

From: William A. Stone
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To: Members of MoDOT Research Email Distribution List
Subject: 2016 MoDOT Research Needs

MoDOT staff has been gathering potential research ideas for the upcoming Fiscal Year 2016, which begins on July 1, 2015. MoDOT then did a prioritization process to identify the "High Priority" needs for the upcoming year. Attached you will find a document which includes 12 "High Priority" needs and also wanted to share the next level of "Medium Priority" needs.

The "High Priority" needs will be those that are planned to be addressed first. As funding is more well defined at the end of this fiscal year (June 30, 2016), we'll investigate how many of those can be accomplished and if there is opportunity we would move to the next level of those "Medium Priority".

Another research idea that was discussed that I wanted to offer through the e-mail is the possibility of short term quick hit research. Our Bridge Division offered this as on-call type of research that would be for 40-80 hours of research. We discussed that this might be to hire a researcher to do a synthesis study or review some national research reports and give that synthesis. Many areas of MoDOT could benefit from this type of research, since daily work activities does not lend itself well to doing the synthesis. We will look to develop a process for this type of quick hit research.

The document provides a "Topic" and a short "Description". You will find a few that describe that MoDOT will be conducting some in-house research, but there is potential for some contract research. We still wanted to share the topic to give you a perspective of the needs for MoDOT.

We will begin to better define the scope and deliverables for these research needs in anticipation of future Request for Proposals.

As always, thank you very much for your interest in the MoDOT Research Program.

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2016 MoDOT High Priority Needs

Topic	Description
H-pile jacketing (e.g. FRP)	Maintenance and Construction/Materials Divisions are working on some demo projects in SE District (2 bridges- St. Francis and Dunklin Co.). Would use our maintenance forces. No need to de-water. From MT's point of view, it's a practical way to repair in state. After the jacket and grout are in, you're done. Would transfer technology to other districts. In-House evaluation, may pursue some contract evaluation/research.
Life cycle bridge costs	Develop bridge deterioration curves. Look at bridge age and condition ratings.
Galvanized metal piles	MoDOT has only just started doing, but no evaluation of its performance or benefits has been completed.
Pile set-up (PDA monitoring)/friction pile restrikes	There is a need to capture data during PDA testing and restrikes, particularly from construction side. The deliverable would be to benefit in the long run from capturing the savings (pay for what is driven vs. needed).
Pipe (metal) longevity/durability	Some believe is that the metal pipes are actually too thin. If you go to a larger gauge and make it even thinner, will it still last as long? Is aluminizing making a difference?
RAP/RAS	Of particular concern is low-temperature fatigue cracking in high recycled content mixes. Some in-house efforts are to take place, potential for some contract research.
AVLs/intelligent snow fight	Adopt a similar approach for intelligent compaction (how do you avoid re-plowing streets that don't need to be plowed). Would investigating decision support systems to pursuing a peer exchange help?
Audible alert for work zones	St. Louis District will be testing an alert this spring.

Crash modification factors	<ul style="list-style-type: none"> - Develop for use of 2 ft shoulders and rumble strips (or use their on-call contract for study) - Have some CMFs developed, what are the next ones to pursue? Investigate whether CMFs from other states could be transferable.
Driver simulator studies (see also DMS)	<ul style="list-style-type: none"> - Test sign messages on DMS before using. Investigate the value of permanent DMS (regarding maintenance, upkeep, power needs) - Try out new ideas using simulator first
Highway Safety Manual (HSM) calibration factors	Develop the next set of Calibration Factors through a research project.
J-turn design	Investigate the “right” design for a J-turn or how to sign it better. Maybe use a driver simulator to evaluate design or signage ideas.

2016 MoDOT Medium Priority Needs

Topic	Description
On-call bridge research contract	For projects taking 40-80 hours
Autonomous vehicles and industry expectations	What will the industry expect of a DOT as more development is invested in autonomous vehicles. Traffic Division to continue to monitor National progress.
Bluebeam	Substitute for MicroStation. The software allows you to embed data and pictures on plan sheets (different from layering on top like what Adobe Pro does). Don't have to redo line work.
Cure (lithium)/ASR	Eliminates 7-day wet cure. Uses lithium-based salt as concrete hardener. Many contractors have approached Bridge Division to allow the use of Lithium Cure. MoDOT would like to learn more about this before using. Some states have banned it.
Curing (internal)	Lightweight aggregate is used for this process. Although we are positive about the process, how can you get vendors/contractors/others more interested in it?
MEPDG calibration	More MEPDG local calibration is needed. This may need to be developed over multiple years due to the cost of this development. Would first need to determine which elements to calibrate that would be of most benefit.
Slide ratings to prioritize repairs	Research concept is to identify/quantify the slide locations in the state through the development of an inventory. Then develop a rating system that could be used to prioritize the slides and repair those that have higher risk. MT suggested assessing slides with a risk analysis. Also, can a less expensive way to collect the data be developed?
Non-Destructive Evaluation (NDE) of silane sealers	Need help with field work and data collection. May be some related SHRP2 initiatives.
High Friction Surface Treatment Research (HFST)	Determine what pavement types and conditions of pavement are most suitable for the placement of HFST
KC Scout System	This research would be to develop a Before and After cost analysis of the KC Scout system.