

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: X Quarter 1 (January 1 – March 31, 2023) 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, 2023	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
\$1,025,000	\$476,767	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
\$83,076		

Project Description:

The Smart Work Zone Deployment Initiative (SWZDI) 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 March 31, 2023 (Overall)**

During this quarter, work on one PY 2021 project and two PY 2022 projects continued. Two PY 2023 projects were contracted and one remains under negotiation (see below). A SWZDI Board meeting was held on March 21 and problem statement topics were discussed and documented. Meeting notes were distributed to the Board for review and comment. These topics will be discussed at the next meeting. Planning continued to have a SWZDI Board meeting on May 11 and May 12 in Davenport, Iowa. Funding for the meeting expenses were added to the administrative contract.

The following is a summary of accomplishments provided by the project principal investigators for the January to March 2023 time period for their individual research projects underway with fund account TPF-5(438).

2023 Program Years Projects

- Usefulness and Reliability of Probe Data when Altering Work Zone Message Signs – Iowa State University, Chris Day as PI

This project got started this quarter. The research team received word that the contract was finalized in early March. A kick-off meeting was held on March 27. The research team began working on the literature review and started preparing a draft of questions for the practitioner interviews.

This project was contracted to start on March 1, 2023 and end on February 29, 2024. The project is 1% complete.

- Guidance for Incorporating Work Zone Data within Traffic Management Operations – Iowa State University, Skylar Knickerbocker as PI

The research team held the kickoff meeting on 3/30/2023 including all TAC members as well as the research team. The kickoff meeting including an overview and objective of the research project as well as a summary of each task. The research were provided feedback related to each task along with the overall project from the TAC.

The research has begun the literature review including identifying any research related to improving the accuracy of work zone data and how that can be incorporated in a TMC. The research team is also expanding the literature as included in the scope to identify any documentation about the benefits of incorporating smart work zones into a TMC which will only be included in Task 2.

This project was contracted to start on March 1, 2023 and end on June 30, 2024. The project is 1% complete.

- Merging Implementation Criteria – Michigan State University, Peter Savolainen as PI. This project contract is still under negotiation. It is proposed to start on April 1, 2023 and end on September 30, 2024.

2022 Program Year Projects

- Mobility and Safety Impacts of Work Zone Lane and Shoulder Widths, University of Wisconsin-Madison, David Noyce as PI
 - Obtained feedback from the TAC on the scope of the project and criteria for data collection locations.
 - Literature review is completed.
 - Team reached out to agencies and obtained WZ plans. Reviewed the plans and identified potential data collection locations.
 - Team collected sample field data to calibrate/validate the new data collection device.
 - Calibration/validation of the algorithm to process the data from the data collection device to obtain speed, vehicle category, and lateral distance is completed. The results of validation were shared with the TAC on 08/11/2022. TAC/Project Monitor gave us the go ahead to start field data collection on 08/22/2022.
 - Coordinated with WisDOT/contractors for data collection.
 - Collected data at five locations in three work zones in Wisconsin on 09/19/2022. Data were collected for roughly one day at each location. Due to equipment issues, data at two locations were not logged or only partially logged.
 - Also collected data at six locations in Wisconsin on 10/19/2022. Five of the locations are same as in Sep data collection.
 - Data have been processed to obtain speed, lateral position, vehicle length/category, headway, presence of vehicle in adjacent lane information.
 - All locations had 2 travel lanes and concrete barriers on both sides with 2 ft clear distance. Two locations had 11 ft lane width and others had 12 ft lane width.
 - Presented summary of data collection to the TAC and got their approval for a no-cost extension for 9 months.
 - Obtained information from WI, MI, and IL about potential WZs where data can be collected this Spring/Summer.

This project was contracted to start on April 15, 2022 and end on July 31, 2023. Due to additional data collection needs in Spring/Summer 2023 the research team requested and was granted a no-cost extension. The project will now be completed on April 30, 2024. The project is 40% complete.

- Analysis of Improvements in the Effectiveness of Speed Feedback Trailers. Michigan State University, Tim Gates as PI

Task 1: Literature Review and Synthesis of Existing Practices - The literature review continued into Q1 FY23 . A state of the practice survey was administered during Q4 and the data are being analyzed and synthesized with the literature review.

Task 2: Site Selection and Data Collection - A series of work zone sites were selected for SFT field data collection, which began during Q3 2022, included: 1.) NB US-127 near Leslie, Michigan; 2.) SB US-127 near

Mason, Michigan, 3.) EB I-69 near Lapeer, Michigan. The SFT variables investigated during the field studies included: 1.) SFT location (taper start, taper end, beyond taper end); 2.) Worker presence/absence; 3.) Enforcement vehicle presence/absence; 4.) SFT used w/ digital speed limit signs. In order to assess these variables of interest, speeds of individual vehicles were tracked through the advance warning area, taper, and beyond the taper.

Task 3: Data Analysis - Analysis of the speed data and subsequent write-ups were performed Q1 23. Speed feedback signs reduce the speeds of vehicles traversing a work zone, and are most effective when positioned near the taper end. The speed reduction effects are most prominent at the speed feedback sign, and are largely sustained for at least 1200 ft beyond the feedback sign. The speed reduction effects of the feedback sign are enhanced by the presence of a police car positioned near the sign. There is no evidence of any difference in the speed reduction effects of a digital speed limit sign displaying 45 mph and the traditional "45 mph when workers present" speed limit sign. However, utilization of a speed feedback sign in addition to the digital speed limit display decreases work zone speeds, but only when a work vehicle or worker is present at the site.

This project was contracted to start on April 15, 2022 and end on October 31, 2023. The project is 50% complete.

2021 Program Year Projects

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

Completed and sent the tech memo to the TAC on field deployment during 2022 construction season

This project was contracted to start on March 1, 2021 and end on June 30, 2022. This contract was extended to December 31, 2022 and another request for extension (to collect more data) to September 30, 2023 has been granted. The project remains 80% complete.

Anticipated work next quarter:

During the next quarter the SWZDI Board will meet in Davenport, Iowa select problem statement topics for PY 2024. It will also discuss general SWZDI operations and the future of SWZDI. Work will continue the five active projects and the contract for the PY 2023 project is expected to be finalized.

Significant Results:

The projects under this administrative contract continued toward completion.

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).

None of the projects under this funding account number appear to be encountering any unusual challenges at this time.

Potential Implementation:

Potential implementation includes project report posting when completed.