



## Research Project Summary

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# Hazard-Based Risk and Cost-Benefit Assessment of Temporary Bridges in California

*PEER-Bridge 2024*

### Principal Investigator

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### Research Team

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### Start-End Dates:

06/01/2022 – 05/31/2024

### Abstract

There is currently no consensus on the hazard level that should be utilized in the seismic design of temporary bridges. Present practice for ordinary bridges is based on a hazard level of 5% in 50 years, corresponding to a return period of ~975 years. Extending this approach to the design of temporary bridges, whose service life is expected to be ~5 years, would be overly conservative and not economical. In 2011, the California Department of Transportation issued a memo to designers advocating the use of design spectra corresponding to a return period of 100 years (10% probability of exceedance in 10 years). Following the release of this memo, simplified methods have been proposed to reduce the spectral parameters for design. However, broad consensus on the most appropriate hazard level is yet to be achieved. In this context, this study carries out a set of analyses across a range of hazard levels and locations of different seismicity in California to develop recommendations to achieve a performance-based and hazard-consistent design.

### Deliverables

This project will produce the following deliverables:

- Library of simulation models representing typical Caltrans temporary bridges.
- Technical papers for submission to peer-reviewed journals/conferences.
- PEER/Caltrans technical report summarizing the research tasks and findings.

### Research Impact

This research will provide a rational basis for performance-based and hazard-consistent design of temporary bridges. Results of the proposed research will allow achieving consistency in temporary bridge design practice and offer decision-makers with feasible options that will mitigate the concerns of under/over- designing temporary structures and allow for risk-informed solutions.



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## Project Image

