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(483)*	**Transportation Pooled Fund Program - Report Period:** Quarter 1 (January 1 – March 31) Quarter 2 (April 1 – June 30) **X** Quarter 3 (July 1 – September 30) Quarter 4 (October 4 – December 31)	
Project Title: Implementation of New Traffic Signal Actuation Concepts using Enhanced Detector		
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Lead Agency Project ID:	**Other Project ID (i.e., contract #):** Addendum 791	**Project Start Date:** 02/01/2022
Original Project End Date: 02/28/2026	**Project End Date:** 12/31/2026	**Number of Extensions:**

X On schedule ☐ On revised schedule ☐ Ahead of schedule ☐ Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Total Percentage of Work Completed
$595,032	$391,707	%73

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
$68,402		%6

Project Description: The objective of this research is to develop field-tested methods of integrating vehicle trajectory data into actuated signal control that can be directly implemented in traffic signal controllers. This research will identify the practical requirements and limitations of establishing trajectory-assisted actuated signal control, including requirements for acquisition, storage, and communication of vehicle trajectory data. The findings will be developed into a resource toolkit that will permit implementation and further development of the methods conceived during the course of the research.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):
In the third quarter of 2025, the team completed the following work: First, the team tested two implementations of control methods that use a concept inspired by the “max pressure” algorithm as a replacement of gap measurement, which showed marginal improvements. These were tested using a scenario that experiences a greater amount of congestion during some volume scenarios, compared to the previous tests. In addition, the team developed a platoon priority control method that uses the Q-Free MaxTime controller logic, and have begun testing this using the Virginia DOT corridor.

Anticipated work next quarter:
The team will continue working on finalization of these test results, which expand upon the initial results by attempting different approaches to local control and to handling platoons. These results also demonstrate that the test methods are transferable to systems with different characteristics. One focus of work in the next quarter will be an exploration of different performance measures based on vehicle trajectories, to characterize the nature of decentralized coordination and compare it with conventional coordination (using multiple optimization and control strategies). Although precent on green and travel time results show that the proposed control methods are able to attain similar performance, the question remains whether the user experience is similar or if there is a cost in terms of reduced reliability, or if the methods tend to cause more frequent but briefer stops in some cases.

Significant Results: Overall, the results of the study as documented in the interim report indicate that there is a potential for improvement of signal control with the integration of vehicle trajectory data into actuated control processes. Total delay reductions up to 20% compared with fully-actuated control and up to 35% compared with actuated-coordinated control were observed. In addition, reductions in split failures and dilemma zone vehicles were observed, along with an increase in percent on green and decrease in corridor travel times. We believe that this package of control methods can offer a new option for signal control that achieves a certain degree of signal coordination without requiring a fixed cycle length and associated cycle-offset-split pattern. In addition to enhancing fully-actuated control, it is likely that these methods can also be integrated with both coordinated and real-time adaptive control as a last-second adjustment to scheduled timings that coordinators and real-time adaptive schedulers set for the next cycle length or planning horizon.