

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, 2019) X Quarter 2 (April 1 – June 30) 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:

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
\$1,375,000 (committed)	\$928,738.36	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
\$11,396.36		25

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 June 30, 2019 (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 2016 to 2019 contracts progressed (see below). Contracts for Program Year 2019 are in place. A request for problem statements for Program Year 2020 was distributed to both the original five states and two additional states (Texas and Illinois). Communications with both states for Board Members was initiated and continued. All problem statements are in now and these will be distributed to the funding states soon.

The following is a summary of accomplishments from April to June 2019 for the individual research projects underway with fund account TPF-5(295).

2019 Program Projects

The following projects were selected in September for funding during the 2019 program year.

- An Intelligent Video-Based End of Queue Warning System for Work Zones, Iowa State University, Shauna Hallmark as PI.
This project has a start date of 1/1/2019 and an end date of 3/31/2020. No quarterly report of was provided for this quarter by 7/12/2019 for this project.
- Field Testing of Non-Motorized Road User Accommodations for Work Zones, Iowa State University, John Shaw as PI.

Task 1: TAC, IRB, Qtr Reports: Recruited TAC members. Project kick-off meeting is scheduled for July 12, 2019.
Task 2: Literature Review: No activities
Task 3: Develop Test Plan: No activities
Task 4: Ped Test Track (PTT): No activities
Task 5: Field Evaluations: No activities
Task 6: Final Report: No activities

This work has a contract of 1/1/2019 and an end date of 3/31/2020. It is 2% complete.
- Investigation of Autonomous/Connected Vehicles in Works Zones, University of Missouri-Columbia, Carlos Sun as PI.

An initial project kickoff meeting was conducted with the TAC via video conference. The study was adjusted according to TAC input. Literature review on work zone AV has started. Human subject study authorization was obtained from the Institutional Review Board.

This project is contracted to start on 4/15/2019 and end on 7/31/2020. It is 10 percent complete.

2018 Program Projects

- Smart Work Zone App, University of Missouri-Columbia, Yam Adu-Gyamfi as PI.

Initial draft and final report submitted and published.

This project started on January 20, 2018 and is expected to finish on January 19, 2019. The end date was extended to April 19, 2019 during this quarter. It is 100% complete and posted.

- Development of Adjustment Factors for HCM Sixth Edition Freeway Work Zone Capacity Methodology, Iowa State University, Jing Dong as PI.

A TAC meeting was held on April 8th. Due to the limited number of work zone sites suitable for the analysis from 2018, the TAC approved to extend the data collection to summer 2019. The project end date is adjusted accordingly. Identify active work zone time periods based on the archived images for 2018 work zones. Compile a list of 2019 work zones for data collection.

This project was contracted to start on April 1, 2018 and was scheduled to finish on July 31, 2019. This end date has been extended to December 31, 2019. It is 50% complete.

- Guidance on Active Work Zone Data Archival, Iowa State University, Anuj Sharma is PI.

Task 1. Develop and Convene TAC - COMPLETED.

Task 2. Conduct Literature Review - COMPLETED. The research team conducted an analysis of existing technical standards and protocols related to work zone traffic data interchange. These included the Traffic Management Data Dictionary (TMDD), SAE standard J2540 / International Traveler Systems Information (ITIS), the European DATEX2 standard, and the draft work zone data exchange protocols currently being proposed by FHWA. Agency work zone data use cases were also compiled and summarized based on the FHWA draft report and other sources. A TAC meeting was held to review the results of this task.

Task 3. Develop Survey - COMPLETED. The first draft of the survey was completed in March 2019 and major revisions were made in May-June 2019 based on TAC recommendations.

Task 4. Conduct Survey - Survey distribution began on June 24, 2019 and is currently ongoing.

Task 5. Analyze Survey Results - Survey results will be analyzed beginning in late July 2019.

Task 6. Meet with TAC - A TAC meeting was held March 29, 2019 to review the progress to date and confirm the project direction.

Task 7. Develop Prototype and Report - Development of a conceptual work zone data collection and management tool is currently ongoing.

Task 8. Finalize Prototype and Report - No progress to report.

This project started on January 1, 2018 and was expected to finish on December 31, 2018. A no-cost extension has been provided to extend the project to December 31, 2019. The project is 40% complete.

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.

Project began June 15, 2016. Due to staff turnover, we could not make much progress. The TAC meeting happened in October, 2016 and we obtained their input on the proposed design. Lot of discussion in the TAC meeting about what sign should be used "Be prepared to stop" or "Slow traffic ahead" or "Watch for stopped traffic". Have been in communication with TAPCO about design of the low-cost system. TAPCO has developed a potential design already. We have gone through multiple iterations to make the design MUTCD compatible. Design changes were required to satisfy crashworthiness requirements of roadside hardware without having to go through crash testing requirements. On February 20, 2018, we presented the design changes to TAC. We communicated with FHWA to ascertain the need for submitting a Request for Experiment to FHWA before proceeding with the field testing. Based on feedback from TAC, we redesigned the sign to avoid the Request to Experiment. Working with TAPCO (private sector partner) on the redesigned sign. Before the fabrication, we reached out to TAC to get their approval for the sign. However, we received comments about crashworthiness/need for crash testing specifically about being MASH compliant. We had to do further review and in consultation with WisDOT staff and Nebraska staff, we had to do another major revision in the design of the sign. We presented the newest version of the sign to the TAC and have not received any comments. We are moving forward with the latest design.

WisDOT/Counties could not find any sites for field testing in Fall 2018. TAPCO, the private sector partner was not able to fabricate the newest design in time. Therefore, we obtained a No cost time extension till the end of 2019.

WisDOT came back to us in mid-March that they do not have any sites where we can test the QWS. We reached out to multiple Counties. Unfortunately, we did not get any County on-board. We need to re-scope the project to one of the following options:

1. Rescope from the current QWS to a DSRC-based QWS. TAPCO has developed a DSRC-based QWS that we can deploy and test.
2. Wrap up the project with the progress so far and complete the report. Hence we will not use the complete budget.

Project started on June 15, 2016 and was expected to finish on December 15, 2017. An extension to December 31, 2018 has been requested and granted. A second extension was also granted for an end date of December 31, 2019. The project is 50% complete. This is the same percent complete as last two quarters. A discussion with the SWZDI board will be arranged to determine how this project should proceed.

Anticipated work next quarter:

Work will continue to work to finalize projects and to advance all the contracts in place. Problem statements will be discussed/selected and a RFP will be released in the next quarter. The Chitturi project will be finalized rescoped. The remaining state DOTs that would like to be members of SWZDI will be encouraged to officially commit to the pooled fund.

Significant Results:

One project was completed and posted. Desirably, all the states interested in continuing with SWZDI will commit on the pooled fund website.

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:

The website for the SWZDI pooled fund is updated on a regular and as needed basis for finished reports.