

IOWA HIGHWAY RESEARCH BOARD (IHRB)

Minutes of September 29, 2017

Regular Board Members Present

A. Abu-Hawash
K. Jones
C. Poole
T. Nicholson
S. Okerlund
R. Knoche
P. Hanley

T. Wipf
W. Weiss
R. Stutt
L. Bjerke
J. Thorius
M. Parizek

Alternate Board Members Present

B. Skinner
T. Kinney

Members with No Representation

P. Assman

Secretary – V. Goetz

Visitors

Tammy Bailey
Brian Worrel
Francis Todey
Kara Harmet
Danny Waid
Yang Zhang
Khyle Clute
Katelyn Freeseaman
Ashley Buss
Chris Williams
Cassandra Rutherford
Micah Loesch
Jerod Gross
Dan King

Iowa Department of Transportation
Iowa Department of Transportation
Iowa Department of Transportation
Iowa Department of Transportation
Iowa County Engineers Association
InTrans/Iowa State University
InTrans/Iowa State University
InTrans/Iowa State University
Iowa State University
InTrans/Iowa State University
Iowa State University
Federal Highway Administration
Snyder & Association
Iowa Concrete Paving Association

The meeting was held at the Iowa Department of Transportation Ames Complex, Materials East/West Conference Room, on Friday, September 29, 2017. The meeting was called to order at 9:00 a.m. by Ahmad Abu-Hawash with an initial number of 13 voting members/alternates at the table.

1. Agenda review/modification

2. Motion to approve Minutes from the June 2017 meeting

Motion to Approve by J. Thorius; 2nd K. Jones
Motion carried with 14 Aye, 0 Nay, 0 Abstaining

3. Final Report: TR-698, “Concrete Overlay Performance on Iowa’s Roadways”, Jerod Gross, (\$104,773)

BACKGROUND

Pavement preservation and rehabilitation have been growing in importance nationwide, leading to increased interest in concrete overlays. This study was necessary to evaluate the performance of concrete overlays as well as understand lessons learned and determine reasons for success.

OBJECTIVES

The objective of this project was to determine the performance of concrete overlays on Iowa’s roadways. The long history of concrete overlay construction in Iowa coupled with the availability of performance data presents the opportunity for a comprehensive, long-term performance study of concrete overlays.

DISCUSSION

Q. You mentioned on phase 1, design, construction and materials as items that you considered having an impact on the service life, what about maintenance?

A. Maintenance is hard to study, it is obviously an important part of maintaining the pavement. Getting the maintenance records is hard for us. Main factors are ensuring you have good materials and construction practices.

Q. You talked about combining information from the paving association with the state pavement management data base, was that something they have set up to continue?

A. Not part of this project phases, but it could be. The DOT is looking at some different strategy data collections. Through the PMP program we could do that.

Motion to Approve by W. Weiss; 2nd J. Thorius
Motion carried with 14 Aye, 0 Nay, 0 Abstaining

4. Final Report: TR-613, “Study of the Impacts of Implements of Husbandry on Bridges”, Brent Phares, (\$153,590)

BACKGROUND

The deterioration of bridges is a prevalent issue in the US. A portion of that deterioration comes from the frequent subjection of bridges to oversized loads, including those from implements of husbandry.

Although states’ definitions vary, this study’s survey results (received from 22 states) showed that an implement of husbandry generally describes a vehicle used in agricultural activities. Some states do not have a legal definition at all, whereas others have criteria as specific as axle weight and tire configuration.

OBJECTIVES

The objectives of this study were to develop guidance for engineers on how implements of husbandry loads are resisted by traditional bridges, with a specific focus on bridges commonly found on the secondary road system; provide recommendations for accurately analyzing bridges for these loading effects; and make suggestions for the rating and posting of these bridges.

DISCUSSION

This project started as an IHRB project, but later evolved to become part of a pooled fund study. Currently NCHRP is doing additional study on Implements of Husbandry and they will review recommendations from this study.

Q. Is there any thought on how we are going to implement the recommendations?

A. We need to look deeper into the data and figure out how it can be used. Distribution factors are very dependent not only on Ag vehicle type but also on the type of bridge. To just apply the same distribution factor for standard vehicle it could greatly decrease the allowable loading.

Q. Since Ag vehicles impact more of the county system, any thoughts on how counties might implement recommendations?

A. Maybe some workshops can be done to share the results and discuss how they can be implemented. Discussion with the ICEA executive committee is recommended.

Q. Is this something that would affect ASHTO code or FHWA regulations on how bridges need to be built.

A. Yes, it could influence it.

Q. This study looked at steel bridges, what about concrete bridges.

A. The NCHRP study is going to look at concrete bridges.

Q. Can you update the live load tables we have with this new information?

A. If we knew the load distribution factor according the AV vehicle, each county can use the known configuration of the bridge and use the equations to rate the bridge for these new AV vehicles.

Motion to Approve by K. Jones; 2nd R. Knoche

Motion carried with 14 Aye, 0 Nay, 0 Abstaining

5. Innovative Project Award Recipient Presentation: “Estimating Energy Efficiency of Connected and Autonomous Vehicles in a Mixed Fleet”, Jing Dong, Iowa State University.

DISCUSSION

Q. When will we be having these mixed fleets with Autonomous Vehicles?

A. The connective vehicles parts are difficult because you need communication strategy between cars, this is something that Federal Highways has certain standards. Currently there are vehicles there is cruise control you can purchase it with the cars package already which helps you know the vehicle in front of you. This is what the Nissan equations are for, they will know the speed and how far the vehicle is from you and adjust your speed.

Q. How many years away is this?

A. It depends who you ask, I went to a conference in San Francisco this past summer on Autonomous Vehicles and they were saying in the next five years.

Q. So really you only need 30% of autonomous connected vehicles mixed in with regular vehicles to start affecting the fuel energy savings of the whole fleet?

A. Yes.

Q. How is that going to affect the fuel tax funds for transportation projects?

A. It will probably shift the focus faster on other ways to fund transportation infrastructure.

6. PROPOSAL: “Load Rating for Short Span Prefabricated Bridge County Standards”, HDR, \$14,860.09.

Motion to Approve by W. Weiss; 2nd R. Knoche

Motion carried with 14 Aye, 0 Nay, 0 Abstaining

7. PROPOSAL: “Holding Strategies for Low Volume State Routes Phase II”, Chris Williams, Iowa State University, \$100,642, (15 min).

Motion to Approve by M. Parizek; 2nd T. Nicholson

Motion carried with 14 Aye, 0 Nay, 0 Abstaining

DISCUSSION

Q. What is your traffic count range for the Low volume state roads?

A. Around fifteen hundred.

8. RFP Proposals:

- a. **IHRB-16-11:** “Performance Evaluation of recent Improvements of Bridge Abutments and Approach Backfill”, ISU, (\$50,000)
- b. **IHRB-16-11:** “Performance Evaluation of recent Improvements of Bridge Abutments and Approach Backfill”, WJE, (\$50,000)

Motion to Approve Wiss, Janney, Elstner Proposal by W. Weiss; 2nd R. Knoche
Motion carried with 14 Aye, 0 Nay, 0 Abstaining

- c. **IHRB-17-01:** “Next generation Life Cycle Cost Analysis Tool for Bridges in Iowa”, ISU, (\$90,000)

Motion to Approve Iowa State University Proposal by R. Knoche; 2nd L. Bjerke
Motion carried with 14 Aye, 0 Nay, 0 Abstaining

- d. **IHRB-17-01:** “Next generation Life Cycle Cost Analysis Tool for Bridges in Iowa”, WJE, (\$90,000)
- e. **IHRB-17-09:** “Shrinkage and Temperature Forces in Frame Piers, ISU/HDR, (\$150,000)

Motion to Approve Iowa State University Proposal by W. Weiss; 2nd L. Bjerke Motion carried with 14 Aye, 0 Nay, 0 Abstaining

- f. **IHRB-17-09:** “Shrinkage and Temperature Forces in Frame Piers”, WJE, (\$150,000)

9. FY18 STIC Project Ranking

V. Goetz stated for Federal Fiscal Year 2018 for the Statewide Transportation Innovation Council Funding which is up to \$100,000 Federal funds with \$25,000 matched by the state for a total of \$125,000 in available funding. V. Goetz received three request for the funding for fiscal year 2018 which she sent out all three project descriptions and a preliminary ranking for the board members to do on-line last week. The priority ranking based on online votes from board members was:

1. NEPA Red Book Training Workshop
2. Virtual Reality Implementation for Public Engagement
3. Workshop Theory’s on Pedestrian Safety in Iowa Communities

The total of the three projects is more than the funding amount and it is up to the board in how they would like to proceed with funding so we can submit applications next month.

V. Goetz asked if the Virtual Reality project, would they need the full amount of the \$125,000 dollars if the board would like to spread out the funding? A. Abu-Hawash stated we could budget a lower amount to start out with. Vanessa stated the board does have other money besides STIC to help supplement some of the projects.

Motion to Select the top 2 projects for funding by K. Jones; 2nd T. Nicholson
Motion carried with 14 Aye, 0 Nay, 0 Abstaining

10. FY18 AID Grant for Sub-Recipients discussion

V. Goetz stated an update on the three previous AID projects selected for funding application:

State Application Federal Fiscal 2017:

Box Beam Project Implementation at the State application, V. Goetz is still waiting from FHWA for a yes or a no they are still evaluating.

Sub Recipient Application Federal Fiscal 2017:

STREET Implementation Project at the Dubuque MPO area, V. Goetz said the application was submitted to FHWA two weeks ago.

State Application Federal Fiscal Year 2018:

Automatic Plate Load Testing and Intelligent Compaction project: currently working on the development application so we have it ready to go for FFY18 Application later this fall.

Current solicitation is for FFY18 Sub Recipient AID application request that was open to Counties, Cities and MPO's. One project was submitted by Clinton County, which is looking at a Pilot Demonstration of a Cake Seal on one of the paved road.

Discussion followed on how to make sure this not just a one-time funding opportunity but how the project will have a big Statewide impact how the innovations are being implemented. One of the goals of the AID program is to offset that risk by trying something new so that Practitioners can see the projects, how they are done and use this opportunity to help promote implementation.

V. Goetz stated Francis Todey with the Iowa DOT has been working and having discussions with the District Engineers to talk about at the State what are we going to do to focus on pavement preservation. Danny Waid has been in discussions regarding pavement preservation at the County level. The board is driving the discussion and bring more to the system of why pavement preservation and what are the things the board needs to do for implementation with this project being one piece of that puzzle component.

Motion to Approve the project for AID application by K. Jones; 2nd J. Thorius

Motion carried with 14 Aye, 0 Nay, 0 Abstaining

- 11. Continuation Phase Project Ranking:** The IHRB membership submitted review and ranking of projects selected for continuation funding consideration. The following is the current ranking for projects to be considered. Secretary Goetz will solicit proposals and review on a case-by-cases basis when projects will move forward for board review and approval.

LRFD Calibration of Geotechnical Resistance Factors for Pile Bearing on Rock	\$50,000
Development of Drilled Shafts LRFD Resistance Factors	\$200,000
Field testing New Design detail for Short Span Box Beam Bridges	\$100,000.00
Impact of Curling and Warping Phase II	\$250,000
Vibrating Mix Design - N Design Phase II	\$200,000

Multimodal Transportation of Aggregates and Transloading Facilities Feasibility Study	\$120,000
GRS Abutment for Short Span Beam Bridges	TBD
Reducing uncertainties in snow fence design: Development of image based methods to estimate snow drifting and the snow relocation coefficient	\$80,000
Implementation of Wide Bridge Systems	\$140,000
Development of Smart Sensing Technologies for Transportation Infrastructure Health Monitoring: Wireless MEMS Chloride Ion Detection System	\$350,000

Motion to Approve by K. Jones; 2nd R. Knoche
Motion carried with 14 Aye, 0 Nay, 0 Abstaining

12. New Business

V. Goetz stated if the board saw the e-mail regarding the availability from FHWA for Tech Transfer Funds or T2 Funds which are available for application. M. Loesch would like the project submittals done today because they are due next week. Eligible activities like Per Exchanges, Workshops and they did state specifically that they are going after every day counts technologies and will be given priority. We have received several that V. Goetz is proposing for consideration and A. Abu-Hawash submitted one dealing with Virtual Reality that some of the board members were able to see this morning. One project proposed is for support of the next Innovation in Transportation Conference.

The board has put out several calls for projects specifically to support Every Day Counts Implementation in the State of Iowa and we have not received many. One project would be an Every Day Counts workshop and mimic what was done in Minneapolis for the region by FHWA but bring it to Iowa to get our local and State partners involved and do more education on what Every Day Counts Innovations. There is a lot of information that is shared with people but not sure if it has actually made a connection.

13. Adjourn

The next meeting of the Iowa Highway Research Board will be held October 27, 2017 in the East/West Materials Conference Room at the Iowa DOT. The meeting will begin promptly at 9:00 a.m.

Vanessa Goetz, IHRB Secretary