Oregon Department of Transportation

Stage 1 Research Problem Statement

Number*: 25-26*

Proposed Title: Return on Investment (ROI) of Work Zone Traffic Control Measures

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

ODOT continues to look for ways to improve safety in construction and maintenance work zones. New ideas, technologies, and practices are being researched and developed, some of which are implemented in ODOT temporary work zones. Their implementation is expected to lead to improved safety for workers and motorists. The addition of more traffic control involves more financial investment. An understanding of the return on investment (ROI) facilitates decision-making when considering whether to adopt new and/or additional traffic control measures.

ODOT maintains historical bid tabulations for construction projects that include detailed cost and quantity data on traffic control items implemented on the projects. The bid items and amounts could be correlated to safety-related metrics (e.g., # of crashes, # of near misses, and vehicle speed) and the cost of safety on the projects with the goal of ultimately identifying the corresponding ROI. Such an analysis would potentially highlight the value of new and additional traffic control measures from a financial perspective and support further, fiscally responsible investment in work zone safety.

2. Document how this **transportation issue** is important to Oregon and will meet the Oregon Research Advisory Committee Priorities

ODOT aims to provide a safe and reliable multimodal transportation system that connects people and helps Oregon's communities and economy thrive. Safety and financial considerations are important to ODOT. The ODOT Research Advisory Committee (RAC) also lists safety and economic and community vitality as primary topics for the research program. Understanding the return on investment of traffic control measures in work zones enables balancing safety performance and the cost of safety to support fiscally responsible decisions. The proposed research study is applied research that is expected to create practical guidance for those in ODOT who are involved in planning and designing temporary traffic control. The guidance has potential to impact ODOT traffic control designs and contractor work practices. Successful implementation of the research results is not only expected to help prevent worker and motorist injuries and fatalities in work zones, but also document the return on the investment in safety.

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

Implementation of the expected research outputs requires detailed information related to the extent to which work zone traffic control measures are implemented on projects and the costs associated with their acquisition and implementation. This information is currently available in historic bid tabulations for ODOT construction projects. Data is also needed that indicates the safety performance on the projects, and the economic costs and benefits associated with the costs and benefits. The following are potential activities for conducting the proposed research:

- Review existing literature on work zone safety performance and how to quantify safety performance directly or indirectly (i.e., proxy).
- Review historical bid tabulations to identify traffic control measures included in projects and quantify the costs associated with implementation of the traffic control.

- Create a process for calculating the ROI of traffic control designs.
- Conduct economic analyses of past projects to determine the ROI for various traffic control designs.
- Prepare a report of the historical ROI for past projects and traffic control designs.
- Prepare final guidance documents for implementation in practice.

Implementation of the results requires that traffic control engineers are aware of the ROI values associated with different traffic control designs. The information needs to be provided to those ODOT traffic control and construction/maintenance personnel who plan and design work zone traffic control, and conduct work operations on active roadways, including those on the Safety and Mobility Advisory Committee. An implementation guide that provides the information mentioned above to educate ODOT staff and improve their ability to apply the ROI analysis process would be a useful final product for practical implementation of the research results.

4. (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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5. Other comments:

Ikpe, E., Hammon, F., and Oloke, D. (2012). "Cost-Benefit Analysis for Accident Prevention in Construction Projects." Journal of Construction Engineering and Management, ASCE, 138(8), 991-998.

6. Corresponding Submitter's Contact Information:

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