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) Quarter 3 (July 1 – September 30) X 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	$943,011	100%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$124,890		

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 December 31, 2024 (Overall)

During this quarter, work related to three PY 2023 projects continued and all of them were completed and posted. One was posted early in the quarter and another in December 2024. The third will be posted soon. Work also continued on three PY 2024 projects and another additional supplemental project for PY 2024 was contracted and work has just begun. During this quarter the SWZDI board also met to discuss the problem statements submitted based on four topics. The board agreed to send out an RFP with a focus on two subjects. The RFP was released in November with a deadline of December 13th. Three proposals were submitted for each topic. These proposals are in the process of being ranked. In addition, states continued to be 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, KS, MN, MO, NE, PA, TX, and WI. Georgia and Michigan have also indicated they are likely to commit.

The following is a summary of accomplishments provided by the project principal investigators for the October to December 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 completed tasks so far include the literature review and the final version of the survey questions. The survey has been published via Qualtrics and is currently awaiting additional responses.

  The literature review commenced on September 1, with a deadline set for November 30. The scope of the literature review includes current practices in nighttime lighting arrangements and guidelines from each state DOT, illumination standards with a focus on relevant documents from CIE and IES, academic papers addressing nighttime work zones involving traffic crashes caused by low visibility or inadequate glare control, and research on the use of lighting systems in nighttime work zones.

  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 research team resubmitted the revised survey questions on October 11 and published them via Qualtrics for researchers to review. On October 22, minor change suggestions were received from a TAC member. During a subsequent team meeting, the research team

discussed the details of the survey options and made further revisions. The updated version was sent to the TAC member on November 19 and received approval. The final version of the survey officially began collecting feedback on November 19. As of now, a total of 113 responses have been received, with 76 valid responses and 14 reference documents submitted. The research team is currently awaiting additional responses as planned, with the collection period set to continue until January 31.

This project has been contracted to start on September 1, 2024 and end on November 30, 2025. The project is 25 percent complete.

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

  Held TAC Meeting on 2024-12-20. Discussed current and future functionalities of tool, requested data from TAC to test the tool.

  Changes to analytical tool: automated snapping to road system, connected vehicle data section added, crash processing added.

  This project was contracted to start on March 1, 2024 and end on May 31, 2025. This project is 55% complete.

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

  Data ingestion pipelines have now been deployed for CAV stream data. Crash detection using CAV data is being explored. This pipeline will produce real-time alerts from the crash data. In addition, a basic version of crash detection using camera has been implemented as we continue to explore use of LLM models for crash detection.

  This project was contracted to start on March 1, 2024 and end on June 30, 2025. This project is 40 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 draft literature review has been completed and will be distributed to the TAC for review. The planning process for the DOT outreach task is well underway, and a number of prospective contacts have been identified. We have also begun preliminary work on developing case study subjects, and the WSU research team made contact with several agencies at the TRB Annual Meeting in January 2025 who expressed interest in providing relevant materials.

  This project was contracted to start on June 15, 2024 and end on June 15, 2025. This project was 20% complete last quarter (September 2024).

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 is 100% complete and the report has been posted.

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

  The research team presented the final results to the TAC on 9/14 then held a follow up meeting on 10/10. Some minor items were addressed as well as a few additional summaries outside of the report. A final wrap up meeting was held on 10/21 and two weeks of review was provided to the TAC. The report was sent to the SWZDI board on 11/4 and did not receive any comments. The report went through the editorial review and finalized by the end of November.

  This project was contracted to start on March 1, 2023 and end on June 30, 2024. An extension had been initially granted to September 30, 2024 and then an extension provided to November 30, 2024. The project is 100% complete and the report has been posted.

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

  This project is 100% complete and the report has been posted.

  This project was contracted to start on April 1, 2023 and end on September 30, 2024. An extension to December 31, 2024 was also granted to complete reviews of the final deliverables and post them. The project is 100% complete and the report will be posted soon.

Anticipated work next quarter:

During the next quarter the proposals submitted for PY 2025 will be ranked and choice made for funding. Additional discussion about another topic will also be held. Planning for PY 2026 will also begin with request for problem statement discussions. The last PY 2023 project will also be posted.

Significant Results:

Work continued on all SWZDI projects. All three PY 2023 projects have been completed with one report that still needs to be posted. Work continued on PY 2024 project and soon PY 2025 project will be funded.

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:

Two project reports were posted this quarter.