

**Project Information Form**

Project Title:	Introducing the Resilience into the State Transportation Network
University:	California State University, Long Beach
Principal Investigator:	Xiaolong Wu
PI Contact Information:	Email: xiaolong.wu@csulb.edu
Funding Source(s) and Amounts Provided (by each agency or organization):	California Department of Transportation (Caltrans) - \$10,538.03
Total Project Cost:	\$10,538.03
Agency ID or Contract Number:	CSULB-CT-TO-026 Caltrans 65A0527 Task Order 026
Start and End Dates:	March 30, 2016 - September 15, 2017
Brief Description of Research Project:	<p>The transportation network is a key component to providing a better transport service for both people and goods. Reliability, vulnerability and robustness are the major characteristics that can be used to analyze a transport network. Exploring the reliability of a road network has attracted significant attention due to the increase in natural disasters. Such natural disasters not only damage roadway connections, but also paralyze the transportation system for a remarkable period of time. To overcome this disadvantage, the reliability of a transport network can be maintained by closely monitoring and ensuring the safety of critical paths in the network so that the users can always have a reliable route for their commute.</p> <p>Critical paths of a transportation network are the most dependable and used paths of that network. Failure of certain paths or sub-networks, which is caused by car accidents, road maintenance, or serious road congestion, has a severe impact on the reliability of the transportation network. Several methods exist to analyze the reliability of the transport network such as the concept of connection reliability, a network reliability technique to monitor the current traffic status.</p> <p>In this study, a network model is developed to calculate reliability by considering the critical paths of a transportation network using the UCINET simulation tool. The implementation of this network model used two path failure strategies (selective and random) using the Betweenness Centrality as a metric. Our preliminary results show that the UCINET tool can be used to successfully estimate the reliability and to further identify the critical paths of a highway transportation network in California.</p>



# National Center for Sustainable Transportation

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>	<a href="https://ncst.ucdavis.edu/project/introducing-the-resilience-into-the-state-transportation-network/">https://ncst.ucdavis.edu/project/introducing-the-resilience-into-the-state-transportation-network/</a>