

| <b>UTC Project Information</b>   |  |
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| Project Title  | MPC-593 – Probabilistic Modeling of Landslide Hazards to Improve the Resilience of Transportation Infrastructure   |
| University   | Colorado State University  |
| Principal Investigator   | Peter A. Nelson  |
| PI Contact Information   | Associate Professor<br>Colorado State University<br>Phone: (970) 491-5247<br>Email: peter.nelson@colostate.edu<br>ORCID: 0000-0002-8679-3982   |
| Funding Source(s) and Amounts Provided (by each agency or organization)                          | USDOT, Research and Innovative Technology Administration<br>\$56,000<br><br>Faculty time and effort<br>\$56,000  |
| Total Project Cost   | \$112,000  |
| Agency ID or Contract Number   | 69A3551747108  |
| Start and End Dates  | February 26, 2019 to July 31, 2022   |
| Brief Description of Research Project  | In steep or mountainous terrain, natural disasters such as wildfire, or severe weather and flooding, are often followed by landslides and debris flows. Roads and highways, which traverse a wide range of potential landslide hazards, are particularly susceptible to damage from mass wasting events. In this project, we will use a probabilistic process-based model for landslide initiation to quantify the probability of landslide hazard across the landscape, and map these hazards onto the road and highway network to determine probabilities of landslide hazard continuously throughout the transportation network. Uncertainty in hydroclimatological forcing, soils, and vegetation parameters will be accounted for through Monte Carlo simulation. Initial model development and application will focus on Colorado; in particular, the September 2013 Front Range floods which triggered over 1,100 debris flows. |
| Describe Implementation of Research Outcomes (or why not implemented)                            |  |
| Place Any Photos Here  |  |
| Impacts/Benefits of Implementation (actual, not anticipated)                                     |  |
| Web Links <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul> |  |