make exceptions to current truck size and weight limits to improve freight efficiency while maintaining road safety.

Prior to his UW-Madison graduate work, Gollnik earned a B.S. in political science with a minor in criminal justice from the University of Wisconsin-La Crosse.

A La Crosse native, Gollnik worked as an assistant dispatch manager for Badger Corrugating Company in La Crosse and as a summer student engineer at Trane Company. Gollnik also worked as a consumer specialist intern for the Wisconsin DOT field investigation unit in Onalaska, Wisconsin.

You can reach Bob at [gollnikjr@wisc.edu](mailto:gollnikjr@wisc.edu)



Bob Gollnik, Jr.

## Grant Year 3 Responses

CFIRE received responses to "innovative breakthrough" research proposals for Grant Year 3. and the peer review process is underway, according to CFIRE research and education programs coordinator Greg Waidley, Jr.

Researchers submitting project proposals needed to address innovative breakthroughs in freight transportation research across all four Signature Technical Areas of Research (STARs).

Projects are expected to address innovative and breakthrough research that will expand the body of knowledge for freight transportation. All projects adhere to the CFIRE theme of Sustainable Freight Transportation Infrastructure and Systems.

CFIRE will announce project selections in mid-July. For more information, visit the CFIRE Web site at <http://www.wistrans.org/cfire/Research/>



## Wind Shipping Challenges Met

Transporting wind energy components across the Midwest region has become a high-tech challenge for Wisconsin transportation planners.

With the growth of so-called “wind farms” in Wisconsin, Minnesota, Illinois, and Iowa, there’s been an increase in oversized or overweight trucks hauling blades and towers for use in constructing wind power generators. Sometimes, hundreds of trucks travel to one concentrated area, increasing road congestion on highways and presenting safety hazards as truck drivers negotiate turns along their routes carrying long and heavy loads.

To promote road safety and support the wind energy industry, Wisconsin DOT planners have used GIS technology to map levels of service (LOS) on Interstate, U.S. and state trunk highways using hourly traffic volume data to classify route segments based on congestion levels and road capacity factors such as lane or shoulder width. The data guides WisDOT permit decisions for multiple trips according to the carrier’s proposed route and schedule and the corresponding level of service, or traffic volume, along that route.

Ethan Johnson of the WisDOT Bureau of Planning and Economic Development, told graduate students at an April Transportation Management Program session that WisDOT wants to support the wind energy industry while promoting road safety and protecting the tourism industry. Oversized or overweight trucks cause congestion and industrial safety issues on major highways.

WisDOT had restricted wind energy permits to night travel but now allows some daytime operation during nonpeak hours.

Dawn Krahn of the WisDOT Bureau of Highway Programming says GIS maps show the least congested and most direct routes for wind industry carriers. There is continuous “backbone” traffic data for Interstate and major U.S. highway routes in Wisconsin but not for nearly 6,000 other roads. WisDOT uses statistical averages for similar roads to assess route congestion for permit purposes. Wisconsin expects a doubling of highway construction sites this year because of federal stimulus-funded projects. Maps and data-based simulations have shown that long, heavy trucks don’t cause vehicles to “bunch up” or create as much congestion as anticipated.

Krahn said the permit system could be even more flexible. In issuing permits, WisDOT takes into account highway construction zones and large trucks traveling through the heart of small towns in the permit decision process. Krahn said more research is needed on the impact of land use on route congestion.



The Port of Milwaukee handles wind energy shipments but with an aging infrastructure.

## 2009 EAR Research Solicited

The FHWA Exploratory Advanced Research (EAR) Program is soliciting proposals on 12 topics in four focus areas -- nanoscale research, concepts for integrated highway safety and systems operations, new technologies and advanced policies for energy and resource conservation systems, and macro, mega and national scale modeling systems.

Proposals are due Wednesday, June 24, 2009 and September 23, 2009.

The EAR Program plans to award approximately \$11.6 million to proposals responding to the solicitation.

EAR addresses longer-term, higher risk research that could lead to transformational changes and revolutionary advances in intermodal transportation. The research emphasizes improving highway safety and efficiency, and reducing traffic congestion and environmental impacts of the nation’s highways. The process involves developing public-private partnerships, and engaging stakeholders in the innovative research and technology process. The research emphasizes improving highway safety and efficiency, and reducing traffic congestion and environmental impacts of the nation’s highways.

Some of the projects include nanoscale electronic measurement devices to monitor pavement life cycles, conditions, and damage; using recycled building materials; developing LED-based traffic control signals and energy-efficient methods to reduce highway operating costs; create analytical frameworks for multi-modal connectivity options in a future seamless transportation system; and develop network-based modeling systems for the nation’s 12 mega regions that have diverse transportation issues and service needs across state boundaries.

For additional details about the topics and proposal requirements, please see the announcement at <http://www.fhwa.dot.gov/advancedresearch/index.cfm>.

## Community Maps Update

The Community Maps pilot project provides an online dynamic map interface using the open Google Maps API to provide roadwork and crash data for Wisconsin. The Midwest Regional University Transportation Center (MRUTC) supported the project and worked with the Southwestern Wisconsin Regional Planning Commission in its initial development. Community Maps has separate Web locations for crash sites and planned roadwork sites in Wisconsin.

To date, all of the 2008 fatalities are mapped on the Community Map Web site at <http://transportal.cee.wisc.edu/partners/community-maps/> The Community Maps crash map is mirrored on the Wisconsin Highway Safety Coordinators Association Web site at [http://wihsca.org/wihsca\\_tops/map](http://wihsca.org/wihsca_tops/map).

The UW Transportation Information Center and UW-Madison Traffic Operations and Safety (TOPS) lab will soon be designing a system that will allow each of the 72 county Traffic Safety Commissions (TSCs) to add the fatality (K) and serious injury (A) crashes in their respective counties immediately after they occur, providing more timely and up-to-date information.



## CFIRE Studies Weigh in on Bridge Load Limits

CFIRE researchers are finalizing a project, *Developing a Rational System for Rating Wisconsin Bridges for Truck Loads (2-20)*, designed to provide local guidelines for truck load limits on bridges in Wisconsin to accommodate the timber hauling industry.

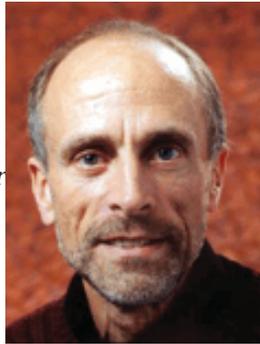
For the past year, CFIRE researchers collected data on truck weights and axle loads from the trucking industry and examined the effects that the trucks would have on State bridges as compared to normal design loads. The researchers received guidance and help from the Wisconsin Department of Transportation (WisDOT) in locating plans for existing old bridges and data for load rating the bridges. WisDOT recently amended state permit rules to allow heavier trucks to add another axle to spread loads. Unfortunately, in some instances local officials set bridge load ratings for county bridges that do not reflect actual capacities.

So far, CFIRE researchers have developed categories for the types of trucks in Wisconsin hauling timber, tested a representative sample of trucks and analyzed how bridges responded to the truck loads, simulated the effects of truck loads on bridges with varying span lengths, compared the effects of timber trucks on bridges to that of standard trucks normally used to establish bridge loads, and continue to develop suggested strategies for economically strengthening old bridges with low load capacities.

Graduate student Michelle Banister has been leading work on the problem supported by the Great Lakes Timber Professionals, the Wisconsin County Forests Association, Wisconsin DNR, the University through an industrial development grant, and CFIRE. Professor Mike Oliva, the faculty investigator, notes that "The capacity of our bridges to handle freight movement is essential to the economy. Particularly in the northern part of the State, the dairy and agriculture industries depend on trucking freight over the highways. Detours because of low load rated bridges can severely affect the viability of businesses."

In a related study, *Bridge Analysis and Evaluation of Effects under Overload Vehicles (02-03)*, CFIRE researchers have been developing a model to predict the effects of overload vehicles on bridge systems. In some cases, industrial freight movement has required special overload vehicles that are five to six times the legal highway weight limit. Though these vehicles have gotten special permits for designated routes, it's difficult for transportation agencies to evaluate the effect of overload vehicles on highway bridges because of the vehicles' unusual configuration.

The purpose of the CFIRE study is to provide agencies with an evaluation method for these unique situations. Researchers have reviewed 3-D analysis techniques and existing data on overload vehicle configurations and



CFIRE Associate Director  
Dr. Michael Oliva

## CFIRE Freight Models Provide Demand Forecasting Tool

Knowing what the freight transportation industry is doing is vital to developing good freight policy and planning strategies.

That's the thrust of an ongoing CFIRE research study, *Understanding and Modeling Freight Stakeholder Behavior (02-06)*, aimed at providing a future policy decisions and accurate freight demand forecasts.

Prof. Jessica Guo, CFIRE associate director of multimodal planning and optimization, has been leading a research team on a two-year project to assess freight stakeholder decisions and activities and then develop a model for making policy and investment decisions in freight transportation.

"This project will develop a conceptual model of private-sector freight stakeholder decisions that impact freight demand," Guo said. "These decisions are also impacted by policies and system conditions that vary throughout the region."

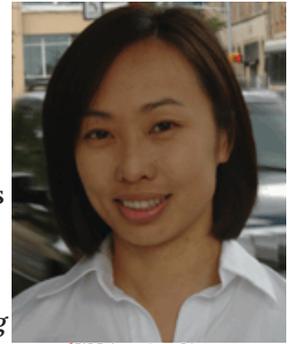
Using East Central Wisconsin as a study area, CFIRE researchers are looking for the elements of freight movement most affected by freight stakeholder decisions and interactions, such as the production and attraction of freight transportation, where it occurs, and in which modes. Researchers will use the study results to make recommendations to the East Central Wisconsin Regional Planning Commission on freight planning and freight demand forecasting.

CFIRE researchers have been collecting data, interviewing stakeholders, holding focus groups, and conducting surveys to develop the conceptual model. They have reviewed more than 20 studies relating to logistics and transportation activities and decisions that produce freight demand.

A companion CFIRE project at the University of Illinois-Chicago, *Understanding Freight Land Use Interrelationships (02-07)*, involves analyzing the effects of freight infrastructure performance on the regional economy, location decisions of businesses, and the effects of land use on freight demand and efficiency within supply chains, especially movement of critical commodities. The study will also consider how stakeholder decisions, motives, constrains, and rationale on land use and freight movement.

To develop policy recommendations based on land use models, CFIRE researchers are focusing on integration of land use and transportation planning. They believe a better understanding of the full impacts of land use decisions on the efficiency of freight movement will help develop policies that improve freight transportation and the Midwest region's economic competitiveness.

For more information, contact Prof. Guo at [jyguo@wisc.edu](mailto:jyguo@wisc.edu) or visit the CFIRE Web site at <http://www.wistrans.org/cfire/Research>



CFIRE Associate Director  
Dr. Jessica Guo



## How Will Freight Fare with Stimulus Funds? Allocations Help, but Fall Short of Needs

The freight transportation part of the American Recovery and Reinvestment Act (ARRA) will likely remain on a two-year roller coaster ride because even significant new federal dollars won't meet critical infrastructure needs.

The long-awaited economic stimulus package is supposed to carry a heavy load of job creation, transportation improvements, state fiscal medicine, health care support, and energy savings from new technologies and 'green' infrastructure projects in urban areas.

Illinois has received \$606.5 million -- more than any other state -- for 249 transportation infrastructure projects. Iowa ranks fourth nationally with 107 projects valued at more than \$220 million. Missouri has had 95 projects approved totaling \$191.1 million, the sixth-highest funding level among the 50 states. Indiana will spend more than \$125 million (9th) on 86 highway and bridge projects seeking federal stimulus aid.

Most Midwest states based their stimulus projects on their long-range transportation plans. Minnesota had hoped to start 79 highway projects valued at more than \$500 million, with additional funds going for urban transit and light rail. Wisconsin designated \$300 million for 47 state highway and bridge projects for federal stimulus funding.

Meanwhile eight Midwest governors have signed a letter supporting the Midwest Regional Rail Initiative to upgrade passenger rail lines from Detroit to Kansas City in two phases using \$8 billion in stimulus funds. These upgrades will affect freight transport throughout the region.

State leaders welcome the federal infusion of transportation funds but realize that many other projects have to wait. Michigan is due to receive \$1.8 billion for state roads over the next two years. After that, however, dozens of repair projects on major roads and highways could be at risk when federal money runs out in 2011. Motor fuel tax revenues have declined with retail gasoline purchases and other economic challenges. A proposed state fuel tax hike from 19 cents to 30 cents a gallon would provide another \$150 million for new roads.

Kansas has directed stimulus funds to short line railroads. According to the American Short Line and Regional Railroad Association (ASLRRA), the stimulus package mingled short-line infrastructure funds into general highway and intermodal discretionary programs. Of Kansas' \$350 million stimulus allocation for highway infrastructure, \$3 million is targeted for short-line railroads. The ASLRRA has estimated that the short-line industry needs \$13 billion to upgrade infrastructure to a "necessary level of efficiency" to meet demand.

A state-by-state information on stimulus allocations is available at <http://www.recovery.org>.

State	Projects	Dollars
Illinois	249	\$606.3M
Iowa	107	\$220.4M
Missouri	95	\$191.1M
Indiana	86	\$125.7M
Minnesota	58	\$191.9M
Wisconsin	43	\$129.M
Michigan	27	\$110.8M
Kansas	6	\$184.3M
Kentucky	4	\$49.7M
Ohio	17	\$16.5M

Approved federal stimulus transportation project and allocation totals for the 10-state MVFC Midwest Region. Source:Stateline.org, Ohio DOT).

**Bridges** from page 8 weights, analyzed effects of overload vehicles on prototype bridge systems, bridge decks, and multi-girder bridges, compared prediction models and continued a detailed analysis of complex bridge types.

"Current CFIRE research projects are focusing on some of the primary aspects of freight movement and the essential infrastructure systems needed to accommodate heavier freight loads." Oliva said. "The highway bridge system components involved in these studies are key parts of the transportation system."

For more information, contact Dr. Oliva at [oliva@eng.wisc.edu](mailto:oliva@eng.wisc.edu), or visit the CFIRE Web site at <http://www.wistrans.org/cfire/Research>

### GLMRI Correction

The spring 2009 CFIRE newsletter incorrectly reported that the Great Lakes Maritime Research Institute (GLMRI) was receiving \$950,000 in stimulus funds from the American Recovery and Reinvestment Act (ARRA).

Actually, GLMRI is receiving \$950,000 through the Omnibus Appropriations Bill.

GLMRI plans to use the funds for projects that benefit maritime commerce on the Great Lakes. Projects include the Great Ships Initiative - Ballast Water Research that will test and develop ballast water treatment technology to resolve the problem of ship-mediated invasive species in the St. Lawrence Seaway system.

We apologize for the error.



Short lines directly employ nearly 20,000 people and reinvest nearly 30% of their annual revenues in infrastructure (Source:ASLRRA)



## TMP students probe freight effect on local roads, farms



Graduate students in the Transportation Management & Policy (TMP) certificate program have used a transportation inventory and local farming data to assess the potential impacts of freight movement from concentrated animal feeding operations, or CAFOs (USEPA photo above) on local road pavements, the environment, and the economy in largely rural Vernon County, Wisconsin.

CFIRE sponsors the TMP program, with CFIRE director Dr. Teresa Adams serving as chair. CFIRE associate director Prof. Jessica Guo was faculty mentor for the project.

Six TMP students -- Lydia Bi, Stacy Cook, Megan Pease, Martin Schilling, Sam Shanahan, and Kevin White -- concluded that Vernon County needs to integrate land use and transportation into its long-range planning to forge a sustainable future.

The practicum project, *Transportation Infrastructure Inventory and Economic Scenario Analysis: Vernon County*, created five scenarios involving the impacts of dairy farm or animal feeding operations with one cow, 500 cows, and 3,000 cows at hypothetical sites. The students used minimal figures on the potential for traffic accidents, injuries, and environmental damage to pavements from large trucks hauling feed, water, milk, and manure on local roads. With limited data with which to assess each scenario, the students assumed that the number of trips, crashes, and related costs increased with the size of the farming operation and distance traveled. While a 500-cow farm would require six truck trips per day, a 3,000-head CAFO would require 32 trips, some from three miles or 10 miles away from U.S. Highway 14, the county's major highway.

The students focused on the impact of large freight trucks traveling on seal coated or blacktopped local roads that last five to 15 years, a life span that would likely shorten with the advent of a new CAFO. They produced a map showing a wide range of pavement conditions throughout the county.

TMP students found that large CAFOs have economic, environmental and social effects that county planners need to address. One study has shown that land near a CAFO loses significant property value. Other research shows that one CAFO puts three local farms out of business. Small farmers spend 90% of their money in the community, compared to 20% for large-scale operations, which also tend to discourage tourism -- a big part of Vernon County's economy.

Large-scale farming operations tend to increase air pollution and traffic congestion from truck traffic and pose greater risk of water pollution from barnyard runoff into watersheds.

TMP students noted that more data is needed for a complete analysis but that transportation, economic, environmental, and social costs would likely be more significant with new CAFOs, given that the current Vernon County road system that was developed for small farms and businesses.

## TMP Students: Red Light Cameras Give Mixed Signals



TMP Student Spencer Gardner explains the traffic enforcement project at the 2009 TMP Reception

Communities have gotten varied results from using traffic enforcement cameras to catch motorists running red lights and potentially causing serious accidents. Crash statistics have shown both increases and decreases in safety hazards while legal issues remain unresolved.

In a project entitled, *Traffic Enforcement Cameras: Implementation and Issues*, TMP students Kaushik Bekkem, Spencer Gardner, and Sam Shanahan looked at trends for the use of red light cameras to reduce the number of accidents at intersections. Approximately half the states across the U.S. have red light cameras in place or are considering their use.

According to USDOT figures, angled crashes have decreased as much as 70% but rear-end collisions from abrupt braking at red lights have actually increased. FHWA has found that 40-45% of crashes occur at intersections, with more than 800 fatalities occurring each year. In 2007, 900 deaths and 153,000 injuries were linked to drivers running red lights.

Some states have found that red light cameras increase accidents. A University of South Florida study has shown an increase in crashes despite the cameras. In Virginia, crashes increased 29% in 2007. The Texas Transportation Institute (TTI) found that crashes decreased 40% if yellow lights lasted one second longer. Thirteen states have banned red light cameras including Wisconsin, Minnesota, Michigan, and Ohio. Researchers have found that most crashes occur because of human error, road conditions or vehicle performance.

Implementation has varied among states and localities. Minneapolis, Minnesota installed red light cameras in 2005. In eight months, authorities issued 26,000 tickets totaling \$1 million. The courts ruled, however, that the cameras violated vehicle owners' rights because there was no state law enabling localities to use them. The images also did not prove the identity of the operator at the time of a violation. Texas has a traffic camera law allowing municipalities to install them. In Irving, Texas, violators pay a \$75 fine.

In general, motorists are more careful if they know there's an enforcement camera around. Debate continues on drivers' rights related to camera-generated violations. Cameras can cost \$25,000 each. Some manufacturers also take a percentage of ticket revenue.

How do traffic enforcement cameras work? Basically, sensors from an underground wiring system identify cars that appear to be driving too fast approaching intersections. A moving car disrupts the electromagnetic field, activating a sensor that sends a signal to a camera that takes a photograph of the car when the light turns red. Video systems are also used to catch red-light runners and to alert other drivers.



# N E W S L E T T E R

## Plotting Policy:

### A TMP Study

In a Transportation Management & Policy (TMP) project entitled, *Shaping Transportation Policy: The Role of Spatial Information and the National Surface Transportation Policy and Revenue Commission*, students argued that applied technology could literally pave the way for a safer, more efficient transportation system that benefits the economy and environment.

CEE 970 students Dana Bera, Megan Pease, and Francisco Serrano focused on applying GIS tools to make predictions for transportation planning and modeling purposes. Entering data into GIS models would guide planners in making safety improvements such as construction of dikes and barriers in areas with a history of flooding or improving road safety at locations with more frequent high-speed vehicle crashes.

The project also called for a performance-based, multimodal mobility public transit system using GIS applications for route planning, ridership analysis, communications, and signal maintenance.

Citing an over dependence on automobile travel and resulting urban decay and air quality problems from fossil fuel emissions, TMP students believe that a balanced transportation system will address these issues and enhance America's global economic position.

Implementation of GIS applications will require more funding, improved data collection, and better system coordination, they concluded.

## Freight Coalition Sets Platform

A new 17-member Freight Stakeholders Coalition has agreed upon the following principles for the upcoming federal surface transportation authorization bill:

- Mandate development of a National Multimodal Freight Strategic Plan
- Dedicate funds for freight mobility and goods movement
- Authorize a state-administered freight transportation program
- Create a national freight transportation trust fund
- Establish a USDOT multimodal freight office and a national freight industry advisory group that would work in conjunction with the multimodal freight office
- Fund multi-state freight corridor planning organizations
- Expand state and local freight planning expertise
- Foster operational and environmental efficiencies in goods movement

Coalition members include the American Association of State Highway & Transportation Officials (AASHTO), the American Trucking Associations (ATA), the American Association of Railroads (AAR), the American Association of Port Authorities (AAPA), the Coalition for America's Gateway and Trade Corridors (CAGTC), the Council of Supply Chain Management Professionals, the Intermodal Association of North America (IANA), the National Association of Regional Councils (NARC), and the National Industrial Transportation League (NITL), and the World Shipping Council.

## TRANSPORTATION PROGRAM COURSE OFFERINGS THROUGH:

### DEPARTMENT OF Engineering Professional Development

The following transportation short-courses are being offered by the University of Wisconsin-Madison. Please refer to the EPD course web pages for more information: <http://epdweb.engr.wisc.edu/>. Click on "Courses" then "Civil and Environmental Engineering Courses".

Title	Course Number	Date(s)	Location
Highway Bridge Design <i>CFIRE Scholarships Available!</i>	K788	June 15-17, 2009	Philadelphia, PA
Railway Bridge Engineering <i>CFIRE Scholarships Available!</i>	K789	June 18-19, 2009	Philadelphia, PA
Upgrading Your Sanitary Sewer Maintenance Program	K834	June 23-24, 2009	Madison, WI
Water Reuse in the United States: Strategies, Trends, and Onsite Applications	K906	July 21-22, 2009	Madison, WI
Improving Your Energy Efficiencies in Water and Wastewater Treatment, Collection and Distribution	K907	July 23-24, 2009	Madison, WI
Structural Steel Design Workshop	K933	August 12-14, 2009	Madison, WI
Wastewater Treatment Plants: Processes, Design and Operation	K851	September 9-11, 2009	Madison, WI
Shoreline Protection: Practical Coastal Engineering Design and Practice	K816	September 9-11, 2009	Madison, WI
Railway Track Systems: Engineering and Design <i>CFIRE Scholarships Available!</i>	K808	September 14-15, 2009	Philadelphia, PA
Fundamentals of Railway Train Control and Signaling Systems <i>CFIRE Scholarships Available!</i>	K810	September 16-17, 2009	Philadelphia, PA
Freight Railroads: Best Operating Practices <i>CFIRE Scholarships Available!</i>	K811	September 28-30, 2009	Madison, WI
Designing and Constructing Sanitary Sewer Systems	K850	October 5-7, 2009	Madison, WI
Docks and Marinas	K852	October 5-7, 2009	Madison, WI
Using HEC-RAS to Compute Water Surface Profiles for Floodplains, Bridge and Culvert Hydraulics	J969	October 12-14, 2009	Las Vegas, NV



#### National Course Coming!

Railroad Engineering: Understanding the Basics, K812  
October 19-21, 2009

UW-Madison College of Engineering

For information and schedule, go to <http://www.epd.engr.wisc.edu>

# U P C O M I N G E V E N T S

## June

- Council of University Transportation Centers (CUTC) Summer Conference, June 30-July 2. Amherst, Massachusetts. <http://www.cutc.org>

## July

- Mississippi Valley Conference, July 15-17, 2009. Hosted by the Michigan Department of Transportation. Amway Grand Plaza, Grand Rapids, Michigan. <http://www.mvc2009.com>
- TRB Joint Summer Meeting: *Forging Ahead in Uncertain Times*. July 19-22, 2009. Seattle Sheraton Hotel, Seattle, Washington. <http://www.TRB.org/conferences/2009/Summer>

## August

- Mid-Continent Transportation Research Symposium, August 20-21, 2009, Iowa State University, Ames, Iowa. <http://www.intrans.iastate.edu/events/midcon2009/>
- ITE Annual Meeting & Exhibit, August 9-12, 2009. Henry B. Gonzales Convention Center, San Antonio, Texas.

## September

- The International Conference on Ecology and Transportation (ICOET): Adapting to Change. September 13-17, 2009. Duluth Convention Center, Duluth, Minnesota. <http://www.icoet.net>
- Integrated Corridor: Systems Management Modeling Best Practices Workshop. September 14-15, 2009. Arnold and Mabel Beckman Center of the National Academies, Irvine, California. <http://www.TRB.org/conferences/2009>

The National Center for Freight and Infrastructure Research and Education (CFIRE) at the University of Wisconsin-Madison is one of ten National University Transportation Centers. The CFIRE consortium includes the University of Wisconsin-Milwaukee, University of Illinois at Chicago, University of Toledo, and University of Wisconsin-Superior. CFIRE's mission is to advance technology, knowledge, and expertise in the planning, design, construction and operation of sustainable freight transportation infrastructure through education, research, outreach, training, and technology transfer. Our vision is to be an internationally recognized authority and resource that creates knowledge, advances understanding, develops technologies, and prepares leaders to meet the nation's need for safe, efficient and sustainable infrastructure for the movement of goods.

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## September continued

- North American Freight Flows Conference: Understanding Changes and Improving Data Sources. September 16-17, 2009. Arnold and Mabel Beckman Center of the National Academies, Irvine, California. <http://www.TRB.org/conferences/2009>
- National Waterways Conference (NWC) Annual Meeting. September 23-25, 2009. Embassy Suites, Charleston, West Virginia. [www.waterways.org](http://www.waterways.org)

## October

- *Freight Research at University Transportation Centers: Integrating Efforts, A National Workshop*. October 20, 2009. Held in conjunction with the National Urban Freight Conference October 21-23, 2009. Hotel Maya, Long Beach, California. <http://www.wistrans.cfire.org/IntegratingEfforts>
- 8th National Conference on Transportation Asset Management: Putting the Asset Management Pieces Together. October 19-21, 2009. The Nines, 525 SW Morrison, Portland, Oregon. Sponsored by CFIRE. <http://www.trb.org/conferences/2009/>
- American Association of Port Authorities (AAPA) Annual Convention. October 25-29, 2009. Galveston, Texas. <http://www.aapa.org>

## November

- Developing a Research Agenda for Transportation Infrastructure Preservation. November 12-13, 2009. Kech Center of the National Academies, Washington, D.C. <http://www.TRB.org/conferences/>
- 27th Intermodal Expo & Annual Membership Meeting. November 15-17, 2009. Anaheim Convention Center, Anaheim, California.

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