Oregon Department of Transportation

Research Stage 1 Problem Statement

Number 26-67 – "Evaluation of Traditional Versus Automated Speed Enforcement Methods for Effectiveness Across Different Types of Speed Zones and Conditions"

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

According to the National Highway Traffic Safety Administration (NHTSA), there are approximately 1.20 traffic fatalities per 100 million vehicle miles traveled (VMT), with roughly 30% being speeding-related. NHTSA also reports that speeding-related fatalities are increasing in the United States [1]. In Oregon, during the 2019-2023 period, the fatality rate on rural non-interstate roads increased during and post-COVID but is now trending towards 2019 levels. Conversely, the fatality rate on all other roads (urban) increased from 0.87 to 1.16 over the same period, marking a 33.3% rise. Between 2018 and 2022, the urban crash rate involving speeding increased by 33% for fatalities and severe injuries (incapacitating injuries) [2].

Traditional enforcement methods, such as manual police interventions, can be effective but are resource-intensive and limited in coverage. Advances in technology have made speed safety cameras (SSC)—formerly known as automated speed enforcement (ASE)—a viable alternative, offering continuous and efficient enforcement over large areas. Speed safety cameras are a proven safety countermeasure, capable of reducing crashes on urban arterials by up to 54% [3]. However, optimizing the deployment of traditional versus automated enforcement methods requires an understanding of their effectiveness across different types of speed zones and varying conditions.

This research aims to explore the strategic prioritization of enforcement efforts across different speed zones, with the goal of maximizing road safety outcomes while addressing equity considerations in the SSC deployment process. A key challenge is balancing the number of SSC locations while considering safety, population statistics, and equity measures. In Oregon, local jurisdictions can develop their own equity measures regarding SSC placement, but the Oregon Department of Transportation (ODOT) can provide evidence-based measures, guidance, reporting templates, and recommendations.

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

Appendix 2 in the current ODOT traffic manual contains updates for SSC-related legislative changes over the past eight years. However, proposed or future SSC legislative changes will require a significant update to the fixed photo radar (FPR) camera guidelines. This research will provide evidence and material to support the development of updated SSC or FPR guidelines, particularly concerning the relationships between enforcement type, speed compliance, crash rates, and equity.

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[1] NHTSA, "Automated Traffic Enforcement Surveys | NHTSA."
[2] Data provided by Christina McDaniel-Wilson, ODOT State Traffic Safety Engineer
[3] https://highways.dot.gov/safety/proven-safety-countermeasures/speed-safety-cameras

This project could lead to the establishment of protocols for SSC deployment, including a Safety Needs Assessment on state highways to determine where SSC could be most effective. It would also gather input from local jurisdictions to provide a statewide picture of SSC needs. The Federal Highway Administration's (FHWA) guide [4] emphasizes that equity must be considered in the implementation of safety programs to determine whether SSC is a suitable countermeasure or if other speed management measures should complement or replace it. Equity is not explicitly discussed in Oregon's current guidelines, though some cities within the state consider equity in their SSC deployment efforts.

Two equity-related aspects requiring spatial attention are:

1. Avoiding overburdening lower-income or disadvantaged populations.
2. Addressing the needs of vulnerable users, such as elderly pedestrians or individuals without vehicle access.

The final product will offer recommendations or an equity template for local jurisdictions to develop ASE equity performance measures and processes. This includes accounting for equity considerations and aligning the number of SSC locations with population and safety statistics. The research will build upon existing sources, such as ODOT's Social Equity Index [5] (SEI), while incorporating additional relevant data to tailor the methodology for SSC deployments.

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.

The following ODOT staff was consulted and provided comments for this research idea:

Name	Title	Email	Phone
Christina McDaniel-Wilson	State Traffic Safety Engineer	Christina.A.MCDANIEL-WILSON@odot.oregon.gov	503.986.3573
Angela Kargel	State Traffic Engineer	Angela.J.Kargel@odot.oregon.gov	503.986.3568
Anisha Datta	Equity Data Manager	Anisha.DATTA@odot.oregon.gov	971.453.2624

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.

[4] FHWA, "Speed Safety Camera Program Planning and Operations Guide."
[5] https://rpubs.com/ODOT_Research/ODOT_SEI_2023

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:

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:

With legislation potentially expanding SSC in scope and location, there is a need to ensure that a reasonable number of SSC locations are established to counter the perception of SSC as a "money grab." Fine structures can also be adapted to enhance equity and safety outcomes, such as implementing flat or progressive fines. It is also important to analyze SSC in relation to the distribution of marginalized populations and identify those who would benefit from SSC expansion in high-priority safety corridors and the spatial distribution of vulnerable users.

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:

Please see previous discussion, this is a safety proposal with an equity component.

5. Other comments:

References

FHWA. “Speed Safety Camera Program Planning and Operations Guide.” U.S. Department of Transportation, January 2023.

NHTSA. “2016 Fatal Motor Vehicle Crashes: Overview.” Research Note. Traffic Safety Facts. U.S. Department of Transportation, October 2017. https://www.nhtsa.gov/press-releases/usdot-releases-2016-fatal-traffic-crash-data.

———. “Automated Traffic Enforcement Surveys | NHTSA.” Text, 2024. https://www.nhtsa.gov/highway-safety-grants-program/automated-traffic-enforcement-surveys.

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