IOWA HIGHWAY RESEARCH BOARD (IHRB)
Minutes of May 20, 2005

Regular Board Members Present

J. Adam
L. Brehm
R. Ettema
T. Fonkert
J. Ites
L. Jesse
J. Krist
C. Marker
M. Nahra
R. Schletzbaum

Alternate Board Members Present

A. Abu-Hawash for R. Gould
S. Gannon for C. Schloz
J. Berger
J. Rasmussen

Board Members with No Representation

S. Dockstader
L. Greimann
J. Joiner

Secretary

M. Dunn

Visitors

Ed Jankowski	*City of Council Bluffs*
John Thomas	*Hungry Canyons Alliance*
Sara Buseman	*Iowa Department of Transportation*
Ed Engle	*Iowa Department of Transportation*
Mike Heitzman	*Iowa Department of Transportation*
Sandra Larson	*Iowa Department of Transportation*
Mike LaViolette	*Iowa State University/Bridge Engineering Center*
Brent Phares	*Iowa State University/Bridge Engineering Center*
Shauna Hallmark	*Iowa State University/CTRE*
Neal Hawkins	*Iowa State University/CTRE*
Omar Smadi	*Iowa State University/CTRE*

The meeting was held in the Conference Room at the Iowa Department of Transportation (Iowa DOT), District 4 Office, in Atlantic, Iowa. The meeting was called to order at 9:30 A.M. by Larry Jesse with 12 voting members/alternates at the table.

Agenda review/modification

- Agenda item 8, Proposal, "Developing Guidance for Use of Lighting on Rural and Urban Roadways in Iowa", was moved up to follow the approval of the minutes.

Approval of the minutes

- Charles Marker moved to approve the minutes as submitted from the April 22, 2005 meeting. Mark Nahra seconded. Carried with 12 yes, 0 no, and 0 abstaining.

Proposal, "Developing Guidance for Use of Lighting on Rural and Urban Roadways in Iowa"

- Neal Hawkins, Iowa State University (ISU)/Center for Transportation Research and Education (CTRE), introduced the research team and reviewed the role lighting has as one of the visual components on the roadway; the problems faced with lighting, including the lack of guidelines for suburban and rural situations; the balance of economics with safety and operations; visual examples of lighting locations; night accident/fatality statistics for Iowa and the nation; the main research objectives and tasks; the schedule; the budget; and the funding partners of the proposed research.

- It was clarified that the following aspects would be included in the study: evaluation of the use of hanging traffic signals; review of the shortened life of certain light fixtures due to vibration on bridges; and consideration of mayfly attraction to certain types of lights, causing slick spots (safety issue) on the pavement beneath the lights.

- Jeff Krist moved to approve the proposal with the recommended funding splits. Todd Fonkert seconded. Carried with 12 yes, 0 no, and 0 abstaining.

Final Report for TR-422, "Pretreatment for Reduction of Asphalt Absorption in Porous Aggregate"

- Ed Engle, Iowa DOT, mentioned that the TR-422 project is a piggybacked project of TR-414, "Superpave Mix Designs for Low Volume Roads", which was presented to the Board last October. The objectives, background, project location, aggregate information, construction details and equipment, data comparing treated and untreated aggregate, and conclusions of the project were presented.

- It was clarified that the aggregate that received an application of the pretreatment material required approximately the same amount of total asphalt added as that without pretreatment. It was also mentioned that an adjustment was made to the mix design due to a timing issue. The mix design called for 25 to 30 minutes from the time it was mixed to the time it was placed and with this project, that period was closer to 5 minutes.

- Mark Nahra moved to approve the final report. Roger Schletzbaum seconded. Carried with 12 yes, 0 no, and 0 abstaining.

Final Report for TR-496, "Development of Standard Plans for the Design of Single Span Pretensioned, Prestressed Concrete Beam Bridges with Concrete Abutments"

- Mark Dunn, Iowa DOT, reviewed that this project had gone through the Iowa DOT's consultant selection process and that Stanley Consultants, Inc. was chosen to complete the work.

- The goal of the project was to take the current H-24S and H-30S concrete beam, single span bridges with timber abutments and add an option to put integral abutments under them. Essentially, another parallel series was created to keep things separate. The plans were also updated with the new barrier rail end sections and the current beam sheets. The length was extended to 110 feet (with 10 feet increments) and stayed with the shallowest beam section that would work for each of those lengths.

- The project was completed under budget, so the Iowa DOT Bridge Design Section is determining the scope of work that would need to be done to update the timber abutment series as well. Stanley Consultants, Inc. will submit a proposal to the Iowa DOT in response to the revisions requested. It is anticipated that the work could be done with the funds remaining from the current project. It was noted that the updates would bring the sheets up to current CAD standards and would include the current concrete beam standard sheets, with the low lax strands, and a few other minor changes.

- It is anticipated that the plans completed from this project will be available electronically in Microstation format on the Iowa DOT's Office of Bridges and Structures web site. Mark Dunn will check with the Iowa County Engineers' Association (ICEA) Service Bureau to see if an AutoCAD version can be made available through the Service Bureau's web site as well. Detailed information will be released on this when final report notifications are sent out from the Research and Technology Bureau (anticipated to be sent at the end of June).

- Mark Nahra moved to approve the final plans. Lyle Brehm seconded. Carried with 12 yes, 0 no, and 0 abstaining.

Discussion on development of updated/combined slab and concrete beam standards for Iowa DOT and county bridges

- Mark Dunn, Iowa DOT, explained that there are currently two sets of bridge standards for both three-span concrete slabs and three-span Prestressed concrete beams, one of each for the counties and the Iowa DOT. The standards need updated for Load and Resistance Factor Design (LRFD) by 2007. There were only minor differences between the county and DOT standards, so it has been requested that they be combined at this time.

- Ron Meyer, Iowa DOT Bridges and Structures Consultant Coordination Section, has requested cost estimates from a couple statewide consultants. Preliminary estimates are at approximately $275,000 to $300,000 for three-span concrete slabs standards and $700,000 for three-span Prestressed concrete beams standards.

- Some of the details which have been considered thus far were presented.

- Input is needed from counties on issues such as if a wood pile alternative is needed for the piers and if there is a need for more than a 30 ft width for lengths less than 200 ft. Anyone interested from the IHRB in getting together with the Iowa DOT Bridge Design Section and discussing the

portions that should and shouldn't be considered is welcome. Discussion will help determine the needs and which aspects can be eliminated and help cut the costs.

- Mark Nahra expressed interest in being involved with the committee. Others interested should call Mark Dunn for correct contact information.

- It was discussed that there would likely be the option to have the Autobridge software adopted for this work.

- After conclusions are made on what the final product should be, proposals will be brought to the Board. Through the normal consultant selection process, WHKS (developers of Autobridge Program) and Stanley Consultants, Inc. were chosen to develop the proposals for the three-span Prestressed concrete beams standards and the three-span concrete slabs standards respectively.

- It was mentioned that the Board has, in the past, funded projects like this as engineering studies for the development and maintenance of county bridge standards. At this time, it is being looked at to combine with the DOT standards to save costs. The counties are in favor of having this done and the IHRB will be asked for funds to cover the counties' portion with 100% Secondary Road Research Funds. The DOT's portion will be covered by consultant services funds.

- It was recommended that a questionnaire be sent through the ICEA Service Bureau to get a more representative response from the counties on the desired direction of this project. Mark Dunn will work with Bridge Design and get a group of questions together and then work with Steve DeVries at the Service Bureau to distribute them to the counties.

Final Report for TR-509, "AAHSTO 2002 Pavement Design Guide Implementation Plan - Phases I and II"

- Mike Heitzman, Iowa DOT, presented the final report information due to a conflict for Dr. Brian Coree, ISU. The objectives; general evaluation of the Mechanistic Emperical Pavement Design Guide (M-E PDG); information on the AASHTO Road Test done in the 1950s; limitations of the present system; flow chart of the M-E Pavement Design Process; M-E PDG process; graph showing pavement design variables; questions posed with the new process; benefits; sample output data; rehabilitation options; reliability; Iowa preparedness; performance models; calibration of distress prediction models, with national information and information specific to Iowa; map showing fatigue cracking calibration sites; Iowa pre-calibration; validation and calibration; sensitivity; output information; and recommendations of implementation of Phases I and II were overviewed.

- It was mentioned that it is up to the designer to input for a more conservative or liberal design.

- The software is well packaged, so that once the basic inputs are understood, the program is quite usable. The intent of the implementation plan for Iowa is to have a separate design guide manual to assist the designer with the inputs instead of having to use the 18 volumes of information which make up the full design guide.

- Charles Marker moved to approve the final report. John Adam seconded. Carried with 12 yes, 0 no, and 0 abstaining.

Proposal, "Instrumentation and Monitoring of Precast, Post-tensioned Bridge Approach Pavement"

- Mark Dunn, Iowa DOT, provided some introduction to the proposal. HR-1085, "Use of Precast Post-Tensioned Concrete Panels for Bridge Approaches" is a FHWA funded project ($200,000) in the early stages; and TR-530, "Development of an improved Integral Bridge Abutment-to-Approach Slab Connection" is an IHRB funded project happening concurrently. This proposal is asking for the Board's support in monitoring the bridge involved in HR-1085 (the FHWA money does not include funding for long-term evaluation or monitoring) and using similar types of monitoring techniques as used in TR-530 to see the affect it has on the bridge.

- Mike LaViolette, ISU/CTRE, reviewed the problem statement; use of polyethylene between the subbase and precast panel; possible applications including, bridge approach pavements, sections of patching (i.e. settled culvert area), small sections of mainline paving where you can't afford to close down lanes for long periods of time, and ramp replacement; selected bridge project; objectives and tasks; preliminary details; implementation and technology transfer plans; benefits; project schedule; staffing and budget.

- It was mentioned that this project is mostly to test the feasibility and monitor the technology. It is being done on a closed road due to the project availability corresponding with the timing of FHWA funds for the construction portion (HR-1085). The information gained will give a good indication on the possibility of accelerated construction of pavement replacement while keeping the goal of minimizing the effect it has on heavier traffic flow.

- Another benefit of the technology that was mentioned was that it would be less dependent on the weather due to the slabs being cured in an inside environment.

- It was stated that the polyethylene used between the subbase and the concrete slabs was to lessen friction during the tensioning process, reducing post-tensioning losses, and the long-term function was not a concern.

- It was requested that the Board keep in mind the idea of comparing pre- and post-tensioning costs and time in future research opportunities. It was said that pre-tensioning would be more applicable in a single slab application. With putting slabs together, post-tensioning would be used.

- There was concern with using this technique in pavement patching due to the unknown of how much of the concrete will need to be removed and replaced.

- John Adam moved to approve the proposal with the recommended funding split. Mark Nahra seconded. Carried with 12 yes, 0 no, and 0 abstaining.

Review of proposed Business Plan language regarding pilot projects for novel ideas and fundamental advances

- Mark Dunn, Iowa DOT, gave a brief overview of the committee involved and the language developed to increase the number of pilot projects for novel ideas and fundamental advances. The committee broadened the scope of what would fit under this heading and suggested that an RFP be sent out once a year for such projects and that no funding restriction is put in place.

- Dr. Rob Ettema, The University of Iowa, explained the motivation of encouraging this aspect of research from a university point of view. It helps the Board meet the goals expressed in the Business Plan and has the potential to bring in more long-term issues from a wider variety of researchers. Currently, the Board's activity is heavily rated on immediate need. It could help younger engineers become more familiar with the Board, boost education and promote collaboration between the state universities. In the *National Academy of Engineers* report, it was mentioned that the number of engineers and research being done is slipping; making these funds available helps encourage research. (Dr. Ettema will plan to e-mail the report to Mark Dunn's office so it can be e-mailed to the Board or made available at the next meeting.) It was suggested that the Board fund three or four projects a year in the range of $50,000 to $70,000 each. At that level of funding, a graduate student and partial faculty salary could be covered.

- It was thought that the proposed Business Plan language was phrased well. It was also mentioned that leaving out a dollar amount/range was preferred. It was suggested that when a proposal is submitted under this portion of the Business Plan that the Board have the flexibility to make a decision of yes, no, amend the scope, or suggest that it be added to the topics to be considered for the next prioritization.

- It was felt that it was a good move being proactive with an area of the Business Plan which was not working. Since the start of the Business Plan, there have been no projects brought to the Board under this area. It is not likely that researchers read the Business Plan. Handling this aspect with an RFP approach should help make the IHRB more visible.

- It was wondered if the Board needed to get more involved with an outreach program (i.e. attend joint university staff dinners, etc.) and further work on becoming more visible.

- It was asked to include, "Adds a substantial benefit to transportation in Iowa", as a fifth point on the back page. However, it was said that the letter which accompanies the RFP, explains those guidelines well enough so that proposals received should fall into the desired categories.

- There was concern spoken about the fourth point on the list on the last page of the proposed language. The Secondary Road Research Funds come from Road Use Tax Dollars and, by Iowa Code, are to have a highway reference to them. It was added that the intent of the Board is to fund research that would be useful to the transportation industry, not fund a graduate student in general. It was felt that the language left things open to a wide variety of student assistance and shouldn't be expressly written in the Business Plan. It was requested that the language be rephrased and Universities provide guidance to researchers as to what is available.

- There was discussion on removing the budget guideline. It was a concern that if that guideline was taken out, that it may be wasting the researcher's and the Board's time because the expected level of research and funding could be quite different from the other. However, part of the intent of this research aspect was to be used as seed money to investigate an idea. After the results from the initial research, it may be that an additional phase is brought back to the Board, put into the prioritization process, or encouraged to go elsewhere for funding.

- It was recommended to keep a single project budget guideline and an annual dollar cap out of the Business Plan. Some of the funding decisions could be based on the amount of funds that are available after the prioritized or other desired projects are considered and that would change the left over funds available for this type of project year to year. For example, currently the bridge standards that were discussed earlier in the meeting will take nearly $1,000,000 to complete.

- It was recommended to leave some latitude in the process and change criteria as the Board deems necessary once this aspect of the Business Plan has been put into motion and more is known on the direction it will take. The researcher will need to show merit on a case by case situation and the Board will need to evaluate each proposal in view of that.

- It was suggested that the remarks from this be taken into consideration and a draft RFP with cover letter be written and discussed at a subsequent meeting.

New Business

- There was a request made for information which may be available on Ipanex and GSB. Information will be sent from Mark Dunn's office on the first and contact information was given for the second.

Pre-tour presentation, John Thomas, Projector Director, Hungry Canyons Alliance.

- John Thomas gave an informational presentation on the Hungry Canyons Alliance and projects in the area. A tour followed the meeting

The meeting was adjourned.

Date of Next Meeting: THE NEXT MEETING WILL BE HELD FRIDAY, JUNE 24, 2005 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