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) X Quarter 2 (April 1 – June 30) Quarter 3 (July 1 – September 30) Quarter 4 (October 4 – December 31)	
Project Title: Implementation of New Traffic Signal Actuation Concepts using Enhanced Detector		
Project Manager: Chris Poole	**Phone:** 515-239-1513	**E-mail:** chris.poole@iowadot.us
Project Investigator: Chris Day	**Phone:** 515-294-3015	**E-mail:** cmday@iastate.edu
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	$323,305	%67

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
$21,829		%2

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 second quarter of 2025, the team completed the following work: (1) Preliminary results from the Virginia DOT corridor (US 220) were obtained, showing delay reductions ranging from 8–55% compared to existing fully-actuated control varying by time of day and control options; one of the control options showed an increase. (2) The team developed new “pressure” based logic as an alternative to gap measurement. This is inspired by the “max pressure” algorithm reported in literature. Tests are ongoing to evaluate its effectiveness. (3) The team worked on implementation of a platoon priority control method using the Q-Free MaxTime controller logic, the goal of which is to be able to create a method that could be more easily field tested with existing infrastructure.

Anticipated work next quarter:
The team will continue to work on the above described tasks with a goal of completing tests to enhance the performance of the trajectory-based control methods, test the use of the methods with conventional cycle-based coordination, facilitate future field testing, and confirm the transferability of the methods to signal system networks with different characteristics.

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.