UTC Project Information	
Project Title	A Connected Vehicle-Based Adaptive Vehicle Routing Algorithm
University	University of Washington
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Funding Source(s) and Amounts Provided (by each agency or organization)	University of Washington PacTrans $36,000 Norwegian Public Roads Administration $36,000
Total Project Cost	$72,000
Agency ID or Contract Number	69A3551747110
Start and End Dates	September 1, 2018-August 31, 2020
Brief Description of Research Project	The goal of this project is to develop an adaptive routing algorithm based on data collected from Connected Vehicle Systems (CVS). Specifically, two types of data sources, infrastructure (including intersections and road sections in the network) and connected vehicles running in the network are utilized in the study. It is anticipated that the system travel cost will be significantly reduced through enabling connected vehicles to dynamically change route choices under prevailing traffic conditions. The project objective aligns well with the PacTrans theme of providing data-driven transportation solutions and improving system-wide efficiency. The research outcomes will provide important insights as well as an applicable routing methodology to support integration and optimization of the transportation system.

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The developed navigation algorithms have been implemented in a microscopic simulation model using VISSIM application programming interface (API) functions. Multiple experiments have been conducted to test the CV navigation algorithms in a virtual traffic environment based on the urban street network in downtown Bellevue, WA.
Impacts/Benefits of Implementation (actual, or anticipated)	Experiment results reveal that CV navigation algorithms are effective in reducing the user cost compared to the static navigation used by non-CVs. The benefits of adaptive navigation algorithms will increase with the CV market penetration, and the maximum benefit is achieved when the CV penetration rate reaches around 60%. In the studied network, the marginal benefit of using the dynamic system optimum navigation over the dynamic user equilibrium navigation is negligible (e.g., around 1%) after considering the traffic flow randomness. Further experiments show that the developed CV navigation algorithms can work effectively during non-recurrent congestions through properly balancing historical and real-time traffic information.
Web Links • Reports • Project Website	