IOWA HIGHWAY RESEARCH BOARD (IHRB)
Minutes of June 27, 2008

Regular Board Members Present

A. Abu-Hawash
J. Berger
V. Dumdei
M. Nahra
J. Rasmussen
S. Rinehart
J. Waddingham

Alternate Board Members Present

T. Ellis for J. Alleman
W. Zitterich for J. Adam

Members With No Representation

K. Hornbuckle
J. Joiner
S. Gannon
J. Krist
B. Moore
D. Waid

Secretary - M. Dunn

Visitors

Dean Bierwagen	Iowa Department of Transportation
Dave Claman	Iowa Department of Transportation
Ed Engle	Iowa Department of Transportation
Jim Nelson	Iowa Department of Transportation
Mary Starr	Iowa Department of Transportation
Wayne Sunday	Iowa Department of Transportation
Tom Cackler	Iowa State University/CTRE

The meeting was held at the Ames Holiday Inn Conference Center, 2609 University Blvd., Ames, Iowa. The meeting was called to order at 9:00 a.m. by Vice Chairperson Jim Berger with an initial number of 9 voting members/alternates at the table.

Agenda
No changes were made to the Agenda.

Approval of the minutes
Motion by J. Waddingham to approve minutes from the May 30, 2008 meeting. 2nd by V. Dumdei. Carried 9 aye, 0 nay, 0 abstaining.

COMBINED REPORTS & PRESENTATION FOR: TR-530, "Development of an Improved Integral Bridge Abutment-to-Approach Slab Connection" ($169,433) & **TR-539, "Instrumentation and Monitoring of Precast, Post-tensioned Bridge Approach Pavement,"** ($149,126)

BACKGROUND
TR-530 & TR-539 looked at two concepts on two bridges in O'Brien County to improve approach slab pavements (both are the same except for the approaches). Integral abutment (I-A) bridges are prone to settlement and cracking, which manifests itself as the *bump at the end of the bridge*. The bump is not a

significant safety problem; rather, it is an expensive maintenance issue. A commonly recommended solution is to integrally attach the approach slab to the bridge abutment, which moves the expansion joint typically found at the approach slab/abutment interface to a location further from the bridge where soil settlement is less of a concern and maintenance is easier.

OBJECTIVES

The primary objective of this investigation was to evaluate the approach slab performance and the impacts the approach slabs have on the bridge. To satisfy the research needs, the project scope involved a literature review, survey of Midwest Department of Transportation current practices, implementing a health monitoring system on the bridge and approach slab, interpreting the data obtained during the evaluation, and conducting periodic visual inspections. Straight and angled bars were compared on cast-in-place and precast approach slabs in addition to instrumentation on temperature, abutments, girders, post-tensioning strands, joints and piles.

CONCLUSIONS

It generally appears that connection detail is functioning well and not inducing any sort of distress with no movement between the approach and the bridge; however, tying the approach slab to the bridge impacts the bridge. The source of impact may not be how the source is attached but it may be how the approach is attached to the mainline pavement. There are still questions to be answered regarding this.

The integral connection between the approach slabs and the bridges appear to function well with no observed distress at this location and no relative longitudinal movement measured between the two components. Tying the approach slab to the bridge appears to impact the bridge. The two different approach slabs, the longer precast slab and the shorter cast-in-place slab, appear to impact the bridge differently. The measured strains in the approach slabs indicate a force exists at the expansion joint and should be taken into consideration when designing both the approach slab and the bridge. The observed responses generally followed an annual cyclic and/or short term cyclic pattern over time.

Q: If you fix the bump isn't there still a void under the pavement?
A: Possibly; just because there's a void that may not necessarily be a bad thing as long as the pavement has enough strength to span that.

C: Additional instrumentation should be used to monitor the joint to fully understand what is happening to the approach (globally) in relations to the mainline pavement.
Q: The precast portion: is there anything that could be changed in the current design detail to improve stresses?
A: No, all of the strains and stresses are low; what is of concern is axial force.

Q: Based on a 30° skew, would you have concerns over going to a 45° skew?
A: The concern is the joint; that's unrelated to the skew. There were no unusually high stress levels in the girders.

Q: Did you find any differential opening and closing of that joint from one corner to the other?
A: Nothing significant.

Motion to Approve
Motion by M. Nahra. 2nd by A. Abu-Hawash.
9 aye, 0 nay, 0 abstaining.

PROPOSAL *Wet Reflective Pavement Marking Demonstration Project*, Neal Hawkins, Iowa State University/CTRE ($125,000)

BACKGROUND
Traditional pavement markings such as traffic paint are made retroreflective by the addition of small round glass beads that direct the light from the headlights back to the driver's eye. Under wet conditions, the beads become covered with water and are unable to perform their retroreflective function.

A number of technologies have been developed in an attempt to overcome this problem, including the use of larger beads, profiled pavement markings, specialized beads, and other treatments such as rumble stripes. Larger beads can overcome some of the effect of water particularly under light rain conditions as the bead simply stands higher in the paint. These products have good wet recovery; however, they are still not designed to function under submerged conditions. Other measures, such as placing the pavement marking within a roadway rumble area, are currently being used to address the visibility particularly under wet conditions.

OBJECTIVES
This project is focused on the development of a two-year long-line test deck which allows for the evaluation and demonstration of a variety of wet reflective pavement marking materials and treatments under wet night conditions. Having the opportunity to document the performance of these various products and treatments will assist the Iowa DOT and local agencies in determining when and where use of these products might be most effective. Performance parameters will include durability, presence, retroreflectivity, and wet night visibility.

C: Iowa DOT has 25,000 lane miles to paint; there are reflective measurements on all of it. We want it to be reflective 100% of the time. We can make it reflective, but we haven't found a way to maintain that reflectivity in the rain. The other issue is: Will it survive the snow plows? And it needs to be affordable. The expensive ones may work well, even after exposure to snowplows, but we can't afford it. This study is very important to the Iowa DOT.

Motion to Approve by W. Zitterich. 2nd by V. Dumdei.
9 aye, 0 nay, 0 abstaining.

2008 FIRST ROUND RFP REVIEW
Mark: Looking at the first five projects, we have two RFPs printed out for you and will discuss other RFP issues.

1. **IHRB 08-01** *Development of Updated Specifications for Roadway Rehabilitation Techniques*
   There were no comments or modifications. It will be distributed as written.

2. **IHRB** 08-02 *Replacing Bridge Decks and Approach Slab Panels Using Precast UHPC Panels*
   Brian Moore is finishing the scope and will possibly be ready to discuss this at next month's meeting. He's worked with Iowa State University (ISU) on past projects regarding this material. I don't know of anyone outside ISU that has expertise in this area, so perhaps this should be a sole source RFP (Possibly for July presentation).

Motion to Sole Source the RFP by A. Abu-Hawash. 2nd by M. Nahra.
9 aye, 0 nay, 0 abstaining.

3. **IHRB** 08-03 *Developing Runoff Frequency Duration Curves for Iowa Streams*
Mark: This is an important topic with all of the flooding going on right now. Dave Claman believes this is already being addressed through the Streamstats project with USGS and the information should be available soon; it is my recommendation we skip this project.
Q: Are they going to slow up Streamstats enough to get this information? They've been working on that for over a year.
Dave: This would be dual effort. The USGS will be doing a low flow frequency estimates in Streamstats, so the information proposed would be provided by Streamstats.

Q: Will the Streamstats budget accommodate for this information?
A: Yes.

Motion to Drop RFP Topic by M. Nahra. 2nd by W. Zitterich.
9 aye, 0 nay, 0 abstaining.

4. **IHRB 08-04** *Investigation of Warm-Mix Asphalt Using Iowa Aggregates* ($125,000 for 18 months)
C: This is a large initiative nationwide; they're currently using this technology in Polk County this afternoon. You'll be seeing a lot of this in the future, especially with asphalt at $750/ton. The cost has skyrocketed.

There were no comments or modifications. It will be distributed as written.

5. **IHRB** 08-05 *Improving Portland Cement Concrete Overlay Construction*
Mark: The National Concrete Pavement Technology Center (VCPTC) submitted this topic and has found some matching funds of $200,000.
Mark: There was one down the list titled 07.06 *Controlling Effective Joint Cracking Through Concrete Overlays*; I'm wondering if there's potential to combine the two projects. Part of the overlay construction project would be to prevent joint cracking; part of that would be identifying exactly where the underlying cracks are. It seems like a good fit.

Motion to Combine Two Topics and Request Sole Source Proposal From NCPTC by M. Nahra. 2nd by V. Dumdei.
9 aye, 0 nay, 0 abstaining.

Discussion: HR-140 Flood Profiles Funding Needs for 2008 - Cedar River, Shell Rock River, Iowa River, and Upper Iowa River Floods presented by Dave Claman, Iowa DOT Office of Bridges and Structures
Dave: The Board approves HR-140 every year to help fund the maintenance of USGS gages; we pay 55% of the cost and USGS pays 45%. Part of that money that we pay to HR-140 and have since the 1950s is used to pay for flood profile reports and data requests. The flood is profiled and they determine the queue and frequency. So this is very important information when you're doing bridge design and setting road grades. (Several examples were shown.)

We're had significant flooding here in Iowa, and I've put in a request to the USGS to go out and document high water marks for all of these flood profiles (Cedar, Iowa, Upper Iowa and part of the Shellrock Rivers). Some of these floods were off the mark; well over 500 floods. To do these reports when you have a flood event like this, of course it takes extra money, time and effort.
The estimate for additional flood profile reports by the USGS (in addition to the normal amount) is $306,287 for the survey work, report and publishing. Our portion is $168,458. USGS would provide the remainder. What we propose to spread this out over three fiscal years; for this year, we'd need an additional $11,700 to maximize

the cost match that the feds have available until October 1, 2008. To get the rest of the reports done, we would stagger that over the next few years, and for 2009 would require $85,556 and for 2020, $71,202. This would be additional to what we normally fund under HR-140. There will still be roughly $51,000 per year to fund any additional flooding that occurs during fiscal years 2009 and 2010. This information is very valuable for bridge design and even from a flood management standpoint for regulating development.

Mark: Is this something we want to budget over three years, or is this something we want to commit the funds to now while they're available.
Dave: In order to maximize our federal matching funds, it was recommended we get approval because it makes it easier for the Iowa USGS to request matching funds from their national office. If we show the commitment, it makes it easier for them.

On another note: Because of flooding, Streamstats is going to be delayed another year; it's not going to change cost. But the completion date will be 2010 rather than 2009; physically, they couldn't be done in one year.

Q: Will the differences in fiscal year make a difference?
Mark: For our state and city funds, we get a lump sum at the beginning of the fiscal year in July; all of the funds roll over to the next fiscal year if unspent. The county money comes in monthly.

Mark: We could approve the entire amount today so they can leverage matching funds; or, we can approve the additional for this fiscal year, knowing they will be back in September to request funds for FY09 with the additional amount included in their proposal; we could also supply a letter of support saying we are going to commit to funding the whole thing and appropriate it every year as requested.

Motion to Approve Entire Additional Amount at 45% State and 55% County ($168,458) by M. Nahra.
2nd by V. Dumdei.
9 aye, 0 nay, 0 abstaining.

Discussion/Status update: R-NET, Rural Safety Information exchange Network - John Whited, Iowa DOT Research and Technology Bureau ($100,000)

BACKGROUND
Rural Safety Information Exchange Network (R-Net) is a proposal from local and state agencies across six states to develop new and leverage existing highway safety information sharing partnerships. R-Net builds upon the USDOT recognized, multi-state **Report Pooled Fund Program**, established 1997. Six of the sixteen Report Pooled Fund agencies will join with local governments to develop and submit a full proposal for support under the Federal Highway Administration's (FHWA) Rural Safety Innovation Program.

Several of our R-Net states already team with emergency responders and local governments to share EMS, crash, road condition and construction data in real time. All of the R-Net states have committed to enhance their statewide Condition Reporting Systems, supporting increased local participation and emergency responder coordination. We now seek Federal funding to extend committed state and local agency information system investments so we can develop further, innovative solutions addressing specific rural highway safety issues. Much of the hard dollar agency match we identify here leverages firm budget commitments that are already dedicated to joint, real-time data-sharing enhancements.

OBJECTIVES
• To ***share state and local road information***—between highway agencies, with sheriffs' offices and emergency responders, and with the traveling public; increasing safety through coordinated responses to crashes, floods, security incidents, and weather events.

• To ***create and/or refine the tools*** required for inter-agency coordination and public outreach, enhancing states' CAD systems, 511 phone systems, 511web pages, and email/text message push systems to contact sheriffs, ambulance services, and trauma units—as well as regular drivers—whenever lives are placed in jeopardy by rural area crashes, disasters, and other emergencies.
• To leverage the ***intelligent transportation system***, directly linking two of today's intelligent vehicle components. The first will support an upgrade to OnStar®'s current CARS Mayday Hub3 feed, while the second will pass rural road reports directly to the national digital traffic broadcasts, displaying traffic icons on vehicle maps.

In the R-Net Project, we will build on existing partnerships between state and local agencies, as well as with *OnStar*® and *Google Maps*® R-Net's National Architecture–compliant approach and its ITS standards–compliant software modules offer a series of deployment choices, as all are interoperable with R-Net states' existing 511 and 911 infrastructures.

John: During the last flood event in Iowa, the 511 call center had over 153,000 calls and the web site had more than 1.4M hits. Information is needed, required and demanded by the public.

The web site is now a Google interface; it is very easy to navigate for more information. R-NET will get tools into the hands of the local system.

C: We do not have office staff to update information although we had a lot of demand for that; we were out in the field. But the system is creating demands on us; there were a lot of calls wanting to know what roads were closed. We work now with the 911 emergency dispatch and notify them when we close a road, but I don't know if they communicate that to others.

John: We were in the same stage a few years ago, having state patrol sharing small amounts of information; we partnered with them to get more detailed information and gave them input screens to update information. Then, they were able to do that at their dispatch center in a matter of minutes as opposed to what it had been. Since then, we've streamlined that. The partnership we've developed was part of this concept: What could we do to give them a tool so we can get them good information and then, they can pass that along. There are voice updates available. There are other products available too (about 20), such as AMBER ALERT, that are invaluable to the agencies and the public.

Q: So you think the 911 dispatch offices may eventually be able to go into the system and update information on county roads?
A: Yes; that's how we started off with the state patrol. They have a lot of information to share.

We're asking for a commitment from the Board for $100,000 to negotiate this first year, to get this statewide over the next few years; the commitment will allow me to get a pilot going and work with Idaho and Maine. I'll come back to the Board before I spend anything with a scope to go forward.

Q: How will the money be used? To hire a consultant?
A: As the state DOT, we've invested in a royalty-free license for this software; any agency in Iowa is entitled to that. But as you know, software requires hardware, server, training, etc. Some contract support staff may need to come and tailor those products for you. But it will be a combination of internet services, hardware and increased communications systems. But you cost share; you're one of 99 counties or one of a number of states, and you get a good return on your money. The system is shared between states, but when you consider the different time zones and regions, it helps share the load.

Q: Where is that server located?

A: It was down in Atlanta, GA but is now part of it is at the Iowa DOT's Data Center in Ames; we also have a portion located in Oregon.

Q: What you're saying is you want to expand this service to the counties.
A: Yes; there may be unique demands we can contribute to.

Q: Would it be possible to get a formal proposal? We'd like city board representative input on this.
A: This is just a request for the authority to offer and deal with other states for pooled funding; a commitment for $100,000 for leverage. If the Board doesn't like the scope, you can still reject it.

C: If we had a formal proposal, we'd know more what we're buying. What do you think is beyond the $100,000? I'm assuming that won't be the end of funding needs.
A: If we get other states, we'll be cost-sharing even though the program will be larger. It comes down to just how far you want to go with it. The public likes bigger maps, 'click and go' etc., and that takes a more effort.

Consensus: That John return for the July 25th meeting with a more formal proposal with county and 911 group input of what this is going to cost now and projected costs so we have an idea of total dollar commitment.

John: This is only for negotiating with other states; if an agreement can be made, a scope will be drawn up and presented.

Note: The proposal was emailed to the Board after the meeting.

NEW BUSINESS
Mark: I did receive a note from the Iowa DOT Road Office yesterday expressing some interest in trying to understand and design against roadway damage due to overtopping of roads during rain or flood events. They're seeing some correlations between shoulder types and/or subdrains, resulting in worse damage to the roads as a result.

C: We were looking at some of the roads that were overtopped, and found that if you pave the shoulders, it lasts longer than if you just have rock shoulders. But we're also looking at places where we've lost the paved shoulders and now it's undermining the pavement.

Mark: There's no sense of urgency; they just wondered if there would be any comments or discussion from bringing up the topic; this will be included in the next project topic list.

Travel Meeting -
The MnROADS Travel Meeting will take place in September 2008 when they are load testing. All of the test sections were constructed last autumn; they did a brief trial test in December 2007. The first full-up testing was done during the thaw of this year. They'll be sending out an interim report. This coming autumn, they're going to test two manure tankers (a two axle and a three axle) as well as a terragator. They're also using a standard vehicle for comparison (a 180,000lb semi used for normal testing) and a newer tank.

They're doing this testing the last week in August or the first week in September; we're welcome to come visit anytime because they'll have some testing going on whenever we visit.

C: I like Thursday and Friday myself.

C: We can have a regular meeting in September and take the trip separately. Those with interest can go.

Consensus: There will be a regular business meeting on September 26th, and a Travel Trip held earlier in the month on Thursday and Friday, September 4-5. Arrangements with MnRoads will be confirmed by the next meeting in July.

ADJOURN
Motion to Adjourn
Motion by J. Waddingham. 2nd by J. Rasmussen.
Motion carried with 9 aye, 0 nay, 0 abstaining.

The July 2008 meeting of the Iowa Highway Research Board will be held **FRIDAY, July 25, 2008 at 9:00 a.m. at the Ames Holiday Inn Conference Center, 2609 University Avenue, Ames, Iowa.**

_____
Mark J. Dunn, IHRB Secretary