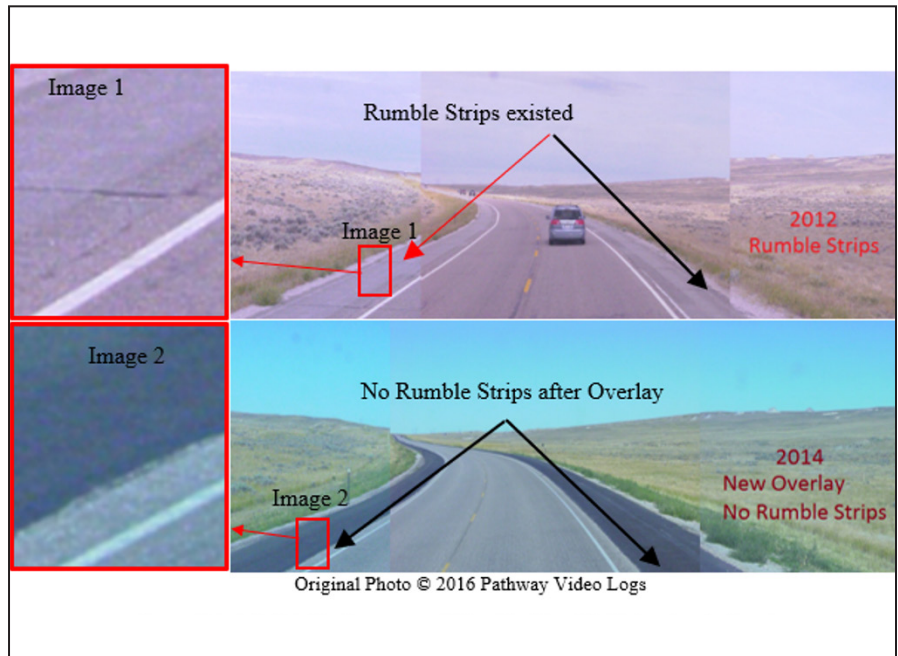


# MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 19-385 (project 474) | May 2019

## Highway Safety Manual Part D: Validation and Application in Wyoming



### the **ISSUE**

Quantifying the safety effectiveness of countermeasures is critical to allocating the limited resources in Wyoming. The transferability of the Highway Safety Manual might be questionable due to the fact that the manual was developed based on data collected from just a few states in the United States.

### the **RESEARCH**

The methodologies used in this study, to calibrate Wyoming-specific Safety Performance Functions (SPFs) and to develop Crash Modification Factors (CMFs), included spatial geographical analyses, regression models with various distributions, observational before-after studies, and cross-sectional analyses. According to the Highway Safety Manual roadway facilities fall into four major categories: 1) roadway segments, 2) intersections, 3) special facilities and 4) road networks. A roadway segment is a portion of the roadway having a consistent geometrical, operational, and traffic characteristics. Roadways with significant variations in characteristics should be considered and analyzed as different segments. Roadway geometry was mainly used for segmentation. To calibrate reliable CMFs, crash, traffic, and weather data were collected for at least three years before and after the implementation of a countermeasure. CMFs were calibrated for shoulder rumble strips, headlights signs, adding left- and right-turn lanes on signalized intersections, and snow fence implementations.



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North Dakota State University  
South Dakota State University

University of Colorado Denver  
University of Denver  
University of Utah

Utah State University  
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### Project Title

Highway Safety Manual  
Part D: Validation and  
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## the FINDINGS

In Wyoming weather conditions are more severe than in many parts of the United States. The state is rural with many remote areas, and the traffic volumes and mix are unique. Therefore, it could be said that the SPFs and Crash Modification Factors (CMFs) provided in the HSM are not transferable to Wyoming-specific conditions. Hence, it was necessary to develop accurate CMFs representing Wyoming-specific conditions, which will help in prioritizing and selecting the most appropriate and cost-effective countermeasures. The results indicated that the majority of the investigated countermeasures are statistically significant in reducing crash frequency and severity.

## the IMPACT

WYDOT started utilizing the results from this study immediately. The quantification of safety benefits of countermeasures is crucial to effectively allocate resources in Wyoming to reduce the frequency and severity of crashes.

For more information on this project, download the entire report at <http://www.ugpti.org/resources/reports/details.php?id=946>

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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