

IOWA HIGHWAY RESEARCH BOARD (IHRB)

Minutes of February 25, 2005

Regular Board Members Present

J. Adam	J. Joiner
S. Dockstader	J. Krist
T. Fonkert	C. Marker
R. Gould	M. Nahra
L. Greimann	R. Schletzbaum
J. Ites	C. Schloz
L. Jesse	

Alternate Board Members Present

W. Nixon for R. Ettema	A. Abu-Hawash
D. Short for L. Brehm	J. Berger
D. Waid for T. Fonkert	G. Bishop

Board Members with No Representation

None

Secretary

M. Dunn

Visitors

Max Grogg	<i>Federal Highway Administration</i>
Gordon Smith	<i>Iowa Concrete Paving Association</i>
Sara Buseman	<i>Iowa Department of Transportation</i>
Dave Claman	<i>Iowa Department of Transportation</i>
Ed Engle	<i>Iowa Department of Transportation</i>
Mike Heitzman	<i>Iowa Department of Transportation</i>
James Cable	<i>Iowa State University</i>
Bob Steffes	<i>Iowa State University</i>
Muhannad Suleiman	<i>Iowa State University</i>
Russ Walters	<i>Iowa State University</i>
Steve Andrlle	<i>Iowa State University/CTRE</i>
Tom Cackler	<i>Iowa State University/CTRE</i>
Shauna Hallmark	<i>Iowa State University/CTRE</i>
Neal Hawkins	<i>Iowa State University/CTRE</i>
Ed Jaselskis	<i>Iowa State University/CTRE</i>
Tom McDonald	<i>Iowa State University/CTRE</i>
Tim Morris	<i>Iowa State University/CTRE</i>
Omar Smadi	<i>Iowa State University/CTRE</i>
Larry Stevens	<i>Iowa State University/CTRE</i>

The meeting was held in the East/West Materials Conference Room at the Iowa Department of Transportation (Iowa DOT), Ames, Iowa. The meeting was called to order at 9:00 A.M. by Larry Jesse with 13 voting members/alternates at the table.

Agenda review/modification

- A discussion on funding splits for projects was added after agenda item 2.
- Agenda item 4, Final Report TR-504, “Extensions to the Iowa Culvert Hydraulics Software - The Design of Energy Dissipators”, will be postponed until the next meeting.

Approval of the minutes

- Jon Ites moved to approve the minutes as submitted from the January 28, 2005 meeting. Charles Marker seconded. Carried with 13 yes, 0 no, and 0 abstaining.

Discussion on Funding Splits

- Mark Dunn passed out a summary of the last 4 years of Board spending showing each of the different jurisdictions’ funds separately. In the long run, the actual spending balanced out to be close to the input percentages of 40% Primary, 50% Secondary, and 10% Street.
- To simplify the process, it was proposed that the Board consider funding projects based on the level of input of funds (40-50-10), instead of setting funding percentages based on each individual project’s anticipated jurisdictional benefit. The Board could also reserve the right to change the funding splits in unique cases, such as when a project is being supported solely by one jurisdiction.
- An additional voting member joined the table, bringing the voting member/alternate count to 14.
- After discussion, Mark Nahra moved that the Board fund all projects at 40% Primary, 50% Secondary, and 10% Street, unless it is supported 100% by a single jurisdiction. John Adam seconded. Carried with 14 yes, 0 no, and 0 abstaining.
- This will begin next fiscal year when the funds are renewed.

Final Report TR-497, “Manual of Iowa Drainage Law”

- Tom McDonald, Iowa State University (ISU) / Center for Transportation Research and Education (CTRE), presented the objectives; members of the advisory committee; research study tasks including literature search, review of laws and regulations, survey of agencies’ needs, survey objectives and responses, development of the manual, distribution and implementation plan, and project report; and budget status for the project. Input on the manual was welcome to be submitted to Tom McDonald on or before March 11, 2005.
- The process for keeping the manual updated was discussed. It was thought it may be beneficial to have the manual reviewed in approximately 5 years; however, it relies heavily on if there are any significant legislative changes, especially at the federal level.
- It was asked if there is a preference for the manual to be in paper form or on a CD. It was felt that the foremen in the field may benefit more from a paper copy; however, a CD may be preferred for

the county engineers' offices. It was recommended that CDs be sent out to the county engineers with a letter stating that paper copies may be obtained upon request.

- The report and manual will also both be available for download on the IHRB and the CTRE websites.
- It was also asked if it would be beneficial for the county auditors to have a copy as well as the county engineers. The recommendation was to contact the Iowa Drainage District Association and get a list of the counties with drainage districts and mail a CD to those county auditors.
- It was requested that copies also be sent to the Iowa DOT Design Office and to each district office.
- Jon Ites moved to approve the final. Mark Nahra seconded. Carried with 14 yes, 0 no, and 0 abstaining.

Final Report TR432, "Ultrathin Portland Cement Concrete Overlay Extended Evaluation"

- Dr. James Cable, ISU, reviewed the project's history (started under project HR-559); location and length; objectives, including evaluating bond, overlay thickness, slab size, and performance; monitoring results from 5 years and 10 years; use of deflection data; importance of surface preparation, edge support and drainage; use of structural fibers; rehab processes; and summary of benefits.
- The traffic count on the project's pavement was at 1090 vpd with 14% trucks when the project started. At the end of the project, the count was estimated to be 1500 vpd.
- The deterioration of the outside wheel path, which was especially seen in the thinner (2 inch) overlay, was thought to probably be due to the lack of lateral support.
- It was anticipated that this overlay would probably give a 20-year pavement with a thinner surface than is customarily done.
- Charles Marker moved to approve the final report. Roger Gould seconded. Carried with 14 yes, 0 no, and 0 abstaining.

Discussion, "Putting Stringless Paving into Practice"

- Dr. James Cable, ISU/CTRE, had presented a problem statement to the Board at the January meeting and was invited to bring a proposal before the Board for review.
- Dr. Cable explained that a meeting was held to discuss costs to parties involved and possible incentive offers in hopes to spread the potential risks and benefits. It is estimated that the cost for a county to put hubs in is \$10,000 per mile (Buchanan County project is 7 miles). CMI Corporation has indicated that the cost to put proportional valves on a paver is approximately \$2000 per leg (4 legs). The owner wants a smooth ride, the developer wants development money and time, and the contractor wants incentive pay for profile. There are also still some limitations on the accuracy of satellites. With all of this factored in, the project is being put on hold for now due to the timing just not being right; no one wants to take the first step. There is some work being done in Michigan and it will eventually come.

Problem Statement, “Evaluation and Enhancement of Longitudinal Joint Forming in PCC Pavement”

- Dr. James Cable, ISU/CTRE, presented some of the questions that have been raised over the last 4 years on the use of the joint former. The proposed research for Phase I will look at the equipment, the size and shape of the knife, the location on the equipment, the location in the paving train, the mix, the weather, the county vs. state projects and the performance. The goal is to make needed modifications and, in turn, develop guidelines on what to do to have the equipment perform better. If there are benefits that can be clearly seen and tied to specific changes, the project could lead to a Phase II demonstration project, taking the modifications into consideration.
- There was concern expressed about having a specification written at this time. An example of a construction project was given in which a county was not given any savings from the contractor if the joint former was used, so due to the possible risk of random cracking, which is being addressed in this proposed project, and no immediate cost savings, the county had the contractor saw the joint.
- It was agreed that things are not ready for a specification to be written on the use of the joint former; more investigation is needed. It was suggested that when a specification is written that it read that the engineer, not contractor, can specify either a sawed longitudinal joint or use of the joint former.
- The desired result of this project is to be able to pool all the information together in one report for evaluation then tighten up the guidance of the use of the joint former; there are too many variances among different pavers currently. The joint former has proven it can be used and perform well, but too many things are unknown at this time.
- It was clarified that this is being brought to the Board outside of the regular process due to timing. To go through the prioritization process, the earliest a proposal would be reviewed would be September. To have the timing work for this summer’s projects, it needs to be reviewed at this time.
- Mark Nahra moved to approve the problem state and invite a proposal to be submitted to the Board. Todd Fonkert seconded. Carried with 14 yes, 0 no, and 0 abstaining.

Problem Statement, “Iowa Data Collection and Analysis for the 2005/2006 National Surface Characteristics Field Experiment Plan”

- Tom Cackler, ISU/CTRE, handed out *The Concrete Paving Road Map - An Executive Summary* which reviews the overall plan of the future research direction. One of the research tracks in the Road Map is on pavement surface characteristics.
- Factors that affect surface characteristics; noise measurement variables; background and future direction of cooperative work between FHWA and ISU on surface characteristics and estimated funding involved; goals of the 2005 Action Plan with a focus on field experiments; objectives; project partners; texturing study with variations and detailed measuring/monitoring; and plan details including construction, data collection and analysis, distinguishing study features and anticipated findings, products and technology transfer, and staffing/coordination of the proposed study were reviewed.

- It was clarified that the IHRB portion of the overall project will be looking at a new pavement with 10 test sections with controlled variations and detailed measuring of results (this will be one of the two hoped to be done nationally this summer). The collection of data from existing pavements nationwide is funded under the larger project.
- There was concern that the data from the existing pavements and national data from research that has already been done (literature search) on the topic should be collected prior to starting the new paving project. This would allow taking into consideration what has already been learned and avoid building some of the errors into the project.
- Part 1 - “2004/2005 Strategic Plan/Management and Evaluation of European/US Methods” of the larger project, was mentioned to have addressed the above literature search concern. It has been found that many of the reports are not structured to evaluate the information as desired in this project.
- It was thought that there was more to gain from this research than just noise efficiencies; the information on friction will be useful.
- Although it was mentioned that there would be benefits to working with more than one contractor on more than one 6,000 foot project and spending additional money on the front end to get a better idea of where noise may be induced by equipment, it was realized that there are both financial constraints involved and other partners with which to coordinate project decisions.
- There will be a cooperative effort with the contractor and the researchers to control the different techniques as much as possible concerning the construction.
- The Board complimented the project on having the Federal and other funding in place.
- There was a clarification that the tests will be made between 30 and 60, not at 30 and 60 days.
- To allow the researchers more time in locating a project and moving ahead with the research, it was agreed by the Board that the problem statement was submitted with adequate information to be considered as a proposal.
- It was mentioned that Dr. Robert Rasmussen, The Transtec Group, compiled the information from the literature search and that information could be given to the Board if so desired.
- A copy of a report from Colorado research was given to Mr. Cackler to insure that information was taken into account.
- Mark Nahra moved to approve the problem statement as a proposal, subject to the review of the findings of the literature search. Scott Dockstader seconded. Carried with 14 yes, 0 no, and 0 abstaining.
- There was clarification on funding splits with regard to the Board’s decision earlier in the meeting. The newly proposed funding splits (40-50-10) cannot be adopted until the start of the next fiscal year due to the spending that has taken place throughout this year on a per project potential benefit basis. This project was accepted with the funding splits recommended on the agenda.

Problem Statement, “Using Scanning Lasers for Real-Time Pavement Thickness Measurement”

- Tom Cackler, ISU/CTRE, talked about the gap this research is addressing. The objective is to show if scanning technology can determine the subgrade pavement interface. The topic fits into the larger objective of bringing manufacturing-type control to the field process. This technology has the potential to allow for better thickness control, more predictable yields, and more economy.
- A printed copy of the PowerPoint presentation was handed out. Dr. Edward Jaselskis, ISU/CTRE, presented the background information, objective, logic in using lasers, and diagram showing the anticipated layout.
- Dr. Russ Walters, ISU/CTRE, reviewed the NDE methods used to determine pavement thickness in real time; and methodology for Phase I, Phase II - lab study, and mentioned Phase III - which would be down the road and look at putting technology on equipment in the field.
- Dr. Jaselskis summarized the benefits; budget; and schedule of the proposed research.
- Total robotic station was thought to be too cumbersome and expensive to be used with this project; however the use of differential GPS was anticipated to be adequate. The technology needs to provide XYZ coordinates, to be able to marry the surfaces together, and to allow that the different locations may not always be on the same plane.
- It was clarified that this proposal is requesting funding for only Phase I, the feasibility study. The principal goal is to develop the algorithm that can filter out all the noise and provide a clean profile of the subbase on the front end of the paver.
- Different characteristics of the pavers, temperature, vibration, noise, etc. and how those could affect a sensor, and different configurations in a paving train to see where the best location to mount the laser are also important aspects to be considered in Phase I.
- The anticipated accuracy was questioned. With the lasers that Dr. Jaselskis has worked with in the past, the accuracy was 2-6 mm at 50 meters with the use of one laser. This project would be closer than 50 meters, so it is estimated that accuracy would be 2-4 mm.
- It was mentioned that it would still be beneficial even if less than 100% of the information in front of the paver was collected; it would still provide a substantial amount of information to indicate pavement thickness compared to the current method of coring which gives a minute representation of the thickness.
- There was a question on the lack of participation from industry. This project is a feasibility study and it wasn't to a point yet that industry was interested in contributing to it. Industry doesn't feel a push from owners at this point. After its feasibility is established, it helps de-risk the technology and benefits are more clearly realized.
- Some of the potential benefits mentioned included savings from not having to core, savings from not having manpower on site solely to measure thickness or yield, and savings from not paving thicker than designed to ensure the thickness is there.

- In regards to ownership, the development of this technology would fall under the “typical” agreement between the Iowa DOT and investigative agency (ISU in this case). The DOT would have ownership.
- It was mentioned how these topics being reviewed work together in *The Concrete Paving Road Map*; this topic fits into Step 3, *High-Speed Nondestructive Testing and intelligent Construction Systems*.
- John Joiner moved to approve the problem statement as a proposal, with the funding splits recommended on the agenda. Mark Nahra seconded. Carried with 14 yes, 0 no, and 0 abstaining.
- An additional voting alternate joined the table, bringing the voting member/alternate count to 15.

Brainstorming workshop to develop strategic research needs for FY 05-06

- The Board members and alternates made suggestions of topics to be considered for solicited research. After the members and alternates, the room was opened up for suggestions from others.
- The topics from last year’s list which did not receive any votes will be e-mailed to the Board for review. Those topics that Mark Dunn is asked to leave on the list, will remain on the list for consideration, all other topics will be taken off.
- March 4 was set as the deadline to submit any additional research topics to Mark Dunn to be considered for next fiscal year’s priorities.
- The newly submitted topics, along with past topics of interest, will be organized and sent out to the members and alternates allowing enough time for initial ranking prior to the deadline of the April Board packet. The final ranking of projects will be done at the April 22, 2005 meeting.

Discussion on May traveling meeting location options

- The following are ideas that have been submitted:
 - Tour of the Hydraulics Lab at The University of Iowa.
 - Tour of the lab to see the Simple Performance Tester for the TR-474 project at The University of Iowa.
 - Tour of the River Station on the Mississippi, which opened in 2002.
 - Tour of the Hungry Canyon projects that were done in the Loess Hills area.
- Any additional suggestions should be given to Mark Dunn and a decision will be made at the April 22 meeting.

New Business

- None

Jon Ites moved to adjourn the meeting. John Adam seconded. Carried with 15 yes, 0 no, and 0 abstaining.

Date of Next Meeting: THE NEXT MEETING WILL BE HELD FRIDAY, APRIL 22, 2005 AT 9:00 A.M. IN THE EAST/WEST MATERIALS CONFERENCE ROOM AT THE IOWA DOT, CENTRAL COMPLEX, IN AMES, IOWA.

Mark Dunn, IHRB Secretary