IOWA HIGHWAY RESEARCH BOARD (IHRB)
Minutes of April 29, 2011

Regular Board Members Present

A. Abu-Hawash
J. Berger
V. Dumdei
J. Joiner
J.D. King
J. Moellering
M. Nahra
D. Schnoebelen
R. Younie

Alternate Board Members Present

B. Braun for R. Knoche
R. Fangmann for C. Schloz
K. Mayberry for D. Ahart
L. Roehl for E. Steffensmeier

Members With No Representation

J. Alleman
District 1/R. Kieffer

Secretary - M. Dunn

Visitors

Nicole Fox	Iowa Department of Transportation
Vanessa Goetz	Iowa Department of Transportation
Scott Schram	Iowa Department of Transportation
Mary Starr	Iowa Department of Transportation
Lisa Bold	Federal Highway Administration
Halil Ceylan	Iowa State University
Scott Schlorholtz	Iowa State University
Sri Sritharan	Iowa State University
David White	Iowa State University

The meeting was held at the Iowa Department of Transportation Ames Complex, Materials East/West Conference Room, on Friday, April 29, 2011. The meeting was called to order at 9 a.m. by Chairperson Doug Schnoebelen with an initial number of 11 voting members/alternates at the table.

Agenda
No changes were made to the Agenda.

Motion to approve Minutes from the February 25, 2011 meeting by R. Younie. 2nd by J. Berger.
Motion carried with 11 aye, 0 nay, 0 abstaining.

*** Two Members Joined the Table***

FINAL REPORT TR-599, "Investigation of Warm-Mix Asphalt Using Iowa Aggregates," Chris Williams, Iowa State University/InTrans ($124,997)

BACKGROUND
The implementation of WMA is becoming more widespread with a growing number of contractors using various WMA technologies. Early research suggests WMA may be more susceptible to moisture damage than traditional HMA mixes. Asphalt performance tests can be a good way of measuring material responses that can be correlated with pavement performance. It is important to know that WMA technologies and/or the reduction in mixing and compaction temperatures do not impact the durability and long-term pavement performance.

OBJECTIVES
Field and laboratory produced mixes were studied. The laboratory-produced mixes compared HMA control mixes with WMA mixes having the same mix design. The addition of 30% recycled asphalt pavement (RAP) was investigated. The field study tested four WMA field-produced mixes.

BENEFITS
WMA reduces emissions and fuel/energy use. Paving benefits are the ability to incorporate higher percentages of RAP, less compaction effort, longer haul distances, and reduced production and placement temperatures.

Q: You said that the RAP seemed to make it less moisture sensitive. Why?
A: The RAP is increasing stiffness in the mix; you can improve the stiffness to a point, but more is not always better.
Q: Does the RAP have the same moisture as the virgin aggregate?
A: Probably a little less, depending on how it's been handled and stockpiled.
Q: Do you think there was enough testing to develop what the optimal RAP content was?
A: We're basically comfortable saying that 30% is the limit. If more is used it would be necessary to shift the binder grade and do an evaluation of the mix.

Motion to Approve by J. Joiner. 2nd by R. Younie.
Motion carried with 13 aye, 0 nay, 0 abstaining.

DISCUSSION ON PROPOSALS *Low Cost Rural Road Surface Alternatives* (response to RFP-10-05) submitted by: Halil Ceylan, Iowa State University ($49,824) and David White, Iowa State University ($50,000)

RFP-10-05 BACKGROUND
Damage frequently occurs on roads in the northern U.S. due to freezing and thawing actions. Damage during freezing (frost heave) and damage during thawing (frost boil) have significant impacts on the traveling public and on the budgets of secondary road departments. Recent research on methods for building or treating granular surfaced roadways to prevent/minimize these problems before they happen is extremely limited.

RFP-10-05 OBJECTIVES
A comprehensive literature survey of the state of the practice for granular surface road construction with respect to freeze/thaw damage resistance; the research will include stabilizing additives such as fly-ash, cement and lime and take into account the various soils encountered in Iowa.

A potential second phase of this research would develop a matrix of soil types, treatments, stabilization depths, stabilization materials, etc. and evaluate these methods in the field. The results of Phase I would determine if Phase II is warranted and, if so, provide guidance about the variables to be considered in that effort.

C: Both proposals were responsive, although I'm leaning more towards David White's in this case. Halil's presented more outreach among the county engineers and David was looking more at literature, which is what makes me prefer David's. Much of the information on soils and frost penetration is already available. This is one that the technical advisory committee could also contribute to. David has already found and referenced a few reports by the Corps of Engineers in the work they've done. Both were good, but I'm leaning toward David's. This is of primary concern to counties regarding county gravel roads.

C: Halil Ceylan: Regarding the survey it was included in the proposal because of the benefit of visiting county sites and discussing problems and the nature of the issues counties face.
C: That would be more welcome than another email survey.
C: From my perspective, both of these proposals are responsive to the RFP and both researchers have done excellent work for the Board in the past.

Motion to Approve David White's IHRB 10-05 Proposal
by M. Nahra. 2nd by L. Roehl.
Motion carried with 12 aye, 0 nay, 1 abstaining.

Motion to Approve Funding 100% County
by M. Nahra. 2nd by L. Roehl.
Motion carried with 13 aye, 0 nay, 0 abstaining.

PROPOSAL ***Investigation into Shrinkage of High Performance Concrete Used for Iowa Bridge Decks and Overlays*** **(response to RFP IHRB-10-09),** Kejin Wang, Iowa State University ($125,000)

BACKGROUND
Shrinkage cracking on bridge decks and bridge deck overlays continues to be a problem in Iowa. High performance concrete (HPC) bridge deck and bridge deck overlays mixes have helped to reduce the occurrences and severity, but certainly not eliminated. Some of the supplementary cementitious materials can actually increase the shrinkage potential. The low w/cm of some of these mixes has introduced another type of shrinkage, autogenous shrinkage.

OBJECTIVES
Investigate the shrinkage behavior of HPC used for Iowa bridge decks and bridge deck overlays. The investigation will cover most commonly used Iowa HPC mixes and study the effects of concrete materials, cement and aggregate types as well as application of admixtures, on both autogenous and drying shrinkage of concrete.

BENEFITS
By identifying and quantifying the shrinkage behavior and types of shrinkage, adjustments to the mix designs, construction practices, and curing practices may be made to further reduce the potential for shrinkage cracking on bridges.

Motion to Approve by A. Abu-Hawash. 2nd by V. Dumdei.
Motion carried with 13 aye, 0 nay, 0 abstaining.

NEW BUSINESS

TOPICS FOR 2012 PRIORITIZATION and RANKING
We allow submitting votes by proxy. This year, District 1 (Robert Kieffer, Boone County) submitted votes before the meeting; his votes will be added to the tally today.

Members and one Iowa DOT guest spoke in support of various topics of interest, including:

- **Vickie Dumdei, Member, District 2: Topic 5.02**, *Evaluation of Epoxy Patching Materials for Concrete Pavement*
- **Robert Younie, Member, Iowa DOT**: **Topic 6.02**, *Asset Management and Optimization of Maintenance Resources*
- **Ahmad Abu-Hawash, Member, Iowa DOT: Topic 10.09**, *Development of Bridge Maintenance, Inspection and Rating Manuals for Iowa*; **NOTE: Topic 10.07**, *Development of a New Ranking System for Prioritizing Bridge Replacement* has been withdrawn due to funding from other sources.
- **John Joiner, Member, City of Ames: Topic 4.03**, *Pilot Project for a Hybrid Road-Flooding Forecasting System on Squaw Creek*
- **Scott Schram, Guest, Iowa DOT: Topic 5.06**, *Development of Bio-Based Polymers for Use in Asphalt*

Voting took place for project topics that will be developed into RFPs for fiscal year 2012. Each regular Board member or their alternate in their place had 20 votes. Up to a maximum of 4 votes may be placed on any one topic to weight its importance.

	IHRB Votes From 29-Apr-11Meeting	FINAL VOTE
5.06	**Development of Bio-Based Polymers for Use in Asphalt**	**25**
1.01	**Optimizing Pavement Base, Subbase, and Subgrade Layers for Cost and Performance on Local Roads**	**24**
7.05	**Reflective Crack-Mitigation Guide for Asphalt**	**23**
5.01	**Preventing Random Cracking Through Proper Design and Concrete Mixes**	**17**
4.03	**Pilot Project for a Hybrid Road-Flooding Forecasting System on Squaw Creek**	**17**
5.02	**Evaluation of Epoxy Patching Materials for Concrete Pavement**	**16**
10.03	**Methods for Removing Concrete Decks From Beam/Girder Bridges**	**16**
8.03	**Update the Guidance Information Available for New County Engineers**	**15**
10.09	**Development of Bridge Maintenance, Inspection, and Rating Manuals for Iowa**	**15**
6.02	**Asset Management and Optimization of Maintenance Resources**	**14**
6.01	Pavement Surface Rehabilitation Techniques for Poor Subgrade Conditions in Iowa	12
6.03	ROI of Highway Maintenance and Preservation	12
***** 10.04	Precast Concrete Box Culvert Survey and Recommendations	12
7.01	Concrete Overlay: Surface Milling of Asphalt Pavements	9
3.01	Evaluation and Rating of Effectiveness of Temporary Erosion and Sediment-Control Measures in Iowa Conditions	7
5.03	Use of Recycled Concrete Aggregates in New Pavements	6
4.02	Riverbed Scour and Deposition Monitoring Plan for Floods Using a Multibeam Hydrographic Survey System	6
8.04	Compiling Legal Opinions Affecting Road Issues	5
7.02	Impact of Curling and Warping on Concrete Pavement	4
1.02	Non-Invasive Surface Wave Testing for Soil Properties and Construction Monitoring	3
6.04	Development of a Guidance Manual for Maintenance of Signs by Local Agencies in IA	3
2.01	Non-Invasive Surface Wave Techniques for Pavement Analysis	3
2.02	Trip Generation Rates for Trucks at Large Grain Elevators Within Iowa	3
8.01	Investigating the Impact of Tax Increment Financing on Iowa's Secondary Road System	3
10.08	Alternative Bridge Deck Overlay Options for the State of Iowa	2
7.03	Prevention and Restoration of Water Related Pavement Distresses	2
5.04	Increasing the Stability of Unbound Shoulder Materials	2
10.01	Adapting Accelerated Bridge Construction (ABC) Best Practices for Small Scale Projects with Local Jurisdictions	2
11.04	Temporary Traffic Control Plans for Local Agency Improvements	2
9.01	Linking Highway Improvements to Changes in Land Use	2
8.02	Route-Specific Traffic and Fiscal Impact Calculator for Iowa's Renewable Energy	2
4.01	Low Impact Design Practices BMPs Pollutant Reduction	2
5.05	Co-Product Uses from Bio-Fuel/Lignocellulosic Plants for Dust Control on Unpaved Roads	1
11.01	Perform an In-depth Study of Low Volume Rural Road Crashes	1

The top 4 – 5 topics will have RFPs developed (with the help of those who submitted the idea) by June or July 2011. Resulting proposals usually are presented to the Board at the September 30, 2011 meeting. Generally, up to ten are funded by the Board, however, more may be funded depending on monies available.

Q: Mark Nahra: Is there any way to fund item **10.04, *Precast Concrete Box Culvert Survey and Recommendations*?** It would be highly beneficial. I have a lot of reservations about using one of these precast concrete box culverts under our soils and under some of our deeper fills. The precaster in western Iowa has an unwillingness to produce a two barrel box; he wants to put two single barrels side-by-side, and I'm less than satisfied with the way those work together. This project, if moved up for funding, would be very useful. Precasters have told us this type of study makes more contractors available to do concrete box culvert work. It would be good to have a study that looks at some of these things.

A: Mark Dunn: We'll look at the top ten, and if it appears that some of them may need less funding or be a smaller project (such as the study on Squaw Creek), maybe we can talk with the flood center and/or others to see if funding may be available from other sources.

C: Mark Nahra: If the Board is interested, there are extra funds available in the Secondary Road Research Fund. It is a very important issue that counties need to find a solution for.
A: Mark Dunn: If there's interest from the counties in bumping this project up using some of their funds, we can (because of the higher number of votes) take a look at that.

Topic rankings were emailed out to the Board Friday, April 29th.

TRAVEL MEETING
Mark Dunn: Generally, May is our Travel Meeting. However, over the past several years we've moved that to another date. This time of year we begin talking about what project sites might be good to have the Board visit. Some things coming up: Van Moore has a Waffle Slab UHPC bridge to be let June 1, 2011. The slabs are already produced. I would think that sometime this fall there'll be some construction going on. It is usually difficult to try and schedule a meeting around construction because of weather changes and other issues, but once a project's completed, a Travel Meeting could be held to visit the finished project.

There's also an ABC bridge project in Pottawattamie County on US-6. There will be a two week closure to remove the old bridge and build the new one; however, this would be even more difficult to schedule around such a short time frame. Does anyone have any other ideas or suggestions?

C: There's a light weight fill project along the Missouri River, but I'm not sure it will still be in progress for our Travel Meeting. It's not really a research topic though. They're using a light-weight fill along a retaining wall to allow a six lane expansion of I-29.
C: Mark Dunn: It doesn't necessarily need to be a research topic. If the project's innovative and the Board is interested, we could consider it. We'll need to check with the resident construction engineer in Sioux City on the schedule. We haven't been up to northwest Iowa in a long time.
C: If you're not looking for a Board funded research project, District 2 also has a PC overlay under traffic that's going to have something similar to a safety wedge along the center line as they do it on US 18. The concrete work has already started but this part of it will be in June or July.
Mark Dunn: This is a current project related to some of the work that we had done on concrete overlays here recently, so I'm sure the project is incorporating some of those recommendations.

C: There's a project in Pocahontas County but may not be ready this year and I don't know if they've got anything of interest on it, but the Department of Agriculture and Land Stewardship has been funding some pilot studies on drainage districts. It was just finished last fall and includes a treatment wetland at the end of it; as results start coming in, that may be of interest.

C: Mark Dunn: Because of the short turnaround between the April and May IHRB meetings (three weeks) it isn't likely we'll have time to put the Travel Meeting together for May; however, we can plan on having more information and finalizing the location. We can plan on having our Travel Meeting later this summer or early autumn. If anyone has an idea, send them to me.

Special Note: We want to remind the county engineers present that on May 11th, 2011, we're going to do the County Engineer Focus Group meeting to discuss county road issues. Hopefully most of you have been contacted regarding that and will be able to attend. We've had Focus Group meetings before to discuss different subjects related to concrete or asphalt pavements, but not to discuss county road issues. There may be some things that come out of this meeting of real interest.

ADJOURN
Motion to Adjourn by J. Berger. 2nd by M. Nahra.
Motion carried with 13 aye, 0 nay, 0 abstaining.

The next meeting of the Iowa Highway Research Board will be held Friday, May 20, 2011, in the East/West Materials Conference Room at the Iowa DOT. The meeting will begin promptly at 9 a.m.

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Mark J. Dunn, IHRB Secretary