Oregon Department of Transportation

Research Stage 1 Problem Statement

Number 26-70 – "Development of a Truck Level of Traffic Stress"

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

To-date, ODOT has developed a Multimodal Level of Traffic Stress (LTS) methodology for autos, transit, bicycles and pedestrians (*1*). These methods allow ODOT operations and planning analysts to perform high-level assessments suitable for applications like network screening using limited data extracted from existing databases or aerial imagery. This supports design choices and programming which improves the mobility of pedestrians and bicyclists (*2*). No comparable methodology exists for assessing how transportation system design elements impact medium (delivery) and heavy (freight) trucks; there is a need for a truck-specific LTS methodology to similarly improve truck mobility and access in Oregon. About 35% of all VMT is commercial traffic, yet transportation analysis consistently focusses on passenger travel and ignores urban commercial and freight movement. This technical gap needs to be resolved; especially as urban areas develop more road reconfigurations have the potential to adversely impact trucks.

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

This research will result in a validated methodology for assessing Truck LTS using a tiered system. The Truck LTS methodology will be immediately implementable by engineers and planners to assess existing infrastructure and make choices about proposed transportation system modifications that improve truck access and mobility. The research team will ensure the methodology is implementable by engaging CDL operators, engineers, and planners in selecting key design aspects of the transportation system that should inform the tiered system. The system will be validated with a simulator study which assesses CDL operator stress using biometric feedback devices (*4*). This step is critical in the process. Many of the LTS models that have been developed and implemented have never been validated. They are based predominantly on conceptual relationships. Validation of the Truck LTS model is critical to its adoption in practice.

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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Amy Ramsdell	Commerce and Compliance Division Administrator	Amy.J.RAMSDELL@odot.state.or.us	503-378-6351
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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:

N/A

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

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 trucking industry is shifting to younger less experienced drivers as driver retirements rise. This trend is confounded by increased restrictions to hours of service and limited access to high quality parking which creates miles of travel seeking parking instead of traveling progressing toward the final destination. We have been spoiled by experienced drivers who are retiring or leaving the occupation because wages are too low to overcome the aforementioned challenges (*3*).

ODOT's mission is to "provide a **safe** and reliable multimodal transportation system that connects people and helps Oregon's communities and **economy thrive**". Improvements to the safety and efficiency of truck operations are integral to both a safe and reliable transportation system and a thriving economy. As trucks share the transportation system with other modes, promoting safety and accessibility for trucks will also benefit other modes (e.g., passenger cars, pedestrians, bicycles).

5. Other comments:

1. ODOT Analysis Procedures Manual Chapter 14: Multimodal Analysis, URL: https://www.oregon.gov/odot/Planning/Documents/APMv2_Ch14.pdf [Accessed Aug, 2021]
2. Regional Mobility Policy Update, URL: https://www.oregonmetro.gov/public-projects/regional-mobility-policy-update/background [Accessed Aug, 2021]
3. 2020 Freight and Economic Analysis Expert Task Group (FEA ETG), URL: https://www.oregon.gov/odot/Programs/ResearchDocuments/FreightandEconomicAnalysisETGPriorites2020.pdf [Accessed Aug, 2021]
4. Cobb, D., Jashami, H., & Hurwitz, D. (2021) "Bicyclists' Behavioral and Physiological Responses to Varying Roadway Conditions and Bicycle Infrastructure," *Transportation Research Part F: Traffic Behavior and Psychology*, Volume 80, Pages 172-188.

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