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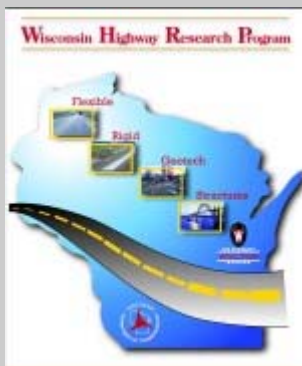
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Message From the Technical Director

With this newsletter we open another venue for updating the Wisconsin highway community on its investment in WHRP. We saw a number of firsts this past quarter.



We selected a first set of implementation projects, which will begin this month. Projects were chosen from completed WHRP reports and will be led by a WisDOT staff member and each study's original principal investigator.

We participated for the first time in two important conferences. At the Mid-continent Transportation Research Forum, held here in Madison, WisDOT technical staff and WHRP researchers presented 12 studies. At the AASHTO Research Advisory Committee Annual Meeting, held in Columbus, Ohio, we learned about and shared our experience about partnerships among universities and state agencies.

We launched the Web site for the "Frozen Four" pooled fund project. Named after a college hockey tournament, this project's goals involve not skates and pucks but coordination of the pavement research activities and findings of four cold-weather states coping with similar conditions.

In July, our new Program Manager Andrew Hanz joined us and we are already benefiting from his technical and administrative skill.

The quarter wasn't all about firsts, however. The Steering Committee approved the budget for 12 new projects recommended by our Technical Oversight Committees for fiscal year 2007. We completed a number of projects, including one we feature this quarter on non-nuclear tools for measuring HMA density.

We hope you will enjoy reading about these topics and more in this and future e-newsletters. Please send your comments, questions, or ideas about the newsletter, or any WHRP matter, to Andrew or myself.

Hussain Bahia, UW-Madison College of Engineering
bahia@engr.wisc.edu, (608) 265-4481

Program Update

New Program Manager: Andrew Hanz

When you first meet Andrew Hanz he's friendly, a little shy, his energy held at bay. A Wausau native, Hanz spent summers in high school and college grading and crushing aggregate for road projects.

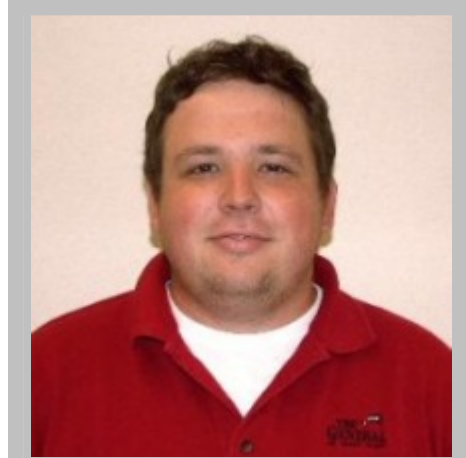
Hanz has a strong grasp on highway technology in the classroom, the field, and the laboratory. He earned his B.S. in Civil Engineering at UW-Madison, and expects to complete his master's degree with a focus on construction materials in 2007.

In the field Hanz has worked as a QC/QA supervisor for constructing base courses for the US 51/WIS 29 Interchange. He's prepared earthwork estimates for subdivisions and commercial sites in Janesville, and helped plan and manage a WIS 13 overlay near Wausau.

Hanz has also been a research assistant for WHRP projects on moisture damage in asphalt mixtures and on the use of the Superpave gyratory compactor in determining mechanistic properties of hot-mix asphalt. He's now working on calibration of the new AASHTO Mechanistic-Empirical Design Guide.

As Program Manager for WHRP, Hanz looks forward to working with the TOCs, expanding his growing knowledge of pavements and learning more about soils and structures. "It's a great opportunity," he explains. "I've always wanted to have a broad-scope, general knowledge of pavements, structures and geotechnics."

Contact Andrew at ajhanz@wisc.edu or (608) 262-3835.



Andrew Hanz, WHRP's new Program Manager

Fiscal 2007 Research Projects Look to Wisconsin's Future

With 37 research projects finished since work began in 1999, and another 30 in progress, WHRP continues to look ahead. On July 21, the WHRP Steering Committee approved the 2007 budget with funding for 12 projects, three from each of the four TOCs.

The Rigid Pavements TOC will fund the final year of a five-year FHWA Pooled Fund Project on preventing premature distress by optimizing materials and construction. A new project focuses on detecting clay fines in concrete aggregates before mixing. Another looks to improve full-depth concrete repair.

The Flexible Pavements TOC will extend a pair of studies into a second phase. One focuses on targeting in-place permeability and density values for contract specifications, another on continued collection and online posting of data from instruments installed in the deep-strength asphalt of the Marquette Interchange Project. The third study will evaluate the effectiveness of open-graded friction courses in Wisconsin.

The Structures TOC will extend monitoring of load distribution sensors installed through a federal project on a 270-foot land bridge in Vernon County. Research will also address fiberglass wraps of deteriorating concrete bridge columns, and the use of precast substructural elements to speed up bridge construction.

One Geotechnics TOC study will compare three methods for determining the load-bearing capacities of piles. Another study will develop methods for mechanistic analysis of pavement supported by geogrid-reinforced aggregate. A third will test an idea proposed by Wisconsin contractors to use steel plates rather than concrete cylinders as anchors for post-and-panel retaining wall foundations.

For more information contact:

Jim Parry (Rigid TOC) at james.parry@dot.state.wi.us

Len Makowski (Flexible TOC) at leonard.makowski@dot.state.wi.us

Scot Becker (Structures TOC) at scott.becker@dot.state.wi.us

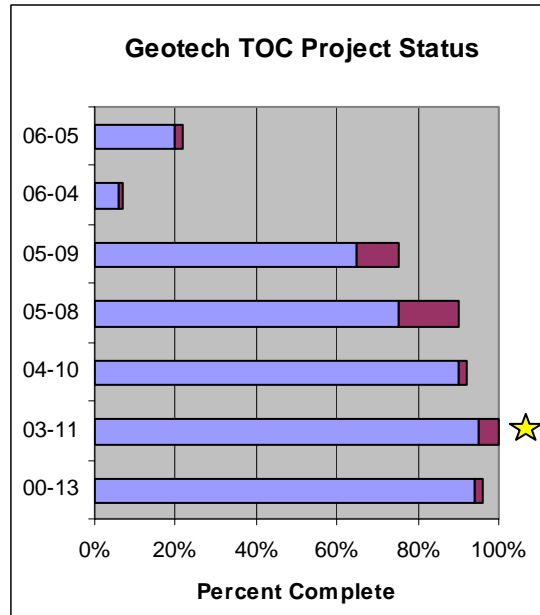
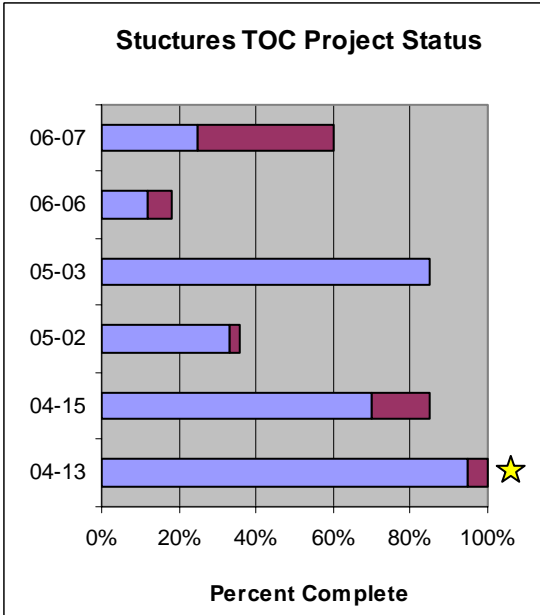
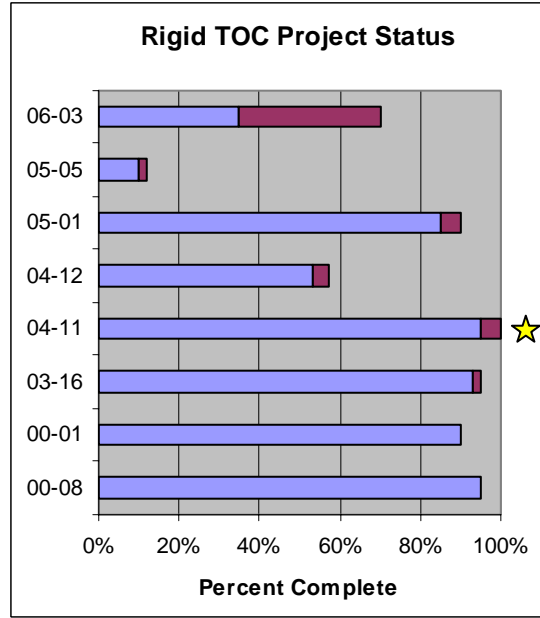
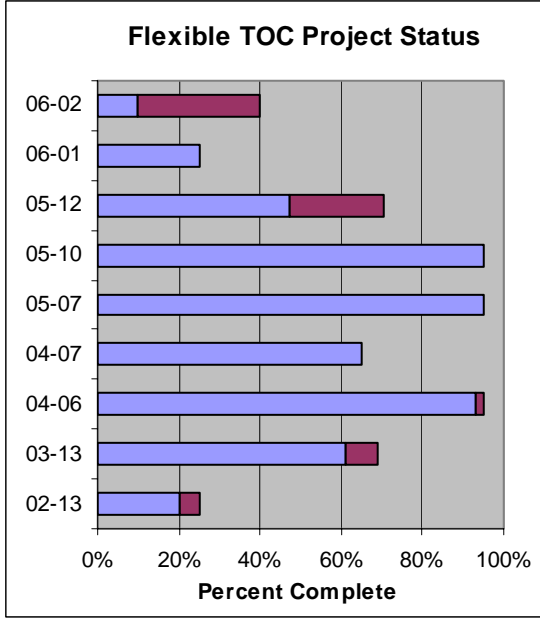
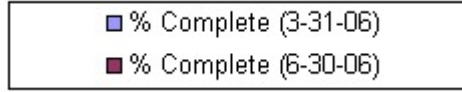
Bob Arndorfer (Geotechnics TOC) at robert.arndorfer@dot.state.wi.us



Fiberglass wraps provide support for deteriorating columns, but may not prevent further decay. WHRP will assess their net benefit.

Project Status at a Glance

As of the June 2006, there were 30 active WHRP projects. Three of these projects were completed during the second quarter.



Research in Focus

Getting Nukes Out of Asphalt Density Measurement

Project 0092-05-10, Non-Nuclear Density Testing Devices and Systems to Evaluate In-Place Asphalt Pavement Density

Since the early 1990s, WisDOT's asphalt paving engineers have used nuclear density gauges to assess new pavement quality. An alternative to pulling cores from pavement, nuclear gauges offer quick, accurate and non-destructive assessments of asphalt density, a critical characteristic of pavement quality.

However, the gauges and their radioactive materials require special care, extensive training, and annual certification to ensure safe transport and use. And even when used well, these gauges struggle to produce consistently accurate readings on coarse Superpave or stone matrix asphalt mixes.

A quick and effective non-nuclear density gauge would reduce risk and save training and handling time and money. So WHRP turned to Bob Schmitt at University of Wisconsin-Platteville to test non-nuclear density gauges against WisDOT's nuclear version and recommend a replacement.

Schmitt, co-authors Chetana Rao and Harold Von Quintus of Applied Research Associates in Texas, and UW-Platteville students Aaron Christ and Nicholas Hoernke worked with engineers from WisDOT regions and the Madison materials testing lab, as well as with 17 contracting companies, testing firms, and manufacturers.

After extensive testing around Wisconsin of three non-nuclear gauges, Schmitt's team found the Troxler PaveTracker 2701b to be the most accurate alternative. WHRP may fund further research in this area to resolve calibration issues and make this project's findings standard WisDOT practice.



This PaveTracker density gauge, shown measuring asphalt samples, operates effectively without radioactive materials.

Regional and National Collaboration

Frozen Four Meets to Compare and Consolidate Research Efforts

Wisconsin isn't alone. Other states struggle with similar challenges in designing, constructing and maintaining durable pavements. So it made sense for WisDOT to lead a pooled fund study called the North Central Pavement Research Coordination Partnership, nicknamed the Frozen Four. WHP manages this pooled fund project for WisDOT.

The Frozen Four draws together state transportation engineers from Illinois, Michigan, Minnesota and Wisconsin. Under the leadership of WHP Technical Director Hussain Bahia, representatives from each agency met in February to start comparing current and planned research.

Participants quickly identified the need for a Web site for information sharing on the overall Frozen Four project as well as on the pavement and soils research in each state. By the time representatives met again in May, the Web site was up and running at <http://www.frozenfour.us/>.

A five-year snapshot shows that Frozen Four states manage 218 research and implementation projects, 127 of which are completed. Tables on the project Web site list each state's research projects on asphalt and concrete pavements, soils and foundations, and pavement design and maintenance.

But the Frozen Four isn't just about peeking into the research labs of neighbor states. Agencies want to share best practices, cooperate on topics of interest, and avoid duplication. Over the next few years, the Frozen Four will leverage resources to improve highway quality and durability in each of the states.



The Frozen Four will compare a range of pavement-related research efforts (flexible pavement, rigid pavement, soils, and design, management and maintenance).

Outreach

Mid-Continent Transportation Research Forum: "Making Research Pay Off"

Iowa DOT and the Center for Transportation Research and Education at Iowa State University have hosted the five previous Mid-continent Transportation Research Forums. The sixth forum came to UW-Madison this year on August 17-18, with plans to alternate between Wisconsin and Iowa in future two-year cycles.

Sponsors for this year's forum included WisDOT, WHRP, the Wisconsin Traffic Operations and Safety Lab, the Great Lakes Maritime Research Institute and the forum host, the Midwest Regional University Transportation Center. Iowa's two organizations sponsored the event as well, and delivered 14 of the 52 technical presentations.

Some 130 practitioners, consultants, academics and FHWA officials from eight states attended this year's forum, including 45 from WisDOT. The focus was on practical applications of transportation research in the areas of freight, operations and safety, pavements and geotechnics, planning, and asset management.

WHRP research was well represented, with several presentations made jointly by principal investigators and TOC project managers. TOC chairs Jim Parry, Bob Arndorfer, and Len Makowski moderated sessions on rigid pavement, geotechnics, and flexible pavement respectively.

Concurrent sessions left participants in the happy quandary of choosing from equally interesting presentations. We salute the capable staff of MRUTC for their excellent management of the conference and thank them for helping us put WHRP's important and practical research in front of transportation professionals from around the country.



WisDOT's Judie Ryan, a member of the WHRP Flexible Pavements TOC, presents recent findings on using the gyratory compactor to measure the mechanical stability of HMA mixes.

WisDOT and WHRP Discuss Research Partnerships at AASHTO RAC Meeting

Research managers from 46 state DOTs, FHWA, TRB, and AASHTO participated in the Research Advisory Committee Annual Meeting, July 10-13, in Columbus, Ohio. At a July 12 session on "Working with Universities and Private Companies," WisDOT's Kristina Boardman and WHRP's Hussain Bahia joined with ARA's Harold Von Quintus to explore the benefits of research partnerships.

Boardman noted that retirements, tightened budgets, and security concerns are leading state transportation agencies to turn to university and private sector specialists for expertise and efficiency. Through clear communication, mutual respect, and recognition of respective needs, these partnerships can flourish, as they do with WHRP.

Bahia offered the university perspective on these cooperative efforts. Academia brings to research diverse expertise, a dedicated and educated workforce, and low overhead. In the WHRP model for partnerships, university researchers work on technical committees with state engineers, consultants and contractors to ensure participation from all stakeholders.

Von Quintus, who has worked on several WHRP projects, gave the private sector perspective on these relationships. He noted that private company interests include maintaining competitiveness and profitability, directing highly technical work forces with economic efficiency, and creating income for staff. Goals of honing expertise and economic efficiency work to each partner's benefit in these state-university-private relationships.



Left to right: Kristina Boardman (WisDOT), Hussain Bahia (UW-Madison) and Harold Von Quintus (Applied Research Associates)

Implementation Report

2006 Implementation Projects Begin

At conferences we often hear about research on new highway construction methods, but sometimes that's the last we hear of it. The new knowledge is captured in the research report, but is it put to use?

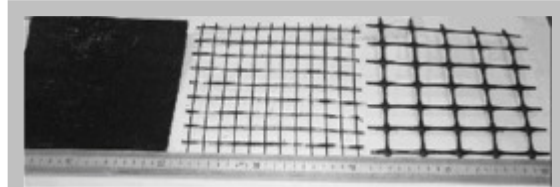
WisDOT is one of many state Dots across the country recognizing the need to put research to work. WHRP renewed its focus on implementation last winter, when each of its four TOCs dedicated funds for projects specifically designed to move research into practice:

The Flexible Pavements TOC will convert into practical guidelines the results from a study on using the Superpave gyratory compactor to evaluate mixture strength, stability and workability.

The Rigid Pavements TOC chose to sponsor several workshops to train WisDOT staff, contractors and consultants on how to use FHWA's HIPERPAV software to design high-quality concrete pavement.

The Structures TOC will host training workshops on research that recommends extending beam lives by coating ends with a polymer resin before installation and after repair.

The Geotechnics TOC combined four studies into one implementation project designed to develop practical thickness equivalencies for subgrades improved with industrial byproducts or geosynthetics, and quantify the strength contribution they offered to the pavements.



Quantifying the strength contribution of geogrids like these is part of a WHRP implementation project.

About WHRP

www.whrp.org

The Wisconsin Highway Research Program was established in 1998 by the Wisconsin Department of Transportation to conduct research on highway materials and construction methods. WHRP is administered by the UW-Madison Department of Civil and Environmental Engineering. A Steering Committee chaired by the WisDOT Research Administrator provides policy direction to the WHRP Technical Director, Program Manager and four Technical Oversight Committees chaired by WisDOT engineers. The TOCs focus their work on Flexible Pavements, Rigid Pavements, Geotechnics and Structures. The Steering Committee and TOCs are composed of representatives from WisDOT, FHWA, academia and industry.

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Jim Parry, Rigid Pavement
WisDOT Bureau of Technical Services

Hussain Bahia, Technical Director
UW-Madison

Len Makowski, Flexible Pavement
WisDOT SE Region

Andrew Hanz, Program Manager
UW-Madison

Bob Arndorfer, Geotechnics
WisDOT Bureau of Technical Services

Scot Becker, Structures
WisDOT Bureau of Structures

ADMINISTRATION

About this newsletter

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