

## 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.*

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|--|---|--|
| <b>Transportation Pooled Fund Program Project #</b><br>TPF-5(483)  | <b>Transportation Pooled Fund Program - Report Period:</b><br>Quarter 1 (January 1 – March 31)<br>Quarter 2 (April 1 – June 30)<br>Quarter 3 (July 1 – September 30)<br>X Quarter 4 (October 4 – December 31) |  |
| <b>Project Title:</b><br>Implementation of New Traffic Signal Actuation Concepts using Enhanced Detector |   |  |
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| <b>Lead Agency Project ID:</b>   | <b>Other Project ID (i.e., contract #):</b><br>Addendum 791   | <b>Project Start Date:</b><br>02/01/2022 |
| <b>Original Project End Date:</b><br>02/28/2026  | <b>Project End Date:</b><br>12/31/2026  | <b>Number of Extensions:</b>             |

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 |
|----------------------|--------------------------------|------------------------------------|
| \$645,000            | \$440,834                      | 80%                                |

**Quarterly Project Statistics:**

| Total Project Expenses This Quarter | Total Amount of Funds Expended This Quarter | Percentage of Work Completed This Quarter |
|-------------------------------------|---|---|
| \$49,127                            |   | 7%  |

**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 fourth quarter of 2025, the team completed the following work: The team completed additional tests for transferability of the results by application to two additional modeled corridors. One of these was a model of US 36 (Pendleton Pike) in Indianapolis, IN with volumes calibrated to field-collected volumes; the other was a model of a Virginia DOT corridor. The team also developed a platoon priority control method implemented in Q-Free MaxTime controller logic as a field-ready component to accompany the control methods tested with more complex logic.

**Anticipated work next quarter:**

The team will work on completing all tests to begin transitioning to developing the final reports for this project. This will include summary results similar to those presented in the interim report, along with a more detailed evaluation of the quality of progression under decentralized control. A sensitivity analysis of the effects of the number of pedestrians on the effectiveness of decentralized control will be completed as part of the final set of tests.

**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.