Oregon Department of Transportation

Research Stage 1 Problem Statement

Number 26-04 – "Development of Improved Characterizations of Loop Trips as an Input for Activity-Based Modeling"

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

Each day, potentially millions of trips are made within Oregon that provide people physical activity but also potentially expose them to risk of injury or death. These trips are not accounted for when planners are considering the needs in an area, nor from the modelers when forecasting future use of a facility. These are "loop trips", trips that start and end at the same location without stopping at an intermediate destination. Examples include walking the dog, going for a stroll at lunch, and riding a bicycle for recreation or exercise. Prior to 2024, data was not available to allow planners and modelers to understand the extent of loop trips in daily household travel.

Loop trips are likely one of the more prevalent active mode trips made by many Oregonians, providing many with a dose of daily physical activity. At the same time, depending on when and where a person makes a loop trip, their exposure to possible injury (e.g., walking along a road without a sidewalk) could increase. Until recently, data has not been available that would allow transportation professionals to understand the importance of loop trips in daily travel patterns.

ODOT along with each MPO (Metropolitan Planning Organization) in Oregon invested in a state-of-the-practice travel behavior survey, with the final cleaned data to be delivered in late 2024 (https://oregontravelstudy.com). This study included an option for households to use a smartphone app that passively monitored their travel and captured a GPS trace of each trip. The app would prompt the individual to provide details of each trip as it took place, instead of relying on recall after the fact. Households opting for the app agreed to use it for seven days, instead of submitting a single day of travel if using the web option. Encouragingly, 55 percent of the households selected the smartphone app, providing ODOT, the MPOs and future researchers a data trove of travel patterns unmatched in previous survey efforts.

The proposed research would determine the prevalence of loop trips in Oregon, investigate how infrastructure changes the likelihood of making a loop trip, and develop methods to be used to estimate future loop trip travel within the urban areas of Oregon.

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

ODOT and the Oregon MPOs are moving to an Activity-Based Modeling paradigm for future travel demand models. This type of model considers travel by the individual, not the household as with the existing Trip-Based Models. Including the loop trip data from the survey would allow for a more complete representation of an individual's travel over a day, allowing for metrics of safety exposure and physical activity to be calculated.

To reach this goal, the data from the 2024 survey needs to be evaluated to determine how significant loop trips are within Oregon. The research should also use the survey, along with other pertinent data, to estimate behavioral models that can be included in the future travel demand models that will be under development starting in 2025. In particular, the survey data needs to be analyzed to answer:

- Who makes loop trips?
- How often are loop trips made?
- Which mode is used?
- When are loop trips made?
- Where people go when making a loop trip (and how this changes based on mode).
- Why people make loop trips – what are the main reasons
- And other questions that help fully describe the trips and allow forecasters to forecast future loop trips.

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:

The proposed research is to understand why, when, where, and how people make loop trips. These trips can substitute for traveling to a gym for physical activity, which would help reduce vehicular GHG

emissions. Understanding loop trips can lead to investment in the transportation infrastructure to encourage people to take them more often. Including loop trips in future travel demand models can lead to better estimates of potential vehicular GHG reductions from loop trip supportive projects.

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:

Many people take loop trips, but without this research it is not known to what extent there is an equity issue. One option for the research to take is to compare areas with similar socio-demographic characteristics and determine whether there is any difference in loop trip-making, and why. Comparing areas with different socio-demographic characteristics would also help understand whether there is an equity issue and the extent.

Developing means to include loop trips in future travel demand models will help in identifying where infrastructure investments should be made. Related it will help identify which populations are traveling along riskier (less safe and more stressful) sections of roadway. This research helps to better understand the scale at which vulnerable users (active modes) are in conflict with motor vehicles with a clear equity

dimension; in that the findings will not just have a person count on the road, but a person count by demographic information. Allowing the state to better understand which populations are required to travel in higher risk areas.

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:

The proposed study will help planners understand where people are making loop trips, and if the characteristics of the built environment, specifically the presence of bike lanes and/or sidewalks, is encouraging loop trip making. Combining the Oregon Travel Study data with information on the built environment will allow researchers to address safety-related questions. Both what investments help to encourage safer ways to travel, while also improving the state's ability to understand where the riskiest (most dangerous) locations are.

5. Other comments:

6. Corresponding Submitter's Contact Information:

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