

Quarterly Research Progress Report

For Quarter 1 FY 15/16

Caltrans Project Manager: Asfand Siddiqui

Project Designation: Task Order 002

Contract Number: 65A0529

1.0 Title of Project: Developing an agent based On-Line Adaptive Signal Control (ASC) framework using Connected Vehicle (CV) technology

2.0 Describe last quarter's task/deliverables.

Task 1. The research team has completed the development of three different MOE models, including the time-of-arrival (TOA) model, queue length model and “current delay” model. The description of these MOE models will be included as a part of the final report/working paper. Currently, these different MOE models have been coded in the application programming interface (API) and the comparison of the effectiveness of different MOE models on the proposed adaptive signal control strategies is still conducted in the microscopic traffic simulation environment.

Task 2. The research team has completed the development of the agent-based on-line adaptive signal control framework. The logics of all sub-agents including signal-head sub-agent (SH-SA), transition feasibility management sub-agent (TFM-SA), information processing sub-agent (IP-SA) and decision making sub-agent (DM-SA), have been completed and coded in Paramics by using the API. The description of all these sub-agents will be included in the final report/working paper.

Task 3. The research team has completed the coding of a hypothetical isolated signalized intersection in Paramics as the test-bed. The simulation runs have been conducted for a) fixed-time control, b) adaptive signal control (ASC) module provided by Paramics, and c) proposed agent-based on-line adaptive signal control strategy (e.g., using queue length as the MOE). Please refer to the separate simulation model file for your reference.

Task 4. The research team is still working on exploring issues for potential field deployment and will document any findings in the final report/working paper.

Task 5. The research is about to draft the working paper and some potential conference paper.

Meetings/Presentations (if any)

A quarterly meeting was held on August 28th to go over the progress and anticipation in terms of tasks, deliverables, key deadlines and other concerns.

Reports (if any)

Quarterly report as is.

3.0 Describe next quarter's task/deliverables and their due date.

Task 1.

To complete the documentation of all MOE models in the final report/working paper.

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Task 2.

To complete the documentation of proposed agent-based on-line adaptive signal control framework in the final report/working paper. If appropriate, further iteration may be conducted as more in-depth insight could be obtained during the simulation study.

Task 3.

To complete the sensitivity analyses on the proposed ASC framework by further testing the system performance under a variety of scenarios in terms of congestion levels, directional traffic volumes, demand distributions and probably vehicle mix (e.g., proportion of heavy-duty trucks). The finding will be documented in the final report/working paper.

Task 4.

To complete the documentation of any finding related to the potential field deployment.

Task 5.

To complete the working paper and draft and potential conference paper on the research project.

4.0 Describe Project Status

Are you on-time? No Are you on budget? Yes

If the answer to any of the above is NO, please explain below.

Due to the late start of this project, the research team is still catching up with the proposed schedule and aims at completing the project at the end of Year 2015.

5.0 Estimated percentage of work completed. 70% Estimated percentage of budget expended. 70%

6.0 What are your expenditure projections for the next four (4) quarters?

\$	\$	\$	\$35000
FY 14/15; Q 3 (Jan-Mar)	FY 14/15; Q 4 (Apr-Jun)	FY 15/16; Q 1 (Jul-Sep)	FY 15/16; Q2 (Oct-Dec)

Report Submitted By:

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