

UTC Project Information	
Project Title	Optimal Charging Infrastructure Design for Battery Electric Buses
University	University of Washington
Principal Investigator	Jeff Ban
PI Contact Information	banx@uw.edu
Funding Source(s) and Amounts Provided (by each agency or organization)	University of Washington PacTrans \$40,000 King County Metro \$40,000 (matching fund)
Total Project Cost	\$ 80,000
Agency ID or Contract Number	69A3551747110
Start and End Dates	September 16, 2020-September 15, 2022
Brief Description of Research Project	<p>The Pacific Northwest (especially Seattle and Portland) has experienced increasingly severe congestion and associated impacts such as emissions and decreased productivity (Lindblom, 2017).</p> <p>To address such issues, transit agencies across the region have established ambitious goals to transition to “zero-emissions” bus fleets. For example, in the greater Seattle area, King County Metro Transit (Metro) has committed to reaching a zero-emissions fleet by 2040, which will be achieved in part by employing approximately 1800 battery electric buses (BEBs).</p> <p><u>The objective of this project is to develop models, methods, and procedures to determine the optimal locations of charging stations for BEBs and apply them in collaboration with Metro.</u> The research contributes to improve “System-Wide Efficiency” of PacTrans themes by supporting system integration and optimization to improve the multimodal transportation system.</p>

<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>The proposed research has produced modeling approaches and procedures for helping determine the charging locations, the number of chargers, and charging power outputs for battery electric vehicles. We have produced tentative results of the charging infrastructure design for the South King County and the larger Seattle bus networks. The team also developed a visual interface to help visualize the charging location results and help analysis. The team has had multiple meetings and discussions with the zero emission team at King County Metro transit, and provided insights on possible charging infrastructure designs when Metro plans to expand their BEB fleet and bus routes. The team is continuing its conversation with Metro about Metro’s charging infrastructure design and how the research results of this project may help this design process.</p>
<p>Impacts/Benefits of Implementation (actual, or anticipated)</p>	<p>Layover charging is necessary and essential for Metro and other transit agencies in the Pacific Northwest to expand their BEB fleets and bus networks. The implementation (i.e., the application of the charging location models and processes produced by this research) of the project results will lead to optimized charging infrastructure design, helping reduce charging cost and minimize service disruptions and delays, and thus promoting smooth and rapid BEB deployment in the region.</p> <p>Ultimately, the switch to BEB fleets by transit agencies can help achieve the zero emission mission of the transit agencies, contributing to reduced emissions and energy use in transportation, and combat the climate change that is critical to the US and all other countries in the world.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project Website 	