

# CFIRE

## NATIONAL CENTER FOR FREIGHT & INFRASTRUCTURE RESEARCH & EDUCATION

Volume 3

Issue 1

Winter 2009

## From the Director



CFIRE hosts successful Workforce Summit, details on Page 2



Teresa M. Adams, Director

### Happy New Year!

2009 will be a year for meeting new challenges. Our nation is finally becoming aware of a serious infrastructure deficit in capacity and condition. After an historic political season, transportation infrastructure will take its place at the legislative forefront again.

AASHTO and other organizations have proposed policies to target at least \$545 billion for transportation infrastructure. That's twice the FY2009 SAFETEA-LU level. Proposals include revenue increases in fuel sales and use taxes, freight tonnage and vehicle miles

traveled fees, a segregated fee on containers passing through U.S. ports, and a \$50 billion tax credit bonding program. The recommendations echo the National Commission report calling for major changes in funding, planning, and implementation of a world-class transportation network.

This issue is more than just payment for pavement or coin for concrete. It's about collective action to achieve an efficient multimodal system of quality highways, bridges, railroads, sea and river ports, and airports.

The old news is that lack of investment has led to roughly 1/5 of state and local bridges being either structurally

deficient or functionally obsolete. This creates obstacles for getting crops to market or deliveries to distribution centers.

The new news has glaring reminders of how important our transportation infrastructure is to economic productivity. Nowhere is this more evident than in our region. Job losses in the automotive industry cause upstream impacts in the manufacturing and technology industries and the related supply chains. We used to worry about the condition of our transportation infrastructure -- now we also worry about the efficiency of that infrastructure to keep us competitive. In 2009, we will see how much we've learned.

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You are invited to the  
**2009 Wisconsin Transportation Reception**  
During the TRB Annual Meeting



**Sunday, January 11, 2009**  
**6:00 p.m. - 8:00 p.m.**  
Marriott Wardman Park Hotel  
Thurgood Marshall Ballroom East  
2660 Woodley Road, NW  
Washington, D.C.

### 2009 Sponsors

- ◀ UW-Madison Civil and Environmental Engineering
- ◀ Midwest Regional University Transportation Center
- ◀ UW-Madison Transportation Services
- ◀ Wisconsin Asphalt Pavement Association
- ◀ HNTB
- ◀ University of Wisconsin-Superior
- ◀ University of Wisconsin-Milwaukee
- ◀ Wisconsin Traffic Operations & Safety Laboratory
- ◀ Mead & Hunt
- ◀ ITS Wisconsin
- ◀ CH2M Hill
- ◀ Wisconsin Department of Transportation
- ◀ National Center for Freight and Infrastructure Research & Education (CFIRE)
- ◀ Marquette University
- ◀ Wisconsin Transportation Builders Association
- ◀ Wisconsin Highway Research Program
- ◀ Wisconsin Concrete Pavement Association
- ◀ Recycled Materials Resource Center
- ◀ CTC & Associates
- ◀ Construction & Materials Support Center
- ◀ Ayres Associates
- ◀ Great Lakes Maritime Research Institute
- ◀ TranSmart Technologies

## CFIRE Co-Hosts 21st Century Regional Workforce Summit

On December 8-9, 2008, CFIRE, the Wisconsin Transportation Center, the Federal Highway Administration, and the Wisconsin Department of Transportation co-hosted the 21st Century Transportation Workforce Summit in Madison, Wisconsin. The event featured over 60 attendees and speakers, panel discussions and working groups that posed current problems and prospective solutions to meet the challenges of the transportation workforce for the 21st Century. Some of the highlighted sessions are summarized here.



MVFC Facilitator Ernie Wittwer (R) moderates panel

### Adams: Engineers need management, technology skills

Most engineers arguably get into the field because they want to build roads and bridges, develop rail and harbor systems, or become part of an exciting, evolving industry. It's possible, however, some of them never thought much about intermodal connectivity, sustainable networks, resiliency, performance measurement, green construction, climate change, or real-time data collection. With the rapid changes in transportation planning and technology, however, CFIRE director Teresa Adams says students need to be "technology smart" and learn management skills as part of their career

education to meet public demands for accountability and results in transportation network improvements.

In her opening talk at the 21st Century Transportation Workforce Summit, Adams emphasized that engineers need to consider project life cycles in design work and coordinate construction and financing timelines so the public gets the most for its money.

Adams reminded the audience that economic efficiencies require engineers to know how to collect money and data and do cost-benefit analyses for a successful project. The "technology-smart" requirement results in part from increased use of real-time traffic management instruments, such as GIS and GPS to increase safety, reduce congestion, improve efficiency of freight movement and motor fuel consumption.

The issue relates directly to climate change, something Adams called an "800 pound environmental challenge for the freight industry and everyone connected with it. There are few incentives, however, to reduce fossil fuel emissions, Adams said, short of another fuel price escalation. The business case for green solutions has not yet been fully realized.

Adams noted that "green construction" goals such as total carbon footprint reduction and zero landfill policies for recyclable building materials can make

an environmental and cost savings difference. Builders, however, need to apply best environmental practices at construction sites.

Traffic management has expanded to include management centers, incident management, real-time information and Intelligent Transportation Systems (ITS) to make roads safer, less congested, and more



CFIRE Director Teresa Adams leads workshop

efficient. The next group of transportation engineers will need to be even more technology-savvy to resolve freight demand and capacity issues.

"If we're not out there giving students these tools, they're not going to be using them in the workplace," Adams said.

### CE Faculty, Students Cram for Skill Sets Solutions

***"You just can't be an engineer in the back room anymore . . ."***

*Leon Hank, Michigan DOT, at the 21st Century Workforce Summit*

Today's transportation engineer not only needs to be an excellent planner and designer. Now he or she is called on to be a leader with communication skills and a working knowledge of project

management, public policy, finance, environmental impacts, technology, and ethics.

That's an increasingly tall order for students already cramming core and related courses into an arduous college program in hopes of embarking on a transportation engineering career. Yet they're not the only ones dealing with the dilemma of matching courses with workforce skill sets. Faculty at leading engineering institutions are aware of the increasingly demanding nature of the engineering profession but see few openings for additional courses to keep students from falling through the cracks.

A panel of engineering faculty and transportation professionals at the 21st Century Transportation Workforce Summit discussed a wide range of options including internships, electives, certificate programs, multidisciplinary partnerships, and mentoring.

Fortunately, CFIRE partners have the foundations to build on and are moving forward. The University of Toledo's Intermodal Transportation Institute (ITI) requires students to work three semesters at DOTs or transportation agencies before graduation. Iowa State University at Ames is the 5th largest civil engineering college in the U.S. Iowa State's programs include community regional planning, logistics operation, and a Ph.D. in transportation engineering, with a variety of internships available.

# N E W S L E T T E R

Educators in attendance from the University of Southern California, California-Long Beach and Georgia Tech University also described how their engineering programs have been updated and expanded to keep pace with current infrastructure and environmental issues.



USC's Genevieve Guiliano (L) makes point during educators' panel discussion. UT's Mark Vonderembse listens.

Panelists from Midwestern DOTs noted that rapid changes in the transportation industry are making additional skills necessary, adding that transportation needs to develop a "compelling vision" for the future and actively recruit students to meet workforce needs and fulfill that vision.

Van Walling of CH2M Hill/ESM in Milwaukee said that a proactive approach is needed rather citing flaws in the current educational system. "We all need to step up to the plate and do something about," he said.

## "People Matter"

There are two ways to view the future of the transportation workforce: as a cloud of uncertainty over replacing retirees and hiring new people to meet increasing service demands or a clearing sky of promise as employers create a positive, career-focused environment that values skilled, committed professionals. If the second scenario sounds good, then the transportation

industry must heed the words of human capital entrepreneur and consultant Julius Rhodes, "People Matter."

In speaking to transportation professionals and researchers at the 21<sup>st</sup> Century Workforce Summit, Rhodes' two-word declaration was aimed at inspiring a new culture based on the changes in transportation and workforce demographics. "We have to treat people as if they matter," Rhodes said, "because they do."

Rhodes, founder and principal of the Chicago-based mpr group and senior consultant for KnowledgeBank, Inc., of Alexandria, Va., spoke of a "transformational change" occurring in workforce management that involves recruiting prospective workers even prior to high school so they'll pursue transportation careers in college and graduate with skills needed for a dynamic profession. "If we're going to build for the future," Rhodes said, "we've got to do things differently."

Rhodes emphasized that everything people do relates to transportation and that the increasingly diverse labor pool needs to know that and consider transportation as a career. Leadership, he added, needs to appreciate the multi generational, diverse workforce.

Rhodes noted that the workforce is aging and that work styles vary by age group. Baby boomers tend to be driven and loyal. Those from Generation X tend to value hard work but change jobs more often and want work/life balance. The

youngest group – Generation Y – typically values job security, money and mobility and tends to be more technology-savvy than the other two groups.

Transportation employers, Rhodes concludes, have to place members of all these groups in the right places to meet their goals. The key is hiring workers committed to the profession and your organization and valuing them in return. "It's a tough, winnable competition," Rhodes said.



Rhodes leads breakout group at Summit

For more information on mpr group or to contact Mr. Rhodes, visit [www.mprgroup.info](http://www.mprgroup.info) or [jrhodes@mprgroup](mailto:jrhodes@mprgroup).

Rhodes has just completed a manuscript for his first book, on the subject of personal branding, to be published by early March. The book will be available to CFIRE members and Summit attendees at a special pre-order price. Contact Dr. Rhodes for details.

## Port Study Initiated

The University of Wisconsin-Green Bay, in collaboration with the Port of Green Bay, has received a \$55,000 research grant from the Great Lakes Maritime Research Institute (GLMRI) for the "The Great Lakes Marine Container Service Feasibility Study."

Faculty and student researcher will use surveys, background analysis and interviews with potential shippers to identify products or commodities for containerized transport; analyze the viability of connecting Great Lakes container operations via the St. Lawrence Seaway to high-capacity, ocean-going vessels at Montreal and Halifax, Nova Scotia; identify shipper requirements and interest in shifting from land-based to marine service linking Great Lakes markets; and determine the viability of a common intermodal terminal at the Port of Green Bay and, if viable, do an analysis of potential terminal size, location, requirements and features.

Supporters say cost-effective shipping options could help retain and attract industry. The Port of Green Bay contributes about \$76 million annually to the regional economy.

**CFIRE RFPs for Year 3** Requests for Proposals (RFPs) for CFIRE's third grant year will be accepted soon. Topics might include bridge approach slabs, freight travel demand forecasting, public-private partnerships, enhancing the rail system, multi-state (regional) freight planning, truck driver simulators, and energy and environmental impacts of freight transportation.

RFPs will be selected by CFIRE's Research Advisory Committee in January and RFPs will be posted in early February through the end of March. For information, contact Greg Waidley at [gwaidley@engr.wisc.edu](mailto:gwaidley@engr.wisc.edu), or visit <http://cfire.wistrans.org>.



# NEWSLETTER

## CFIRE Presents GIS Map Project at TRB

CFIRE researchers are presenting a paper entitled, "A Web-Based GIS Tool to Collect and Disseminate Truck Parking Information" at the 88th annual Transportation Research Board (TRB) annual meeting in Washington, D.C.

The research team included Praveen Srivastava, University of Wisconsin - Madison, Bruce (Xiubin) Wang, Texas A&M University, Teresa Adams, University of Wisconsin - Madison, and Jessica Y. Guo, University of Wisconsin - Madison

With the advent of Web-based and interactive mapping technologies, it is now possible to gather, analyze, visualize and distribute geo-spatial information over the Internet and globally.



The World Wide Web serves as the link to freight researchers, planners, and businesses for collecting transport-related geographic data. The online tool discussed in this paper enhances freight communications to foster public-private partnerships for better transportation planning and operations.

This research focuses on truck parking problems along major Interstate freight corridors in the 10-state Mississippi Valley Region and state trunk highways in Wisconsin. With increasing

freight traffic on highways, freight infrastructure is facing serious challenges in maintaining an uninterrupted flow of interstate movements. Communication via spatial information is essential in addressing such issues. Location-specific information can be easily collected using the survey tool developed in this research. Distant participants can mark spots on an underlying Google map, answer questions, and make comments over the internet. The results from analysis of the collected information can be disseminated online graphically.

The research concludes the following about truck parking issues:

1. Truck parking problems tend to be near major urban areas that are likely to have the most intensive freight operations. About 14% of the survey markers are in the Chicago area, indicating critical truck parking shortages. The second most serious area for truck parking is Minneapolis and its outskirts. Indianapolis, Columbus, Cincinnati, St. Louis, Ann Arbor and Milwaukee have moderate truck parking problems.

2. Interstate 70 to St. Louis and almost every interstate corridor bound for Chicago have serious truck parking problems. Interstate 94 connecting Minneapolis -St. Paul to other cities, the start of I-90 and I-43 in Wisconsin and I-94 east to Milwaukee have several problematic parking locations. Other Midwestern



Prof. Jessica Guo is using Web mapping to research freight planning and bottleneck alleviation. Truckers say many truck parking sites are 'too full,' indicating high freight demand.

corridors with truck parking shortages are I-96, I-75 and I-94 near Detroit, I-71 near Columbus and Cincinnati, I-90 near Cleveland and I-65 and I-70 near Indianapolis. Other problem corridors are I-35 near Kansas City and I-80 near Des Moines and Davenport, Iowa.

3. Capacity is the most common problem. Parking facilities are 'always too full.' This means parking capacity does not meet demand. Other parking issues are 'security concerns,' inability to handle traffic, maintenance, and poor striping and/or design.

4. Possible solutions need to consider truck parking along with logistics efficiency. In urban areas, for example, large distribution centers should consider providing truck parking spaces which are most convenient to truckers. The outskirts of large urban areas such as Chicago and Minneapolis need more truck parking capacity for trucks staging for next-day delivery. A major reason truckers stage

for early next-day delivery is because of peak hour traffic or night delivery restrictions. Local ordinance revisions would widen the delivery window for truckers.

In summary, survey participants suggest more use of technology. Variable message boards can be used to provide advance parking information so truckers can make early and informed route decisions. Upstream truck parking lots can display capacity availability for downstream lots. Internet and radio could be used to deploy availability information.

## TRB 2009 Sessions

The 88th Transportation Research Board annual meeting features a variety of presentations related to freight systems, harbor and ports, the trucking industry, energy and environmental issues and technological applications. Page six of this CFIRE newsletter provides a comprehensive listing of highlighted sessions. For more details, go to <http://www.trb.org/am/ip>



# N E W S L E T T E R

## Adams continued from p.1

As an industry, we have repeatedly supported revenue increases and user fees, provided they're invested to increase freight capacity, reduce congestion, and improve freight technology.

In 2009, I will be encouraging our researchers to provide results that keep us economically competitive and advance our world-class transportation network. We have the right mechanisms in place to capture the expertise of faculty, staff, practitioners, and other stakeholders to meet this goal. We've already planned to work with other UTCs and public sector stakeholders. We'll host the next Mississippi Valley Freight Coalition (MVFC) spring meeting in Kansas City with Missouri and Kansas DOTs. We'll sponsor the Mid-Continent Transportation Research Forum with CTRE and a national conference, "Freight Research at University Transportation Centers: Integrating Efforts," in collaboration with METRANS, among other key activities.

During another landmark presidential year (1960), John F. Kennedy said, "I don't want historians in ten years to say that these were the years that the tide ran out on the United States. I want these to be the years that the tide came in." This vision helped us achieve the economic success of the past 50 years. We can now apply those words to guide our current actions and also take advantage of the spotlight and our new president's motto, "Yes We Can" to take the first step. I do believe we will. I look forward to working with all of you in 2009.

## UW-Madison Courses Help Growing Rail

### Industry Stay on Track

By Sandra Knisely, UW-Madison College of Engineering

With merely one gallon of fuel, a train can move one ton of freight 400 miles. Despite such astonishing fuel efficiency, the railroad industry shrank dramatically in the 1970s when highways became the preferred form of transportation. Today as fuel prices soar, trains again are becoming an attractive method for moving freight - and people - across the country.

As railroads make a comeback, so must railroad engineers. Currently, there are few undergraduate or graduate programs in the United States that teach engineers to design, build and maintain railroads that are safe, efficient and consumer-oriented.

However, the University of Wisconsin-Madison offers a comprehensive continuing education program. Directed by engineering professional development professor emeritus C. Allen Wortley, the UW-Madison Railroad Engineering Program began in 2001 when Wortley developed a survey course that covered civil engineering fundamentals of the rail industry. More than 120 people from around the country came to Madison to sit in, and Wortley knew he was on to something.

"America's prosperity depends on a sound transportation infrastructure," he says. "We must increase our commitment to rail

- a key transportation component - to compete, reduce problems on our highways and skyways, reduce

air pollution, save energy and meet future needs."

That initial course now has expanded into eight annual offerings that last two to three days each. Taught by experts from the rail industry, the courses feature a variety of topics, including highway-rail grade crossing safety, railway train control and signaling, rail transit passenger systems, freight railroad operating practices, and track design and maintenance. The most recent course covers railroad bridge engineering.

The National Center for Freight and Infrastructure Research and Education (CFIRE) at UW-Madison offers scholarships for government officials who attend the courses. CFIRE director and UW-Madison civil and environmental engineering professor Teresa Adams says the courses address an important need. "We need to provide more professional capacity for railroads," she says. "Lately, there has been a push from railroads to renew their workforce."

Ron Adams is one of the students who has benefited from the UW-Madison Railroad Engineering Program. "It's given me things to think about as I manage the state's rail programs and provide ideas about how to do things better,"

says Adams, who is chief of the railroads and harbors section of the Wisconsin Department of Transportation.

He has been a student in two courses and

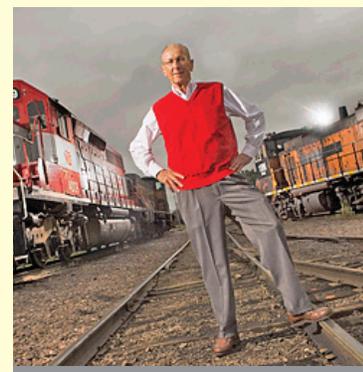
has lectured at several more. "There is a lot of good material in the courses, and I find myself looking back at the class notebook periodically," he says.

One topic of interest in the United States is commuter rail systems. While the country has a strong freight transportation system, commuter rail is not as common or well-developed as in other countries.

That could change if other schools do as Wortley hopes and launch their own railroad engineering programs. He would like to see several universities in the United States and Canada develop their own railroad research and education.

"Although 'railroading' is nothing new, there are new problems to be solved with new materials, methods and technologies," he says.

UW-Madison may be the first to adapt Wortley's model and CFIRE is



C. Allen Wortley is leading in UW RR education

currently developing railroad components for introductory civil and environmental engineering courses.



# N E W S L E T T E R

## 88th TRB Annual Meeting Presentations feature Freight Activities

### Freight Systems

Highlighted sessions include a four-part series entitled “Moving Freight Through Global Change”:

**Session 437** – *Hunting for Carbon Reductions in Freight Systems.* Tuesday, January 13, 8:00-9:45 a.m.

**Session 487** – *Policies to Bag Big Carbon Reductions.* Tuesday, January 13, 10:15 a.m.-Noon.

**Session 521** – *Effects of Climate Change on the Physical Transportation System: What are the risks?* Tuesday, January 13, 1:30-3:15 p.m.

**Session 577** – *How Supply Chains Respond to Fuel Price Volatility.* Tuesday, January 13, 3:45-5:30 p.m.

Other freight systems sessions of that may be of interest are:

**Session 204** - *Freight Railroad Perspectives on Energy Cost Increases.* Monday, January 12, 8:00-9:45 a.m.

**Session 216** - *Improving Efficiency at Intermodal Freight Terminals.* Monday, January 12, 8:00-9:45 a.m.

**Poster Session 327** - *Freight Systems Research.* Monday, January 12, 2:30-5:00 p.m.

**Session 597** - *Data on Goods Movement Impacts on Air Quality Issues.* Tuesday, January 13, 7:30-9:30 p.m.

**Session 617** - *Innovations in Freight Modeling.* Tuesday, January 13, 7:30-9:30 p.m.

### Trucking

**Session 260** - *Emerging Highway Transportation Issues Identified by the National Transportation Safety Board (NTSB).* Monday, January 12, 10:15 a.m.-Noon.

**Session 303** – *Getting Our Bang for the Buck: Impacts of Higher-Productivity Vehicles on Energy and Emissions.*

**Session 359** – *Truck Drivers, Congestion, and Carbon Footprints.* Monday, January 12, 3:45-5:30 p.m.

**Session 403** - *Experiences with Large-Truck Operational Safety from Around the World.* Monday, January 12, 7:30-9:30 p.m.

**Session 421 (Part 1) and Session 477 (Part 2)** - *Federal Motor Carrier Safety Administration's Analysis, Research and Technology.* Tuesday, January 13, 8:00-9:45 a.m., 10:15 a.m. -Noon.

**Session 659** - *Freight Fuel; and Carbon Reduction in Metropolitan Areas.* Wednesday, January 14, 8:00-9:45 a.m.

**Session 694** - *Motor Coach and School Bus Safety.* Wednesday, January 14, 10:15 a.m. - Noon.

**Session 760** - *Collecting, Analyzing and Displaying Freight Data.* Wednesday, January 14, 4:30-6:00 p.m.

### Harbors & Ports

**Session 220 (Part 1) and Session 275 (Part 2)** – *Water Transportation Data for Decisions: Transformed Federal Systems.* Monday, January 12, 8:00-9:45 a.m., 10:15 a.m.-Noon.

**Session 246** - *Current Research on Marine Transportation and Freight Systems.* Monday, January 12, 9:30 a.m. -Noon.

**Session 270** – *Climate Change and Maritime Transportation.* Monday, January 12, 10:15 a.m.-Noon.

**Session 305** – *Art of the “Port Deal” and Future of Seaport Infrastructure Finance.* Monday, January 12, 1:30-3:15 p.m.

**Session 356** - *Institutional Framework of Seaports as Public Enterprise for the 21<sup>st</sup> Century.* Monday, January 12, 3:45-5:30 p.m., followed by *Freight Systems and Marine Forum*, 5:45-7:15 p.m.

**Session 615** - *Developing Greenhouse Gas Inventories for Aviation and Maritime Sectors.* Tuesday, January 13, 7:30-9:30 p.m.

**Session 657** – *Marine Highway Advances.* Wednesday, January 14, 8:00-9:45 a.m.

**Session 703** - *Maritime Transportation in 2030.* Wednesday, January 14, 10:15 a.m. - Noon.



The Ohio Department of Development (ODOD), Ohio Department of Transportation (ODOT), and the Ohio Environmental Protection Agency (OEPA), proudly announce the second round of the Diesel Emissions Reduction Grant (DERG) Program. Invited to apply are all public diesel engine fleets and private diesel engine fleets with a public sponsor that will undertake machinery/vehicle replacement, repower, retrofit, or installation of anti-idle equipment for the purpose of emission reductions. A projected total of \$11.2 million

will be made available through federal CMAQ moneys authorized by SAFETEA-LU. The application deadline is March 2, 2009. Awards will be announced in May. Each application must contain a request for at least \$20,000 to be considered.



The DERG Committee makes all project selections and funding decisions. Up to \$5 million will be set aside for public transit projects.

For more information, visit <http://www.odod.state.oh.us/diesel-emissions/>

## Holloway Named SAGE Director

CFIRE associate director Tracey Holloway's academic and professional life has focused on understanding the causes of health-damaging air pollution and climate change, and on figuring out how solve environmental problems in an efficient, economic way. As new director of SAGE (Sustainability And the Global Environment), Holloway is enthusiastic to connect her freight expertise from CFIRE with broader environmental and energy issues. Founded in 2000, SAGE is a 50-person, interdisciplinary research center based at the Nelson Institute for Environmental Studies at University of Wisconsin-Madison.



New SAGE director Tracey Holloway

SAGE research has a strong focus on determining the effects of fossil fuel emissions on public health and the environment and assessing alternative energy and land use options. Emissions from freight trucks and passenger vehicles continue to be linked to increased mortality rates and public health risks. By understanding how air quality responds to changes in fuel characteristics, technology, energy use, and other factors, Holloway aims to identify cost-effective strategies to meet energy and environmental goals.

One thrust of Holloway's work at SAGE and CFIRE addresses environmental impacts of biofuel production and use. This research complements the activities of the Great Lakes Bioenergy Research Center (GLBRC), a five-year, \$125 million research effort to develop cellulosic biofuels as renewable energy sources. Holloway's CFIRE work addresses both "current generation" ethanol and biodiesel produced from agricultural products and evaluates the potential effect on freight demand if cellulosic ethanol production becomes a major commodity flow for the Upper Midwest. Two CFIRE-funded connected to SAGE research involve testing air quality effects of blending biofuel and regular diesel fuel and evaluating whether rail shipments of ethanol would reduce diesel emissions. SAGE researchers have also been studying the effects of Smart Growth, or managed growth, strategies on driving patterns that affect vehicles miles traveled and fossil fuel consumption and emissions on a national scale. "One of the goals of cities is to keep their air clean," Holloway says. "We want to see if smarter growth affects air quality."

In addition, SAGE faculty contribute to the Transportation Management and Policy (TMP) graduate certificate, a CFIRE-sponsored program that allows students on campus to complete coursework and research projects to earn a credential relevant to careers in transportation.

## Wisconsin releases Connections 2030 Plan

Wisconsin expects continued economic growth over the next 20 years that will require a sound infrastructure and new energy, environmental and transportation policies.

**Wisconsin's Connections 2030** plan released in November 2008 expresses a comprehensive multimodal strategy that promotes economic growth, safety, efficiency, mobility and transportation choice. The *Connections 2030* plan proposes improved planning, design, and data collection to prioritize safety projects, education, and enforcement and to improve emergency response, developing partnerships with stakeholders to improve freight infrastructure, and completing priority highway projects and local road and bridge improvements.

The plan has specific freight policies identified and calls for better freight rail service, preservation of rail corridors for future transportation uses, investment in harbor and waterway freight projects to increase shipping activities, and improved aviation infrastructure and services for large and small planes.

*Connections 2030* proposes to build alliances, business opportunities, and a diverse workforce to meet future transportation industry needs, something the 21<sup>st</sup> Century Regional Transportation Workforce Summit addressed in December (see Workforce Summit, page 2). For more on Connections 2030, go to [www.dot.wisconsin.gov/projects/state/connections2030.htm](http://www.dot.wisconsin.gov/projects/state/connections2030.htm)

### Freight Strategies from *Connections 2030*

- **Freight Focus: Incorporate freight planning in day-to-day activities**
- **Facilitate/Advocate: Bring stakeholders together**
- **Data: Capture new data in different ways**

**All-mode freight study: Provide the structure to determine WisDOT's freight mission, goals, objectives**



# NEWSLETTER

## Bridge Research Passes Tests

A federal-state partnership has rapidly produced five durable bridges using materials and technologies that could become the building blocks of bridge construction in the future.

CFIRE associate director Dr. Michael Oliva worked with Dr. Lawrence Bank, Dr. Jeffrey Russell and a UW-Madison research team that collaborated with the Wisconsin Department of Transportation in the design and construction of five experimental bridges over the past eight years, using new methods and materials that reduced construction time and associated traffic disruption compared to traditional concrete bridge projects.

The Wisconsin partnership used mostly Federal Highway Administration (FHWA) grants to replace traditional steel inside bridge decks with fiberglass and also pre-cast concrete panel for decks that will actually extend the life of the bridges.

What's more, an Interstate 90 pre-cast decking project was completed in a matter of days. That compares with two to four weeks for normal concrete construction.

"Closing down a highway to one lane or sending traffic on a detour route for a month can cost millions of dollars to the trucking industry and the public," Oliva said.

The research team did extensive testing to make sure the materials would work and that the bridges would be safe. That's good news for Wisconsin transportation officials looking for ways to preserve highway bridge pavement that's subject to increased traffic volume and winter weather hazards.

"Our weather here is really tough on all materials, but it's



CFIRE Associate Director Michael Oliva

grants, the UW/WISDOT team had to develop original projects, conduct laboratory studies, and monitor a real highway bridge that would be tested under normal conditions. The projects also had to follow standard DOT construction schedules and use its regular construction contractors.

WisDOT officials say cost and using new materials and design techniques are two obstacles to overcome before the tougher, fast-track bridges are commonplace. Still, Oliva is pleased with the test results. "To do all the research and then have it stuck on a shelf always kills me," Oliva says. "But to develop the project, see the bridge built, and then test it afterwards, that's the fun part — to see research put to use."

A video of the project can be viewed at <http://www.wisconsinidea.wisc.edu/profiles/Bridges>. A high-resolution map is available at <http://www.news.wisc.edu/newsphotos/bridgeMap.html>. For more information, contact Michael Oliva at [oliva@engr.wisc.edu](mailto:oliva@engr.wisc.edu), (608) 262-7241.

**Baldwin (St. Croix County)**  
U.S. Hwy 63 over the Rush River completed in 2008  
For the first time in Wisconsin, this bridge's supporting structure, or abutment, was assembled from pre-cast concrete parts, rather than from concrete that is cast in place. Not only is pre-cast concrete of higher quality, but its use in this project also cut construction time in the field to just two days.

**Black River Falls (Jackson County)**  
U.S. Hwy 12 over Coffee Creek completed in 2007  
When salt-laden water seeps into a bridge's concrete deck, it corrodes the steel reinforcing bars inside and reduces the bridge's lifespan. To avoid this problem, the deck of this bridge locks reinforcing rods entirely. Instead, galvanized steel bars were placed between the bridge beams, allowing easy inspection and keeping them away from damaging saltwater on the deck.

**McFarland (Dane County)**  
Interstate 39/90 over Door Creek completed in 2005  
One deck of this twin span bridge was assembled from pre-cast concrete panels, allowing construction workers to place the deck in just one day. Casting concrete on-site, in contrast, can take two to three weeks. The second deck was built with standard methods, so that researchers can compare the two decks' performance side-by-side.

**Fond du Lac (Fond du Lac County)**  
U.S. Hwy 151 over De Neveu Creek completed in 2004  
One deck of this twin span bridge uses fiber-reinforced polymer as reinforcement for concrete instead of steel. Lightweight, strong and rustproof, this high-tech plastic could extend the deck's lifespan by up to 100 years. The second deck was built traditionally with steel, so that researchers can compare the two decks' performance side-by-side.

**Waupun (Dodge County)**  
U.S. Hwy 151 over State Hwy 26 completed in 2003  
One deck of this twin span bridge uses fiber-reinforced polymer as reinforcement for concrete instead of steel. Lightweight, strong and rustproof, this high-tech plastic could extend the deck's lifespan by up to 100 years. The second deck was built traditionally with steel, so that researchers can compare the two decks' performance side-by-side.

especially tough on concrete," Wisconsin has few problem bridges compared to most states but its 13,600 bridge spans would benefit from longer-lasting structures that could be erected quickly.

Oliva says. Freezing and thawing widens cracks that allow water containing road salt to seep in, eventually causing steel reinforcement to rust and cracks to further expand. Fiberglass won't rust and researchers expect that bridges could last 20 to 30 percent longer, or up to 100 years.



CFIRE supports the Innovative Bridge Research and Deployment (IBRD) program that the FHWA started in 1998. To receive federal

### MARK YOUR CALENDAR

CFIRE will host "Freight Research at UTCs: Integrating Efforts, a day long research forum in conjunction with the 3rd National Urban Freight Conference.

The workshop will be held October 20th 2009 in Long Beach, California. Visit the CFIRE website for updates and more information.

# NEWSLETTER

## Edil Earns Distinguished Researcher Award



Professor Tuncer B. Edil

The United States Universities Council on Geotechnical Education and Research has named Civil and Environmental Engineering and Geological Engineering Professor Tuncer B. Edil recipient of its 2008-09 Distinguished Researcher Award.

The award recognizes Prof. Edil's creative accomplishment, outstanding and innovative contributions to research, and scholarship in the field of geo engineering. The council provides advocacy for the continued development and expansion of high-quality geotechnical, geomechanical, geoenvironmental, geological, and geophysical engineering research and education by U.S. academic institutions.

A CFIRE principal investigator, one of Prof. Edil's CFIRE projects, Assessing Environmental Impacts Associated with Bases and Subgrades Stabilized with Coal combustion Products (CCP), focused on material composition and properties and conducting leachate testing. He is starting a new CFIRE project on Reconstruction of Railroads and Highways with In-Situ Reclamation of Materials.

## CFIRE Begins Global Import Safety Study

*Managing Challenges of Import Safety in a Global Market* will study risk management related to imported commodity shipments from the global supply chain that may have been deliberately or unintentionally contaminated. Ultimately, the study will develop proposals to be sent to state government and health officials.

CFIRE will partner with the Center for Human Performance and Risk Assessment (CHIPRA) to conduct research and on-campus activities involving industry representatives, regulators, and visiting researchers to examine market, regulatory or hybrid approaches to addressing safety issues in global commodity shipments. The research will define commodities as foods, bulk chemicals, spices, and nutritional supplements which tend to be produced and sold much cheaper abroad. Contamination of commodities in the global supply chain can have far-reaching effects, from restrictions on world trade and a loss of consumer confidence in the import market. Because commodities supply chains are large, complex, poorly documented and high proprietary, researchers believe that Customs and Border Protection (CBP) officials need to be involved in the regulatory information process.

The research team will hold three annual conferences with industry, government

and academic stakeholders, including a capstone conference to be publicized in an international risk management journal. Speaker events, panel discussions and seminars will be held to educate the general public.

Information will be published on the Web for the benefit of the business community and the public. For more information, visit <http://www.wistrans.org/CFIRE/research/>

3.932 GPA and received the UW-Superior Department of Business and Economics Outstanding Sophomore Award in 2007. In his current role as president of the UW-Superior Transportation and Logistics Student Club, Brad has orchestrated speaker presentations, aircraft manufacturing and railyard tours, and publication of a regular newsletter. Brad has also helped establish a study abroad program for undergraduate students for railroad related activities.

His CFIRE research work includes a mode utilization study on the movement of raw materials for the logging industry and compilation of a logging truck profile. In addition, Brad has coordinated research meetings and assisted a third party logistics provider in manipulation of transport data that has provided valuable information to decision makers throughout the Upper Midwest region.

Brad will remain involved in numerous CFIRE research efforts and plans to work in the rail or maritime industries after graduation.

## 2008 CFIRE Student of the Year



CFIRE Student of the Year Brad Allen Peot

Brad Allen Peot has been named 2008 Student of the Year for the National Center for Freight & Infrastructure Research and Education (CFIRE). Brad is a junior at the University of Wisconsin-Superior (UWS) majoring in Transportation & Logistics Management. A native of Luxembourg, Wisconsin, Brad is the first UW-Superior student to receive this award. Brad has an impressive track record in academics, leadership and research. He holds a

Where are CFIRE's Past Students of the Year? See pages 10-11



## Our Students of the Year: Where are they Now?

Since 1999 the Wisconsin Transportation Center's UTC program has recognized Students of the Year. The 2008 selection was Brad Peot of the University of Wisconsin-Superior (see page 9 for details on Brad's achievements). We've decided to visit with each of our past Students of the Year. As you can see, they're making significant contributions.

### 1999

**Jason Bittner** is currently the deputy director of the National Center for Freight & Infrastructure Research and Education (CFIRE). He is also a researcher for the Center, with projects dealing with Truck Size and Weight, Maintenance Quality Assurance, and Transportation Asset Management. Jason was recently named chair of the TRB Committee on Conduct of Research. Jason also served as program chair of the 7th National Transportation Asset Management Conference. Jason was also a 2000 Eno Transportation Fellow.



Jason Bittner

### 2000

**Kathleen Swindler** is currently the technical manager of traffic engineering at CMX, an engineering and consulting firm headquartered in Manalapan, NJ that serves public and private clients in the areas of environmental, land development, public works, sports engineering, building services, telecommunications, and transportation. Kathleen has worked as an engineer for the City of San Francisco and was part of their Smart Corridors Task Force. She was also a traffic engineering intern at the San Francisco Department of Parking and Traffic, focusing on startup of the San Francisco Integrated Transportation Management (ITMS) program.

### 2001

**Nicholas Koncz** is an assistant research scientist at the Texas Transportation Institute (TTI). Nicholas earned a Ph.D in Civil and Environmental Engineering from the University of Wisconsin-Madison in 2002, and a Master of Science in Transportation from the New Jersey Institute of Technology in 1995. Nicholas's professional areas are transportation infrastructure and operations with a focus on global position system (GPS), geographic information system (GIS), and intelligent transportation system (ITS) technologies. Nicholas has also published several journal articles on engineering design data management. Before joining TTI, Nicholas was active in transportation-based geospatial data modeling, critical infrastructure management and protection, and right-of-way data management at the University of Wisconsin and Virginia Polytechnic and State University.



Nicholas Koncz

### 2002

**Larry Snyder** is an Assistant Professor in Industrial & Systems engineering at Lehigh University, and the co-director of the Center for Value Chain Research. He held the Frank Hook Assistant Professorship from 2006-08. Larry's research interests are in the areas of supply chain management, especially models for the design and operation of robust and reliable supply chains. At Northwestern University, Larry did groundbreaking doctoral fellowship research in this area and received funding from the university, the National Science Foundation, and General Motors. His dissertation won the INFORMS Section on Transportation Science and Logistics Dissertation Award, and the IIE Pritsker Doctoral Dissertation Award. Larry's work is supported by NSF, as well as by the Commonwealth of Pennsylvania and by private companies including Air Products, IBM, Agere Systems, and Just Born Candies. His latest research projects focus on modeling and mitigating supply disruptions in supply chains. Larry teaches operations research, inventory theory, and supply chain management at Lehigh.



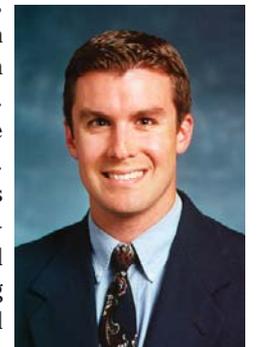
Larry Snyder

### 2003

**Rebecca Wuellner** is a structural engineer with Ericksen, Roed & Associates in Minneapolis, Minnesota. Previously, Rebecca had worked in the bridge design and bridge maintenance sections of the Wisconsin Department of Transportation. She remains active in the Society for Women in Engineering. At UW, she earned a master's degree in civil engineering and received the prestigious Hilldale Undergraduate Research Fellowship in 2001. Rebecca's research included Nondestructive Testing of Steel Bridge Members using the Time of Flight Diffraction Method. The research developed used ultrasonic technology to help bridge inspectors detect flaws such as cracking could lead to structural failure but aren't apparent in standard visual inspections. Rebecca was also active in research related to seismic responses in existing reinforced concrete buildings. The study was done in response to buildings that collapsed from earthquakes in California and Japan. The research helps engineers make informed decisions on whether to improve seismic resistance of existing buildings or raze the buildings and construct new buildings with more resistance.

### 2004

**Timothy Gates** is an assistant professor in the College Engineering at Wayne State University. His specialty is transportation engineering with a research emphasis on traffic engineering, operations, and safety. Tim teaches an undergraduate course in highway design and a graduate level course in pavement management. Tim currently serves as the secretary of the TRB Traffic Control Devices Committee.



Tim Gates

Timothy was a researcher at the Texas Transportation Institute from 2000-2003. He received his bachelor's and master's degrees in civil engineering from Michigan State University and a Ph.D in civil engineering from the University of Wisconsin-Madison in 2007.



# NEWSLETTER

**2005**

**Andrea Bill** is currently a graduate student and research/teaching assistant at the University of Wisconsin-Madison pursuing a Ph.D. in Civil Engineering, with an emphasis in traffic engineering and safety. She has taken courses in traffic safety, traffic operations, human factors, and statistics to gain the background for future work in traffic safety. Her current research incorporates aspects from each of these disciplines, with a specific emphasis on discovering new and innovative ways to analyze traffic crashes, especially among the young.



Andrea Bill

Currently, Andrea serves as the chair for the Civil and Environmental Graduate Student Committee. Andrea is a FHWA Dwight D. Eisenhower Graduate and an Eno Transportation Fellow. She is also a member of Chi-Epsilon (National Civil Engineering Honor Society) and Sigma Pi Sigma (National Honorary Physics Society). Prior to enrolling, Andrea was an associate researcher at the Massachusetts Traffic Safety Research Program for two years where she researched crash safety statistics and effect crash countermeasures.

**2006**

**Nicholas Hornyak** is currently completing his Ph.D in industrial engineering at Marquette University and plans a career in teaching. Nicholas received bachelor's and master's degrees in civil engineering from Marquette in 2003 & 2005. His master's thesis involved studying the effects of self-consolidating concrete on steel reinforcement. As a researcher, Nicholas focused on pavements materials, instrumentation, and structural mechanics and was part of a research team working on a flexible pavement instrumentation project on Interstate 43 north of Milwaukee, Wisconsin. Funded by the Wisconsin Highway Research Program (WHRP) and MRUTC, researchers recorded real-time data from embedded sensors to characterize structural behavior.

**2007**

**Bill Holloway** is currently working with the freight group at the main office of Cambridge Systematics in Austin, Texas. Bill has been actively involved in the Kansas Statewide Freight Plan research and the National Coordinated Freight Research Program (NCFRP) Project 05 - Framework and Tools for Estimating Benefits of Specific Freight Network Investment Needs. Bill has also been in a freight study for New Mexico and a train volume forecast for the Corpus Christi and Yoakum districts of Texas. Bill has a master's degree in urban and regional planning specializing in transportation and land use with an emphasis on public finance. He earned a bachelor's degree from Colorado College. As a CFIRE researcher from 2006-2008, Bill played a major role in production of the Wisconsin Trucker's Guide and in characterizing truck parking and freight flows for the Mississippi Valley Freight Coalition on expanded regional truck parking strategies



Bill Holloway

## 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
Advanced Steady Flow Modeling Using HEC-RAS 4.0	K307	May 18-19	Madison, WI
Calculating Water Surface Profiles	J970	April 16-17	Madison, WI
Railway Track Systems: Engineering and Design	K500	May 6-7	Elk Grove Village, IL
Drainage Engineering Fundamentals for Non-Engineers	K416	April 20-21	Madison, WI
Fleet Management - Effective Practices for Public and Private Fleets	K326	April 29-30	Madison, WI
Foundation Engineering and Design	K417	January 21-23	Madison, WI
Highway-Rail Grade Crossing Safety Course	K335	May 6-7	Madison, WI
Improving Public Works Construction Inspection Skills	K098	January 20-21	Madison, WI
Maintaining Asphalt Pavements	K117	January 22-23	Madison, WI
Municipal Engineering Fundamentals for Non-Engineers	K338	March 9-10	Madison, WI



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

## January

- 88th Transportation Research Board (TRB) Annual Meeting, January 11-15, 2009, Washington, D.C.

## February

- Technology & Maintenance Council (TMC) 2009 Annual Meeting and TMC Transportation Technology Exhibition, February 9-12, 2009, Orlando, Florida

## March

- 50th Annual Transportation Research Forum, March 16-18, 2009, Portland, Oregon
- ITE 2009 Technical Conference and Exhibit, *Transportation Operations in Action*, March 22-25, 2009, Phoenix Convention Center, Phoenix, Arizona

## April

- Mississippi Valley Freight Coalition 2009 Annual Meeting, April 14-16, 2009, Kansas City, Missouri. Hosted by the Missouri and Kansas Departments of Transportation. Sponsored by the Mississippi Valley Freight Coalition, CFIRE and the Great Lakes Maritime Institute

## May

- 34th Annual TRB Ports, Waterways, Freight, and International Trade Conference, May 4-6, 2009, Beckman Center of the National Academies, Irvine, California
- 20th Annual CTS Transportation Research Conference, May 19-20, 2009, Bloomington, Minnesota

## June

- ITS America's 2009 Annual Meeting & Exposition, "Moving America Forward," June 1-3, 2009, National Harbor, Maryland

## July

- Mississippi Valley Conference, *Today's Innovation= Tomorrow's Reality*, July 15-17, 2009, Amway Grand Plaza, Grand Rapids, Michigan. Hosted by the Michigan Department of Transportation.

## August

- Mid-Continent Transportation Research Symposium, August 20-21, Iowa State University, Ames, Iowa. Sponsors include the Center for Transportation Research and Education (CTRE), UW-Madison Midwest Regional University Transportation Center, Iowa DOT, Wisconsin DOT.

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. CFIRE has four signature technical areas of research as noted below.

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