

UTC Project Information	
Project Title	MPC-617 – Modeling Disrupted Transportation Infrastructure System Due to Multiple Hazards
University	Colorado State University
Principal Investigator	Suren Chen
PI Contact Information	Professor Colorado State University Phone: (970) 491-7722 Email: suren.chen@colostate.edu ORCID: 0000-0002-3708-5875
Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT, Office of the Assistant Secretary for Research and Technology \$58,000 Colorado State University \$58,000
Total Project Cost	\$116,000
Agency ID or Contract Number	69A3551747108
Start and End Dates	February 18, 2020 to July 31, 2024
Brief Description of Research Project	<p>A transportation system, consisting of roads and bridges, experiences various types of disruptions subjected to different hazards, including long-term, short-term and temporary ones. Due to the complex nature and different causes, disruptions can be very hard to predict with high uncertainty. Different from normal traffic conditions with intact transportation system, actual field data is often lacking, preventing from developing some data-based models.</p> <p>As a key step toward predicting travel time of disrupted traffic system due to several representative hazards, this project tries to achieve following research objectives in order to support the preparation, response and recovery of modern community before and following natural hazards: 1) Appropriately define various natural hazards and incidents, which may cause transportation disruption in urban and rural settings; 2) Develop a general method to model the caused disruptions on transportation system, particularly roads and bridges, due to full or partial blockage.</p>
Describe Implementation of Research Outcomes (or why not implemented)	The research findings have potential to be applied in future risk assessment and mitigation of urban trees before windstorms.
Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	The proposed tree fragility and performance assessment framework can help people understand the risks of tree failure and the impacts to some critical infrastructures and the community resilience in a specific wind event. Accordingly, the stakeholders can make risk-informed decisions

	<p>in terms of effective prevention and preparation measures to protect these infrastructures and further improve the resilience of the whole community subjected to wind events.</p>
<p>Web Links</p> <ul style="list-style-type: none">• Reports• Project Website	<ul style="list-style-type: none">• MPC Research Report – <u>Modeling Disrupted Transportation Infrastructure System Due to Fallen Trees under Wind Hazards</u>• CSU Doctoral Dissertation – <u>Multi-scale Traffic Performance Modeling of Transportation Systems Subjected to Multiple Hazards</u>• Journal Paper – <u>Probabilistic Modeling of Disrupted Infrastructures Due to Fallen Trees Subjected to Extreme Winds in Urban Community</u>