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Transportation Funding and the Wisconsin Budget

The 2011-2013 Wisconsin Biennial Budget, introduced on March 1, 2011 by Governor Scott Walker will—if passed in its current form—have a profound effect on Wisconsin citizens and the State of Wisconsin as a whole. This budget, in combination with the Budget Repair Bill (S.B. 11), has created a great deal of controversy, especially regarding benefits of public employees, the collective bargaining rights of public unions, and the status of the University of Wisconsin—Madison as the flagship institution of the UW System. While these issues have received the bulk of media attention since these two pieces of legislation were introduced, both the Budget Repair Bill and the Biennial Budget include substantial changes to transportation investment in Wisconsin.

Unlike many other parts of the proposed Wisconsin budget, there are several proposed improvements

to transportation infrastructure investments. Specifically, it will improve the ability of our state to build and develop new freight and transportation corridors by advancing critical southeast Wisconsin highway projects. It will allow work to begin on highway expansions in several parts of the state, notably Interstate Highway 39-90 in south central Wisconsin and Highway 15 in the Fox Valley area. And it enhances the transportation fund by gradually adding revenue from vehicle sales taxes. This allows the transportation fund to be more diversified—something that transportation proponents have been advocating for some time. The diversified revenue base would allow transportation investments in maintenance, operations, and new construction of critical facilities.

However, there are several key challenges associated with transportation in the budget bills that

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From the Director's Chair



Spring has finally arrived in Madison after a long, cold winter in the Midwest. The snow from a winter's worth of storms has melted away, leaving salty and sandy roadways riddled with potholes. Another road construction season is getting underway. The ice on the Great Lakes and connecting rivers is breaking and freight is moving again through the St. Lawrence Seaway and our nation's inland waterways.

However, the transition from winter to spring has been anything but smooth. The recent earthquake and tsunami in northern Japan has—in the midst of massive destruction and human tragedy—caused a substantial disruption in the regional and global freight system. The land-based freight systems in the earthquake zone were either destroyed or severely curtailed. Major ports and airports were closed, disrupting the flow of cargo and air-freight. Freight is beginning to move again, but the global effects of this disruption and how long it will take to recover are not yet known. In the meantime, our thoughts are with those in Japan who are still recovering from this disaster.

In Madison, the Walker administration's Budget Repair Bill and proposed Biennial Budget are getting much attention here and abroad. Both of these legislative actions seek to reduce or eliminate collective bargaining rights for public unions, increase public employees' contributions for health care and pension benefits, and reduce or eliminate many publicly funded programs in all parts of state government. There's also a proposal to separate the University of Wisconsin-Madison from the rest of the UW system. The only certainty is that our dedicated CFIRE staff will be affected, but whatever the changes we will continue to focus on our core mission: sustainable freight and infrastructure and systems. We'll continue to conduct research, sponsor training opportunities and conferences, and educate the next generation of transportation professionals in order to help improve the freight transportation system of the United States.

On both the state and national levels, there are many questions and little meaningful discussion about how transportation—and everything else—should be funded and at what level. For some, there is a reluctance to face the fact that current revenues are declining in actual and real dollars. Some want to use financing solutions to solve the revenue problem. Others say we should work toward a Vehicle Miles Traveled (VMT) tax but cannot offer a short-

term solution. There is a faint glimmer of reality: while at the Wisconsin TDA fly-in in Washington, DC last week, I heard distant rumblings of a gas tax increase. In this issue of the CFIRE News, we examine the effect of the proposed biennial state budget on transportation in Wisconsin. This article is the first in a new ongoing series that examines the pros and cons of current transportation policy and funding at the state, regional, and national levels.

The importance of an efficient freight transportation system became all the more clear with the publication of the 2010 Urban Mobility Report. As the result of the collaboration of CFIRE researchers with mobility researchers at the Texas Transportation Institute, this most recent edition of the UMR includes information about truck delay and commodity value for each of the 101 US urban areas included in the report. It's now possible to see the true cost of congestion on freight movements: \$33 billion nationwide for truck delays alone.

While we continue to work on a wide array of ongoing research projects, we're also gearing up to evaluate and award funding for projects in CFIRE's fifth grant year. The proposal submission deadline recently passed and there were at last count more than twenty project proposals distributed across the Center's four Signature Technical Areas of Research (STARs). As spring turns into summer, we'll announce which projects have been accepted for funding.

And finally, we congratulate Erica Bickford, our 2010 Student of the Year in Transportation. Ms. Bickford is a PhD candidate in the Nelson Institute for Environmental Studies at the University of Wisconsin-Madison. Her research focuses on environmental science, transportation, and policy.

Teresa Adams, PhD
CFIRE Director

Contributors

Content and photographs for this edition of the CFIRE News were contributed by Teresa Adams, Erika Bickford, Jason Bittner, Bob Gollnik, Jessica Sanfilippo, Steve Wagner, Greg Waidley, and Ernie Wittwer.

Continued from page 1...

will have tremendous impact on the state's residents. First, the proposed budget removes transit from the transportation fund altogether and shifts it to the general fund. This modification will make transit more susceptible to cuts and competing forces within the general fund budget (a budget already constrained by other provisions in the legislation). When across-the-board cuts are made, the transportation fund has been relatively protected; under the new model, transit systems will be required to pare back even further. New investments in pedestrian and bicycling infrastructure will have to take a back seat as the budget also removes program funding for these initiatives. Livability initiatives are passed over in favor of increased attention on highway development.

The Wisconsin DOT stands to lose 175 positions under the bill, placing additional stress on the Department to deliver its \$6 billion in programs. A rash of retirements is also expected. Nearly 50 percent of the transportation workforce is nearing retirement eligibility. This knowledge departure will pose challenges to the agency in program development and continued operations.

The proposed budget includes substantial cuts in transportation aids to municipalities. Combined with the Budget Repair bill, which makes increases in property taxes nearly impossible without substantial referendum efforts, the acts will mean that municipalities will need to maintain and operate their systems on 10 percent fewer dollars. This will encourage even greater use of deferred maintenance practices, costing the traveling public dearly in years to come. The trade-off is simple. Faced with growing shortfalls, municipalities will need to reduce the amounts dedicated to maintenance and operations. Snow removal will suffer. Mowing and clearing debris will be curtailed or eliminated. Lane markings, sign replacements, and pothole filling will need to be reduced. It may be that serious discussions will occur about the vast size of our roadway network, but in all likelihood reduced maintenance will be the norm. February 2011 saw the lowest number of fatalities on state highways since records have been kept. Whether it will be possible to continue to keep highways in Wisconsin safe and meet our Zero in Wisconsin goals with reduced funding for enforcement, maintenance, and operations very much remains an open question.

The Budget Repair Bill will also affect transportation funding and create challenges for maintaining the high quality of life in Wisconsin. Eliminating the collective bargaining rights with public unions will cost the state \$46 million in federal support for transit programs. Transit operators in Appleton and La Crosse have already

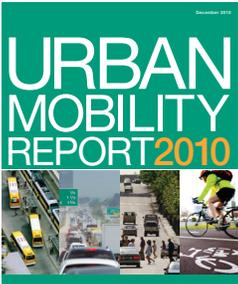
indicated that they cannot fill that gap and will likely abandon their transit programs entirely. Systems in Madison and Milwaukee and other communities will likely remain operational but service will be drastically reduced. The impact is disproportionate on the elderly, disabled, and poor residents of Wisconsin. It's become all too clear, based on the listening sessions that CFIRE researchers have conducted as part of the Addressing Elderly Mobility Issues in Wisconsin (CFIRE 04-05) project, that many elderly residents rely on public transit systems and their associated specialized services to get around—to medical appointments, to get groceries, and to be active in their communities. Cuts to transit funding in both the proposed budget and in the Budget Repair Bill will likely cripple the ability of those who rely on transit to be able to use these systems to remain mobile.

The Budget Repair Bill also includes possible cuts to medical transportation programs as part of changes to the way that Medicaid funding is handled around the state. While the Walker administration has not provided final details about these cuts, it's possible that changes to program eligibility and the allocation of funding will further isolate older Wisconsinites and make them face hard choices in order to make ends meet. Some have suggested that volunteer driver programs can fill this gap, but our research and feedback from Wisconsin's older residents makes it clear that these programs are unreliable, inconsistent, and often oversubscribed. To make matters worse, volunteer driver programs in rural areas often rely on mileage reimbursements from Medicaid and other state assistance programs. Volunteer programs will face further problems as the cost of fuel continues to rise. These factors will combine to create far-reaching problems for the state of Wisconsin and its older residents in particular.

Significant investment in our freight infrastructure has to occur to make our economy stronger. The budget does provide for continuations in the freight rail programs and for some harbor maintenance. However, the needs for investment in freight infrastructure far outweigh available resources. Without alleviating freight bottlenecks that constrain the efficient goods movements, our competitiveness with China and Brazil is weakened and the US economy suffers. Yet, there is little willingness to raise revenue to make these investments.

Taking all of these proposals together, it seems clear that the state of Wisconsin faces new challenges in delivering a transportation and other areas should the Biennial Budget and the Budget Repair Bill pass in their current forms.

The Economic Impact of Traffic Congestion on Truck-borne Freight



The 2010 Urban Mobility Report, the most accurate picture of traffic congestion in 101 US urban areas, now includes information about truck delay and the economic impact of congestion specific to trucking. This work was done under the auspices of the Development of an Areawide Estimate of Truck Freight Value in the Urban Mobility

Report (CFIRE 04-16) project, led by CFIRE Associate Director Jessica Guo and Deputy Director Jason Bittner in partnership with David Schrank and Bill Eisele at the Texas Transportation Institute.

This project expands upon a framework for estimating commodities moving on the roadways through and within a given city. The original framework, developed by the Texas Transportation Institute as part of their ongoing work on the Urban Mobility Report, uses the Federal Highway Administration’s Freight Analysis Framework (FAF) database to identify the commodities in the trucks that originate and terminate in a given city, as well as pass through it. The research team created and tested a methodology for generating truck freight values using case studies in Austin, Texas, and Denver, Colorado, and are in the process of refining it for Milwaukee, Wisconsin under this project. An early version of the resulting areawide freight value methodology was used in the 2010 Urban Mobility Report to develop freight value estimates for all 101 urban areas included in the report.

Of the 101 urban areas included in the 2010 Urban Mobility Report, seventeen are located in the Midwest. Two of these are very large urban areas (Chicago and Detroit), while there are nine large urban areas (Minneapolis-St. Paul, St. Louis, Indianapolis, Milwaukee, Louisville, Kansas City, Cincinnati, Cleveland, and Columbus), five medium urban areas (Wichita, Grand Rapids, Akron, Dayton, and Toledo), and one small urban area (Madison).

In these urban areas alone, delays represent nearly \$6 billion (of the \$33 billion nationwide) in freight-related congestion costs for the more than \$1.3 trillion of total commodity value that moved through these areas in 2009.

Larger, more densely populated urban areas have greater traffic volumes and consume more goods and thereby have higher total commodity values. This research also illustrates the important role of long transportation corridors in freight movement. A number of smaller urban areas along major East-West interstate highway corridors—such as Milwaukee, Columbus, and Madison—have commodity values rankings much higher than their delay rankings. This means that while there is less congestion impeding freight movement through these urban areas, it also means that these areas form crucial links in much larger freight transportation systems. “Wisconsin’s Interstate and US highway corridors help serve the whole nation,” says Bittner. The same is true of most—if not all—of the other Midwest states.

The 2010 Urban Mobility Report also suggests a number of operational treatments for reducing congestion in

Urban Area	Total Delay Ranking	Truck Delay Ranking	Commodity Value Ranking
Chicago	3	1	1
Detroit	12	15	6
St. Louis	21	17	16
Minneapolis-St. Paul	17	19	15
Milwaukee	33	34	20
Kansas City	34	35	18
Cincinnati	36	32	28
Cleveland	35	46	19
Indianapolis	38	31	22
Louisville	47	45	34
Columbus	50	51	23
Grand Rapids	68	69	43
Dayton	70	75	50
Wichita	75	79	88
Akron	76	80	75
Toledo	84	89	72
Madison	91	93	57

urban areas–freeway incident management, freeway ramp metering, arterial street signal coordination, arterial street access management, and high-occupancy vehicle lanes–and the particular urban areas where these strategies are applicable. For example, the report suggests that all of these strategies except HOV lanes would be beneficial in Milwaukee and Chicago.

CFIRE researchers also have identified several strategies for reducing congestion, including identifying and mitigating bottlenecks and removing artificial restrictions such as delivery prohibitions and lane restrictions. Guo has led national efforts to better identify and alleviate bottlenecks in the trucking network. “Findings to date about truck delay and freight bottlenecks calls for more comprehensive and localized analysis of the causes of and solutions to freight bottlenecks,” says Guo. “Cooperation between states, as well as between the public and private sectors, is vital to ensuring that valuable and limited resources are distributed such that they reduce freight congestion in a prudent and cost-effective manner.”

“As our economy begins to rebound, it is critical that shipments navigate the supply chain distribution system efficiently. Unfortunately, the cost to the economy of congestion—and specifically freight congestion—is too high,” says Bittner. “We offer some solutions, but at the end of the day, we need to recognize that if we don’t invest in the system, our competitiveness will suffer here and abroad.”

The 2010 Urban Mobility Report is published by the Texas Transportation Institute and uses a wealth of traffic speed data provided by INRIX, a leading private-sector provider of travel time information.

Bickford 2010 UTC Student of the Year



Erica Bickford has been named the University Transportation Center 2010 Student of the Year in Transportation. CFIRE Director Teresa Adams presented Bickford with this award at the 14th Annual Council of University Transportation Centers Awards Banquet, held on January 22, 2011 in conjunction with the 2011

Transportation Research Board Annual Meeting.

Bickford is a PhD candidate in the Nelson Institute for Environmental Studies at the University of Wisconsin-Madison. In addition to a PhD in Environment & Resources, she is also pursuing certificates in Transportation

Management and Policy (TMP) and Air Resources Management.

Bickford is the lead graduate researcher on two projects funded by CFIRE and conducted by the Nelson Institute for Environmental Studies under the leadership of CFIRE Associate Director Tracey Holloway.

- Long Term Environmental Sustainability for Freight Transport (CFIRE 02-09)
- Freight from Space: Evaluating Freight Activity and Emissions Trends from Satellite Data (CFIRE 04-20)

These two projects together form the basis for Bickford's dissertation.

In addition to her research, she recently participated in two policy-related conferences: the Eno Leadership Development Conference and the American Meteorological Society's Summer Policy Colloquium. And in 2009, she participated in the International Institute for Applied Systems Analysis' Young Scientists Summer Program in Vienna, Austria, where she worked on projects that considered the potential for new technologies to reduce greenhouse gas emissions from on-road transportation and the effects of uncertain future fuel prices on technology costs.

“Before I started research with CFIRE, I knew very little about the transportation field. Through my CFIRE research, and the Transportation Management & Policy certificate program, I have learned about the policies, logistics, infrastructure, and economics that comprise our transportation system,” says Bickford. “I have participated in prestigious policy workshops, an international summer research program, and presented at several academic conferences—all of which has helped prepare me for a future as a transportation researcher.”

Bickford will complete her PhD in 2012. After she graduates, she plans first to gain experience in the policy arena and then pursue a career working at the nexus of environmental science, transportation, and policy.



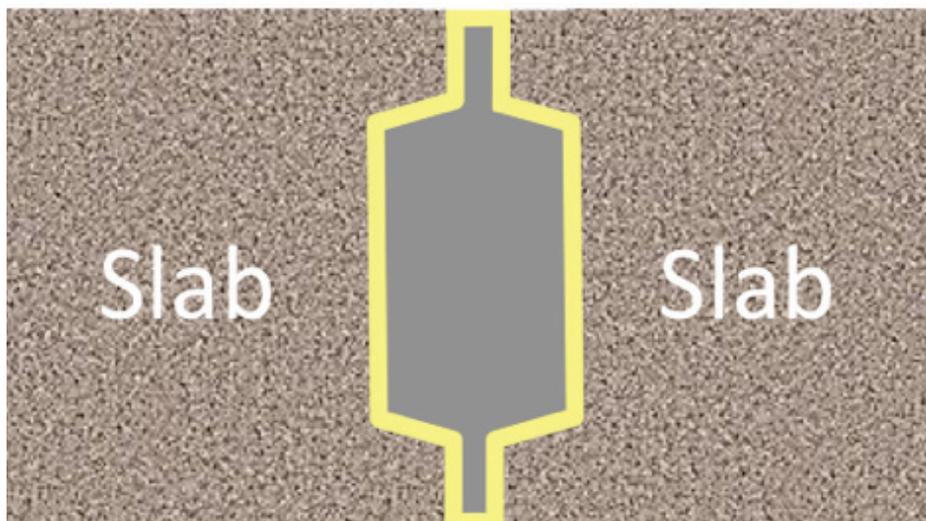
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Nanoporous Thin-Film Additives for Improving Pre-Cast Concrete

Studies show the advantages of using precast slabs in construction of bridges, but there are still problems and limitations related with connecting precast concrete units. The existing grouted joints often create a precracked condition due to low grout bond adherence with the hardened concrete and grout shrinkage. Failures lead to the development of leaking, freeze-thaw pockets, and a gradual degradation of the joints. These problems lead to intensive and costly maintenance operations.

Additionally, even though precast concrete components represent high quality final products, major opportunities exist for improving their performance. New high strength prestressed components often demand excessively high early strength to allow early prestress application, in less than a day after casting, often achieved by high cement contents. With the high cement content these mixes may also exhibit high shrinkage and creep that are undesirable in precast production.

This project—Nanoporous Thin-film Additives to Improve Precast Concrete Construction of Transportation Facilities (CFIRE 03-13)—is investigating both the ability of nanomaterials to improve the bonding strength of grout to finished concrete surfaces in joints between precast bridge components and the strength of the interfacial transition zone (ITZ) in the concrete itself. The project team is led by Dr. Marc Anderson (PI) and includes Dr. Michael Oliva, Dr. Isabel Tejedor, and graduate research assistant Jessica Sanfilippo.



Configuration of the female-female joint.

To address the first problem of grout bonding strength, the research team is currently investigating the ability of nanoparticle solutions to form a reactive film on the

surface of the precast concrete allowing grout to better bond to the finished surface. At this point, they have tested several different application methods of the materials and determined that by liberally painting these materials onto the slabs allows the material to access the pores of the concrete surface in a slip-casting manner. This method of application allows ample reactive materials to exist at the interface of the grout and precast concrete for increased bonding strength.

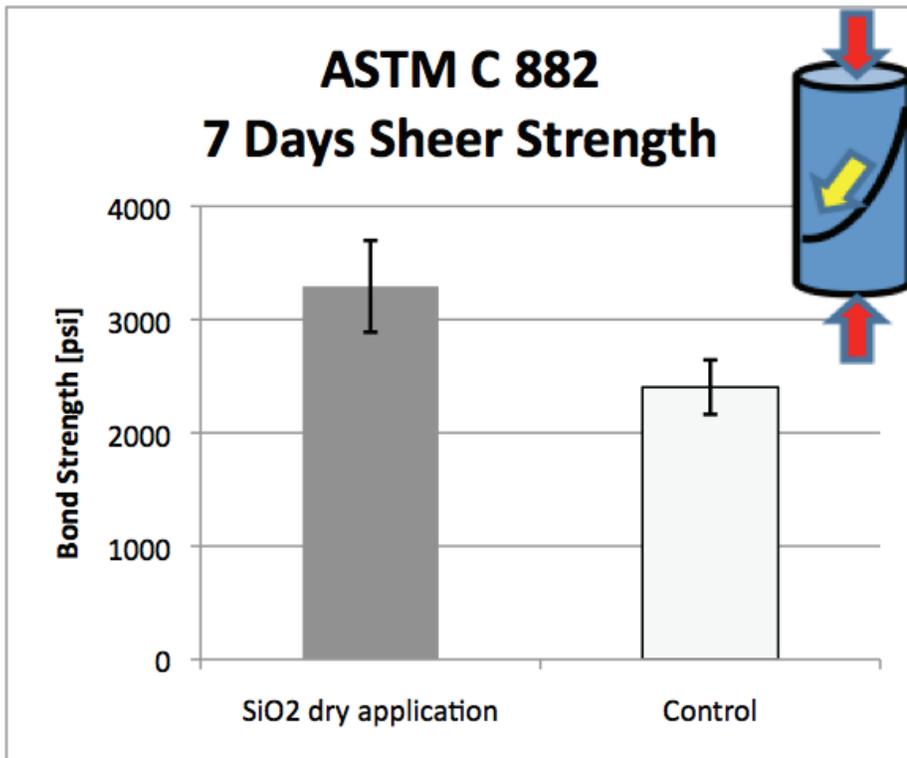
The researchers have also previously found that the same nanoparticle solutions will increase early compression, tension, and flexure strengths as the interfacial transition zone (ITZ) is improved by changing the composition of this important region of concrete. A hypothetical increase in early strength should require less cement in the mixes, which in turn will decrease the high shrinkage and creep seen in current production.

At the time of writing, the research team has preliminary results to support the conclusion that the nanomaterials can increase the bond strength between grout and precast specimens. They have conducted two types of shear tests to determine changes in bonding strength. First we conducted ASTM C 882 tests using 3x6 cylinders cut at an angle and rejoined by grout. These specimens were then subjected to compressive loading to test the shear and compression strength.

Secondly, the project team fabricated L-shaped cubic blocks that they joined together in the same fashion as in the previous test. These shape factors allowed them to better test only shear strength. Furthermore, these specimens are easier to manufacture than the cut 3x6 cylinders. By comparing the results of the ASTM standardized test to this shear test, they were able to determine the accuracy of their test. The researchers found that by using their nanomaterials, they are able to increase the strengths in both tests.

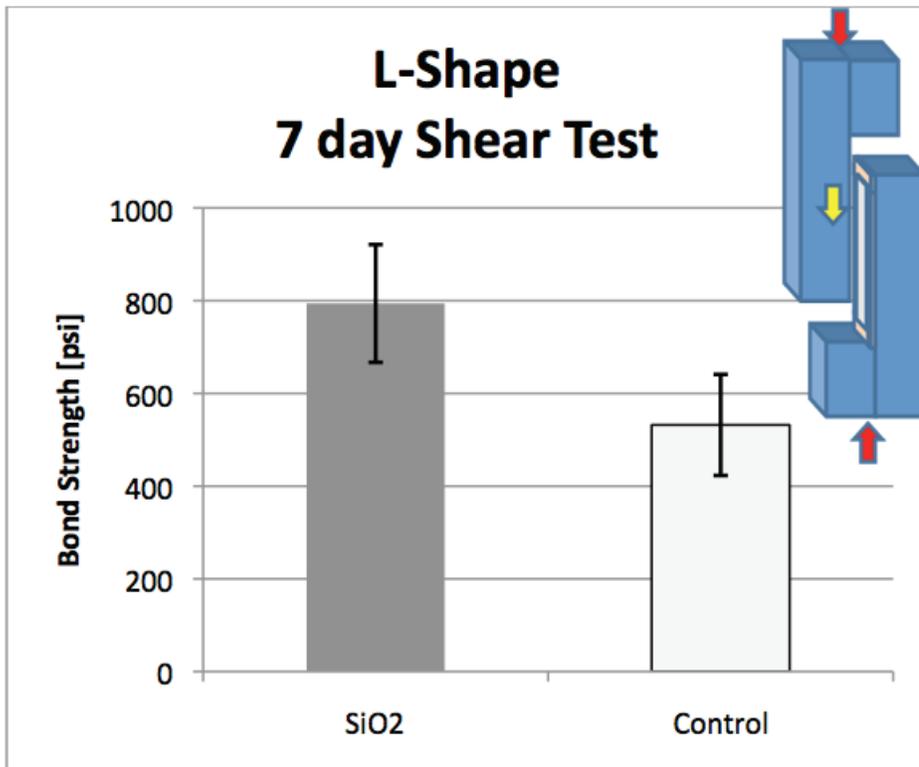
To date, preliminary results in the research team's efforts to determine the ability of these nanoparticulate

materials to improve the precast specimens themselves have been inferior to their previous findings with concrete pavements. Their previous studies—presented at the



7 day slant shear results from ASTM C 882 test.

First International Conference in North America on Nanotechnology in Cement and Concrete—used gravel aggregates while this study employs dolomite limestone aggregates. They have found the effectiveness of their materials to improve the ITZ depends greatly on the type of aggregate used in the concrete. These results were found by comparing previously conducted shear and compression strength tests at early ages using ASTM C 496 and ASTM C 39 respectively. The researchers have determined that based on the composition of the dolomite limestone aggregate, the film that is applied is consumed by the Calcium in the dolomite limestone leaving no reactive material left on the surface when the cement comes in contact with the aggregate during the mixing process. To address this issue, they employed a secondary nanoporous film as a barrier between the reactive layer and the aggregate. Unfortunately, this procedure did not improve strengths in either compression or tension.



7 day shear results utilizing ASTM C 39 load specifications.

Next, the project team will add a durability test to determine the efficacy of their coating applications. In particular, they are interested in freeze-thaw durability as it pertains to grout adhesion. They will run ASTM C 666 in order to determine if our materials, when applied to the interface, can improve the durability of the joint. They will also continue mechanical testing to determine the parameters that produce the greatest improvement in joint bonding. For example, the number of coatings applied, the time devoted to drying, and lastly the time allowed for application in advanced. At this point, they are transitioning into larger scale testing since the research has narrowed our material testing needs.

For more information about this project, visit cfire.wistrans.org.

Transit Planning 101

More than 40 people attended a recent Transit Planning 101 workshop sponsored by CFIRE and HNTB at the UW-Madison Pyle Center on Wednesday, February 23, 2011. The workshop was designed by Chris Kopp, a transportation planning manager at HNTB's Chicago office and organized by CFIRE Researcher Bob Gollnik.

This workshop aimed at introducing transit planning concepts in the short-form to all experience levels. Topics covered included: What is transit? Transit planning process, Market analysis, System planning, Transit-supportive land use, Service planning, Cost estimates, Financial analysis, and Governance. Graduate students comprised the majority of the audience, though Wisconsin Department of Transportation, Capital Area Regional Planning Commission, City of Madison, Madison Metro Transit, and other public and private organizations were also represented.

CFIRE Research and Education Coordinator Greg Waidley also attended the workshop. "Transit Planning 101 was an excellent foundation for further study in transit and was clearly a hit with students of the Transportation Management and Policy (TMP) certificate program as close to half of them enrolled in the TMP were in attendance at the workshop," says Waidley.

You can also download the presentation from this workshop at cfire.wistrans.org/documents/TransitPlanning101-Final.pdf.

CFIRE Website Remodeled

The CFIRE website underwent a major overhaul in the first quarter of 2011 and went live during the Transportation Research Board Annual Meeting.

The centerpiece of the new CFIRE website is a blog, which the CFIRE communications staff uses to provide updates about events, research, and news relevant to the freight transportation community. You can read this blog on the website itself, or subscribe to the RSS feed. Updates to the blog are also automatically pushed to the CFIRE Twitter timeline. You can also add your comments and feedback to each blog post.

In addition to the new blog, the website boasts a simple design that both makes it more readable and easier to navigate and search.

Visit the CFIRE website at cfire.wistrans.org.

2011 Regional Future City Competition

On January 22, 2011 the MSOE Kern Center in Milwaukee, Wisconsin was filled with more than sixty teams from 19 different schools for the 2011 Wisconsin Regional Future City Competition. This year, students presented solutions to a timely challenge: provide a reliable and effective health care product or system that will improve the quality of life and care of those who are injured, ill, or handicapped.

The Future City Competition also includes a number of special awards, including Best Freight Transportation Network, an award sponsored by CFIRE and judged by Center staff and students. CFIRE Research and Education Coordinator Greg Waidley was joined by research assistants Byron DeLuke and Rosa Kozub in the hectic round of judging required to select the winner of this award.



"This year saw a doubling in the number of teams competing. The students really embraced the competition and it always surprises me how prepared and knowledgeable they are at such a young age—not to mention their ability to handle the stress of presenting in front of about 200 parents, teachers, and judges," says Waidley. "This competition is a tremendous tool to get young people to think about engineering challenges and to prepare them for a future in a STEM career."

The Best Freight Transportation Network award went to the team from Roosevelt Middle School for "Enterprise."



CFIRE Research Presented at the 2011 TRB Annual Meeting

At the 2011 Transportation Research Board Annual Meeting, CFIRE researchers presented the results of a wide array of freight- and infrastructure-related projects.

Workshop 137: Integration of MOVES and Dynamic Traffic Assignment Models for Fine-Grained Transportation and Air Quality Analyses. Jie (Jane) Lin, University of Illinois, Chicago.

Poster Session 245: Understanding Consequences of Panama Canal Expansion on Midwest Grain and Agricultural Exports. Jason Bittner, Robert Gollnik & Timothy Baird, University of Wisconsin–Madison.

Session 324: Establishing Online Compendium Tool for Management of Wisconsin Local Roads. Jason Bittner, Dadit G. Hidayat & Joshua Levine, University of Wisconsin–Madison.

Session 388: Applying Lean Techniques in the Delivery of Transportation Infrastructure Projects. Awad S. Hanna, Michael Wodalski & Gary Whited, University of Wisconsin–Madison.

Session 416: Low-Cost Knowledge Management Techniques for Use in a Changing Workforce. Ernie Wittwer & Teresa Adams, University of Wisconsin–Madison.

Poster Session 479: MOVES Versus MOBILE: Comparison of Greenhouse Gas and Criteria Pollutant Emissions. Suriyapriya Vallamsundar & Jie (Jane) Lin, University of Illinois, Chicago.

Session 528: Comparison of Earthwork Computation Methods. Cassie A. Hintz, University of Wisconsin–Madison; Alan Vonderohe, Vonderohe Consulting, LLC

Session 532: Evaluation of Variables Affecting Sustainable Highway Design Using BE2ST-in-Highways System. Jin Cheol Lee, Tuncer B. Edil, Craig H. Benson & James M. Tinjum, University of Wisconsin–Madison.

Poster Session 557: Evaluating Freight Transportation Resilience on a Highway Corridor. Teresa Adams, Kaushik Reddy Bekkem & Vicki M. Bier, University of Wisconsin–Madison.

Poster Session 611: North-West Passage Corridor-wide Commercial Vehicle Permitting. Robert Gollnik, Ernie Wittwer, Dan Kleinmaier & Patrick Fuchs, University of Wisconsin–Madison.

Session 614: Freight Resiliency Performance Measures: Hudson-to-Beloit Corridor, Teresa Adams, University of Wisconsin–Madison.

Poster Session 675: Transshipment Problem in Travel Forecasting: Tour Structure Model. Alan J. Horowitz & William J. Melendez, University of Wisconsin–Milwaukee.

Poster Session 738: Firm-Based Freight Demand Modeling Framework: Capturing Intrafirm Interaction and Joint Logistic Decision Making. Qi Gong & Jessica Y. Guo, University of Wisconsin–Madison.

Poster Session 738: Modeling Commercial Vehicle Daily Tour Chaining Patterns. Minyan Ruan, Jie (Jane) Lin & Kazuya Kawamura, University of Illinois, Chicago.

Poster Session 738: Freight Resiliency Performance Measures: Hudson-to-Beloit Corridor. Teresa Adams & Edwin J. Toledo-Durán, University of Wisconsin–Madison.

Wisconsin Transportation Reception at the TRB Annual Meeting

On January 23, 2011 CFIRE joined the Transportation Development Association (TDA) of Wisconsin and a host of other sponsors to kick off the 2011 Transportation Research Board Annual Meeting with the Wisconsin Transportation Reception.

More than 200 attendees spent time networking with colleagues and talking about a wide range of transportation issues. And unlike last year, the Packers pulled out a win to continue their march toward another Super Bowl Championship.



Upcoming Events

Mid-America Freight Coalition Conference and Annual Meeting

April 26-28, 2011, St. Louis, Missouri

midamericafreight.org/events/2011am/

International Transportation Economic Development Conference

May 1-4, 2011, Charleston, West Virginia

www.trb.org

2011 Transportation Planning, Land Use, and Air Quality Conference

May 10-11, 2011, San Antonio, Texas

www.trb.org

13th TRB National Transportation Planning Applications Conference

May 8-12, 2011, Reno, Nevada

www.trb.org

3rd International Conference on Roundabouts

May 18-20, 2011, Carmel, Indiana

www.trb.org

4th International Transportation Systems Performance Measurement Conference

May 18-20, 2011, Irvine, California

www.trb.org

28th International Bridge Conference

June 5-8, 2011, Pittsburgh, Pennsylvania

www.trb.org

Using National Household Travel Survey Data for Transportation Decision Making: A Workshop

June 6-7, 2011, Washington, DC

www.trb.org

Joint Harbor Safety Committee and Area Maritime Security Committees Conference

June 7-9, 2011, Houston, Texas

www.trb.org

CUTC Summer Meeting

June 13-15, 2011, Portland, Oregon

otrec.us/events/special/CUTC

2011 TRB Joint Summer Meeting

July 10-13, 2011, Boston, Massachusetts

www.trb.org

2011 International Visualization in Transportation Symposium

August 20-23, 2011, Chicago, Illinois

www.trb.org

Mid-Continent Transportation Research Symposium

August 18-19, 2011, Ames, Iowa

intrans.iastate.edu/events/midcon2011/

Emerging Issues in Safe and Sustainable Mobility for Older People

August 30 - September 1, 2011, Washington, D.C. Area

www.trb.org

Smart Rivers 2011 Conference: "Systems Thinking"

September 13-16, 2011, New Orleans, Louisiana

www.trb.org

Professional Development Courses

For more information about transportation-related professional development courses available through the University of Wisconsin–Madison Department of Engineering Professional Development, visit their website at epd.engr.wisc.edu/courses. Courses marked with an asterisk (*) are eligible for CFIRE scholarships.

Effective Roadway Lighting

April 26-28, 2011, Madison, Wisconsin

Fundamentals of Railway Train Control and Signaling*

May 10-11, 2011, Madison, Wisconsin

Solving Neighborhood Traffic Problems

June 20-22, 2011, Madison, Wisconsin

Highway Bridge Design

December 5-7, 2011, Madison, Wisconsin

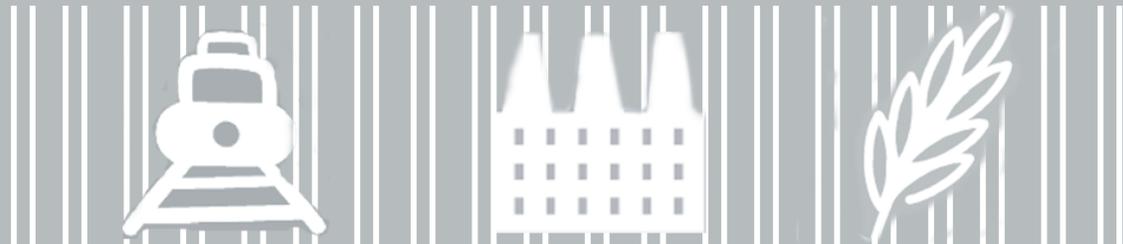
Improving Intersection Safety and Efficiency

February 14-16, 2012, Madison, Wisconsin

Traffic Impact Analysis and Access Design

April 10-12, 2012, Madison, Wisconsin

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About CFIRE

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–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.



2011 Mid-Continent Transportation Research Symposium

August 18–19, 2011
Iowa State University, Ames, Iowa

Visit intrans.iastate.edu/events/midcon2011/ for more information.

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