

UTC Project Information	
Project Title	MPC-381 – Performance-based Interaction Analysis of Damage on Bridge Deck and Heavy Traffic
University	Colorado State University
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Funding Agencies	USDOT, Research and Innovative Technology Administration
Agency ID or Contract Number	DTRT12-G-UTC08
Project Cost	\$84,000
Start and End Dates	January 1, 2012 – December 31, 2013
Project Duration	2 Years
Brief Description of Research Project	<p>A bridge deck in a poor condition typically will not be able to resist corrosion and prevent water or chemicals from penetrating into bridge bearings and piers, which will greatly expedite the deterioration process of the bridge structure. In addition to threatening the integrity of bridge structures, a damaged bridge deck and expansion joint may also cause serious risks of traffic accidents when vehicles pass in high speeds. According to FHWA, over 60% of the joints were leaking water and 40% were experiencing problems that would shorten their service lives. According to the existing studies, the actual damage scenarios of bridge deck and expansion joints for a particular bridge can be pretty complicated. One critical challenge lies on the failure of rationally considering the interactions of bridge deck/joints, passing vehicles and deteriorating process of the bridge deck/joints. For example, traffic loads induce more dynamic impacts on the bridge deck which cause damages. More damages, such as unevenness will cause more dynamic interactions with passing vehicles, which in turn cause more impacts loads on the deck and joints from the vehicles. Such a process continues which will accelerate the deterioration process of the joints.</p> <p>Research Objectives: As an important step toward tackling the accelerating damage problem of bridge deck, the objective of this study would be to characterize the basic interactions between the passing traffic, bridge deck and the deteriorating process by developing a rational model. As a result, better understanding of the lifetime performance of the joints can be achieved.</p>
Describe Implementation of Research Outcomes (or why not implemented)	Develop a simulation methodology to assess bridge deck performance under stochastic traffic; and evaluate the fatigue performance of the bridge deck of the prototype bridge.
Place Any Photos Here	

<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>Methods developed will help researchers conduct similar studies on other bridges. The dynamic performance of future bridge decks can be analyzed more accurately. The fatigue performance of bridge deck subjected to traffic can be analyzed in a more realistic way.</p>
<p>Web Links</p> <ul style="list-style-type: none">• Reports• Project Website	<p>http://www.ugpti.org/resources/reports/details.php?id=885</p>