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		
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:**	**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	$160,937	%33

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
$38,804		%21

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.):
The team developed initial results on proposed green extension methods which were written up for a paper that was submitted to the Transportation Research Board Annual Meeting. At the time of writing we have heard that the paper was accepted for presentation and is under review for publication. Subsequent to the production of this paper, the team did a more extended analysis of the green extension methods.

Anticipated work next quarter: In the fourth quarter of 2023, the results will be documented in an interim report, which we anticipate will be completed by the end of the year. The interim report is expected to include the following chapters:

1. Introduction and background
2. Expanded literature review
3. Concept of operations for trajectory-based actuation
4. Results on prototyped trajectory-based actuation methods
5. Plan for the second half of the project

Significant Results: At this point we have developed and tested control concepts for green extension that map to specific operational objectives. We have obtained results demonstrating improved performance for five such actuation methods:

1. Replacement of gap/passage timer with direct measurement of gaps (objective: efficient termination of green).
2. Queue clearance – a new concept tracking queued vehicles and extending green until these vehicles have queued; (objective: reduce split failures).
3. Dilemma zone (DZ) protection, with optional allowance of single DZ vehicles under certain conditions (objective: reduce DZ vehicles).
4. Secondary extension for platoons (objective: avoid stopping platoons).
5. Mainline gap identification for side-street service (a previously reported method called “free optimization” that was previously field tested in Colorado Springs; objective: efficient utilization of green).