Research Stage 1 Problem Statement

PROPOSED TITLE: Developing High Quality Bicycle and Pedestrian Risk Factors for Updating the Active Transportation Needs Inventory (ATNI)

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

Many roadway environments continue to pose disproportionate risks to people walking and biking due to design and operational characteristics such as vehicle speeds, crossing distances, lack of sidewalks, and roadway configurations identified as risk to active transportation users (NCHRP 803). Despite decades of research, the ability for ODOT to develop data driven risk factors using Oregon data has been limited by inconsistent and incomplete data on multimodal infrastructure and operations. Up-to-date and accurate bicycle and pedestrian crash risk factors are necessary inputs for ODOT programs aiming to proactively address safety since they highlight roadway locations with geometric and operational characteristics that present more risk to active transportation users. ODOT's Active Transportation Needs Inventory (ATNI) uses bike and pedestrian risk factors from data and analysis (ODOT 2020) that is now more than five years old. The active transportation safety picture has changed in the last five years and with out-of-date data active transportation staff are using the ATNI tool less than when it was first released. The crash risk factors for the ATNI need to be updated which requires an up-to-date inventory of the roadway as well as new crash data.

The Multimodal Inventory project, managed through the Metropolitan Transportation Planning Program, now provides a comprehensive, statewide dataset for Oregon's MPO areas of roadway, bicycle and pedestrian infrastructure that captures detailed roadway and intersection characteristics—offering an unprecedented opportunity to develop more rigorous, data-driven bicycle and pedestrian risk models. Leveraging this new dataset along with crash data and measures of exposure, will enable analysis that will identify the specific roadway and operational features most strongly associated with pedestrian and bicycle crash risk. These data driven risk factors can support proactive, systemic safety improvements planning and implementation that target high risk roadways and intersections before crashes occur and guide investments toward the most effective, equitable design interventions.

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

The final product of this research will provide ODOT with a comprehensive and up-to-date list of pedestrian and bicycle crash risk factors that will be implemented into the Active Transportation Needs Inventory. Additionally, ODOT performs the Vulnerable Road User Assessment (VRU) analysis each year and calculates pedestrian and bicycle risk factors but uses incomplete infrastructure data (ODOT 2023). The results of this research can inform both the ATNI update and the VRU program. These risk factors will be based on new data and emerging methodologies that quantify more precisely than previous work, the relationship between roadway and active transportation infrastructure on bike and pedestrian crashes. ODOT's Active Transportation Needs Inventory is a multicriteria project prioritization tool used to

determine the highest value locations on the network to make improvements given safety, activity, existing planned work and transportation disadvantaged population.

The data integration and analysis framework provided by this research can be used to update risk factors in the future as infrastructure data is updated and new crash data is released. This research intends to make transportation project selection more proactive for improving bicycle and pedestrian safety by allowing ODOT staff and leadership to understand features of the network that are higher.

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.

Name	Title	Email	Phone
Ian Davidson	ODOT Bike and Pedestrian Program Manager	ian.t.davidson@odot.oregon.gov	503.986.3300
Jiguang Zhao	Statewide Traffic Safety Engineer	jiguang.zhao@odot.oregon.gov	971.458.2649

4. Other comments: Sources referenced above

NCHRP Research Report 893 (2015). *Pedestrian and Bicycle Transportation Along Existing Roads*

ODOT (2020) Oregon Bicycle and Pedestrian Safety Implementation Plan

ODOT (2023) Oregon Vulnerable Road Users Safety Assessment

5. State of Oregon Decision Making Lenses

State decision making lenses are a part of the state of Oregon's policy structure. State policy and federal policy are not always aligned. The state will prioritize research according to state policy, however ODOT may be required to skip prioritized proposals based on constraints placed on the use of federal funds. If state funds are available ODOT will attempt to fund prioritized research that is deemed ineligible for federal funding.

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 a high value research need.

Climate

Oregon recognizes the climate crisis and makes systemic changes to reduce emissions caused by travel. To that end, we seek research that reduces carbon emissions from construction activities and materials, and from maintenance equipment and operations. Oregon envisions a transportation system that is resilient, this means a system that is durable in the face of seismic events and extreme weather to avoid negative impacts, withstand them or bounce back quickly to resume system function. We seek research that improves the ability of the transportation system to adapt or cope with more frequent and extreme weather events. This may include innovations in data and data sharing, construction materials and project design, communication, emergency planning and response, and more. Similarly, we seek research that avoids negative impacts on key habitats and ecosystems that can buffer or reduce damage to infrastructure and improve 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.

5a. 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 gases (GHG)?

☐Yes ☒No ☐Unsure

5b. 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

5c. Will 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

5d. Will 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

5e. Will the solving the **transportation issue** in question 1 lead to work that will support, measure, or monitor, transportation system resilience in response to expected climate events, effects, or natural disasters in general?

☐Yes ☒No ☐Unsure

5f. Will 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

5g. If you answered yes to any of the climate questions above or can provide alternative details related to climate, please provide additional information:

ODOT's climate strategy hinges on reducing the number of vehicle miles traveled by households in Oregon and one-way ODOT's Statewide GHG emissions strategy plans to accomplish this VMT reduction is through mode shift from single occupancy vehicle travel to transit, walking and bicycling. For people to safely divert trips to these other less carbon intensive modes the infrastructure to support this travel behavior must be constructed. This research project will aid ODOT staff in building this infrastructure by identifying the highest risk locations on the existing network.

Equity

Equity can have many dimensions and impacts relating to communities and transportation. It is important that problem statement proposals clearly explain the equity dimensions or impacts being examined. Oregon commits to social equity in the OTP, specifically 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*. We seek research that studies elements of this goal or applies analysis to specific transportation topics to ensure the resulting research recommendation is consistent with agency equity goals. For definitions and details please review the equity vision, goals, and objectives of the ODOT Strategic Action Plan and Oregon Transportation Plan.

5h. Is the **transportation issue** identified as a need in Question 1 specifically focused on transportation equity?

☒Yes ☒No ☐Unsure

5i. 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

5j. 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

5k. 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

5l. If you answered yes to any of the equity questions above or can provide alternative details related to equity, please provide additional information:

Pedestrian injury outcomes are disproportionally experienced by low-income people and people of color (ODOT 2021). Addressing pedestrian safety through this research project can help ensure equitable pedestrian access across the state.

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.

5m. Will solving the **transportation issue** in question 1 support improving **safety culture** for either transportation workers or the traveling public?

☒Yes ☐No ☐Unsure

5n. Will the solving the **transportation issue** support improving safety through **healthy and livable communities**?

☒Yes ☐No ☐Unsure

5o. Will solving the **transportation issue** support improving safety through using **best available technologies**?

☒Yes ☐No ☐Unsure

5p. Will solving the **transportation issue** support improving safety through **communication and collaboration**?

☐Yes ☒No ☐Unsure

5q. Will solving the **transportation issue** support improving safety through **investing strategically**? 5r. If you answered yes to any of the safety questions above or can provide alternative details related to safety, please provide additional information:

This research project will update and augment ODOT's ability to proactively target locations on the roadway network that have higher crash risks by integrating the data and updating methods to better account for current risk across the system.

6. Corresponding Submitter's Contact Information:

Name:	Jason Anderson
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7. ODOT Sponsor Contact Information (Required if Submitter is not an ODOT employee)

Name:	Theresa Conley

Title:	Lead Climate and TPR Planner
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This form is not a grant application or contract document. Please do not include proprietary information on this form. Once this form is received ODOT may revise and publish the problem statement. If selected, ODOT will assign investigator(s) of the department's choosing to conduct research.