

Research Stage 1 Problem Statement

PROPOSED TITLE: WORK ZONE CONDITIONS AND ACTIVITY CORRELATION WITH VEHICLE SPEED

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

Motorist and worker safety in construction and maintenance work zones continues to be a focus area for ODOT. Prior ODOT research has explored ways to reduce vehicle speed (e.g., SPR 751, 769, 791, and 839) and minimize speed variation between adjacent vehicles (SPR 822). However, vehicle speed in work zones remains a significant concern in Oregon and nationally, with some states reporting increases in both average vehicle speed and distracted driving compared to prior years. Work zone safety is especially a concern during the “100 deadliest days of summer” (ODOT News Release, “*Stay alert, stay safe: ODOT urges caution during the 100 deadliest days of summer,*” May 21, 2025) when roadway work is more prevalent at the same time when there is a greater percentage of less experienced (teen) drivers on the road. The effort to reduce speeds and increase driver awareness in work zones during this period could benefit from a detailed and updated understanding of the specific roadway, traffic, and work operation conditions and activities present when speed is particularly high, many of which are not identified or go unreported by roadway workers when there is time pressure to complete the work or a last-minute change.

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

The research study would collect and synthesize information about conditions and activities present in a work zone and analyze how the conditions and activities correlate to vehicle speeds in the work zone. Conditions associated with the roadway features, weather, traffic, and work zone design, along with the activities being undertaken to perform the work, would be documented along with the vehicle speeds in the work zone. Speeds relative to the traffic control measures deployed would also be recorded. The data would be recorded throughout the work shift when work operations are being undertaken. Data collection would also take place regularly over an extended period of time (e.g., every day over multiple weeks) to capture the range of conditions that can occur in a work zone. Emphasis would be placed on unique conditions and events that are often unnoticed or normalized by the field workers or which might be a change to anticipated and planned conditions, but which result in increased vehicle speed and safety risks. Prior research related to construction safety has shown that common causes of worker injuries and fatalities are poor hazard recognition and last-minute changes.

The envisioned output is a detailed and comprehensive assessment of conditions and activities present in work zones and how they commonly correlate to vehicle speed in the work zone. It is expected that the research could also complement prior ODOT research related to the effectiveness of various traffic control measures in reducing vehicle speeds in work zones. Recommendations for traffic control measures to implement when different conditions are present and work activities undertaken could also be provided based on prior research. The information would be incorporated into an online document

that could be readily accessed in the field to react to hazardous and changed conditions and activities in real time.

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
Justin King	State Work Zone Engineer	Justin.S.King@odot.state.or.us	503-986-3584

4. Other comments:

The proposed research study would differ from prior ODOT research in several ways. The proposed study would involve detailed field data collection on an on-going construction project over a long period of time (e.g., for multiple weeks during the summer months). This effort could include embedding a researcher with the work crew to observe the work, worker behaviors, equipment usage, and traffic patterns, and record data for the study. The research would include detailed documentation of the work being conducted throughout the workday, along with the roadway, weather, and traffic conditions, and traffic control present throughout the day. Vehicle speeds throughout the day would also be recorded or, if possible based on the work zone location, downloaded from RITIS. The goal would be to correlate vehicle speeds with work zone conditions and activities as precisely as possible. To contain the research scope and improve validity in the results, observations could be focused on selected conditions, features, and traffic control measures that are likely to influence speed. In addition, the researchers would record unique conditions and events that arise, especially those that may not be recognized, may be disregarded as potentially impactful to motorist and worker safety, or are normalized due to prolonged exposure to roadside hazards. Instances of a near miss, intrusion, or crash will also be documented along with the conditions present and activities taking place at the time of the incident.

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:

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:

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:

Work zone fatalities continue to be an issue of concern for the transportation industry. According to the National Work Zone Safety Information Clearinghouse (<https://workzonesafety.org/work-zone-data/worker-fatalities-and-injuries-at-road-construction-sites/>), from 2021-2023, 53.5% of the fatal highway worker injuries were due to workers on foot being struck by vehicles, some of which were due to vehicles intruding into the work area. The Clearinghouse also reports that there were 10 work zone fatalities in Oregon in 2023. Vehicle speed is commonly associated with work zone crashes. Lowering vehicle speeds and minimizing speed variation in work zones are key aims of work zone safety management. The proposed research is directly related to the safety of ODOT construction and maintenance workers as well as workers employed by roadway contractors and the motorists who travel through construction and maintenance work zones. A thorough understanding of the conditions and activities present when vehicle speeds are high, and those that commonly go unnoticed or are intentionally disregarded (i.e., normalized) can help inform safe work zone and traffic control design.

6. Corresponding Submitter's Contact Information:

Name:	John Gambatese
Title:	Professor
Affiliation:	Oregon State University
Telephone:	541-737-8913
Email:	john.gambatese@oregonstate.edu

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

Name:	AJ Jacobson
Title:	Resident Engineer – Consultant Project Manager (Region 2)
Crew Number:	
Telephone:	541-517-0472
Email:	AJ.Jacobson@odot.oregon.gov

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.