



UNIVERSITY TRANSPORTATION CENTER RESEARCH BRIEF

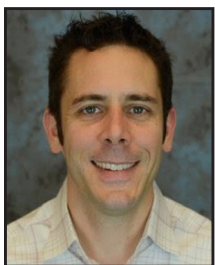
PROJECT TITLE: How Does Charging Network Design Affect Electric Vehicle Adoption?

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INSTITUTION: UNIVERSITY OF WASHINGTON

ESTIMATED COMPLETION DATE: AUGUST 2019

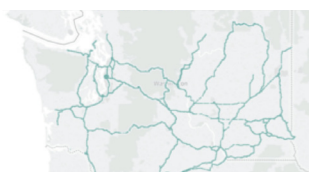
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Background

Washington and Oregon are leaders in the early adoption of electric vehicles (EVs), and both states have ambitious goals for continued growth of EVs. Washington intends to have 50,000 plug-in vehicles on the roads by 2020, while Oregon aims “to have tens of thousands of ZEVs [zero-emission vehicles] on the road by 2025,” and to have all new passenger vehicles sold be ZEVs by 2050.

Over the next few years, significant new public and private investments in charging infrastructure are expected, particularly in Washington and Oregon. The two states have a goal of building out charging infrastructure and thus “allowing more people to choose to drive a ZEV.” At the same time, they talk about the need to “Fill gaps in connectivity among urban centers and deepen deployment in high-population areas” and to “Leverage existing regional networks of early ZEV adopters.” There is a tension between these competing goals of deepening coverage of the existing network on the one hand, versus broadening the coverage of the network on the other hand. This raises the question of how to direct investments in order to get the greatest public benefit from new charging infrastructure. This project seeks to answer that question by identifying how EV adoption is affected by characteristics of the charging system, such as the number, density, type, and reliability of charging stations in the region.



Research Project

The goal of this project is to enable investments in electric vehicle (EV) charging infrastructure that most effectively increase consumer demand for EVs. We will use a data-driven approach to understand how charging infrastructure system attributes (station locations, density, type, etc.) affect demand for EVs across regions with diverse mobility needs. This knowledge will help state and local officials to ensure that the benefits of EVs, including their lower per-mile costs and lighter environmental impacts, are available to all residents in the Northwest.

We plan to use region-level data from across the US to identify how changes in different types of public charging stations (Level 2, DC fast charging) lead to changes in the sales of different types of electric vehicles – battery electric and plug-in hybrid vehicles – in future periods. Vehicle sales data at the metropolitan statistical area (MSA) level will be purchased from IHS Inc., and the Department of Energy’s Alternative Fuels Data Center is the source of charging infrastructure data.

The results of this work will be incorporated into a WSDOT-supported effort to develop an agent-based simulation of statewide electric vehicle travel and charging demand for Washington State.