

UTC Project Information	
Project Title	MPC-561 – Reliability-Based Assessment of Landslide Risk Along Roadways
University	Utah State University
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Funding Source(s) and Amounts Provided (by each agency or organization)	<p>USDOT, Research and Innovative Technology Administration \$50,000</p> <p>Utah State University - Utah Transportation Center \$50,000</p>
Total Project Cost	\$100,000
Agency ID or Contract Number	69A3551747108
Start and End Dates	December 11, 2017 to July 31, 2022
Brief Description of Research Project	<p>This research will adapt a procedure that the PIs have previously developed for assessment of underseepage and internal erosion risk for levees (Boulware and Rice 2017, Polanco and Rice 2014, 2012) to the problem of landslide disruption of roadways. Models will be developed for each geologic feature type that can assess the stability of the feature for ranges of geometric parameters (depth of deposit, slope inclination, groundwater level, etc.) and material properties (unit weight, strength, etc.). Depending on the complexity of the analysis, the landslide model may be represented by a closed-form equation or, in the case of a large number of input parameters, a response surface (a multi-dimensional function representing the relationship between input parameters and the failure potential). A Monte Carlo analyses will then be performed for each feature along the stretch of roadway using probability density functions (pdfs) representing the likelihood of a given parameter having a certain value over the range of possible values. The failure probability can be annualized by considering triggering events (such as rainfall events having calculated return frequencies) and assessing the effects of multiple levels of these</p>

	<p>events. The resulting fragility curve ties the probability of failure to the likelihood of the triggering event. This method will provide a tool for agencies to assess their annual risk due to landslide hazards and will give these agencies a means for optimizing their mitigation efforts.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project Website 	