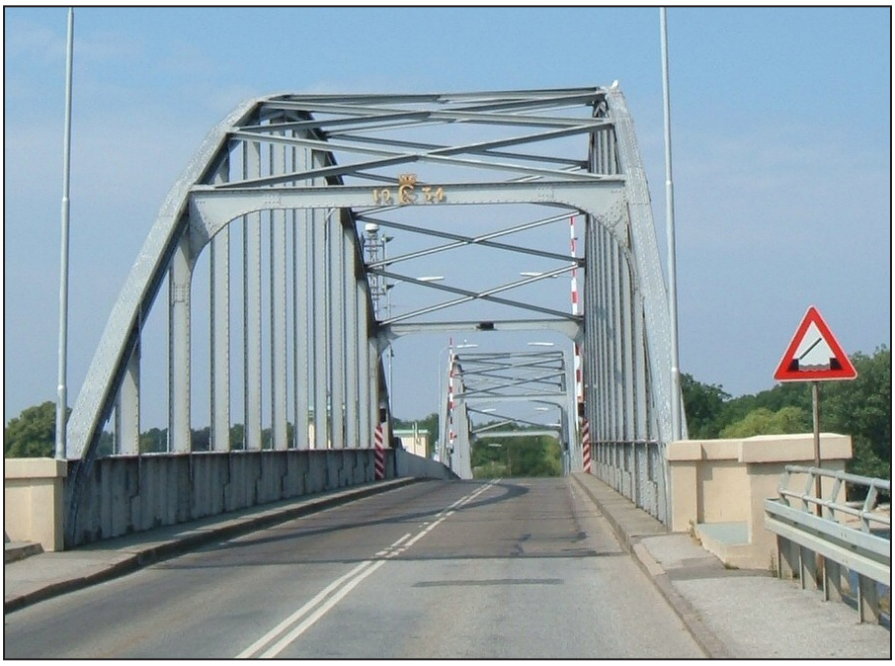
MOUNTAIN-PLAINS CONSORTIUM

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.

MOUNTAIN-PLAINS CONSORTIUM REGION 8

A University Transportation Center sponsored by the U.S. Department of Transportation serving the Mountain-Plains Region. Consortium members:

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

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Project Title

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

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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, 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.