TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Michigan DOT

INSTRUCTIONS:

Lead Agency contacts 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 # *(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* *TPF-5(490)*	**Transportation Pooled Fund Program - Report Period:** ☐ Quarter 1 (January 1 – March 31) ☐ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☒ Quarter 4 (October 1 – December 31)
TPF Study Number and Title: **TPF-5(490) ENTERPRISE-Phase III (Phase II Continuation)**	

Lead Agency Contact: **Michigan Department of Transportation**	**Lead Agency Phone Number:** **517-636-0036**	**Lead Agency E-Mail** FeldpauschE1@michigan.gov
Lead Agency Project ID: **OR17-101**	**Other Project ID (i.e., contract #):** **2018-0172**	**Project Start Date:** 3/6/2023
Original Project Start Date: **3/6/2023**	**Original Project End Date:** **9/30/2028**	**If Extension has been requested, updated project End Date:** Click or tap to enter a date.

Project schedule status:

☒ On schedule	☐ On revised schedule	☐ Ahead of schedule	☐ Behind schedule

Overall Project Statistics:

Total Project Budget	Total Funds Expended This Quarter	Percentage of Work Completed to Date
$1,195,980.00	$54,891.47	39%

Project Description:

TPF-5(490) is a continuation of TPF-5(359) led by the Michigan Department of Transportation. This pooled fund federal project originated under the project titled "ENTERPRISE Group" that was established in 1991. Each year, partner members contribute funds in support of ITS projects of mutual interest.

Selected research studies/projects typically involve private sector partners contracted to work with designated member agencies. An administrative contract, currently with CTC & Associates LLC, covers project management, meeting planning, website and other tasks. Over time ENTERPRISE has grown into a multi-national consortium dedicated to the advancement of ITS. The consortium provides a focus for coordinating ITS developments and sharing results within and outside the ENTERPRISE program.

Primary Focus:
To enhance innovation in highway operations and intelligent transportation systems through research and technology transfer, as well as to continue assessing transformational technologies and their impact on the transportation industry.

Objectives: The Board has selected the following 14 research projects for this phase of the pooled fund study.
Primary Projects
1. State of the Art Roadway Sensors – Phase 1
2. New Methods of Traffic Data Collection
3. Potential Approaches for Wrong Way Driving Applications – Phase 2
4. Procurement Specification for Physical Security of ITS
5. Novel Uses of Unmanned Aerial Systems in ITS
6. State of the Art of Roadway Sensors – Phase 2

Secondary Projects
7. Administration of Communications – Phase 1
8. Something Old, Something New – New Applications of Old Technologies
9. Uncontrolled Pedestrian Crossing ITS Countermeasures
10. Communication Future - Phase 1
11. Quick Connect DMS Replacement
12. Administration of Communications – Phase 2
13. Analysis of the Benefits of Connected Street Lighting
14. Communication Future - Phase 2

Progress this Quarter
(includes meetings, work plan status, contract status, significant progress, etc.):

Board teleconferences held on October 18, November 15 and December 20, 2023. CTC & Associates developed the agenda, took notes, and finalized, distributed and posted meeting minutes.

CTC & Associates assisted MDOT with members' pooled fund commitments and transfers.

CTC & Associates updated the website with current information. (http://enterprise.prog.org)

CTC & Associates finalized and posted the ENTERPRISE Program Brochure that highlights projects completed in the previous phase of the study and the current in-progress projects.

CTC & Associates assisted Athey Creek with activities related to individual research projects.

<u>Research projects</u>
Project 1: State of the Art Roadway Sensors – Phase 1
- Task 1: Literature Search, Survey, and/or Interviews – Task complete.
- Task 2: Roadway Sensor Analysis – Task complete.
- Task 3: Use Cases – Completed use cases that were identified in Tasks 1 and 2. Task Complete.
- Task 4: Draft Final Report – Completed and submitted draft report for ENTERPRISE member review. Task Complete.

- Task 5. Final Report – Made revisions to Draft Report based on comments received and submitted for posting online. Task Complete.

Project 2: New Methods of Traffic Data Collection
- Task 1: Literature Search and Survey – Task complete.
- Task 2: Industry Scan – Task complete.
- Task 3: Compare Traffic Data Collection Alternatives – Began to compare each emerging traffic data collection method found in Task 1 and 2 to traditional traffic detection methods.
- Task 4: Draft Report – Began developing the draft report.

Project 3: Potential Approaches for Wrong Way Driving Applications – Phase 2
- Task 1: Synthesis of Current WWD In-Vehicle or Mobile Applications – Task Complete.
- Task 2: Industry Outreach - Automobile Manufacturers and Application Providers – Task Complete.
- Task 3: Industry Outreach – Enhance Phase 1 White Paper – Task Complete.
- Task 4: Outreach to Providers that May Contribute to a National WWD Data Feed – Began investigating readiness of wrong-way event data that could be contributed to a national data feed. Developed 2 surveys to poll TMC operators/managers and 911 dispatch managers regarding how they log and track wrong-way driving events.
- Task 5: Outreach to Public/Private Entities that May Ingest from a National WWD Data Feed - Continued to discuss potential for wrong-way data feed with representatives from FHWA's programs that are supporting development of a national data standard for incidents and disruptive events.

Project 4: Procurement Specification for Physical Security of ITS
- Task 1: Investigate Best Practices for Security of ITS Field Devices – Task complete.
- Task 2: Best Practices Checklist: Developed four (4) checklists outlining successful physical security practices for agencies to consider for the following ITS enclosures: cabinets, shelters/huts, mounted boxes, and in-ground boxes/vaults.
- Task 3: Create a "Model" Procurement Specification – Created a library of materials applicable to physical security of ITS enclosures, including specifications, construction drawings and agreements, as gathered during agency interviews. The library is expected to be included of the final report.
- Task 4: Draft Report – Began developing the draft report.

Project 5: Novel Uses of Unmanned Aerial Systems (UAS) in ITS
- Task 1: Literature Search, Survey, and/or Interviews – Developed and distributed a survey to gather input from State DOTs regarding their use of UAVs for ITS and transportation operations purposes. Compiled survey responses and reported initial survey findings at the December ENTERPRISE Board meeting. Contacted 4 agencies to request phone interviews to gather information for case studies.
- Task 2: Use Cases and Applications – Finished compiling UAS use cases from the literature. Began compiling use cases from the survey.
- Task 3: Draft Report – Began developing the draft report, documenting the literature search findings and survey responses.

Project 6: State of the Art of Roadway Sensors – Phase 2
- Task 1: Propose Assessment Options – Develop and share presentation with ENTERPRISE Board Members based on available findings from Project 1 to select specific sensor of interest.
- Task 2: Conduct a High-Level Systems Engineering Approach – Begin developing high-level systems engineering approach for sensor selected in Task 1. Contacted two ENTERPRISE agencies who are currently testing the selected sensor of interest to understand how the sensor is being used.
- Task 3: Draft Report – Begin developing a report that includes findings in Tasks 1 and 2.

The following research project is complete, and the final report is posted to the ENTERPRISE PFS website:
State of the Art Roadway Sensors – Phase 1: https://enterprise.prog.org/wp-content/uploads/ENT-Roadway- Sensors-Phase-1-Final-Report.pdf

The following research projects have not yet begun, therefore there is no progress to report:
- Project 7: Administration of Communications – Phase 1
- Project 8: Something Old, Something New – New Applications of Old Technologies
- Project 9: Uncontrolled Pedestrian Crossing ITS Countermeasures
- Project 10: Communication Future – Phase 1
- Project 11: Quick Connect DMS Replacement
- Project 12: Administration of Communications – Phase 2

- Project 13: Analysis and Benefits of Connected Street Lighting

Continued discussing project priorities and potential revisions to secondary projects with members during the September 19-20 ENTERPRISE Board meeting.

Anticipated work next quarter:

The Board will hold teleconferences on January 17, February 21 and March 20, 2024. CTC & Associates will create agendas, take notes, and finalize, distribute and post meeting minutes for monthly Board meetings.

A hybrid in-person/virtual meeting will take place from April 2-3, 2024 in Ankeny, Iowa.
-- CTC & Associates will be responsible for the meeting planning and logistics including meeting agenda, meals, hotel, flights, facilities, and the virtual platform. CTC will take the meeting notes, and finalize, distribute and post meeting minutes.
-Athey Creek will present project updates and discuss the secondary projects.

CTC & Associates will update the website with current information. (http://enterprise.prog.org).

CTC & Associates will monitor the research projects schedules and obtain TAC approval for the researcher's invoices.

<u>Research projects - Athey Creek (Project updates are presented at monthly Board meetings.)</u>

Project 2: New Methods of Traffic Data Collection
- Task 3: Compare Traffic Data Collection Alternatives – Complete comparison of each emerging traffic data collection method found in Task 1 and 2 to traditional traffic detection methods.
- Task 4: Draft Report – Complete draft report.

Project 3: Potential Approaches for Wrong-Way Driving Applications – Phase 2
- Task 4: Outreach to Providers that May Contribute to a National WWD Data Feed – Compile results from surveys of TMC operators/managers and 911 dispatch supervisors. Conduct interviews with selected State DOTs who operate wrong-way detection field equipment.
- Task 5: Outreach to Public/Private Entities that May Ingest from a National WWD Data Feed - Continue to share findings from this project with FHWA.
- Task 6: Draft Report – Begin developing the draft report.
- Task 7: Finalize the report.

Project 4: Procurement Specification for Physical Security of ITS
- Task 3: Create "Model" Procurement Specification – Finalize the library of applicable materials for inclusion in the final report.
- Task 4: Draft Report – Continue developing the draft report and route it for review and comment.

Project 5: Novel Uses of Unmanned Aerial Systems (UAS) in ITS
- Task 1: Literature Search, Survey, and/or Interviews – Complete the agency interviews to gather information to document 3-4 expanded case studies.
- Task 2: Use Cases and Applications – Continue documenting the use cases and applications as gathered in Task 1.
- Task 3: Draft Report – Continue developing the draft report and route it for review and comment.

Project 6: State of the Art of Roadway Sensors – Phase 2
- Task 1: Propose Assessment Options – Develop testbed methodology.
- Task 2: Conduct a high-level systems engineering approach – Complete high-level systems engineering approach for the sensor identified in Task 1 that defines the needs addressed, operational concepts, and preliminary requirements.
- Task 3: Draft Report – Develop draft final report based on findings in Task 1 and Task 2.

Work is anticipated to begin on the following secondary projects:
- Project 7: ITS Simple Innovations
- Project 8: Defining and Advancing Digital Infrastructure
- Project 9: Uncontrolled Pedestrian Crossing ITS Countermeasures
- Project 10: Role of AI in ITS
- Project 11: Alternate Methods of Traffic Data Analysis

To be determined as individual projects progress.

- Project 12: Analysis and Benefits of Connected Street Lighting
- Project 13: Administration of Communications
- Project 14: Documenting Current RWIS Technologies

Significant Results:

See Progress This Quarter section.

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, along with recommended solutions to those problems).

None

Potential Implementation: