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) X Quarter 3 (July 1 – September 30) 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:

X 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
$925,000 (committed)	$534,645.57	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
$106,570.10		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 September 30, 2017 (Overall)
During this quarter we communicated with a number of principal investigators as needed. Resolved some progress issues as they occurred. Contracts for program Years 2014 to 2017 were finished continued, and started, depending on the program year. A TAC meeting was held July 27 to select problem statements for program year 2018, the request for proposal was distributed and proposals gathered. The ranking process for proposal selection and contracting is ongoing.

The following is a summary of accomplishments from July to September 2017 for the Year 2014-2017 individual research projects under fund account TPF-5(295).

2017 Program Projects

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

  A list of data that would be useful for developing the tool was developed, and a written request for data regarding work zones and crashes was prepared and sent to Kansas and Wisconsin. Work on the literature review has continued. Metadata for the MoDOT Transportation Management System (TMS) database was reviewed. Based on this review, a list of roadway, intersection, work zone, and crash data that is needed from the MoDOT Transportation Management System (TMS) database was prepared. A request for TMS data tables was prepared and submitted to MoDOT.

  Project started on March 1, 2017 and is expected to finish on September 30, 2018. It is 10% complete.

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

  The team presented their initial vision of the project to the TAC in a kickoff meeting on July 13th. We shared possible methodologies, and discussed data needs with the TAC. WZ lane configuration, traffic demand, and intensity of work/impact on demand were identified as key attributes of interest to both the team and the TAC.

  We have started exploring Wisconsin data available to us through multiple avenues (WisTransPortal's LCS, VSPOC etc., NPMRDS) to identify attributes of WZs that are most relevant to travel time reliability. The team will use this analysis to share a finalized 'data requirement' plan with TAC.

Literature Review: SHRP2 L08 (Travel time reliability), NCHRP 03-107 (Work zone capacity), HCM chapters 10-13 and corresponding material from HCM Vol. 4, and other related papers and reports. We have reviewed the literature listed, but will continue to also review relevant material as our methodologies evolve.

Projected started on May 15, 2017 and is expected to finish on May 14, 2018. It is 25% 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. Additionally, recent systems that have been tested to MASH were identified and summarized. The research team then contacted SWZDI member state representatives to determine what non-proprietary work zone signs or barricades would be the most used in their state and what would be the most useful for MwRSF to test to MASH. Many states did not provide specific examples. However, their answers were compiled. The research team is putting together a presentation to have a meeting with the TAC in the next quarter.

Project started on May 1, 2017 and is expected to finish on April 30, 2018. The PI has declared 5% 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 shortly.

Project started on June 15, 2016 and is expected to finish on December 15, 2017. It is 30% complete.

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

Speed-flow plots were developed and organized according to lane closure configuration. Among the seven (3,2) work zones, four were related to bridge related work activity while the remaining three belonged to pavement related activity. It was observed that the variation in capacity value is much lower for bridge related work than pavement related work. There are only a few types of activities for bridge related work, and this may be the reason for low variance in capacity values. In contrast, the pavement related work has a wide range of activities, and this may be the reason for higher variation in capacity values. A similar comparison was made for (2,1) and (4,2) configurations. Tables showing work zone capacity and free flow speed based on lane configuration and type of work were developed. The draft final report was completed and revised based on the feedback from the Technical Advisory Committee (TAC). The report is currently under review by the Board of Directors.

This project started on April 1, 2016 and is expected to finish on October 1, 2017 (a no-cost extension has been requested). It is 90% complete.

- Best Practices for Managing Work Zone Data, University of Wisconsin-Madison, Steven Parker as PI.

Project has been completed and posted on the SWZDI website.

- 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.

  VISSIM calibration was completed. VISSIM was calibrated for an 18-mile segment of a 3-lane freeway using actual data collected on I-64, I-44 and moving work zone videos. Analysis using the calibrated VISSIM model was conducted for different levels of work zone duration and traffic volumes. Performance measures such as travel time, delay, number of stops, queue length, and number of traffic conflicts were obtained from the VISSIM analysis. Regression models to predict work zone speed based on variables such as speed limit, number of lanes, volumes, and work zone duration were developed. The developed regression models are being coded into a user-friendly spreadsheet tool. The draft final report was completed and submitted to the project Technical Advisory Committee (TAC) for review. The draft final report was then submitted to the SWZDI Board of Directors. The report is currently being finalized for publication.

  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 90% complete. The report is being finalized for posting.

2015 Program Projects

- Evaluation of Alternative Work Zone Signing, University of Wisconsin – Madison, Madhav Chitturi as PI.

  Project has been completed and posted on the SWZDI website.

- 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. Following their review, we will submit the final report for publication by December 31, 2017.

  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 remains at about 90% complete.

Anticipated work next quarter:

Work will continue on contracted projects and projects will be selected for Program Year 2018.

Significant Results:

A couple final reports were posted. The RFP was distributed and proposals collected for 2018 and are under review by the board. There are two reports that are in queue for review by the board. Extensions for projects this quarter appeared to related to PIs not anticipating the review process necessary.

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:

Several projects neared completion and were reviewed.