



Montana Department of Transportation
PO Box 201001
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Memorandum

To: RRC Members
Steve Albert/WTI
Mike Bousliman, Administrator/Information Services Division
Jeffery M. Ebert, P.E./District Administrator-Butte
Larry Flynn, Administrator/Administration Division
Dwane Kailey, Administrator/Highways and Engineering Division
Bob Seliskar/FHWA
Jon Swartz, Administrator/Maintenance Division
Mike Tooley/Director
Duane Williams, Administrator/Motor Carrier Services Division
Pat Wise/Deputy Director
Lynn Zanto, Administrator/Rail, Transit, and Planning Division

From: Susan C. Sillick, Manager Research Programs

Date: March 8, 2018

Subject: February 23, 2018 RRC Meeting Notes

Action items are in bold.

RRC Members Present: Mike Bousliman, Dwane Kailey, Sue Sillick, Jon Swartz, Mike Tooley, and Duane Williams.

Others in Attendance: Fred Beal, Paul Bushnell, Bobbi deMontigny, Paul Jagoda, Lenci Kappes, Matt Needham, and Roy Peterson

1. **Budget Report:** Attached

No discussion.

2. **[Research Projects - current listing](#)**

- a. Unmanned Aerial Vehicle (UAV) Applications for Montana Transportation Corridors (18-020) – Recommend Cancellation

Fred Beal and Paul Jagoda were present to recommend on behalf of the technical panel that this project be cancelled. When this project was moved forward to a technical panel, the topic was fairly new to us. However, between then and now, we've moved forward

and have better direction. Also, the industry is changing so quickly such that any research would be outdated by the time it is completed. In addition, MDT created a UAV forum so that we can learn from others and vice versa; this forum includes a listserv to which anyone can subscribe and a resources web page, documenting information shared - <http://www.mdt.mt.gov/mdt/uav-forum.shtml>. Finally, it was noted that UAVs will be a component of FHWA's Every Day Counts (EDC) initiative and there is a Legislative Audit Division audit on MT government use of them. **Note: Subsequent** to this meeting, Fred provided a PowerPoint presentation to share where we are with our UAV program - <\\mdthq\mdtshares\tempstore\Const\uav\uav.pptx>.

Dwane made a motion to cancel this project. Duane seconded the motion. All RRC members present voted to cancel this project. The motion passed. **Sue will make this change and update documents as appropriate.**

3. **Reports:** Available on Research [website](#)
 - a. Effective Production Rate Estimation and Monitoring of Controlling Activities Using Daily Work Report Data (15-013) - Task 1, 2, and 3, and Quarterly Progress Reports
 - b. Guidelines for Stabilizing Problematic Soils Using Calcium-Based Stabilizers (15-008) - Task 2 and 3, and Quarterly Progress Reports
 - c. Regional Regression Equations Based on Channel-width Characteristics to estimate Peak-Flow Frequencies at Ungauged Sites Using Data through Water Year 2011 (15-015) - Quarterly Progress Report
 - d. Traffic Safety Culture Pooled Fund - Quarterly Progress Report
 - e. Wildlife Accommodations Process (14-031) - Quarterly Progress Report

No discussion.

4. **Proposed Research Projects (attached)**

- a. Alkali-Silica Reactivity in the State of Montana (18-018)

Paul Bushnell attended to represent the project technical panel in requesting funding approval for this project. This research project has the potential to help us ensure the long-term durability of the concrete used in our infrastructure. Alkali-Silica Reactivity is the reaction between alkalis in Portland cement and reactive forms of silica in some aggregates. An expansive gel is formed in the presence of water which causes internal stresses to the concrete, in some cases, leading to rapid deterioration of the structural integrity and appearance of the concrete. Ultimately ASR can lead to costly, extensive repairs and potential replacements. The extremely limited amount of research we do have available would suggest that we have reactive aggregates in Montana. We do not know the extent of our potential risk. We also don't know how prevalent ASR in Montana.

The primary objective of this research is to evaluate the potential for ASR in the State of Montana, by getting boots on the ground to document existing ASR damage and help to identify geological features that may yield potentially reactive aggregates. Through this

research, a testing protocol will be developed for identifying potentially reactive aggregates. This research project will also look at the effectiveness of mitigation techniques to limit ASR.

If approved, this project will be co-funded between MCA (\$35,000) and MDT (\$66,428).

Dwane made a motion to fund this project. Jon seconded the motion. All RRC members present voted in favor of the motion. The motion passed. **Sue will proceed with obligating the funds for and contracting this project.**

- b. Feasibility of Non-Proprietary Ultra-High Performance Concrete (UHPC) for Use in Highway Bridges in Montana: phase 2 - Further Evaluation of Analysis/Design Methodologies (18-016)

Lenci Kappes attended the meeting on behalf of the technical panel to request funding for this proposal. UHPC has mechanical and durability properties that far exceed those of conventional concrete; it is a super material. However, using UHPC in conventional concrete applications has been cost prohibitive, with commercially available/proprietary mixes costing approximately 30 times more than conventional concrete. Previous research conducted at Montana State University (MSU) resulted in nonproprietary UHPC mixes made with materials readily available in Montana. These mixes are significantly less expensive than commercially available UHPC mixes, thus opening the door for their use in construction projects in the state.

The Bridge Bureau is interested in initially using UHPC in field-cast joints between precast concrete deck panels. The use of UHPC in this application will reduce development lengths and, subsequently, reduce the requisite spacing between the decks and improve the overall performance of the bridge. The research proposed will build on the non-proprietary UHPC research already completed at MSU and will focus on ensuring the successful application of this material in these field-cast joints. Specifically, this research will investigate several items related to the field batching of these mixes and the potential variability in performance related to differences in constituent materials. Further, rebar bond strength and the subsequent effect this has on development length will be investigated. A literature review will also be conducted to include the identification of specifications from other states.

Lenci added that the Surface Response statistical analysis MSU used in the Phase I research was a unique and an efficient method to quantify the effects of each component in the UHPC mixes. In fact, Lenci felt the use of this method was key in the efficient development of low cost, non-proprietary mix designs.

An added benefit in conducting this research in Montana is MDT staff can visit MSU to gain first-hand knowledge in working with this material.

Dwane asked if when this research is complete we will have all that we need to implement the results. Lenci replied, yes, assuming the goals of the research are completed successfully. Dwane also asked if the use of this material would help to

alleviate some maintenance problems with conventional concrete. Lenci again replied, yes.

Sue explained the issues that arose with equipment purchase. State DOTs are directed to not purchase equipment with federal funds. The one exception is Special Purpose equipment; equipment for use in research is classified as Special Purpose equipment. However, written request and approval must occur prior to any equipment purchase. Sue indicated a letter from FHWA-DC dated September 2017 was sent to all of the FHWA Division Offices and was shared with MDT. Sue learned of this letter when FHWA reviewed the proposal for this project. This letter identifies specific certifications states must make to obtain this approval. Sue worked with Dave Hamer to draft a letter and Dave was required to update equipment procedures. While the response has not yet been received, Sue was assured prior to this meeting that the approval letter was signed.

Jon made a motion to fund this project at \$145,668. Dwane seconded the motion. All RRC members present voted in favor of the motion. The motion passed. **Sue will proceed with obligating the funds for and contracting this project.**

c. Effectiveness of Highway Safety Public Education at DMV and Vehicle Registration Stations by Streaming Safety Videos (HSIP funds)

Roy indicated this research idea came from Marcee Allen/FHWA. As many crashes are behavior -related, the goal is to provide education for drivers on highway safety and the consequences of engaging in risky behaviors while driving such as texting while driving, driving while impaired or distracted, and driving unbuckled; and the benefits of proven innovative road safety countermeasures such as roundabouts. This education would be provided through videos continuously playing highway safety video clips to the captive audiences at Department of Motor Vehicles (DMV) licensing and vehicle registration stations around the state.

Roy indicated he spoke with Patrick McJannet/DOJ, who was supportive of the idea. Jon pointed out that this only covers the DMV. The individual counties are responsible for vehicle registration and that the stations might not all be open every day, all day. Also, at the county level, the audience is not just those individuals seeking title registration, but also includes individuals paying their property taxes and those there for other reasons as well, which may not be all that bad. Mike T. asked about remote stations. Jon added that the Department of Commerce (DOC) has some traveler information kiosks at some rest areas and stated perhaps these safety videos could be added to the current messages being displayed. Roy indicated that FHWA may be able to provide some TV screens, which aren't all that expensive. Jon asked about accommodations for the visually and hearing impaired. Dwane asked about the distraction for the workers.

Initially, Roy thought he would use HSIP funds for this project. However, he is no longer sure that he can. Sue indicated a couple of states contributing to the traffic safety culture pooled fund project originally committed HSIP funds. However, with the FAST act, HSIP funds were no longer eligible for research activities. Roy needs to confirm this

with Marcee. Sue told Roy, that if HSIP funds are not eligible to be used for this project and he is requesting research funds, the regular process should be followed, with the Stage 1 Research Idea form being due 3/31/18 and the Stage 2 Research Topic Statement form being due 4/30/18. Since Roy completed the Stage 1 form for this meeting, his next deadline is 4/30.

Dwane responded that the RRC needs more information. Roy was encouraged to hold a stakeholders meeting to further discuss and flesh out the idea and determine the funding source.

5. **Implementation/Performance Measures/Technology Transfer:** None

6. **Department/Division Hot Topics - RRC Members Roundtable Discussion**

Sue indicated next month, the RRC agenda may include the last two proposals for projects approved to move forward to technical panels for FFY 2018. Sue will also discuss the research peer exchange held in 2017.

Copies: Craig Abernathy/Research Section
Audrey Allums/Grants Bureau
Kevin Christensen/Highways and Engineering Division
Ryan Dahlke, P.E./Consultant Design Bureau
Lisa Durbin/Construction Administration Bureau
Mike Dyr Dahl/Engineering Operations Bureau
Ed Ereth/Data and Statistics Bureau
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Paul Jagoda, P.E./Construction Engineering Services Bureau
Tom Martin, P.E./Environmental Services Bureau
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