

TRANSPORTATION POOLED FUND PROGRAM

QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Indiana Department of Transportation

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 # TPF-5(380)	Transportation Pooled Fund Program - Report Period: <input type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input checked="" type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31)	
TPF Study Number and Title: TPF-5 (380): Autonomous Maintenance Technologies - Phase 2		
Lead Agency Contact: Michael Lane	Lead Agency Phone Number: 3174319478	Lead Agency E-Mail mlane1@indot.in.gov
Lead Agency Project ID: TPF-5 (380)	Other Project ID (i.e., contract #): Click or tap here to enter text.	Project Start Date: 7/1/2025
Original Project Start Date: 7/1/2025	Original Project End Date: 6/30/2029	If Extension has been requested, updated project End Date: Click or tap to enter a date.

Project schedule status:

<input checked="" type="checkbox"/> On schedule	<input type="checkbox"/> On revised schedule	<input type="checkbox"/> Ahead of schedule	<input type="checkbox"/> Behind schedule
---	--	--	--

Overall Project Statistics:

Total Project Budget	Total Funds Expended This Quarter	Percentage of Work Completed to Date
\$1,123,000	\$0	5%

Project Description:

Background

Road maintenance activities are crucial for ensuring safe and efficient delivery of goods and people. Well-maintained roads not only extend their lifespan but also significantly reduce the risk of accidents and improve fuel efficiency. In recent years, with the development of vehicle automation, wireless communication, and robotic technologies, some road maintenance activities can be partially or fully replaced by machines, which bring significant benefits in improving road maintenance workers' safety and productivity and alleviating the growing workforce shortage in state DOTs.

The existing pooled fund project titled "Autonomous Maintenance Technology (AMT)" started in 2018 and the main focus so far has been the Autonomous Truck Mounted Attenuator (ATMA) technology. Current research in ATMA has led to broader interest in other AMTs such as autonomous cracking sealing, autonomous mowing, and autonomous snow plowing, among others. This motivates us to expand the scope of the current pooled fund project and develop a cooperative agreement to conduct further research on other available AMTs (including the ATMA) and their supported road maintenance activities. The Indiana DOT (INDOT) will serve as the lead state for the execution of the continuing pooled fund project. INDOT, through the Joint Transportation Research Program (JTRP) at Purdue University, will handle all administrative duties associated with the project. Purdue University will also serve as the lead research institution for the project.

Objectives

The overall objective of this study is to support and promote collaborative research efforts in the field of AMTs for road maintenance activities. Specific objectives include 1) Identify needed research priorities from participating state DOTs; 2) Provide a platform for technology, experience, and lessons learned exchange among participants; 3) Fund research related to AMT development, testing, evaluation, and deployment in various DOT maintenance activities; 4) Foster collaboration among state agencies, industry, and academia; and 5) Provide technical leadership in AMT to advance the state-of-the-art road maintenance practices. It is expected that this consortium will become a national leader in AMT-related research and applications.

Scope of Work

- The project will fund research and development efforts to achieve the program goals, with proposed initial research focusing on
- AMT Deployment Requirements: Identify the purpose, features, functionalities, and underlying technologies of each AMT and Investigate how the AMT is intended to be used in what road maintenance activities, and corresponding external conditions (e.g., road, traffic, weather, etc.).
- Human-AMT teaming: explore how the AMT interacts with DOT workers to what extent in road maintenance activities.
- Machine-machine teaming: explore how multiple AMTs can be operated together in terms of interoperability, safety, reliability, scalability, and cybersecurity.
- Cost-benefit analysis: analyze potential benefits and costs and build business cases for each technology.

Progress this Quarter

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

July 1 – Sept 30, 2025

The solicitation was approved by FHWA and the project started from July 1, 2025. Eleven states committed a total amount of \$1.123M, which include CA, CO, IL, IN (lead), KS, MI, MN, MO, MS, PADOT, TX. Projects under this pooled fund study will be funded incrementally by the Joint Transportation Research Program (JTRP) at Purdue University as funds from the participating states are transferred.

The team decided to have monthly meetings on the third Wednesday of each month from 2:30pm – 4:30pm EST. Three monthly meetings (July 16th, August 20th, and Sept 17th) have been conducted during this quarter via MS Teams. Participating state representatives, interested state representatives, and universities researchers attended the meeting. The main agenda discussed in the monthly meetings are:

1. Admin transition from Colorado DOT to Indiana DOT.
2. Year one timeline of call-for-proposal (September 2025: determination of target technologies; November 2025: solicitation release; January 2026: proposal response, discussion, and determination; Spring 2026: subcontracting and new project start)
3. Prioritized AMTs to investigate: A survey has been delivered to all member states to seek input on the agency's prioritized AMTs, and the AMTs that have the highest technology readiness level. Based on the inputs from all states, the team selects autonomous vegetation control (including both autonomous mowing and drone based spraying) and autonomous crack sealing/pothole patching as the AMTs to investigate in year one.

Anticipated work next quarter:

- Continue monthly meetings
- Purdue will work with INDOT to write the solicitation with specific research ideas.
- The solicitation will seek feedback from member states and be released by November.

--

Significant Results:

None

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: