MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 17-335 (project 352/400) | October 2017

Evaluation of Ice Loads on Bridge Sub-Structures in South Dakota

the **ISSUE**

Researchers developed and used an on-site monitoring device to measure ice impact load on bridge sub-structures in South Dakota streams. This data will help researchers to evaluate the applicability of AASHTO code ice load estimation for these locations. Estimations of ice loads on bridge structures used in designing bridges may be quite different than those encountered on actual bridges. Lack of accurate data may lead to bridge substructures that are over designed with excessive construction cost or under designed, compromising public safety.

the **RESEARCH**

A customized ice load monitoring device was designed and installed at two locations in South Dakota and collected impact data for two years. Statistical analysis was performed using the data obtained and compared to ice load calculations currently used in South Dakota.

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

Evaluation of Ice Loads on Bridge Sub-Structures in South Dakota

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USDOT, Research and Innovative Technology Administration

the **FINDINGS**

Based on limited data, it is safe to use the AASHTO ice load calculation with the highest effective ice strength and without small stream reduction.

the **IMPACT**

Research results confirmed the safety of the current ice load calculation practice adopted by SD DOT. Improved ice load estimations will allow for appropriately-designed bridge substructures that optimize construction cost without sacrificing safety.

For more information on this project, download the entire report at http://www.ugpti.org/resources/reports/details.php?id=892

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.