

UTC Project Information	
Project Title	Analytical Tools for Resilience of Lifeline Highway Bridges to Tsunami Events
University	Oregon State University
Principal Investigator	Michael Scott
PI Contact Information	michael.scott@oregonstate.edu
Funding Source(s) and Amounts Provided (by each agency or organization)	University of Washington PacTrans \$35,000 Oregon Department of Transportation \$35,000
Total Project Cost	\$70,000
Agency ID or Contract Number	DTRT13-G-UTC40
Start and End Dates	December 16, 2016 – January 31, 2018
Brief Description of Research Project	<p>The work aims to develop simplified engineering tools for tsunami load effects on bridges. This will consist of analyzing data from wave flume experiments on bridges and developing simple analytical models of bridges subjected to tsunami loads. Single degree-of-freedom (SDF) models have guided the design of structures to resist seismic loads from earthquake ground motion since the 1960s.</p> <p>This project will extend the response spectra concept to SDF models of bridge superstructures subjected to a time history of hydrodynamic forces. The natural period dependence will be based on bridge weight and the stiffness of connections between the superstructure and substructure. Linear-elastic systems will be investigated first followed by systems with nonlinearity owing to bearing failure and/or the presence of shear keys.</p>

<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>The research outcomes have aided in the development of design guidelines for bridges subjected to tsunami loading, an FHWA-sponsored pooled fund study involving Pacific state DOTs – Oregon, Washington, California, Alaska, and Hawaii.</p>
<p>Impacts/Benefits of Implementation (actual, or anticipated)</p>	<p>The influence of mass and stiffness on the response of bridges subjected to hydrodynamic loading will aid in the assessment and design of bridges to resist tsunami loading.</p>
<p>Web Links</p> <ul style="list-style-type: none">• Reports• Project Website	<p>Final report submitted to Pactrans</p>