Oregon Department of Transportation

Research Stage 1 Problem Statement

Number 26-68 – "Analyzing the Oregon Travel Survey Data With Statistics Analysis and Simulating Alternative Scenarios With VisionEval"

1. Concisely describe the **transportation issue** (including problems, improvements, or untested solutions) that Oregon needs to research.

Electric vehicles (EVs) play a crucial role in addressing climate challenges, yet their growing adoption presents significant policy complexities, particularly regarding transportation funding traditionally derived from fuel taxes. Developing balanced state policies that maximize EV benefits while ensuring equitable fee structure during this transition requires a comprehensive understanding of the socio-demographic profile of EV owners and their behavior [1,2]. There is an opportunity to leverage the recently completed Oregon Travel Survey to analyze EV ownership profiles and travel behavior, providing essential insights to guide evidence-based policy decisions and infrastructure planning.

Despite extensive research on EV adoption and travel behavior in other states [2,3], Oregon lacks current, state-specific data, as the last comprehensive statewide travel survey was conducted in 2011. While the most recent 2022 National Household Travel Survey included Oregon participants, the sample size was insufficient to draw robust conclusions about statewide patterns. This data gap is particularly critical given the rapid acceleration of EV adoption in the last few years. Without up-to-date information, ODOT faces challenges in monitoring the progress of existing policies and crafting new policies that both maximize the benefits of EV adoption and ensure sustainable funding mechanisms for transportation infrastructure maintenance and operation.

This research will benefit ODOT in a few fronts:

1. Inform the development of evidence-based EV policies, such as incentives for purchasing EVs and the establishment of equitable fee systems;
2. Enable planning and optimized siting of EV charging infrastructure;
3. Providing metrics for assessing and monitoring policies in VMT and greenhouse gas emission reduction
4. Enhance ODOT's modeling capabilities, particularly in refining activity-based models to better reflect adoption and travel patterns of EVs.

2. What **final product or information** needs to be produced to enable this research to be implemented?

This research will utilize the 2024 Oregon Travel Survey data, which will become available in Summer 2025, to understand these questions:

- Who owns EVs and what types of EVs in Oregon;
- How is the socio-demographic profile of EV owners compared to non-electric vehicle owners;
- How do they use EVs: trip purpose, destinations, driving distance, time-of-day;
- How is their usage compared to non-electric vehicle owners;
- How do they charge their EVs: location and time-of-day

- What is the benefit of EV adoption in terms of VMT and GHG reduction
- Given the EV usage and benefit, what is a fair policy

A research project will aim to answer these questions through analyzing the Oregon Travel Survey data with statistics analysis and simulating alternative scenarios with VisionEval – a strategic modeling system. The products from this project will include a project report, analytic and modeling results, and software code that ODOT units such as TPAU and the Climate Office can use to improve their understanding of EV adoption and usage in Oregon and enhance the monitoring and analytic capacity.

3. (Optional) Are there any individuals in Oregon who will be instrumental to the success of implementing any solution that is identified by this research? If so, please list them below.

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4. Decision making lenses

Please complete the following three sections. Your answers to these questions will be applied on a programmatic basis to support agency decisions. Answering yes to the questions below is not required. Resolving a narrowly focused technical research problem may meet agency needs without answering yes to any of the following questions. The ODOT Research Section will seek a balanced portfolio some projects will answer yes to one of the three categories below (e.g. climate, equity, and/ or safety) and other projects in a different category.

We are looking for an overall program balance and no one project is expected to balance all categories. Generally, a research problem statement is expected to be able to answer yes with clear and verifiable information in only one of the three categories below, some projects may be able to answer yes in two or even three categories. Some projects (i.e. needs focused on specific elements of infrastructure design), may have no yes answers but may still be high value research need.

Climate

Oregon recognizes the climate crisis and makes systemic changes to reduce emissions caused by travel. Every mile driven in Oregon is powered by a clean source of fuel. We seek research that supports construction and maintenance operations are carbon neutral and investments in mobility that support travel by low and no emission modes. While every research project may not result in a reduction in emissions, transportation investments overall support emission reductions to achieve state goals. Oregon envisions a transportation system that is resilient in the face of seismic and climate events and impacts to the degradation of the natural environment are reduced. Our vision includes a transportation infrastructure is built in a way that avoids impacts on key habitat and results in better environmental conditions for wildlife and native vegetation. For definitions and details please review the equity vision, goals, and objectives of the ODOT Strategic Action Plan and Oregon Transportation Plan.

4f. Will addressing the **transportation issue** identified as a need in Question 1 develop, or validate methods for the estimation, measurement, or monitoring of transportation generated greenhouse gasses (GHG)?

☒Yes ☐No ☐Unsure

4g. If climate or GHG is not the focus of this **transportation issue** identified in this problem statement, will the research apply a GHG analysis to transportation infrastructure, planning, operations, maintenance, or materials?

☒Yes ☐No ☐Unsure

4h. Will the addressing the **transportation issue** include development or testing of construction practices, methods, or materials to establish potential reductions in greenhouse gas emissions?

☐Yes ☐No ☒Unsure

4i. Will the solving the **transportation issue** in question 1 study or support the reduction of vehicle miles traveled and single occupancy vehicle travel or support transition to electric vehicles (or other types of zero emission vehicles) or low-carbon alternative fuels?

☒Yes ☐No ☐Unsure

4j. Will the solving the **transportation issue** in question 1 lead to work that will support, measure, monitor, transportation system resilience in response to expected climate events, effects, or natural disasters in general?

☐Yes ☒No ☐Unsure

4k. Will the solving the **transportation issue** in question 1 lead to work that may result in better environmental conditions for wildlife and native vegetation ?

☐Yes ☒No ☐Unsure

4l. If you answered yes to any of the climate questions above or can provide alternative details related to climate, please provide additional information:

This research project will directly contribute to improve the method for the estimation, measurement, or monitoring of transportation generated greenhouse gasses by analyzing the adoption and usage of EVs in Oregon using the latest Oregon Travel Survey.

Equity

Equity can have many dimensions and impacts relating to communities, and transportation. It is important that problem statement proposals clearly explain in what capacities are equity dimensions or impacts being examined within problem statements. It is a goal of the OTP to “Improve access to safe and affordable transportation for all, recognizing the unmet mobility needs of people who have been systemically excluded and underserved. Create an equitable and transparent engagement and communications decision-making structure that builds public trust”. Proposed research may have the intent of studying elements of this goal or apply analysis to specific transportation topics to ensure the resulting research recommendations is consistent with our equity goals. For definitions and details please review the equity vision, goals, and objectives of the ODOT Strategic Action Plan and Oregon Transportation Plan.

4a Is the **transportation issue** identified as a need in Question 1 specifically focused on transportation equity?

☐Yes ☒No ☐Unsure

4b If the **transportation issue** is not focused on transportation equity, will the primary topic be assessed for equity benefits or impacts within the research project?

☒Yes ☐No ☐Unsure

4c Is the implementation of potential findings from this research likely to directly involve participation from an identified group that would benefit from an equitable process or outcome?

☐Yes ☒No ☐Unsure

4d Is the intended final product or information expected to support ODOT's equity efforts (Including but not limited to supporting one of the equity related objectives of the ODOT's Strategic Action Plan or Oregon Transportation Plan) ?

☐Yes ☒No ☒Unsure

4e If you answered yes to any of the equity questions above or can provide alternative details related to equity, please provide additional information:

This research will investigate equitable fee structure among EV and non-EV owners in funding transportation infrastructure maintenance and operation. We will examine the distributional effects under current fuel tax and hypothetical VMT fee scenario across multiple economic and demographic dimensions.

Safety

Research outcomes may include interventions and countermeasures to prevent or reduce the frequency of crashes or other causes of transportation-related injury or death; or may include measures to reduce severity of injury (including prevention of death) after a crash or other injurious event. For definitions and details please review the equity vision, goals, and objectives of the ODOT Strategic Action Plan, Oregon Transportation Safety Action Plan and Oregon Transportation Plan.

4m. Will solving the **transportation issue** in question 1 support improving **safety culture** for either transportation workers or the traveling public?

☐Yes ☒No ☐Unsure

4n. Will the solving the **transportation issue** support improving safety through **healthy and livable communities**?

☐Yes ☒No ☐Unsure

4o. Will solving the **transportation issue** support improving safety through using **best available technologies**?

☐Yes ☒No ☐Unsure

4p. Will solving the **transportation issue** support improving safety through **communication and collaboration**?

☐Yes ☒No ☐Unsure

4q. Will the solving the **transportation issue** support improving safety through **investing strategically**?

☐Yes ☒No ☐Unsure

4r. If you answered yes to any of the safety questions above or can provide alternative details related to safety, please provide additional information:

5. Other comments:

Citations

[1] Ju, H., Rahman, M., Khan, M., Burris, M., 2024. Distributional Impact of a Vehicle Miles Traveled Fee. Transportation Research Record 2678, 405–412. https://doi.org/10.1177/03611981231206157

[2] Jia, W., Chen, T.D., 2022. Beyond Adoption: Examining Electric Vehicle Miles Traveled in Households with Zero-Emission Vehicles. Transportation Research Record 2676, 642–654. https://doi.org/10.1177/03611981221082536

[3] Ledna, C., Muratori, M., Brooker, A., Wood, E., Greene, D., 2022. How to support EV adoption: Tradeoffs between charging infrastructure investments and vehicle subsidies in California. Energy Policy 165, 112931. https://doi.org/10.1016/j.enpol.2022.112931

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