IOWA HIGHWAY RESEARCH BOARD (IHRB)

Minutes of October 30, 2009

Regular Board Members Present

A. Abu-Hawash
J. Adam
D. Ahart
J. Alleman
J. Berger
V. Dumdei
S. Gannon
J. Joiner
M. Nahra
S. Rinehart

Alternate Board Members Present

R. Kieffer for Wade Weiss

Members With No Representation

Keri Hornbuckle
Jeff Krist
Brian Moore
Jay Waddingham

Alternates Present as Guests

R. Younie

Secretary - M. Dunn

Visitors

Edward Engle	Iowa Department of Transportation
Mary Starr	Iowa Department of Transportation
Chris Brakke	Iowa Department of Transportation
Donna Buchwald	Iowa Department of Transportation
Ken Dunker	Iowa Department of Transportation
Mark Kerper	Iowa Department of Transportation
Scott Neubauer	Iowa Department of Transportation
Shashi Nambisan	Iowa State University/InTrans

The meeting was held at the Iowa Department of Transportation's Ames Complex, Materials East/West Conference Room, on Friday, October 30, 2009. The meeting was called to order at 9 a.m. by Chairperson Jim Berger with an initial number of 11 voting members/alternates at the table.

Agenda

Items three and four were not presented but will be at a later date to be determined.
Items six, seven and eight were discussion only with no presentations made.

Approval of the Minutes

Motion to approve minutes from the September 25, 2009 meeting by M. Nahra. 2nd by D. Ahart.
Motion carried with 11 aye, 0 nay, 0 abstaining.

FINAL REPORT TR-577, "Evaluation of Rumble Stripes on Low-Volume Rural Roads in Iowa," Shauna Hallmark, Iowa State University (Presented by Tom McDonald) ($53,807)

BACKGROUND
Single-vehicle run-off-road crashes are the most common crash type on rural two-lane Iowa roads. Rumble strips have proven effective in mitigating these crashes, but these strips are commonly installed in paved shoulders adjacent to higher-volume roads owned by the State of Iowa. This project involved installing "rumble stripes," which are a combination of conventional rumble strips with a painted edge line placed on the surface of the milled area, along the edge of travel lanes but at a narrow width, to avoid possible intrusion into normal vehicle travel paths.

OBJECTIVES
The project evaluated the effectiveness of rumble stripes in reducing run-off-road crashes and in improving the longevity and wet weather visibility of edge line markings. Phase I selected pilot study locations, a set of test sites, installed rumble stripes, summarized lessons learned during installation, and provided a preliminary assessment of the rumble stripe performance.

CONCLUSIONS
Preliminary evaluation results were encouraging. The installation process and visual observations indicate that narrow width rumble stripes along lower-volume rural roads is a feasible and relatively low-cost mitigation for local agencies to consider for sections of roadway with high road departure crash histories or the potential for that type of crash. Although longevity of painted edge lines did not seem to improve in rumble stripe locations, general results from the installation of these narrow width rumble stripes has been mostly positive.

Q: Did you check the feel of the stripes with vehicles other than the van? Were there any noise complaints?
A: The same results were reported from some counties that used full-sized pick-up trucks to drive over them with wider tires. We didn't receive any complaints or negative comments. Not from bicyclists or neighbors.

C: This is a modified diamond grinding machine. Any time you're not sitting on a perfectly flat surface it has a tendency to tip over because it's top-heavy with a narrow wheel base.

C: We didn't like grinding through the joints (on a PC surface) so we reset it so we didn't get any of the transverse joints. And we didn't get as close to the edge joint.
A: We found in NE Iowa that the paint looked excellent. There was no deterioration whatsoever. Why it performed so well in some areas and not in others is difficult to explain.

Q: Was there a difference in production rates between large and small grinders?
A: No. The larger grinder went about walking speed, and the smaller grinder was very close in timing.

Motion to Approve by J. Alleman. 2nd by J. Adam.
Motion carried with 11 aye, 0 nay, 0 abstaining.

DISCUSSION Proposal IHRB-09-01 ***Study of the Impacts of Implements of Husbandry on Iowa Bridges***, Terry Wipf, Iowa State University ($153,590)

BACKGROUND
Traditional bridge design and bridge rating are based upon codified procedures that examine a bridge's capability to resist traditional highway-type vehicles (e.g., trucks). However, other vehicles (e.g., farm/agricultural vehicles or implements of husbandry) use these bridges and have different characteristics from traditional vehicles. Specifically, they tend to have different wheel spacing, gage widths, wheel footprints,

dynamic coupling characteristics, and others and carry heavier loads. Currently, the Iowa DOT Bridge Rating Engineer must make assumptions about how highway bridges resist these non-traditional vehicles.

OBJECTIVES
To determine how implements of husbandry distribute their load within a bridge structural system and to provide recommendations for accurately analyzing bridges for their loading effects. Load testing and evaluation of two general types of bridges will be carried out and recommendations will be developed.

BENEFITS
This work will help bridge rating/evaluation engineers make better assessments of the capability of highway bridges to support implements of husbandry. As an example, consider that overly conservative rating procedures could result in unnecessary and expensive bridge replacements or upgrades, while un-conservative rating procedures could compromise the safety of bridge users.

C: This is an issue for counties from a road management perspective. Also, we're preparing a couple legislative agendas this year through the Iowa State Association of Counties (ISAC) steering committee. A lot of exceptions are made with implements of husbandry and we want to have a better understanding of what's going on so we can adequately rate our bridges. It is of great importance to the counties. I thought this proposal targeted the needs of the counties and I'd like to see it move forward.

Mark: Minnesota's Transportation Engineering and Road Research Alliance (TERRA) has been actively looking for ways to work with us (even though we do not participate in TERRA directly through funding). We've shared our list of higher-ranked topics with them and will discuss the ones they have a special interest in during an upcoming teleconference. This project is one of those. This will give us an opportunity to get additional resources to look at more types of bridges. We'll probably know more in a month or two.

C: I've been working with Farm Bureau recently and one thing they want to see is year-round gravel roads; in other words, a super gravel road not quite as subject to the degradation of spring thaw. They mentioned weights being hauled by their semi-tractors and grain carts as they go to elevators, and I have some of those weights confirmed. I have confirmation of loads 110K pounds and up. Bridges that we consider legal (so they're not posted) may need gross load limits applied. We need to protect some of these bridges.

Q: Is that only a problem on county roads?
A: No. And not just a problem on county bridges, either. But in my experience there are more heavy loads being run on county roads. Counties have a lot more risk on infrastructure. In the last ten years agriculture productivity has increased by over twenty percent; it is anticipated that during the next twenty years there'll be a steady five percent increase every year. The problem is only going to get worse.

Motion to Approve by M. Nahra. 2nd by Ahmad Abu-Hawash.
Motion carried with 11 aye, 0 nay, 0 abstaining.

DISCUSSION Proposal *Structural Characterization of a UHPC Waffle Bridge Deck and its Connections*, Sri Sritharan, Iowa State University ($50,000)

BACKGROUND
The potential use of full depth, ultra-high performance concrete (UHPC) waffle deck panels in bridges is gaining significant interest from State Departments of Transportations (DOTs) and the Federal Highway Administration (FHWA). This project deals with structural characterization of a UHPC waffle deck panel and its connections. This panel is intended for use in a bridge replacement project in Wapello County, Iowa. When completed, this will be the first bridge to have used the UHPC waffle deck panels in the nation.

OBJECTIVES
To perform structural characterization of a UHPC waffle bridge deck panel designed for a bridge in Wapello County and its critical connections; to evaluate system performance and ride ability of the panel top surface.

BENEFITS
Research findings will be disseminated through technical presentations at local/regional and national conferences; one journal paper and a technology transfer sheet will be created.

C: We're combining resources from a Highways for Life grant (through Coreslab of Omaha) to extend the use of Ultra High Performance Concrete (UHPC) with Wapello County's interest in placing a waffle deck on one of their bridges. We already had a proposal from Wapello County and combined efforts with Coreslab, who will produce the deck panels and supply them to Wapello County.

Motion to Approve by S. Gannon. 2nd by V. Dumdei.
Motion carried with 11 aye, 0 nay, 0 abstaining.

DISCUSSION Proposal *Connection Details and Field Implementation of UHPC Piles* - Phase II: *Use of Ultra-High Performance Concrete in Geotechnical and Substructure Applications*, Sri Sritharan, Iowa State University ($210,000)

BACKGROUND
Research outcomes of Phase I of this project revealed several benefits of the UHPC pile including reduced risk of damage during driving, drivability with a greater range of hammers and strokes, possibility of driving the pile without any cushion, use of the existing equipment for pile handling and driving, and reduced maintenance costs compared to steel and concrete pile due to enhanced durability of UHPC.

OBJECTIVES
To: 1) Establish and test connection details to extend the length of UHPC piles in the field; 2) Develop and test suitable details that can be used to connect the UHPC pile to concrete pile cap as well as to bridge abutment; 3) Study a UHPC pile behavior as part of a bridge foundation in the field and compare its behavior to that of a steel H pile, and 4) Develop a preliminary geotechnical design methodology.

BENEFITS
This research will develop a successful, IHRB high-risk seed funded project to the next phase, allowing implementation of UHPC piles in construction practice.

Motion to Approve by M. Nahra. 2nd by A. Abu-Hawash.
Motion carried with 11 aye, 0 nay, 0 abstaining.

PROPOSAL *Local Technical Assistance Program* (LTAP), Duane Smith, Iowa State University ($130,000)

BACKGROUND
This proposal requests continued funding for managing Iowa's Local Technical Assistance Program (LTAP). A significant point of note for LTAP is the retirement of current director Duane Smith in December, 2009.

OBJECTIVES
To provide technology transfer to local government transportation agencies and aid Iowa's local agencies in implementing the results of research; newly recorded modules from the Leadership Academy are available online and more recordings are planned for future modules.

BENEFITS
Iowa LTAP is a key venue for disseminating and implementing research. Many research projects become topics for technical and/or newsletter articles, workshop and seminar presentations, and library reference materials.

Q: Is LTAP contracting with ISU Extension for registration services for the Leadership Academy? Will you be involved after your retirement? Would you be volunteering your time?
A: A financial agreement is being developed. The contract being considered specifies that revenues be shared until ISU Extension recovers production costs; then, revenues will be100% returned to LTAP. Speakers volunteer, so funds coming back are all LTAP. There is a start of a revenue stream. In the future, the advisory board will direct monies within LTAP. The goal is to reduce future funding requests to IHRB.

If possible I (Dr. Smith) will be involved after December 2009. I would be paid for my time.

C: This is targeting non-degreed plow operators with a high school background who are trying to fill future foreman and leadership positions for small operations. Having modules separate from on-campus activities is an advantage. I'm glad to see our funding level ratcheting down and the program becoming self-supporting.

Shashi Nambisan, professor and Iowa State University InTrans Director: I'd like to respond to a few questions and comments from the Board. First, the Leadership Academy agreement contract is in my office; however, I'm not ready to sign off on that agreement yet because there are financial issues going on that must be considered before that happens.

Regarding the Business Plan and in- and out-of-state participants, the question was asked: 'If the state has subsidized the development of this program should there be a cost break?' I'd like to work with the advisory board in setting up that structure.

Lastly, the Leadership Academy is a separate cost center. Once we've recouped program costs, any additional revenues will be used to improve programs. We project breaking even in 2010.

Motion to Approve by J. Joiner. 2nd by M. Nahra.
Motion carried with 11 aye, 0 nay, 0 abstaining.

NEW BUSINESS
None

ADJOURN
Motion to Adjourn
Motion by J. Alleman. 2nd by S. Rinehart.
Motion carried with 11 aye, 0 nay, 0 abstaining.

The next meeting of the Iowa Highway Research Board will be held on THURSDAY, DECEMBER 3, 2009, at 1:00 p.m. in the East/West Materials Conference Room at the Iowa DOT.

Mark J. Dunn, IHRB Secretary