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, 2023) 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, 2023	**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
$1,250,000	$496,574	75%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$19,807		

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, 2023 (Overall)

During this quarter, work on one PY 2021 project was completed, and two and three PY 2022 and PY 2023 projects, respectively, continued. Problem statements for PY 2024 were distributed to the SWZDI Board last quarter and a meeting was held on July 21. The PY 2024 problem statements were finalized during that meeting. The PY 2024 Request for Proposal with three subject problem statements was distributed on September 7 with a due date of October 9. Nineteen proposals were submitted and the ranking process will begin soon.

The following is a summary of accomplishments provided by the project principal investigators for the July to September 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

  In the third quarter of 2023, the research team completed Task 2 (Literature Review), Task 3 (Practitioner Interviews), and Task 4 (Site Selection) and commenced work on Task 5 (Data Collection) as well as Task 6 (Evaluation of Probe Data). In the fourth quarter, the team will complete data collection and make substantial progress on Task 6.

  This project was contracted to start on March 1, 2023 and end on February 29, 2024. This project is 25% complete.

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

  The research team completed work on Task 3 to interview agencies on the current state of practice with connected devices and the integration into the TMC. The research team conducted interviews with Iowa DOT, Wisconsin DOT, Washington DOT, Minnesota DOT and Colorado DOT. Each interview was an hour long with a set of questions on cTTCD and smart work zones integration into the ATMS. The cTTCD questions made up the primary portion of each interview with the smart work zone questions typically including the last 10-15 minutes. Upon completion of the interview, the research team summarized each interview and put the

information into a tech memo. The tech memo was separated into two categories that corresponded with the two categories covered in the interview. A summary table for each section was put together to provide a high level overview and comparison across the states interviewed. The tech memo was sent to all people involved in each interview as well as the TAC for review. The research team had a TAC meeting on 9/14/23 where the literature review and interviews were summarized for the TAC.

The research team has begun work on Task 4 which has primarily focused on data collection. The research team is utilizing the WZDx Registry Archive to access the historical 15 minute archived data for Iowa, Minnesota, Colorado, and Wisconsin. The team is also working on developing a process to archive the Colorado experimental WZDx and MnDOT device feed for inclusion in the analysis. This will be used in coordination with the existing data the research team has available for Iowa DOT and smart arrow boards across the country.

This project was contracted to start on March 1, 2023 and end on June 30, 2024. The project is 30% 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 subcontract with the University of Missouri was finalized. The literature review and synthesis is ongoing.

  Task 2: Driver Feedback Survey in SWZDI States – The draft road-user survey is nearly complete and will be sent to the TAP for review. The survey will gather information on road users' knowledge and opinions on different lane merge strategies.

  Task 3: Site Selection and Data Collection – Fall data collection has been completed at two sites. Data reduction has been time-intensive and approximately half of the data have been reduced for one of these sites. Additional sites are being considered in consultation with the Michigan DOT.

  Task 4: Data Analysis - The data from the first (I-94) site are currently being reduced.

  Task 5: Develop and Submit Deliverables - No progress to report.

  This project was contracted to start on April 1, 2023 and end on September 30, 2024. The project is 20% complete.

2022 Program Year Projects

- Mobility and Safety Impacts of Work Zone Lane and Shoulder Widths, University of Wisconsin-Madison, David Noyce as PI

  - Regular TAC meetings. Literature review is completed. Verified the new data collection device and shared results with the TAC on 08/11/2022.
  - Collected data at five locations in three work zones in Wisconsin on 09/19/2022. Also collected data at six locations in Wisconsin on 10/19/2022. However, there was limited variability in lane/shoulder widths at these locations.
  - Data have been processed to obtain speed, lateral position, vehicle length/category, headway, presence of vehicle in adjacent lane information. Presented preliminary data to TAC on 02/28/2023 when they approved the NCTE.

- Obtained information from WI, MI, IA, and IL about potential WZs where data can be collected in Spring/Summer of 2023.
- Coordinated with WisDOT/MDOT/contractors for data collection. Collected data at
  - ✓ Six locations in Milwaukee, WI area
  - ✓ Three locations in Mauston, WI area
  - ✓ Six locations in greater Detroit, MI area.
- Data is being processed currently.
- Algorithm for processing the raw data is being refined using the field data.
- Analysis methods are being explored for safety and mobility modeling.
- Obtained information from Illinois DOT in late August about a WZ on I-80 in IL. Data will be collected in early October.

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 to April 30, 2024. This project is 70% 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 - Complete. Will be included in the final report.

  Task 2: Site Selection and Data Collection - SFT related research evaluations that are being (or have been) performed in this research include: 1.) SFT location approaching and within a lane closure; 2.) effects of SFT within a median crossover; 3.) SFT with/without worker presence (with DSLs); 4.) SFT with/without law enforcement vehicle; 5.) SFTs with/without law enforcement coupled with/without PCMS messaging related to the law enforcement. Other possibilities for evaluations, if feasible, include: 6.) SFT used at a shorter duration work zone that do not include temporary rumble strips; 7.) DSLs with 45mph/60mph activated/deactivated by worker transponders.

  Task 3: Data Analysis - Data collection and analysis is still ongoing. SFTs 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 SFT, and are largely sustained for at least 1200 ft beyond the feedback sign, with the effects diminishing by approximately 2500 ft beyond the SFT. The speed reduction effects of the SFT 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 (DSL) sign displaying 45 mph and the traditional "45 mph when workers present" speed limit sign. However, utilization of a SFT in addition to the DSL decreases work zone speeds, but only when a work vehicle or worker is present at the site. PCMS enforcement messages did not substantively affect work zone speeds with or without an enforcement vehicle present at the site.

  This project was contracted to start on April 15, 2022 and end on October 31, 2023. The project team will be requesting a no-cost extension to December 31, 2023. A March 31, 2024 end date was agreed to with SWZDI in connection to its report review workload at the end of the year. The project is 85% complete.

2021 Program Year Projects

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

  Collected and analyze data from the Sugar Creek work zone
  Prepared a draft final report, sent for TAC and SWZDI board review, finalized the report based on SWZDI requirements

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 is 100% complete.

Anticipated work next quarter:

During the next quarter the SWZDI Board will review, rank, and select proposals for PY 2024. One PY 2022 project report might come up for review.

Significant Results:

One final report was reviewed and posted. The request for proposals was released and responses received. 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. There may be one posted in the next quarter or very soon thereafter.