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, 2024) 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 733	**Project Start Date:** January 1, 2020
Original Project End Date: December 31, 2020	**Current Project End Date:** December 31, 2024	**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
$1,300,000	$818,121	50%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$50,835		

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 September 30, 2024 (Overall)

During this quarter, the last PY 2022 project was posted. Work related to two PY 2023 projects continued and another was very near completion. Work also continued on three PY 2024 projects and another additional supplemental project for PY 2024 was contracted and work has just begun. States were also encouraged to commit to the next round of the SWZDI pooled fund on the FHWA site. At the time this quarterly report was written the following states had officially committed funds for the next round: AK, IA, IL, MO, PA, TX, and WI. This quarter a call for PY 2025 problem statements was also completed and these will be discussed on October 21, 2024.

The following is a summary of accomplishments provided by the project principal investigators for the July to September 2024 time period for their individual research projects underway with fund account TPF-5(438).

2024 Program Years Projects

- The Effect of Nighttime Lighting Systems on Workers' Visibility and Safety – University of Nebraska – Lincoln, Chun-Hsing Ho as PI.

  The project's first kick-off TAC meeting was taken place on September 24, 2024. The PI gave an updated beginning date on September 1, 2024 instead of October 1, 2024 in the proposal.

  The research team has presented the first edition of survey questions to the TAC meeting on September 24 and received feedback and comments from the TAC members. The team is working on revising the survey questions and will circulate the revised edition of questions to the TAC members.

  This project has been contracted to start on September 1, 2024 and end on November 30, 2025. The PI has reported that the contract is working through the University of Nebraska research office and that the project is zero percent complete.

- Development of an Analytical Tools for Work Zone Performance – Iowa State University, Guillermo Baulto-Elias as PI.

  - Developed interface to upload work zone shapefiles according to WZDx standards with option to snap to HPMS road system.

- Improve system to download templates by state.
- Develop visualization block by individual project.
- Defined and started implementation of system to upload crash data according to FARS or CRSS.

This project was contracted to start on March 1, 2024 and end on May 31, 2025. This project is 35% complete.

- Improving Work Zone Management and Safety through AI-Powered Connected Vehicle Data Analysis – Iowa State University, Meenakshi Sumeet Arya as PI (resigned). Anuj Sharma resumed work as PI.

  Task 3- detecting lane-closures using CAV data has been completed

  Task 4- Team worked on initial setup for ingesting, in real-time, CAV data stream to be made available by streetlight data.

  Task 5- Team has also started exploring advance machine learning models for incident detection.

  This project was contracted to start on March 1, 2024 and end on June 30, 2025. This project is 35 percent complete.

- Accommodation of Vulnerable Road Users – Wayne State University, Steven Lavrenz as PI.

  The kickoff meeting with the TAC has been completed, and the amplified work plan has been generated and received by the TAC. The WSU team is currently in full gear on the literature review task, and has begun preliminary scoping for the survey development.

  This project was contracted to start on June 15, 2024 and end on June 15, 2025. This project is 5% complete.

2023 Program Years Projects

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

  The team completed the project final report in July, but a panel meeting could not be scheduled until August 1. After allowing two weeks for panel comments, the report was finalized and submitted for board approval on August 20. A no-cost extension was submitted to ensure sufficient time for board review and final report production. Comments from the board were received on September 3 and the final version of the report was prepared and submitted for editorial review. The final report is currently in final stages of production.

  This project was contracted to start on March 1, 2023 and end on January 31, 2024. An extension to the project has been granted to July 31, 2024. Another extension to October 31, 2024 has also been documented by the PI. This project is 100% complete and the report is getting ready to be posted.

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

  The research team completed the analysis for all three states WZDx and arrow board data as well as added an expanded analysis of 18 states for just the arrow board data. When completing the analysis, it was identified that there were duplicate work zones which was caused issues in the final performance metrics being evaluated. The duplicate work zones was related to updates to the end date and description in the WZDx which was not accounted for. The work zone data for all three states was re-processed which resulted in a cleaned work zone dataset with only one work zone occurrence. As part of the analysis, it was also identified

their was an issue with the id field for one arrow board manufacturer. Because the id was not unique it caused all arrow boards from the manufacturer to be aggregated creating hundreds of thousands of short arrow board activations. The arrow board data was also re-processed adding an additional field to make the identifier unique from the specific vendor.

After addressing the issues, the data was summarized and wrapped up into a final report that was delivered to the TAC. The research team will present the results for feedback and wrapping up the final deliverables.

This project was contracted to start on March 1, 2023 and end on June 30, 2024. An extension had been granted to September 30, 2024. The PI has communicated to SWZDI that another extension has been requested to complete reviews of the final deliverables and post them. The project is 95% complete.

- Merging Implementation Criteria – Michigan State University, Peter Savolainen as PI.

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

  Task 1: Literature Review and Synthesis of Existing Practices – The state agency survey and literature review have been completed.

  Task 2: Driver Feedback Survey in SWZDI States – The road-user survey has been completed.

  Task 3: Site Selection and Data Collection – Fall data collection and reduction has been completed.

  Task 4: Data Analysis - Data analysis is complete. Recommendations have been developed based on the study results.

  Task 5: Develop and Submit Deliverables - The project report has been submitted and reviewed by the TAC. Revisions have been incorporated and the team is awaiting final approval.

  This project was contracted to start on April 1, 2023 and end on September 30, 2024. The PI has also communicated with SWZDI that an extension will also be requested to complete reviews of the final deliverables and post them. The project is about 95% complete.

Anticipated work next quarter:

During the next quarter a request for proposals for PY 2025 will be released. It also appears that all three projects from PY 2023 will be completed and posted.

Significant Results:

Work continued on all SWZDI projects. The last PY 2024 project was contracted and three PY 2023 projects neared 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:

One project report was posted this quarter.