

# IOWA HIGHWAY RESEARCH BOARD (IHRB)

*Minutes of March 27, 2009*

## **Regular Board Members Present**

A. Abu-Hawash  
J. Alleman  
D. Ahart  
J. Berger  
V. Dumdei  
S. Gannon

J. Krist  
B. Moore  
M. Nahra  
S. Rinehart  
J. Waddingham  
W. Weiss

## **Alternate Board Members Present**

A. Bhatti for K. Hornbuckle  
W. Zitterich for J. Adam

## **Members With No Representation**

J. Joiner

## **Alternates Present as Guests**

K. Mayberry  
R. Younie

## **Secretary - M. Dunn**

## **Visitors**

Edward Engle  
Sandra Larson  
Mary Starr

Iowa Department of Transportation  
Iowa Department of Transportation  
Iowa Department of Transportation

Jake Bigelow  
F. W. Klaiber  
Shashi Nambisan  
Brent Phares

Iowa State University-CTRE  
Iowa State University-CTRE  
Iowa State University-CTRE  
Iowa State University-CTRE

Doug Schnoebelen

University of Iowa – IIHR

Christy Twait

University of Northern Iowa

The meeting was held at the Iowa Department of Transportation's Ames Complex, Materials East/West Conference Room on Friday, March 27, 2009. The meeting was called to order at 9 a.m. by Chairperson Jim Berger with an initial number of 14 voting members/alternates at the table.

## **Agenda**

Items four and three on the Agenda were switched due to scheduling.

Mark Dunn introduced Christy Twait, director of grants and external relations for the University of Northern Iowa (UNI), emphasizing that future involvement of UNI with the Board is something the state anticipates in the near future. Christy spoke briefly regarding several current research projects at UNI that are funded independently and may be of interest to IHRB; she said UNI welcomes future collaborations with IHRB.

Shashi Nambisan, professor and director for the Center for Transportation Research Education (CTRE) at Iowa State University (ISU), announced that CTRE has been designated a Transportation Research Institute; therefore, a name change has officially been announced changing CTRE to InTrans.

## **Approval of the Minutes**

Motion by M. Nahra to approve minutes from the January 30, 2009 meeting. 2<sup>nd</sup> by J. Krist  
Motion carried with 14 aye, 0 nay, 0 abstaining.

**Final Report TR-561, “Laboratory and Field Testing of Precast Bridge Elements,” Terry Wipf, Iowa State University/CTRE (\$341,059)**

**BACKGROUND**

Both the Federal Highway Administration (FHWA) and the Iowa Department of Transportation (Iowa DOT) Office of Bridges and Structures recognize the importance of using precast concrete elements in bridge construction. Before wide-scale implementation, however, the performance and benefits of precast bridge elements and accelerated construction practices must be verified in the laboratory and field. In this research, precast bridge elements, accelerated construction practices, and completed bridges were examined at all three county bridge sites in Iowa: Boone County, Madison County, and Black Hawk County.

**CONCLUSIONS**

**Vol. 1-1. Laboratory Testing of Precast Substructure Components: Boone County Bridge; Vol. 1-2. Laboratory Testing of Full-Depth Precast, Prestressed Concrete Deck Panels: Boone County Bridge; and Vol.1-3. Field Testing of a Precast Concrete Bridge: Boone County Bridge**

This continuous four-girder, three-span bridge was constructed in 2006, and included precast abutments, pier cap elements, prestressed beams, and precast full-depth deck panels. All of the precast elements performed well during strength testing and were set quickly and smoothly during construction. The completed bridge experienced very small displacements and strains when subjected to live loads.

**Vol. 2. Laboratory Testing, Field Testing, and Evaluation of a Precast Concrete Bridge: Madison County Bridge**

This two-lane single-span bridge was constructed in 2007, and had precast box girders with precast abutments. The elements performed well during laboratory load transfer and strength testing. During testing, the completed bridge’s maximum deflections and differential displacements between longitudinal girder joints performed well.

**Vol. 3. Laboratory Testing, Field Testing, and Evaluation of a Precast Concrete Bridge: Black Hawk County**

Two precast modified beam-in-slab bridge (PMBISB) systems were constructed in 2007, each of which included precast abutment caps, backwalls, and deck panels. Various deck panel configurations transferred load effectively during laboratory testing, and all precast elements met expectations. The completed bridges experienced very low induced stresses and met AASHTO deflection criteria, while the PMBSIB system effectively transferred load transversely.

Q: Were these bridges continuous for live load?

A: The post-tensioned superstructure was continuous for live load.

C: They do behave continuous over the pier although the beam itself was not designed to be continuous; however, the load test shows that it is continuous. The post-tensioned deck contributes to that.

C: It seems likely that if you’re trying to build a bridge in a hurry, a single span is easier to make additions to.

A: All prestressed concrete beams have been designed that way (simple span action) for a long time; with the load tests we’ve done over the years there is continuity (over the pier).

C: If it behaves continuous over the pier, we make sure we have enough enforcement in the slab/deck to account for that; but we don’t design it to take advantage of the continuity.

C: Iowa is one of the top states investigating Accelerated Bridge Construction (ABC) technology, with Utah leading the way. At the Mid-Continent Transportation Research Symposium this August there will again be a structured track with presentations, including those on ABC research. We have recently arranged for Jim McMinimee who oversees Utah’s ABC program to speak at the symposium. We hope you will attend.

**Motion to Approve** by J. Alleman. 2<sup>nd</sup> by B. Moore.

Motion carried with 14 aye, 0 nay, 0 abstaining.

**Final Report Presentation TR-585, “National Agriculture Image Program Participation,”** Karen Carroll, Iowa DOT, Office of Transportation Data (\$100,000)

**BACKGROUND**

Since 2001, the USDA Farm Service Agency has administered the National Agriculture Imagery Program (NAIP) across the United States. Aerial imagery is a growing vital resource for many governmental and nongovernmental entities, providing the visual content of a photograph while being as accurate as a map for measurements. These qualities allow users to easily measure distances, calculate areas, determine shapes of features, calculate directions, and determine accurate locations (coordinates).

According to the Farm Service Agency’s (FSA) status map showing 1 meter acquisition cycle, Iowa would not have been flown again until 2011. This research provided acquisition on a shorter cycle through cost sharing.

**CONCLUSIONS**

These images have been used to collect a wide variety of information and serve as a seamless base map layer to which many other layers are registered. NAIP imagery was acquired under two sets of specifications: A one meter ground sample distance (GSD) with a horizontal accuracy that matches within five meters of a reference ortho image, and a two meter GSD image matching within 10 meters of reference ortho imagery. The reference ortho imagery was mosaicked digital ortho quarter quads (DOQQs) that were used to digitize USDA FSA common land unit boundaries.

Iowa is providing this statewide imagery free of charge on the Iowa State University Iowa Geographic Map Server at: <http://ortho.gis.iastate.edu>.

Q: Have county GIS departments been contacted and made aware of this imagery ?

A: Yes, through the Iowa Geographic Information Council. In addition, the DNR is in the process of developing a pilot with 30 counties to show them what’s possible; to take another step in helping identify what they need to do.

C: Part of the issues for the counties is that most of what GS is used for is tax mapping, and you’re taking most of these shots with leaf-off, restricting utility use.

A: We have the same issue; however, this is an attempt to gather useful data with a higher level of detail to push collaborative efforts.

Q: Is there a way to announce this technology and research are available to the cities and counties?

A: I will check with our partners at the Iowa Geographic Council to see if the information has been pushed out to cities and counties.

C: There is also one vendor who has means to distribute information to 30-40 counties with their web site.

A: We continue to pursue collaboration with all entities.

C: Counties now have Emergency Managers; that is also a funding possibility.

**Motion to Approve** by A. Abu-Hawash. 2<sup>nd</sup> by J. Waddingham.

Motion carried with 14 aye, 0 nay, 0 abstaining.

**SECOND ROUND RFP DISCUSSION**

**08-06 Update Single Barrel Box-Culvert Standards to Include Straight Headwall Option**

C: This update will be done in-house through the state’s Office of Bridges & Structures. If we are willing to wait for inclusion of this in the LRFD standards updates there will be a substantial savings of funding. Delaying this may be appropriate.

C: This is something that several counties have requested; however, if there will be a cost savings we’d be willing to wait.

A: There shouldn’t be a long delay. These standards are needed by 2010 so we’re talking months, not years.

Q: Unless there is more discussion, we agree to hold off on this with the intent to combine it with standards to LRFD after in-house investigation, correct?

A: General consensus: Yes.

**08-07 Evaluation of Low-cost, Non-Destructive Equipment for PCC Pavement Thickness Determination**

C: Since this was sent out to the Board there have been some changes to this RFP.

C: The Office of Materials has been investigating alternatives to determine low-cost, non-destructive equipment for PCC pavement thickness determination; we've come across a piece of equipment called the Massachusetts Institute of Technology (MIT) scanner. The Iowa DOT intends to purchase two of them this year and test them in the field. The level of accuracy is 1mm which is really impressive, eliminating the need for repetitive coring. This equipment is also non-destructive. There's no need to develop this RFP because it will be done in-house; we can save money and pursue other research requiring the funds.

A: The results of this inquiry will be reported back to the IHRB.

Q: Unless there is more discussion, we agree that this research will be done in-house by the Iowa DOT?

A: General consensus: Yes.

**08-08 Assessment of Iowa County Roadway Financing Needs**

C: This was submitted by a focus group for local jurisdictions last year.

A: This is mostly in-house work, not laboratory investigation. We were trying to put it together with enough funding to get in-depth with research, but \$150,000 should be good. If researchers feel they need more, perhaps that could be shared with the Board at proposal time.

No changes were suggested.

**Innovative RFP Discussion for 2009-2010**

C: In the past we've used a soft cap of \$75,000 for Innovative RFP projects. Are there any changes you'd like to this policy? There's been some discussion about reducing that amount further, however, this cap has worked well in the past and no one has requested more. If more funding is needed researchers are welcome to contact me for discussion regarding their project. This amount works fairly well but if we want to include another project, we'll need to reduce it a little, but not too much because we want to be able to fund a graduate student for these projects.

C: It is difficult to fund these below \$50,000.

A: The point we want to make is that we won't consider \$125,000 projects for the Innovative Program; we simply want to provide seed funding for small phases to step through the concept. We can take that further in a separate phase if necessary, but still have the flexibility to do something else if needed.

Q: Could we see a list of progress for Innovative Projects already funded?

A: Yes, I'll report back to the Board on the progress of funded Innovative Projects at the next meeting.

Q: \$200,000 is the total available amount of funding for the coming year?

A: That's what we've discussed setting aside; at \$75,000 each, that would give us about three projects, depending on individual budgets. Last year was the first year we enforced the cap and it's worked well. I suggest we continue using it. We encourage researchers to collaborate and find additional funding if necessary.

Q: Unless there is more discussion, we agree that IHRB will use a \$75,000 cap for Innovative Projects.

A: General consensus: Yes.

**NEW BUSINESS**

**Mark Dunn explained the 2009 Topic Ballots and Voting Process: Completing the Preliminary Ballot Worksheet for Research Program Prioritizing**

Work space is provided for evaluating priorities on the work sheet. Board members will rank their preferred or top 20 topics across all groups or categories, selecting the top 20 out of the entire list. The highest or preferred

should be ranked 1, continuing up to a maximum of 20. Results will be tabulated and reported using groupings of city, county, Iowa DOT and university representatives, each as separate groups. In addition, a combined result for the entire Board will be developed. Members should email The Ballot Worksheet to Mark Dunn in advance and your votes will be added to the Preliminary tally. All Members should email Mark with their votes by deadline: April 10, 2009.

### **Project Topic Prioritization Process at April's IHRB Meeting**

Prior to voting, there will be an opportunity for individuals to show support and explain the need or significance of a particular project. Each regular Board member, or their alternate in their place, shall receive 20 votes to be placed on the various topics of interest. Up to a maximum of 4 votes may be placed on any one topic by a voter to weight its importance. After each voter has placed all 20 of their votes, the totals will be tallied and the projects ranked. If neither an individual member nor their alternate is able to be present for the voting, they may submit their votes to me prior to the meeting. The votes will then be submitted by proxy to the ranking.

### **Project Update**

Brian Moore, Wapello County Engineer, submitted a proposal about a year ago (May 2008 IHRB meeting) for an Ultra-High Performance Concrete bridge in Wapello County. Coreslab out of Omaha, NE, the materials supplier, submitted an application for funding to the Federal Highway Administration (FHWA) through the Highways for Life program for a demonstration project. We postponed coming to IHRB for funding to see what developed; however, that grant has been approved by FHWA for some testing and the complete payment of the slabs. The construction will be paid for by FHWA. A meeting is planned between Iowa DOT and Iowa State next week, so hopefully we'll have a better idea of what we'll be asking the IHRB for regarding funding very soon .

### **ADJOURN**

#### **Motion to Adjourn**

Motion by J. Alleman. 2<sup>nd</sup> by V. Dumdei.

Motion carried with 14 aye, 0 nay, 0 abstaining.

The April 2009 meeting of the Iowa Highway Research Board will be held **FRIDAY, April 24, 2009 at 9:00 a.m. in the East/West Materials Conference Room at the Iowa DOT.**

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**Mark J. Dunn, IHRB Secretary**