

# IOWA HIGHWAY RESEARCH BOARD (IHRB)

*Minutes of July 26, 2019*

## **Regular Board Members Present**

W. Dotzler  
R. Knoche  
A. Bradley  
D. Sanders  
L. Bjerke  
B. Wilkinson

J. Thorius  
T. Kinney

## **Alternate Board Members Present**

D. Harness  
M. Cox  
T. Roll

## **Members with No Representation**

S. Struble  
D. Claman  
T. Nicholson

## **Executive Secretary – V. Goetz**

## **Visitors**

Tammy Bailey  
Nicole Moore  
Shauna Hallmark  
Tim Morris  
Roy Sturgill  
Marian Muste  
Ibrahim Demir  
Dan King  
Keith Knapp  
Micah Loesch

Iowa Department of Transportation  
Iowa Department of Transportation  
Institute of Transportation/Iowa State Uni  
Institute of Transportation/Iowa State Uni  
Iowa State University  
The University of Iowa  
The University of Iowa  
Iowa Concrete Paving Association  
Local Technical Assistance Program  
Iowa Federal Highway Administration

The meeting was held at the Iowa Department of Transportation Ames Complex, East/West Materials Conference Room on July 26, 2019. The meeting was called to order at 9:00 a.m. by Chair Allen Bradley with an initial number of 11 voting members/alternates at the table.

**1. Agenda review/modification**

Add a new item for discussion under New Business to review needed changes to TR-730. Bora Cetin is the P.I. for this project and is leaving Iowa State University. IHRB needs to discuss the fate of the proposed new equipment to be developed under this project.

Motion to Approve by B. Wilkinson; 2<sup>nd</sup> W. Dotzler

Motion carried with 10 Aye, 0 Nay, 1 Abstaining

**2. Membership Update**

V. Goetz stated Jon Joiner, City of Ames is the new alternate for Ron Knoche and Mitch Rydell, Audubon County is the new alternate for Steve Struble for District 4 Counties.

**3. Minutes Approval from the May 31, 2019 meeting**

Correction: Change Chair Person, Opening Meeting from A. Bradley to R. Knoche.

Motion to Approve by R. Knoche; 2<sup>nd</sup> T. Kinney

Motion carried with 11 Aye, 0 Nay, 0 Abstaining

**4. Final Report: TR-744, "Transfer of the Iowa DOT Culverts Web-Tool Prototype to Iowa DOT Mainframe" Marian Muste, University of Iowa, \$75,008.**

**BACKGROUND**

The Iowa DOT Culverts web tool works atop of a variety of data sources (time series, statistical analyses, maps, and other site-specific characteristics) that are stored in various formats in multiple data provider repositories. Rather than acquiring the above-mentioned data and information from individual sources (such as IDOT, Department of Natural Resources, Environmental Protection Agency, or US Geological Survey) piece-by-piece for each culvert site, we decided to develop tools to access of all the relevant information sources from one place, a kind of one-stop-shop, culvert-centered database. The information can be retrieved on-the-fly from this central data and information repository whenever needed and subsequently subjected to further analyses, mostly

making inferences from the existing data (i.e., data-driven modeling). The previous IHRB-funded project, TR-665, carried for prototyping the IDOT Culvert web tool entailed the following developmental tasks (Muste and Xu, 2017a):

- A. Review of the essential physical processes involved in culvert sedimentation and identification of the contributing factors and key drivers of the problem.
- B. Development of a comprehensive culvert sedimentation data repository by integrating culvert sediment observations (obtained through field inspections and sediment mapping onto aerial imagery) with selected drivers identified in the previous objective.
- C. Quantification of the sedimentation occurrence at culverts based on the outcomes of Multiple-Criteria Decision Analysis (MCDA) and integration of the research outcomes obtained in the previous two objectives into a web-based portal for forecasting culvert sedimentation in Iowa.

### **OBJECTIVES**

The transfer of the prototype Iowa DOT Culverts web platform entails the following activities:

- 1. Meeting with Technical Advisory Committee for TR-665 and potential users from IDOT personnel for evaluating the workflow contained in the platform
- 2. Applying modifications resulting from Activity 1
- 3. Installation of the acronym Windows/Apache/MySQL/PHP, Python, (and/or) Perl (WAMP) web stack (WAMP is a set of free, open source applications, combined with Microsoft Windows, which are commonly used in Web server environments).
- 4. Installation for Geoserver and PostGress and PostGIS (back-end components)
- 5. Migrate the data files stored in PosGress and PostGIX
- 6. Migrate the Javascript libraries and JSON datafile
- 7. Testing of the functional and operational features of the platform and final checkup of the platform functionality (connection with SIIMS and hydraulic design software to be evaluated)
- 8. Implementation of the observations made in Activity 7
- 9. Preparation of presentation materials and tutorials to be incorporated on the platform
- 10. Delivery of training session with groups of potential users

### **BENEFITS**

The web-based geo-portal developed through this study aims at assembling in one place the pre- and post-construction data and information on culverts, along with relevant watershed characteristics, to aid culvert design and monitoring processes. The benefits of this geo-portal are multi-faceted. First, the web-portal integrates sources of data that are currently available in various formats and repositories. Most of these data are online so they continue to be updated by

specialized agencies. following verified and sustainable protocols. By connecting those sources to the Iowa DOT Culverts platform, a new, customized resource will that can a) inform and facilitate on-going culvert related activities (e.g., updates on the status of sedimentation at the level of county or IDOT district for resource planning purposes); b) serve as a living repository that can be mined to infer aspects of current designs in relationship with the location of the culvert in diverse geographic areas.

Second, the software tools embedded in the platform allow for the exploration of various relationships between a culvert's status and its evolution in time, commensurate with the changes in the watershed (e.g., correlating changes in the landscape due to socio-economic activities with the changes in conveyance capacity of the culverts over time). Lastly, data sources and software will be hosted in a customized web-portal developed with the end user in mind. Therefore, the platform's tools and functions are equipped with user-friendly graphical interfaces that accommodate the needs of engineers with a minimum computer programming background. The transferred portal usefully complements current culvert design specifications with conceptualized ground-truth information that correlates sedimentation at culverts with their geometry, stream, and watershed characteristics draining to the culvert site, irrespective of its location in the state.

## **DISCUSSION**

Q. Is the platform available on the DOT website now?

A. Yes.

**Motion to Approve by R. Knoche; 2<sup>nd</sup> L. Bjerke**

Motion carried with 11 Aye, 0 Nay, 0 Abstaining

**5. Proposal, “*Iowa Local Technical Assistance Program (HR-296)*”, Keith Knapp, InTrans/Iowa State University, \$190,000.**

## **BACKGROUND**

The Iowa LTAP began in 1983 as the Rural Technical Assistance Program (RTAP). It was one of 10 original RTAPs funded by the Federal Highway Administration (FHWA). These programs were typically called technology transfer centers, or T2 centers. The goal of the Iowa RTAP was to share new research and information with local transportation agencies and help them in their daily transportation operations. The Iowa RTAP outreach efforts—including a quarterly technology newsletter, transportation lending library, training workshops, and individualized funding is continuously explored.

The Iowa LTAP has worked to foster a close relationship with local government personnel and their leadership. Input is received through a variety of means, and we also hear from local government representatives through the Iowa LTAP advisory board. This board meets twice a

year and consists of representatives from cities, counties, IHRB, Iowa DOT, GTSB, and the FHWA. Many local transportation agency representatives also assist Iowa LTAP by presenting, organizing, and helping define training event content. LTAP staff have also presented at and continue to assist with the planning of meetings for those organizations or professional societies that are important to our local customers. These meetings include a wealth of technology transfer activities. Finally, a statewide needs assessment is also done every other year.

## **OBJECTIVES**

The primary objective of Iowa LTAP is to provide quality training events and technical transportation-related information that is useful to local transportation agencies. These activities need to be completed, within current LTAP funding, in a manner that is effective and efficient. Desirably, these activities are also provided when they are most needed by local transportation agencies and in a format that is useful and useable. New knowledge, tools, and innovations developed through IHRB research and/or a variety of other entities (e.g., the Institute for Transportation (InTrans)), have also always been incorporated into existing LTAP activities. They will also become a focus of some new efforts proposed in this document. The tasks included in this proposal were developed to support the primary objective of Iowa LTAP, the mission previously noted, and the three goals below from the draft strategic plan material presented by FHWA in January 2019.

**Motion to Approve by T. Kinney; 2<sup>nd</sup> L. Bjerke**  
Motion carried with 11 Aye, 0 Nay, 0 Abstaining

## **6. Final Ranking STIC FY19 Projects**

1. Funding Request 350, "Updating Statewide Design Guidance with complete Streets Considerations" – this project will be developed to apply for FY19 STIC funds and submit to FHWA for consideration.
2. Funding Request 352, "Comprehensive Risk Management Database for Iowa DOT"
3. Funding Request 351, "Project Delivery Methods Peer Exchange".

## 7. RFP

- **IHRB-172** – “Development of a Best Practice Decision Matrix and Guidelines to Remediate Bridge Deck Cracking”.

**Motion to Approve by** R. Knoche; 2<sup>nd</sup> W. Dotzler

Motion carried with 11 Aye, 0 Nay, 0 Abstaining

- **IHRB-181**- “Alternative Funding Approaches for Iowa Roads”.

**Motion to Approve by** J. Thorius; 2<sup>nd</sup> T. Kinney

Motion carried with 11 Aye, 0 Nay, 0 Abstaining

## 8. New business

- a. TR-730 - Advanced Testing and characterization of Iowa Soils and Geomaterials Discussion  
D. Sanders explained the current situation with Bora leaving ISU and moving to Michigan State University and need to make a decision on the equipment being purchased through this project. Board members decided that more information is needed before it can come to a vote. V. Goetz will schedule special meetings as needed due to address this item. IHRB will not reconvene for their regular meeting until September, and this item is time sensitive.
- b. V. Goetz stated the September Meeting will be an extended workshop meeting. If approved, there will be lunch provided. It’s time to look at any changes needed to the board’s Business Plan.

## 9. Adjourn

The next meeting of the Iowa Highway Research Board will be held Friday, September 27, 2019 at 9:00 a.m. In the East/West Materials Conference Room at the Iowa DOT.



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**Vanessa Goetz, IHRB Executive Secretary**