

# IOWA HIGHWAY RESEARCH BOARD

*Minutes of July 30, 2004*

## **Regular Board Members Present**

R. Ettema	J. Krist
T. Fonkert	C. Marker
L. Greimann	M. Nahra
J. Ites	C. Schloz
L. Jesse	J. Selmer

## **Alternate Board Members Present**

J. Berger for R. Gould	A. Abu-Hawash
R. Schletzbaum for C. VanBuskirk	G. Miller
B. Younie for J. Adam	

## **Board Members with No Representation**

L. Brehm  
G. Parker

## **Secretary**

M. Dunn

## **Visitors**

John Thomas	<i>Hungry Canyons Alliance</i>
Gordon Smith	<i>Iowa Concrete Paving Association</i>
Stu Anderson	<i>Iowa Department of Transportation</i>
Tracey Bramble	<i>Iowa Department of Transportation</i>
Sara Buseman	<i>Iowa Department of Transportation</i>
Ed Engle	<i>Iowa Department of Transportation</i>
Mohammad Mujeeb	<i>Iowa Department of Transportation</i>
Paul Spry	<i>Iowa State University</i>
F. Wayne Klaiber	<i>Iowa State University/CCEE</i>
Terry Wipf	<i>Iowa State University/CCEE</i>
Steve Andrlle	<i>Iowa State University/CTRE</i>
Dale Harrington	<i>Iowa State University/CTRE</i>
Neal Hawkins	<i>Iowa State University/CTRE</i>
Larry Stevens	<i>Iowa State University/CTRE</i>
Jim Grove	<i>Iowa State University/PCC Center</i>
Bob Steffes	<i>Iowa State University/PCC Center</i>
Thanos Papanicolaou	<i>The University of Iowa</i>

**The meeting was held in the East/West Materials Conference Room at the Iowa Department of Transportation, Ames, Iowa. The meeting was called to order at 9:05 A.M. by Larry Jesse.**

**Agenda review/modification**

- No additions or modifications.

**Approval of the minutes**

- Jon Ites moved to approve the minutes from the June 25, 2004 meeting with no additions or corrections. Bob Younie seconded. Carried with 11 yes, 0 no, and 0 abstaining.

**Proposal, “Field and Laboratory Investigation of Hydraulic Structures Facilitating Fish Abundance and Passage Through Bridges in Western Iowa Streams”**

- Dr. Thanos Papanicolaou, The University of Iowa, presented the problem statement; an overview of conventional structures; an overview of new designs, including fish ladders and grouted structures; the specific research needs; the objectives; the research tasks; a matrix of the proposed field and laboratory tests; the field methodology and techniques; the laboratory methodology; the products of the research; the previous experience; the role of the advisory board; and the schedule and budget of the proposed research.
- There was discussion on the immediacy of the research due to both the timing of fish migration and the current availability of matching funds. The Hungry Canyons Alliance and the DNR are contributing the other 50% of the project funds, bringing the total project cost to \$119,246. Thus, the request was submitted to the Board as a proposal, not a problem statement.
- Although this project addresses western Iowa, it was thought that the results would apply statewide. Anytime a proposal goes to the DNR which elevates the water more than three feet above its natural stream, DNR approval is needed. Studies are also showing the need to mitigate fish migration. Presently trial and error is the process that is being used. It is felt that this research will help accelerate finding acceptable structures, slopes and other needed details.
- Mark Nahra moved to approve the proposal with the recommended funding split of 40% Primary, 50% Secondary, and 10% Street. Jim Berger seconded. Carried with 12 yes, 0 no, and 1 abstaining.

**Final Report TR-469, “Reduction of Concrete Deterioration by Ettringite Using Growth Inhibition Techniques – Part II – Field Evaluation of Inhibitor Effectiveness”**

- Dr. Paul Spry, Iowa State University, reviewed the background of the study; summary of the results of Part I; goals of Part II; characteristics of highways used in the experiments; types of lab and field experiments; effects of DTPMP treatment; field tests application information; results from US Highway 20; analysis of ettringite; conclusions; and recommendations of the research completed.
- It was clarified that adding sulfate to harden concrete quickly is common practice, as a result of that, ettringite can be a byproduct. Later, sulfur is released and secondary ettringite forms. If a chilorator (DTPMP) is used to remove the ettringite once the concrete is hardened, it stops the harmful effects. The growth of ettringite is what expands and causes cracking.

- There was discussion on some specifics of DTPMP. It was mentioned that it is fully soluble and it was found to perform equally well at high and low temperatures. DTPMP doesn't appear, at this time, to have any harmful effects on the concrete. The product is mainly manufactured to reduce carbonate build-up on the inside of pipes. The cost of DTPMP is approximately \$60/container. It was felt that the container could be used for possibly 10 years for a roadway similar to the current test project on US 20.
- There was discussion on the application frequency, process and concentration. It was recommended by the principal investigator that it be applied at approximately 10 times within the year and could be applied throughout the life of the concrete. For this project, DTPMP was added to the deicing solution and applied with every pavement treatment during regular winter maintenance (19 applications in a 15 month period). It was thought that the solution would likely be equally effective if it was added to just water and not a deicing solution for application, however, keeping the application frequency the same was thought to be an important factor.
- The research showed that the level of penetration of the solution in concrete during the 15 month period was 6 mm. It was used on US 20 which is not a very porous pavement. The amount used for the project was .1 volume percent, however, it was felt that .001 to .01 volume percent would be sufficient. It was mentioned that the experiments have shown that, over time, the level of penetration of the tested solutions in concrete happen at different rates and different distances than deicing solutions. It was felt that with more applications over time it would descend deeper.
- It was thought that this treatment would be effective on pavements with little or moderate deterioration. If there is fly ash or slag used, this doesn't need to be used; ettringite will not grow. C-3 and C-4 mix types are good candidates for the use of the product. Not only should it be decided for use by looking at concrete type, but aggregate should be looked at as well. Dolomites seem to have a greater chance of deterioration with use of deicing salt.
- It was recommended by Dr. Spry that ideally, the pavements should be treated and looked at over a 10 year period to see the true long-term effects.
- Bob Younie moved to approve the final report. Rob Ettema seconded. Carried with 13 yes, 0 no, and 0 abstaining.

#### **Review of final RFP for 1<sup>st</sup> Solicitation for FY 04-05**

##### ***IHRB 04-08, "Development of a New Process for Determining Design Year Traffic Demands"***

- After review of the RFP at the previous meeting, the Board requested that the comments and input given be reviewed by the Iowa DOT Systems Planning Office, and Duane Wittstock, City of West Des Moines and acting RFP Technical Contact. Mark Dunn reviewed the changes, mostly clarifications, which were made as a result of that meeting. The review committee felt that the more mature communities facing redevelopment would be able to use the model in a similar fashion as a new developing community. It was also felt that the model would not work as effectively for a community decreasing in size.
- There were no further comments or discussion. The RFP will be sent out in August and proposals will be reviewed at the October meeting.

## **Video and discussion on 2004 priority topic IHRB -04-12, “Effective Methods for Removing and Eliminating Roadside Obstructions”**

- Ed Engle did a background search on this topic. Story County has done some work in this area. CTRE has produced a brochure for their use for public education. The County Engineers’ Association is also working with the legislature on a rewrite of Code 319. The Texas DOT has a video available on roadside mailboxes/obstructions, which includes crash tests. There are other models available that can be looked at that could also be incorporated into a final product for use in Iowa. Anything developed by the Board will be coordinated with these other efforts.
- The Texas DOT video was shown and the Board discussed important aspects of the video and topics that would be beneficial to incorporate into a video.
- It was mentioned that it would be helpful to have a shortened and a full version of the video on the same DVD to have either available to adapt to different audiences as necessary. It was recommended to isolate some of the crashes and requirements for the shorter version. One section in need of update on the video is the reference to the AASHTO guide; there is a newer version available.
- It was questioned if it was possible for any of this information to be done in commercial form to help with public education. It was mentioned that the DOT has video capabilities.
- It was thought that the DVD would also be a beneficial tool for the classroom.
- There is also a video that Larry Jesse presented at a County Engineers’ meeting which discussed other aspects such as ditches, culverts, guardrails, etc. It was recommended to incorporate parts of that which would be useful for public education, such as slopes and ditches.
- One thought was to set up a Power Point presentation with some of the video clips included.
- It was recommended that Steve DeVries, Iowa County Engineers’ Association Service Bureau, be contacted about the possibility of doing the distribution.
- With the other efforts going on and information that is already available, Ed Engle will contact Bob Sperry, Story County Engineer, and coordinate what the Board may be able to do to assist in getting a quality end product. It was, however, expressed that it would still be beneficial to have this video, with updated AASHTO information, available as soon as possible and improvements or changes can be made to it as needed and it could also be used as a legislative tool.

## **Discussion on Business Plan modifications to accommodate separate RFPs for projects relating to only one of the jurisdictions**

- Draft language for single jurisdiction solicitation was included in the Board packet.
- Both support and concern was expressed for allowing the proposed process into the Board’s procedures.
  - It was mentioned that the current process used, somewhat constrains the number of projects being approved by the Board.
  - It was expressed that the amount of money that is building up, especially in the Secondary Road Research Fund, would really like to be accessed and put to good use. Since there are projects that need more immediate attention, however, some potentially beneficial projects weren’t high

enough on the list to get funded. Some topics also develop throughout the year and the process requires that they wait until the next prioritization.

- The concern that was expressed with a single jurisdiction going outside the normal process was that separate agendas could form for the different jurisdictions and it could create a less solid Board. It was added that the Business Plan already allows for certain circumstances for proposals to come before the Board without going through the prioritization process.
  - It was clarified that it was desired for a single jurisdictional topic to still go through the normal steps of solicitation, review and voting as one in the regular process would; it would need full Board discussion and approval. The difference would lie in the initiation process and it would be brought forward by only one of the funding groups on an individual basis and would be fully funded by that group.
  - It was mentioned that the Board could try the single jurisdictional support idea and re-evaluate it after 6 months.
- The Board discussed other potential changes to be made to the Business Plan to address apparent issues with the current process.
    - One suggestion to add to the process was to revote on the remaining priorities after the first solicitation is completed. The thought was that this would allow the topics a bit lower on the list to be given prioritization which may be more accurate. Since the top priorities are usually given several votes to ensure that they are addressed, the lower ones get the left over votes and the true priority of them may not show through.
    - It was suggested that the second vote could possibly be made with weighted votes, according to fund balances.
    - It was also thought that additional topics could be brought in at the time of a second prioritization vote so topics don't have to wait a full year to be submitted for consideration.
    - It was mentioned that it may be beneficial (although difficult) to earmark some of the money for longer range topics which could develop new techniques or fundamental insights. Much of what is done now is felt to address an immediate need.
    - It was mentioned that the Board already has accommodations in place to provide seed money for a new and original idea. Since the Business Plan's adoption, there have been no proposals submitted under this provision.
    - It was suggested to look at vote plateaus.
    - Another option of a wild card was mentioned.
    - There was a concern expressed about the potential for a problem on the political end of things with the amount of money sitting in the Secondary Road Research Fund and was thought that Board needed address that issue.
  - After discussion, it was agreed that Mark Dunn will add the second vote aspect and look at other areas of the discussion to incorporate into the Business Plan. Any areas that contain changes will be highlighted and it will be sent out with the September Board packet and will be further discussed at the next meeting.
  - With these changes, more time commitment will be needed from members, alternates, and staff to process the increase in projects.

### **New Business**

- There was a reminder to county members and alternates that following the tour of the Mobile Concrete Lab, there is a meeting with Drs. Klaiber and Wipf in the Small Materials Conference

Room. The meeting is to discuss the direction of the next phase for TR-452, “Alternative Solutions to Meet the Service Needs of Low Volume Bridges in Iowa.”

**Presentation of the Center for Portland Cement Concrete Pavements Technology Mobile Concrete Research Lab**

- Jim Grove, PCC Center, presented the background, funding partners and travel/testing plans for the Mobile Concrete Lab.
- Bob Steffes, PCC Center, gave an overview of the design and capabilities of the lab and offered a tour of the mobile lab following the meeting.

**Charles Marker moved to adjourn the meeting. Mark Nahra seconded. Carried with 12 yes, 0 no, and 0 abstaining.**

**Date of Next Meeting: THE NEXT MEETING WILL BE HELD FRIDAY, SEPTEMBER 24, 2004 AT 9:00 A.M. IN THE EAST/WEST MATERIALS CONFERENCE ROOM AT THE IOWA DOT, CENTRAL COMPLEX, IN AMES, IOWA.**

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Mark Dunn, IHRB Secretary