

Project Information Form

Project Title:	Graduate Fellowship Project: Signal Control Optimization for Bus Transit based on Simulation of Urban Mobility
University:	University of California, Davis
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Funding Source(s) and Amounts Provided (by each agency or organization):	University of California, Davis, Graduate Studies - \$61,000
Total Project Cost:	\$61,000
Agency ID or Contract Number:	DOT 69A3551747114
Start and End Dates:	October 1, 2018 – September 30, 2019
Brief Description of Research Project:	<p>Bus transit has been played an important role in the sustainable communities, leading to an environmentally friendly and economical mode of transportation. However, with uncomfortableness such as long time travel and unpunctual schedules, the public prefer driving themselves instead of taking buses. Schedule delay is of great importance for buses. With punctual buses schedule, bus transit can be a reliable way for people into consideration. The transit signal priority (TSP) can provide the signal priority for buses to get through the signalized intersections easily, reducing random delay. As for different buses within the same intersection, the cobalt controller can adjust appropriate signal timing by dividing them into different levels of priorities with effectiveness, allocating the most delayed buses with the highest level of priority and so on.</p> <p>In our project, we implement TSP strategies into Simulation of Urban Mobility (SUMO), building up an intersection or with different coming buses, using (V2I) communication models with the signal controller in complex scenarios to reduce delays for each bus with different priorities. The most important part of this project is to adjust the cobalt controller logic into VENTOS, a vehicular network open simulator to combine the signal controls with TSP strategies. Once we implement the combined two of them, the test could be conducted under one or multiple intersections with buses. In the beginning, we will conduct a simple test with one bus in an intersection to demonstrate our project works well</p>



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	<p>and then take complex scenarios into considerations. We divide this project in following parts:</p> <ol style="list-style-type: none">1. Construct a complex scenario of intersections in SUMO2. Using hardware in the loop strategy to adjust the controller logic into VENTOS3. Simulate the real-world transportation with delayed buses4. Conduct a test to demonstrate the effectiveness of the signal control optimization.
<p>Describe Implementation of Research Outcomes (or why not implemented):</p> <p>Place any photos here</p>	
<p>Impacts/Benefits of Implementation (actual, not anticipated):</p>	
<p>Web Links</p> <ul style="list-style-type: none">• Reports• Project website	<p>https://ncst.ucdavis.edu/graduate-student-research/</p>