Oregon Department of Transportation

Research Stage 1 Problem Statement

Number 26-44 – "Development of Methods to Produce High-Quality 'Household-Based' VMT Dataset"

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

Vehicle Miles Traveled (VMT) is a core dataset for the agency that is used in safety, climate, equity, and other planning related work. While there are many ways to define VMT (for example, Fehr & Peers identifies nine definitions typically used in California), ODOT's official dataset for decades has been an "on-road" definition, reported to FHWA and published in the Highway Statistics Series. This VMT calculation methodology includes all vehicles on the roadways within a certain geography, is based on traffic counts, and is a useful measure for sizing roadways and performing many kinds of analysis. Recently, new state planning requirements focus on a different VMT definition, one that is calculated from travel generated by "household-based, light vehicles". This new definition focuses on the travel by residents (passenger vehicles only) of a region, regardless of where the travel occurs. This definition is used to track Oregon's metropolitan greenhouse gas (GHG) reduction targets (OAR 660-044, 660-012), as it better represents the influence of climate actions by local agencies on VMT generated by residents. The need for this household-based VMT[1] data is vital; as ODOT sets up new local and metropolitan GHG reporting requirements, is called to track VMT per capita reductions as a Key Performance Target in the 2022 Oregon Transportation Plan and is asked to report electric-vehicle VMT by the legislature (which is more tied to vehicles than roadway links).

This research would identify, document, and test a path for building a high-quality "household-based" VMT dataset to meet these new requirements.

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

This research will help ODOT monitor household VMT more effectively by exploring and testing methods for integrating various datasets available to the agency, enabling more precise measurement of household-based VMT. Multiple potential data options exist that could be leveraged for this monitoring task include:

- Odometer readings from vehicle inspections performed by Department of Environmental Quality (DEQ)
- VMT measures from vehicles involved in the OReGO program
- VMT measured for households participating in Oregon Travel Survey which included 22,000 Oregon households
- Third-party data (big data) from transportation data companies

[1] OAR 660-012-0005(64) definition "Vehicle Miles Traveled (VMT) means all jurisdiction household-based light vehicle travel regardless of where the travel occurs."

This research proposes to identify a path for building a high-quality "household-based" VMT dataset, considering current and future sources. Other states have purchased VMT from big-data aggregators such as Streetlight Data, but data methods from private third-party vendors are opaque, inconsistent, and costly. Instead, replication of (and improvement upon) these commercial data products could potentially be synthesized in-house at a lower cost and with higher confidence in their quality by a variety of existing state data sources. An effort to build an official household-based VMT dataset would need to identify and document methods and data sources that are well-defined, reviewed, and validated, along with agency roles and responsibilities for implementation.

Additional information this research project could develop include how household VMT varies by various factors such as the built environment, land use, availability of pedestrian and bicycle infrastructure, and transit service. Using some of the collected VMT data, this research could help describe how well current strategies within the ODOT Statewide Strategy (STS) are achieving their intended outcomes.

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 (climate, equity, and 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 (e.g., 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:

The proposed research would build a household-based VMT dataset needed to track VMT reduction for climate regulations (OAR 660-044, 660-012), OTP Climate Key Performance Target, ODOT Strategic Action Plan, and other climate requests. It would improve our ability to track progress on these climate efforts.

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: N/A

The proposed household VMT datasets, when combined with ODOT's social equity map, will allow analysis of the cost of driving and electric vehicle use by disadvantaged communities. As called for in the Oregon Transportation Plan, this would support the addition of an equity lens to assess the benefits and disbenefits of ODOT investments and policies (e.g., electric vehicle chargers, health, transportation costs).

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:

Tracking household-based VMT in a dataset and using the information supports ongoing planning and project development areas within urban areas within Oregon. Having a household VMT dataset helps track progress on the Climate-Friendly and Equitable Communities rules and performance measures including designated Climate Friendly Areas (envisioned as compact mixed-use neighborhoods) within metropolitan areas. These areas are intentional in the creation of healthy and livable communities, while also allowing ODOT investments that support public and active travel safety outcomes to be spent more strategically.

5. Other comments:

Creating a VMT dataset as described above provides additional source data that can support further work in several areas of interest in Oregon: statewide greenhouse gas modeling, metropolitan (or statewide) travel demand modeling calibration, new policy or legislation, regional transportation plan analyses and similarly related efforts.

Finally, the adage of "what gets measured gets done" is apt to this proposal. Tracking VMT provides multiple opportunities to better evaluate the effects of existing policies, report out to the public and legislators on progress to reduce carbon emissions, and inform future decision-making to enable Oregon to reach statewide targets.

6. Corresponding Submitter's Contact Information:

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