

SPR RESEARCH PROGRAM

SECOND-STAGE PROPOSAL SUMMARY

PROBLEM NUMBER AND TITLE

24-03 Social Justice in the Transition to Electrified Transportation in Oregon

PROBLEM SUMMARY

Climate change will have more far-reaching consequences for marginalized communities in Oregon. Thus, it is imperative that climate mitigation strategies— including decarbonization of transportation – do not also amplify existing social disparities for our residents. Oregon DOT is already working to decarbonize the state’s transportation system through electrified transportation infrastructure, and while the Strategic Action Plan highlights some equity issues pertaining to charging infrastructure gaps, there is a need for more extensive research on the broader equity dimensions of expanding electrified transportation in Oregon.

ODOT OBJECTIVES

Primary objective is to raise awareness of the potential social disparities of adopting electric vehicle technologies in mass and inform Oregon decision makers of opportunities and unintended consequences related to EV adoption. In addition, another objective is to provide in-depth (qualitative) as well as broad (survey/quantitative) understanding of Oregonian’s knowledge and perceptions of EVs/EBs and barriers to adoption.

BENEFITS

An ODOT-funded study examining diversity, equity, and inclusion concerns related to electrified transportation would be in line with the agency’s mission of helping all Oregon communities thrive and ensuring that in the quest to address climate change, equity issues are at minimum identified and at best addressed. This study would support ODOT’s strategic priorities of equity and modernizing the transportation system, as well as support the agency’s current efforts of examining equity in charging infrastructure around the state.

SCHEDULE, BUDGET, AND AGENCY SUPPORT

Estimated Project Length: 27 months.

Estimated Project Budget: \$283,192

ODOT Support: Erika McCalpine, Assistant Director for Social Equity, erika.mccalpine@odot.oregon.gov

FOR MORE INFORMATION

For additional detail, please see the complete STAGE 2 RESEARCH PROBLEM STATEMENT online at: <https://www.oregon.gov/odot/Programs/ResearchDocuments/24-03.pdf>

SPR RESEARCH PROGRAM

SECOND-STAGE PROBLEM STATEMENT

FY 2024

PROBLEM NUMBER AND TITLE

24-03 Social Justice in the Transition to Electrified Transportation in Oregon

RESEARCH PROBLEM STATEMENT

Climate change will have more far-reaching consequences for marginalized communities in Oregon. Thus, it is imperative that climate mitigation strategies— including decarbonization of transportation – do not also amplify existing social disparities for our residents. Oregon DOT is already working to decarbonize the state’s transportation system through electrified transportation infrastructure, and while the Strategic Action Plan highlights some equity issues pertaining to charging infrastructure gaps, there is a need for more extensive research on the broader equity dimensions of expanding electrified transportation in Oregon.

The existing literature points to ways that the shift to electrified transportation could further divide affluent and low-income communities, including disparities in EV rebates and other incentives [1], problems of environmental injustice such as disproportionate exposure to air pollution from motor vehicles [2], and the relative advantages of electric vehicle and bike use for financially secure versus struggling families in terms of household transportation costs [3]. Furthermore, while electric vehicles (EVs) and electric bikes (EBs) are significantly cheaper to operate than internal combustion vehicles (especially with inflating gasoline prices) [4], purchasing them is still beyond the reach of disadvantaged communities.

Finally, different communities in Oregon have different transportation needs and limitations, so there is a need for a localized approach to social justice research related to electrified transportation developments. Future policy and administrative measures to address these equity issues should take into account contextual differences – strategies used in urban Oregon may not be appropriate for rural Oregon, for example.

To address the above, we are proposing a social justice research project that will provide ODOT with a sophisticated understanding of these various equity issues involved in transition to electrified transportation, including how they manifest in different geographic and sociodemographic contexts. The developing literature in energy justice as well as the ‘just transition’ concept will provide a useful framework for this study. Implementing a ‘just transition’ means that the process of decarbonizing the economy is done in a way that is equitable and inclusive, leaving no one behind. In the subfield of energy justice, the concept of ‘transportation energy burden’ refers to the portion of income spent on household transportation while ‘transportation energy poverty’ applies to households that are unable to attain a necessary level of transport services [5]. This project will directly address the barriers standing in the way of a just transition to decarbonized transportation, including the factors contributing to transportation energy poverty in light of increasing electric vehicle and bike adoption.

RESEARCH OBJECTIVES

There are four objectives to the proposed research:

1. Foster awareness of the potential social disparities of adopting electric vehicle technologies in mass and inform Oregon decision makers of opportunities and unintended consequences related to EV adoption.
2. Provide in-depth (qualitative) as well as broad (survey/quantitative) understanding of Oregonian’s knowledge and perceptions of EVs/EBs and barriers to adoption.

3. Estimate the relative ‘transportation energy burden’ of various social groups in representative regions of Oregon and identify potential hot spots of ‘transport energy poverty’.
4. Examine disparities in access to EVs and EBs, including access to charging infrastructure, awareness of and access to rebates, and access to purchasing and maintenance of EVs and EBs.

WORK TASKS, COST ESTIMATE AND DURATION

Project duration: 2.25 years, four phases:

Phase 1: Community Leaders Interview & Scan of Existing Research - 9/1/2023 – 6/15/24

With the help of a .40 FTE graduate assistant during the 2023/2024 school year and allocating .1 FTE of Hazboun’s OSU faculty appointment, we will first complete a thorough literature review of emerging research on equity issues related to electrified transportation (including e-bikes), with particular attention to literatures on environmental justice and the “just transition”. Then we will conduct 40 telephone or online interviews with community leaders in 4 representative regions of Oregon, asking about barriers to expanding access to electric vehicles and bikes in each region and soliciting ideas about how to address these barriers. Stakeholders will be both public officials and known representatives of and advocates for likely-marginalized communities (e.g., racial/ethnic minority groups, low-income residents). Counties or community clusters/counties will be selected based on geography, economy, and access to marginalized communities. For example, we wish to examine: (a) urban Oregon, (b) suburban mid-size communities, (c) rural destination communities with tourism economies (likely coastal), and (d) rural frontier communities (likely Eastern Oregon). Site selections will consider proximity to tribal communities [e.g., Pendleton or Tillamook/Lincoln counties] and racial and ethnic minority communities [e.g., particular neighborhoods in Portland and/or Woodburn/Keizer]. Interviews will focus on questions about local context and known or hypothesized concerns of local residents about electrified transportation. These interviews will also provide opportunities to solicit assistance in promoting Phases 2 and 3 in these areas. *Output of Phase 1: A report (a) summarizing existing research as described above, and (b) analyzing the results of community leader interviews. This will include a 2-page policy brief for ODOT administrators.*

Phase 2: Survey of Residents in Representative Study Areas - 6/15/24 – 12/15/24

With assistance of two full time graduate students (1.0 FTE each) earning summer wages, and with 4 weeks of Hazboun’s summer employment, we will complete mail surveys and an online survey in each of the 4 selected areas where community leader interviews have taken place. OSU’s Policy Analysis Laboratory, part of our School of Public Policy, has experience conducting surveys like this achieving acceptable response rates and will provide training and oversight of the student team conducting the survey. The questionnaire design will be informed by the literature review and the results of the interviews. Following standard survey methods, requesting participation of a representative random sample from each area, and with the assistance of recruited local organizations to promote participation in the mail survey, we will gather samples from each area and analyze the data. Simultaneously, all residents of the selected communities will be given the opportunity to participate online in the survey, allowing us to compare results between the mail and online survey. (Recent work we have done in Tillamook County used this method to good effect.) Results of this survey will identify the breadth, extent, and distribution of concerns about electrification of transportation among community members. *Output of Phase 2: A report which analyzes the data collected from the surveys, submitted to ODOT by 12/15/24.*

Phase 3: Results Validation and Clarification through Qualitative Interviewing - 12/15/24 – 9/15/25

With the help of a .40 FTE graduate assistant during the 2024/2025 school year, and allocating .1 FTE of Hazboun’s OSU faculty appointment, we will conduct qualitative interviews (one-on-one and focus groups) with residents from various groups identified through the previous two phases. While some of these interviews may be done remotely (telephone or video conference), most will be on-site, necessitating more travel on the part of students and faculty. Participants will be recruited through (a) expressions of interest

from within the mail and online survey and (b) assistance from local informal leaders of relevant groups (e.g., mutual aid societies, churches, service organizations, etc.) These interviews will focus on identifying more fully the potential complexities and contingencies of people’s views on electrified vehicles (cars, bikes, or other vehicles) and on perceptions and experiences of equity issues potentially related to electrification of transportation. Interviewees will be compensated for their time participating in the interviews. This phase may also include attendance at existing meetings of groups or other opportunities to solicit qualitative data input from residents representing groups who may be especially impacted (again, low-income residents, members of racial/ethnic minority communities, tribal groups, etc.). *Output of Phase 3: A report which analyzes the data collected from the interviews, submitted to ODOT by 9/15/25.*

Phase 4: Synthesis, Final Report and Policy Brief - 9/15/25 – 12/30/25

Hazboun will complete final writing of the synthesis of results, assemble final report which includes the previous reports and recommendations. *Output of Phase 4: Full-length final report, accompanied by a policy brief which details findings and recommendations for ODOT administrators.*

Estimated Project Length: 27 months

Estimated Project Budget: \$283,152

IMPLEMENTATION

Overall, the objective of this research project is to identify social disparities arising from mass adoption of electric vehicles (including e-bicycles). The implementation path for the findings in this research is through the policy updates recommendations to ODOT Senior Executives and Administrators.

POTENTIAL BENEFITS

An ODOT-funded study examining diversity, equity, and inclusion concerns related to electrified transportation would be in line with the agency’s mission of helping *all* Oregon communities thrive and ensuring that in the quest to address climate change, equity issues are at minimum identified and at best addressed. This study would support ODOT’s strategic priorities of equity and modernizing the transportation system, as well as support the agency’s current efforts of examining equity in charging infrastructure around the state.

PEOPLE

ODOT champion(s): Erika McCalpine, Assistant Director for Social Equity,
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Problem Statement Contributors:

Dr. Shawn Hazboun, Assistant Professor of Sociology and Public Policy, Oregon State University

Dr. Mark Edwards, Professor of Sociology and Director of Oregon State University Policy Analysis Laboratory (OPAL)

REFERENCES

- [1] S. Guo and E. Kontou, “Disparities and equity issues in electric vehicles rebate allocation,” *Energy Policy*, vol. 154, p. 112291, Jul. 2021, doi: 10.1016/j.enpol.2021.112291.
- [2] S. Zhu, M. Mac Kinnon, A. Carlos-Carlos, S. J. Davis, and S. Samuelsen, “Decarbonization will lead to more equitable air quality in California,” *Nat Commun*, vol. 13, no. 1, Art. no. 1, Sep. 2022, doi: 10.1038/s41467-022-33295-9.
- [3] J. Vega-Perkins, J. P. Newell, and G. Keoleian, “Mapping electric vehicle impacts: greenhouse gas emissions, fuel costs, and energy justice in the United States,” *Environ. Res. Lett.*, vol. 18, no. 1, p. 014027, Jan. 2023, doi: 10.1088/1748-9326/aca4e6.
- [4] A. Burnham *et al.*, “Comprehensive Total Cost of Ownership Quantification for Vehicles with Different Size Classes and Powertrains,” Argonne National Lab. (ANL), Argonne, IL (United States), ANL/ESD-21/4, Apr. 2021. doi: 10.2172/1780970.
- [5] N. Simcock, K. E. H. Jenkins, M. Lacey-Barnacle, M. Martiskainen, G. Mattioli, and D. Hopkins, “Identifying double energy vulnerability: A systematic and narrative review of groups at-risk of energy and transport poverty in the global north,” *Energy Research & Social Science*, vol. 82, p. 102351, Dec. 2021, doi: 10.1016/j.erss.2021.102351.

STAFF REVIEW PAGE

Literature Check

TRID&RIP

A review of TRID & RIP databases found no existing research that answers the research question

Technology & Data assessment

No Identified T&D output

At the end of this project, the implementing unit(s) within ODOT will need to coordinate the adoption of new technology or data in order to realize the full potential of this research.

Cross-agency stakeholders

- List stakeholders or impacted units
 - Office of Equity

- Identify any issues of concern raised by an ODOT stakeholder. Note expected mitigation
 - None at this time