# 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.*

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| **Transportation Pooled Fund Program Project #**<br>*TPF-5(438)* | **Transportation Pooled Fund Program - Report Period:**<br>Quarter 1 (January 1 – March 31, 2023)<br>X Quarter 2 (April 1 – June 30)<br>Quarter 3 (July 1 – September 30)<br>Quarter 4 (October 1 – December 31) |
| **Project Title:** Midwest Smart Work Zone Deployment Initiative | |

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| **Name of Project Manager(s):**<br>Dan Sprengeler | **Phone Number:**<br>515-239-1823 | **E-Mail**<br>Dan.Sprengeler@dot.iowa.gov |
| **Lead Agency Project ID:**<br>Keith Knapp | **Other Project ID (i.e., contract #):**<br>Addendum 733 | **Project Start Date:**<br>January 1, 2020 |
| **Original Project End Date:**<br>December 31, 2020 | **Current Project End Date:**<br>December 31, 2023 | **Number of Extensions:**<br>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 | 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 |
|---|---|---|
| $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 June 30, 2023 (Overall)**

During this quarter, work on one PY 2021 project and two PY 2022 projects continued. Three PY 2023 projects were contracted and started (see below). A SWZDI Board meeting was organized and held on-site in Davenport on May 11 and 12. The problem statement topic for PY 2024 were discussed and finalized. Operational details were also discussed and several researchers presented their work and ideas. Meeting notes were distributed to the Board for review and comment. The request for problem statements was distributed with four topics and 11 problem statements were received. No problem statements were received for the worker visibility lighting topic. The problem statements submitted have been distributed to the SWZDI Board and a meeting set to finalize one for each of the topics addressed has been set for July 21.

The following is a summary of accomplishments provided by the project principal investigators for the April to June 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 2nd quarter of 2023, the research team conducted interviews with several practitioners and conducted a literature review. In the third quarter, the research team will complete the interviews, draft a write-up of the literature review, select project locations for analysis, and commence with data collection and analysis.

  This project was contracted to start on March 1, 2023 and end on February 29, 2024. The project is 8% complete.

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

  The research team completed the literature review and delivered to the TAC on 6/1/2023. The literature review included three sections which were connected temporary traffic control devices, cTTCD integration and integrating smart work zones in ATMS. The sections provided summaries off the existing literature related to improving the accuracy of work zone data and how that can be incorporated in a TMC. The final section also included the expanded literature on any benefits in the literature for incorporating smart work zones into the

TMC. The literature review included a summary of 27 papers/reports identified as relevant by the research team. We tried to schedule a review of the document with the TAC but will need to complete this in the next quarter based on the availability of the TAC.

This project was contracted to start on March 1, 2023 and end on June 30, 2024. The project is 15% 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 is currently being finalized.

  Task 2: Driver Feedback Survey in SWZDI States – The draft road-user survey is approximately 75% complete. The survey will gather information on road users' knowledge and opinions on different lane merge strategies.

  Task 3: Site Selection and Data Collection – Preliminary data collection activities are underway on I-94 in Macomb County between 23 Mile Rd and County Line Rd. There are zipper merges in place on both the eastbound and westbound directions. To date, three rounds of data collection have occurred. Additional sites are being identified in consultation with the Michigan DOT.

  Task 4: Data Analysis - The data from the 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 10% 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.

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 60% 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 - Ongoing. Will be included in the final report.

  Task 2: Site Selection and Data Collection - SFT related research evaluations that were performed as a part of this project in 2022 included investigation into the effects of: 1.) SFT location within the work zone; 2.) SFT with/without law enforcement vehicle; 3.) SFT with/without worker presence (with DSLs). The research team met with the TAC to identify SFT research evaluations for 2023, which includes some combination of the following: 1.) SFT spacing within the work zone; 2.) SFT at a location with 60 mph work zone speed limits (no 45 mph when workers present); 3.) SFTs with/without law enforcement coupled with/without PCMS messaging related to the law enforcement; 4.) SFT used at a shorter duration work zone that do not include temporary rumble strips; 5.) DSLs with 45mph/60mph activated/deactivated by worker transponders.

  Task 3: Data Analysis - Analysis of the speed data and subsequent write-ups were performed in Q1/Q2 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 team will be requesting a no-cost extension to December 31, 2023. The project is 60% complete.

**2021 Program Year Projects**

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

  Coordinated field deployment at the Sugar Creek work zone
  Collected traffic data before the deployment

  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 90% complete.

**Anticipated work next quarter**:

During the next quarter the SWZDI Board will meeting to finalize the PY 2024 problem statements. These statements will be reviewed and used in the PY 2024 request for proposals. The PY 2021 project that is ongoing should also be completed by September.

**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. There may be one posted in the next quarter or very soon thereafter.