

# MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 17-333 (project 381) | September 2017

## Dynamic Assessment of Bridge Deck Performance Considering Realistic Bridge-Traffic Interaction



### the **ISSUE**

This study is to develop simulation methodology to conduct the dynamic assessment of bridge deck performance subjected to traffic.

### the **RESEARCH**

Concrete bridge decks are exposed to daily traffic loads and may experience some surface cracking caused by excessive stress or fatigue accumulation. Bridge decks experiencing such cracking will require repair or replacement. In the present study, a hybrid dynamic analytical approach is developed for a typical multi-span concrete bridge and stochastic traffic flow by considering the excitation from road roughness. Based on the dynamic response results, the fatigue assessment is also conducted focusing on providing some insights on vulnerable locations and the impacts from different traffic, and road roughness conditions.



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Colorado State University  
North Dakota State University  
South Dakota State University

University of Colorado Denver  
University of Denver  
University of Utah

Utah State University  
University of Wyoming



### Lead Investigator(s)

Suren Chen  
schen@engr.colostate.edu  
Colorado State University

### Project Title

Dynamic Assessment of  
Bridge Deck Performance  
Considering Realistic Bridge-  
Traffic Interaction

### Research Assistant(s)

Yufen Zhou  
former Ph.D. student /  
postdoctoral student @  
Colorado State University

### Sponsors | Partners

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### the **FINDINGS**

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.

### the **IMPACT**

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.

For more information on this project, download the entire report at <http://www.ugpti.org/resources/reports/details.php?id=885>

For more information or additional copies, visit the Web site at [www.mountain-plains.org](http://www.mountain-plains.org), call (701) 231-7767 or write to Mountain-Plains Consortium, Upper Great Plains Transportation Institute, North Dakota State University, Dept. 2880, PO Box 6050, Fargo, ND 58108-6050.



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