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(438)*	**Transportation Pooled Fund Program - Report Period:** Quarter 1 (January 1 – March 31, 2021) 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 733	**Project Start Date:** January 1, 2020
Original Project End Date: December 31, 2020	**Current Project End Date:** December 31, 2021	**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
$500,000	$80,632.09	25%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$23,706.73		

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, 2021 (Overall)
During this quarter, work on three PY 2020 and two PY 2021 projects continued. Discussions about the approach to be taken to request problem statements and proposals for PY 2022 began. Two SWZDI Board meetings were held. One was on May 11 and the other on June 23. An approach was selected during the first meeting. Topics were requested and provided for discussion on June 23. Four of the topics suggested were selected for use in the upcoming request for PY 2022 problem statements. The description of these topics is currently being finalized.

Concerns have been raised about the progress on two projects. One of these projects is currently being funded on this account. The principal investigator of the PY 2020 project, "Work Zone Activity Data Logging – Phase II", has been asked to have a TAC meeting (held June 22, 2021), provide monthly progress reports to the SWZDI program coordinator and his TAC project monitor, and to submit a work plan that shows how the effort will be completed by the current end of this project contract (i.e., April 30, 2022).

The following is a summary of accomplishments provided by the project principal investigators for the April to June 2021 time period for their individual research projects underway with fund account TPF-5(438).

2021 Program Projects

- Evaluation of Messaging Techniques to Increase Vehicle Spacing at Work Zones, Iowa State University, Jing Dong as PI

  Added representatives from other SWZDI states and Iowa state patrol to the TAC
  Studied the headway based feedback sign strategy
  Planned a site visit for July 13

  This project was contracted to start on March 1, 2021 and end on June 30, 2022. The project is 5% complete.

- Work Zone Speed Limits and Motorist Compliance, Michigan State University, Peter Savolainen as PI

  Task 0: Formation of the Technical Advisory Committee - The research team held a kickoff meeting on March 15, 2021.

  Task 0: Formation of the Technical Advisory Committee – Task complete.

Task 1: Synthesis of Existing Practices – The subcontract with the University of Missouri is currently being finalized.

Task 2: Site Selection – MSU has worked with the Michigan DOT to select work zone sites and speed control strategies to evaluate during the summer 2021 construction season. The types of work zone configurations have included lane closures and cross-overs. To date, this has included (1) temporary rumble strips and (2) radar speed feedback trailers. The team has also conducted data collection in the presence and absence of workers. Data have been collected at six work zones to date. The radar speed feedback trailers have been evaluated in two different positions at select locations: (1) beginning of the taper and (2) end of the taper.

Task 3: Data Collection – Speeds of individual vehicles are tracked through each work zone with LIDAR guns by a team of three data collectors. The data collectors are positioned at strategic roadside locations in advance of and through the work zone. To help control for external biases, the feedback signs are typically varied during a single data collection period; for example, feedback sign on/off and/or feedback sign repositioned.

Task 4: Develop and Submit Deliverables - No progress to report.

This project was contracted to start on March 1, 2021 and end on September 30, 2022. It is 6 percent complete.

2020 Program Projects

- Work Zone Activity Data Logging – Phase II, Iowa State University, John Shaw as PI

  TAC meeting held June 22, 2021 to review project goals and status.

  This project was contracted to start on May 1, 2020 and end on April 30, 2022. This project is 2% complete.

- Using Smart Work Zone Trailer Data to Evaluate and Predict Lane Closure Impacts with a Consideration of Work Intensity, The University of Texas-Austin, Natalia Ruiz-Juri as PI

  - Documentation: prepared draft and final project report that described data cleaning and pre-processing, work zone data preparation, machine learning (ML)-based work zone impact forecasting using data from smart work zone trailers (SWZT), and short term travel time prediction through work zones using INRIX and SWZT data.
  - Documentation: prepared technical transfer document that summarized project work effort and findings.
  - Worked with TAC and BOD on documentation review, modification, and finalization.
  - Project complete.

  This project was contracted to start on May 15, 2020 and end on April 14, 2021. A request for extension to June 14, 2021 this quarter. The extension was approved. The project report is posted and the project is 100% complete.

- Temporary Traffic Control Devices at Driveways within a One-Lane, Two-Way Section, Tim Gates as PI

  Task 1: Review of Literature and Practice - The literature review was completed in Q4.

  Task 2: Expert and Public Survey of DADs Displays - The MSU team designed and implemented a public survey in Qualtrics to a panel of 1,000 drivers nationwide in early August 2020. Data were compiled and presented to

the technical panel on November 12, 2020. A full statistical analysis is ongoing and will be included in the final report.

Task 3: Field Evaluation - A series of field evaluations of DADS implementations occurred in June, July and August of 2020 on US-31 in Benzonia, Michigan. The field data was collected used elevated video cameras positioned at each subject driveway/minor road approach where the DADS device was installed. This setup allowed for the following measures to be assessed: 1.) Proportion of drivers on the subject minor approach that perform appropriate/inappropriate maneuver; 2.) Gap selection and dwell time; 3.) Minor approach queue length. The feedback from the survey was utilized to determine various auxiliary sign messages to field test. Five different auxiliary signs, including the standard MDOT sign, were rotated through the various DADs installations at the US-31 site to determine the impact of sign message on driver behavior. Data were compiled and presented to the technical panel on November 12, 2020. A full statistical analysis is ongoing and will be included in the final report.

Task 4: Simulation Modeling - Simulation modeling of various DADs layout scenarios will occur during Q3 of 2021.

Task 5: Develop Guidelines - Guidelines for use of DADs have been developed in draft form and will be presented to the technical panel for vetting in Q3. The final guidelines will be included in the final report.

Task 6: Develop and Submit Deliverables. - Development of deliverables, including the final report, is underway. A draft TRB manuscript was prepared in Q2 and will be circulated to the panel in Q3 of 2021.

The project was contracted to start on May 1, 2020 to October 31, 2021. It is 75% complete.

Anticipated work next quarter:

The projects from PY 2020 and PY 2021 will continue. PY 2022 topics will be advertised for problem statement request and preparations will be made to put out a PY 2022 request for proposal.

Significant Results:

The projects under this administrative contract continued toward completion. One PY 2020 project was completed and the project report posted.

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, with recommended solutions to those problems).

It is not expected that the COVID 19 shut downs will have an impact on the administration of the SWZDI pooled fund but it may impact the progress of the projects above.

Potential Implementation:

Potential implementation includes project report posting when completed. One project report was posted this quarter.