FY 2010 RESEARCH PROBLEM STATEMENT

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TITLE (*more info*)

Climate Change Impact Assessment for Surface Transportation in Oregon

PROBLEM (Description of need) (*more info*)

Regional climate change has and will continue to affect the physical condition and serviceability of ODOT's facilities. The nature of the climate changes at a regional scale, and their potential impacts on the transportation system and its use are very poorly understood. The widely diverse topography, climate regimes, and localized variability of impacts within the region complicate efforts to understand and plan for adapting to the potential impacts of climate change on the regional transportation system.

The rising costs of building and maintaining reliable transportation infrastructure place tremendous pressure on transportation planners, engineers, researchers, and policy makers to deliver resilient transportation systems and maximize return on investment. As such, there is an urgent need to synthesize information to characterize the regional impacts of climate change to support development of economical and resilient adaptation strategies for Oregon and the other states that make up the region.

PROPOSED RESEARCH, DEVELOPMENT OR TECHNOLOGY TRANSFER ACTIVITY (*more info*)

The objective of this study is to conduct a preliminary assessment of the risks and vulnerabilties climate change poses to the surface transportation infrastructure system in the region and specifically in Oregon. At a minimum, the research will:

1. synthesize data needed to characterize the region - such as its physiography and hydrology, land use, past and projected climate, current population and trends, and multimodal surface transportation infrastructure,
2. identify critical infrastructure vulnerable to climate change impacts, and
3. provide recommendations for more detailed analysis as appropriate to support managing risks and opportunities to adapt multimodal surface transportation infrastructure to climate change impacts.

The research must address the potential impacts of climate change and their associated adaptation opportunities throughout the region with specifics for Oregon, giving equal deference to inland and coastal areas as well as all modes of the regional surface transportation system. The research team should focus on identifying opportunities to:

1. incorporate climate change in long-range multimodal transportation planning,
2. collect data needed to monitor conditions and assess climate-related impacts, and
3. develop more robust probabilistic analysis tools to support transportation infrastructure, planning, design, operation, maintenance, and relocation.

BENEFITS (*more info*)

Climate change is posing unique and unprecedented challenges for Oregon and other state departments of transportation in the region. Changing weather patterns and their associated physical, financial, and social impacts are affecting or will affect the way transportation professionals finance, plan, design, construct, operate, and maintain multimodal transportation infrastructure. Oregon Department of Transportation (ODOT) and other state transportation agencies have optimimzed their procedures and practices for environmental conditions and variability that may not be valid in the future. For example, more frequent, high intensity precipitation events and associated floods may cause expensive and unpredictable catastrophic failures of roads designed with outdated hydrologic data. ODOT along with the other DOTs in the region may experience hundreds of millions of dollars in infrastructure damage that potentially may be avoided with more robust data collection, planning, and design tools/methods for managing risks. Likewise, climate-related socioeconomic changes may also be occurring, but transportation planners are currently ill-equipped to analyze them and may be delivering transportation projects that do not address future needs.

Transportation professionals and policy makers will use the results of this assessment to guide public debate, planning, investment, operational decisions, and development of policy for surface transporation systems in the region. The research team will prepare the present and future transporation workforce by developing educational and outreach materials and curricula to educate ODOT staff and leaders, private sector transportation professionals, and university students.

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