

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Iowa DOT

INSTRUCTIONS:

Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

Transportation Pooled Fund Program Project # TPF-5(295)	Transportation Pooled Fund Program - Report Period: Quarter 1 (January 1 – March 31, 2017) Quarter 2 (April 1 – June 30) Quarter 3 (July 1 – September 30) X Quarter 4 (October 1 – December 31)	
Project Title: Midwest Smart Work Zone Deployment Initiative		
Name of Project Manager(s): Dan Sprengeler	Phone Number: 515-239-1823	E-Mail Dan.Sprengeler@dot.iowa.gov
Lead Agency Project ID: Keith Knapp	Other Project ID (i.e., contract #): Addendum 535	Project Start Date: July 1, 2014
Original Project End Date: June 30, 2020	Current Project End Date: June 30, 2019	Number of Extensions: None

Project schedule status:

On schedule
 On revised schedule
 Ahead of schedule
 Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
\$1,150,000 (committed)	\$662,726	0

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$128,081		0

Project Description:

The Midwest Smart Work Zone Deployment Initiative (MwSWZDI) was initiated in 1999 as a Federal Highway Administration (FHWA) Pooled Fund Study intended to coordinate and promote research among the participating states related to safety and mobility in highway work zones.

The program is an ongoing cooperative effort between State Departments of Transportation, universities, and industry. The studies completed have consisted of evaluations of various work zone related products, various innovative topics, and several synthesis studies. Completed reports and descriptions of ongoing projects can be obtained at the Iowa State University's Institute for Transportation (InTrans) website (www.intrans.iastate.edu/smartwz/) link to the Smart Work Zone Deployment Initiative. InTrans currently operates as the program manager of the pooled fund efforts and completes administrative tasks related to request for ideas and proposals, meetings, project files, quarterly reports, and recommending reimbursement.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**Quarter Ending December 31, 2017 (Overall)**

During this quarter we communicated with a number of principal investigators as needed and resolved progress issues if they occurred. Projects from Program Year 2014, 2015, and 2016 contracts progressed (see below). Proposals were received for the Program Year 2018. Two ranking efforts were completed and were finalized. The administrative contract/budget was sent out, reviewed, and approved by the Board. Emails with the board were used to select three projects for funding in 2018. Work advanced to finalize these three contracts. Two contracts are believed to be completed at this time. Two project have been completed, one report was posted and one is being finalized for posting. Another project report is still under review.

The following is a summary of accomplishments from October to December 2017 for the Year 2015-2017 individual research projects under fund account TPF-5(295).

2018 Program Projects

- Smart Work Zone App, University of Missouri-Columbia, Yam Adu-Gyamfi as PI.
This project has not yet started and the contract is being finalized. It is proposed to start on January 20, 2018 and finish on January 19, 2019.
- Development of Adjustment Factors for HCM Sixth Edition Freeway Work Zone Capacity Methodology, Iowa State University, Jing Dong as PI.
This project has not yet started, but the contract is close to being finalized or has been finalized. It is proposed to start on April 1, 2018 and finish on July 31, 2019.
- Guidance on Active Work Zone Data Archival, Iowa State University, Peter Savolainen as PI. This project has not yet started, but the contract is close to being finalized or has been finalized. The project is proposed to start on January 1, 2018 and finish on June 30, 2019

2017 Program Projects

- Extension of Safety Assessment Tool for Construction Work Zone Phasing Plans, University of Missouri-Columbia, Henry Brown as PI.

Work on the literature review has continued. Tables containing roadway, intersection, work zone, and crash data from the MoDOT Transportation Management System (TMS) database were obtained from MoDOT. The data contained in these tables were reviewed. Development of a database for analyzing the safety of work zones at intersections was undertaken. The preparation of this database is almost completed and links the work zones, intersections, AADT, road geometry and crashes from the MoDOT TMS data tables. The database

will be used to make crash modification factors or safety performance functions for the work zones for signalized intersections. A methodology for linking Missouri segment crashes to work zones was developed in the previous project to develop a work zone safety assessment tool. This methodology will be utilized in this project to develop safety performance functions for facility types such as arterials, multi-lane highways, and ramps.

Project started on March 1, 2017 and is expected to finish on May 31, 2018. It is 35% complete.

- Analytical Methods for Work Zone Travel Time Reliability. University of Wisconsin-Madison Susan Ahn as PI.

We have identified various (historical) WZs in Wisconsin on major freeways where WZ data (from WisCLCS), traffic volume data (from Continuous ATRs) and travel time data (from NPMRDS) are available.

Details of the WZs and the corresponding travel times for periods before, during, and after the WZ activity have been obtained for candidate locations to develop travel time distribution plots. This includes interstate freeways (I-90, I-94, I-41, I-39, I-43) and US highways (US12, US14, US18, US151), with WZs located in areas that see at least some form of congestion.

We are in the process of generating various travel time reliability indices (such as TTI, Misery index etc) for candidate sites, as well as obtaining hourly traffic volumes for an empirical model.

We are also considering adding certain WZs where hourly traffic volumes are not accurately known in order to expand the data set. This is specifically to address that rarity of WZ sites that see congestion and for which ATR traffic volumes are also readily available.

Projected started on May 15, 2017 and is expected to finish on May 14, 2018. It is 50% complete.

- Testing Non-Proprietary Devices to MASH 2016 Criteria. University of Nebraska-Lincoln, Jennifer Schmidt as PI.

The research team reviewed the most commonly used work zone signs and barricades that were identified in NCHRP Project 03-119, recent systems that have been tested to MASH, and the highest priorities for testing from the SWZDI member state representatives. Type III barricades were mentioned by 3 of the 5 states. Other tall work zone signs with two perforated steel tubing masts were noted. The tall work zone signs were not preferred for this project as other similar type of systems have already been tested to MASH, many of which resulted in failures and required design work. Since design work was outside the scope of this project, and no non-proprietary Type III barricades have been tested to MASH, a Type III barricade was presented to the TAC as the preferred test article and the TAC agreed. Details of currently utilized Type III barricades were obtained from Wisconsin and Nebraska. A 3-month no-cost extension will be requested to allow the TAC sufficient time to review and comment on the report.

Project started on May 1, 2017 and is expected to finish on April 30, 2018. The PI has declared 10% progress.

2016 Program Projects

- Design Optimal and Effective Queue Detection and Notification: Design of a Low-Cost Work Zone Warning System, University of Wisconsin, Madhav Chitturi as PI.

No additional information was provided on progress for this project during this quarter. The percent complete has remained the same. The PI has indicated that due to staff turnover the project is behind schedule and a no-cost extension will be requested. It was requested in December and is being finalized.

Project started on June 15, 2016 and is expected to finish on December 15, 2017. A extension to December 31, 2018 has been requested. The project remains at 30% complete.

- Understanding the Impact of Work Zone Activities on Traffic Flow Characteristics, University of Missouri-Columbia, Praveen Edara as PI.

The final report was revised based on comments received from the TAC and submitted to Iowa State University for final editing. A TRB paper based on the project was submitted and accepted for publication in the Transportation Research Record (TRR). The paper will be presented as a lectern session at the January, 2018 TRB Annual Meeting.

This project started on April 1, 2016 and is expected to finish on October 1, 2017. It was extended to September 30, 2017. It is 100% complete.

- Development of a Data Collection Prototype and a Traffic Impact Assessment Tool for Moving Work Zone Operations, University of Missouri-Columbia, Praveen Edara as PI.

The final report has been completed.

The project started on March 15, 2016 and was expected to be finished on July 31, 2017. A no cost extension for the project to September 30, 2017 was granted. This project is 100% complete. The report has been posted.

2015 Program Projects

- Orange Work Zone Pavement Marking Midwest Field Test, University of Wisconsin – Madison, Madhav Chitturi as PI.

Literature review is completed. We have collected information on standards and specifications of different agencies and also material specifications from different vendors. We have identified a site on I-94 (between Madison and Milwaukee) in Wisconsin. We communicated with WisDOT and FHWA and developed a test plan for the field evaluation. We developed and obtained approval for a Request to Experiment from FHWA. Purchased and integrated the equipment to collect field data. Field data collection completed. Analysis is completed. Completed survey of drivers at a rest area near the work zones. Completed agency and contractor interview. The draft final report has been reviewed by the project TAC. The Board of Directors is yet to review the report. All comments have been addressed and the report submitted for publication.

The project was expected to end by September 30, 2016, but it has been extended to March 31, 2017. And extended further to June 30, 2017. It was extended further to September 30, 2017. A no-cost extension has also been started, but not yet received by SWZDI, until December 31, 2017. The project was indicated as 100% complete by the PI but has not yet passed final review of comments. The comments have been addressed, but final approval has not yet taken place.

Anticipated work next quarter:

Work will continue on contracted projects and projects have been selected for Program Year 2018. We will finalize plans for a face to face meeting in September 2018.

Significant Results:

One report was posted. One report is being finalized. And, one report is still being reviewed for finalization. Two out of three 2018 PY contracts have been finalized. Plans started to schedule the face to face meeting in September 2018.

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

Currently there are no problems to report with the administrative contract. Any issues that have come up with the individual projects that may impact schedule or budget are resolved on a case by case basis.

Potential Implementation:

One project was finished and two others are near completion.