TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): FHWA

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 # *(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* TPF-5(176) --Traffic Analysis and Simulation Pooled Fund Study		**Transportation Pooled Fund Program - Report Period:** ☐ Quarter 1 (January 1 – March 31) ☐ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☑ Quarter 4 (October 1 – December 31)
Project Title: Multi-Resolution Modeling for Traffic Analysis		
Name of Project Manager(s): Hyungjun Park	**Phone Number:** 202-493-3491	**E-Mail** Hyungjun.Park@dot.gov
Lead Agency Project ID: DTFH6116D00030-693JJ319F000376	**Other Project ID (i.e., contract #):**	**Project Start Date:** 09/23/2019
Original Project End Date: 09/23/2021	**Current Project End Date:** 09/23/2021	**Number of Extensions:** 0

Project schedule status:

☑ On schedule ☐ On revised schedule ☐ Ahead of schedule ☐ Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
$ 414,326.64	$17,580.22	4%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
4%	$17,580.22	4%

Project Description:

Transportation analysis, modeling, and simulation (AMS) tools exist at a variety of resolutions: microscopic, mesoscopic, and macroscopic. Each of these models have specific advantages and disadvantages.

Microscopic models simulate the realistic movement of individual vehicles through the network; they are frequently composed of car-following (acceleration/deceleration), lane-changing, gap acceptance, speed selection, and other submodels that represent the grander driving task. These extremely detailed models enable the detailed analysis and comparison of project alternatives, but are limited in spatial and temporal scope given the high-resolution representation of the study area. Macroscopic models are the most aggregate form of traffic modeling and are based on the well-established relationships between traffic flow, density, and speed; the reduction in details enables the expansion of model scope with the tradeoff of model accuracy. Macroscopic models assign vehicles flow to roadways, but do not simulate flow; thus, traffic flow properties (e.g., capacity) can be violated. Mesoscopic models exhibit properties of both microscopic and macroscopic models. In mesoscopic models, the relationships between traffic density, volume, and flow are respected, as with macroscopic models; however, traffic is modeled at the link or "cell" level, which offers increased accuracy and resolution of the results, though not to the degree of microscopic models. Unlike microscopic models, mesoscopic and macroscopic models (i.e., static and dynamic traffic assignment) can assess route diversion of drivers through assignment procedures.

The selection of which model resolution to use depends on the question an agency is trying to answer, as each of these models have specific tradeoffs with their application. However, the application of these different types of models are not mutually exclusive. To unlock the full potential of transportation AMS tools, analysts should explore the complete, multi-directional integration of an array of tools with different capabilities, increasingly called multi-resolution modeling (MRM). In fact, NCHRP 08-36-90 called multi-resolution modeling the "future of current modeling practice" (pg 50).

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

Task 1 - Project Management and Work Plan - Estimated completion date: 09/23/2021 | On schedule, 4% complete
A final Work Plan and a draft Data Management Plan were delivered. Bi-weekly calls were held.

Task 2 - Stakeholder Engagement - Estimated completion date: 09/23/2021 | On schedule, 4% complete
A stakeholder list was developed and an initial engagement email was sent out. A draft presentation slide deck for a first bi-monthly stakeholder meeting was developed.

Task 3 - State of Practice Report - Estimated completion date: 08/30/2020 | On schedule 0% complete
A draft annotated outline of the State of Practice Report was prepared and being reviewed.

Task 4 - Gap Analysis - Estimated completion date: 10/31/2020 | On schedule, 0% complete
(No updates)

Task 5 - Guidebook for Multi-Resolution Modeling - Estimated completion date: 08/30/2021 | On schedule, 0% complete
(No updates)

Task 6 - Case Study and Benefits Quantification - Estimated completion date: 03/31/2021 | On schedule, 0% complete
(No updates)

Task 7 (OPTION) - Training Webinar - Estimated completion date: 01/31/2021 | On schedule, 0% complete
(No updates)

Anticipated work next quarter:

Task 1 - Project Management and Work Plan - Estimated completion date: 09/23/2021
Bi-weekly meetings will be held.

Task 2 - Stakeholder Engagement - Estimated completion date: 09/23/2021
A first stakeholder group meeting will be held on 01/28/2020. A presentation slide deck will be finalized.

Task 3 - State of Practice Report - Estimated completion date: 08/30/2020
An annotated outline for the State of Practice Report will be completed. Interviews with selected experts will begin. Preparation of the State of Practice Report will be initiated.

Task 4 - Gap Analysis - Estimated completion date: 10/31/2020
(No updates)

Task 5 - Guidebook for Multi-Resolution Modeling - Estimated completion date: 08/30/2021
(No updates)

Task 6 - Case Study and Benefits Quantification - Estimated completion date: 03/31/2021
(No updates)

Task 7 (OPTION) - Training Webinar - Estimated completion date: 01/31/2021

Significant Results:

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).

Potential Implementation:

It is hoped that the project will produce a guidebook that State and local agencies can use to move multi-resolution modeling into practice.