Oregon Department of Transportation

*Stage 1 Research Problem Statement*

**Number***: 25-87*

**Proposed Title: Adaption of ODOT Design Practices for Climate Change**

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

There is a need to include climate change effects on ODOT's transportation systems including pavement, hydraulic, and bridge systems. Climate change effects on existing assets as well as for new designs needs to be considered to ensure long-term performance of these systems. Engineering assessments require quantitative information to establish new design parameters as well as to identify and prioritize necessary adaptations. To incorporate climate change effects requires application of global climate models (GCMs) for different scenarios of representative concentration pathways (RCPs) to future amounts of greenhouse gas emission concentrations in the atmosphere. GCMs should be selected based on their ability to properly model the salient regional climate characteristics for Oregon. Presently a large number of CGMs are available and not all are well suited to capture climate influences in Oregon. This project will draw on prior ODOT work assessing climate vulnerabilities and compare the available GCMs for predicting climate in Oregon climate regions. Key design data including rainfall, sea level rise, and temperature changes will be compared for the nine (9) NOAA climate divisions using specific watersheds and sites with long historical records to identify those GCMs that can best be used to quantify future changes that can enable incorporation of climate change effects for engineering decision-making and design.

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

The proposed research is aligned with the Oregon Research Advisory Committee priorities of Stewardship of Public Resources, Safety, and Sustainability and Climate Action. By incorporating climate change effects into design and management of critical transportation assets, the proposed research will enable ODOT to continue be good stewards of public resources, provide safe and reliable infrastructure that can perform as intended even with new environmental stressors, and provide the citizens of Oregon with sustainable infrastructure that endures.

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

The research will produce a set of recommended GCMs and associated methodologies (such as regional downscaling and refinements) that can be properly used to model the climate effects within the Oregon NOAA climate regions. The GCMs will be selected based on the ability to capture rainfall, temperature, and sea level rise changes. The research will also identify which of ODOT's asset design approaches need to be informed with climate change data and how the CGMs can be used for design and asset management.

**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.

| Name | Title | Email | Phone |
|---|---|---|---|
| Geoff Crook | ODOT Climate Office Policy Lead | Geoff.S.CROOK@odot.oregon.gov | 503.986.3425 |
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**5.** Other comments:
NA

**6.** Corresponding Submitter's Contact Information: [1 individual]

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