

Research Stage 1 Problem Statement

PROPOSED TITLE: Project Expenditure: Cost Attribution and Accounting

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

When conducting the 2024 HCAS lookback study, we discovered that the existing approaches within ODOT to identifying, tracking, attributing, and accounting for project expenditures are inadequate. The information collected at the inception of the project generally includes the technical dimensions and the high-level budget information; information such as stakeholders, the user groups that the project affects (benefits/disbenefits), and the detailed breakdown of the direct, indirect, and general overhead costs is either incomplete or not included. This has led to many issues, including the inability to assess the effectiveness and efficiency of the project execution, the inability to attribute the consumption of resources to the appropriate user group, and thus the inability to attribute the benefits/disbenefits to different user groups and the inability to allocate responsibilities for the cost (user fee).

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

The outcome from this process improvement research project will be a consistent, replicable, and reliable *procedure* to collect and process all necessary information for project expenditures that will allow ODOT to identify, track, account, and attribute project expenditures and perform assessments on projects. To achieve this outcome, we will need to conduct a current state analysis, future state identification, gap analysis, and develop and validate the procedure.

Tasks: The tasks to be completed to address the problem we identified in Part 1 are:

1. Current State: Examine and establish the current approach in project selection and execution, focusing on the cost/benefits and stakeholders' needs and how this information is currently being used within and beyond ODOT. The technical/engineering dimensions of ODOT's project procurement/selection and execution will not be the focus of this task.
2. Future and Current Needs for Assessments: Identify ODOT's and its external stakeholders' information needs related to project expenditures. This task will involve identifying all sources of data requests that ODOT has received and reporting that ODOT has to comply with; this includes reporting to other governmental agencies and data requests from private entities.
3. Identify the Gaps in Information Needs: By comparing the current state and the future needs of information related to project expenditures and the associated assessments that need to be performed, we will identify the gaps, assess the priority to address each of the gaps, and identify the stakeholders that are affected by these gaps.
4. Develop and Validate Solutions: Based on the priority and stakeholders' ranking, we will identify and categorize the type of information that needs to be collected, develop methods to collect the information, and conduct a pilot study to validate that the methods we develop can support the

information needs of ODOT to perform necessary assessments related to project expenditures tracking, attributing, and accounting.

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

4. Other comments:

Prior work:

1. The transportation problem presented in this document was uncovered during the 2024 HCAS Lookback Study and is fully documented in its corresponding final report, accessible via this [link](#).
2. In 2017, we conducted a study for ODOT Engineering and Technical Services to calculate the Return on Investments for advanced technologies that were implemented across ODOT. This project involved identifying and quantifying all the costs and benefits associated with the procurement and deployment of new technologies. Reports and publications from this project are:
 - Sillars, D., E. Ng, J. Calvo-Amodio, S. Capalbo, M. Martin, Q. Jahanger, G. Zimmerman, A. Hadziomerspahic, S. Wang, and R. Elatlassi. (2017). Advanced technology: Return on investment at the Oregon Department of Transportation. Project 30530-16-14. Corvallis, OR: Oregon State University. ([Report to ODOT](#))
 - Martin, M. A., Jahanger, Q. K., Zimmerman, G., Hadziomerspahic, A., Sillars, D. N., Ng, E. H., & Calvo-Amodio, J. (2020). Case study: Economic analysis of statewide roadway 3D mapping using mobile LiDAR. *Journal of Transportation Engineering, Part A: Systems*, 146(7), 05020004. <https://doi.org/10.1061/JTEPBS.0000377> (Non-paywall)
 - Jahanger, Q. K., Zimmerman, G., Hadziomerspahic, A., Martin, M. A., Sillars, D. N., Ng, E. H., & Calvo-Amodio, J. (2023). Economic and operational impacts of three-dimensional engineered models and automated machine guidance on statewide roadway projects. *Practice Periodical on Structural Design and Construction*, 28(3), 05023003. <https://doi.org/10.1061/PPSCFX.SCENG-1223> (Non-paywall)

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:

This proposed research addresses climate goals indirectly through an improved method of coding project expenditure that will lead to highway cost allocation that more accurately reflects the environmental impact of different vehicle classes on roadway usage.

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:

Additional information for 5i: The proposed procedure to collect and process information related to project expenditure from the cost/benefits and stakeholders aspects of the project will reduce the resources needed to assess the equity of current and future projects.

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**?

☐ Yes

☒ No

☐ Unsure

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

None of the components directly aligns with safety goals.

6. Corresponding Submitter's Contact Information:

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7. ODOT Sponsor Contact Information (Required if Submitter is not an ODOT employee)

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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.