

MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 22-471 (project 655) | July 2022

Motorcycle Safety Assessment in Wyoming and Utah: Crash Characteristics and Contributing Factors



the ISSUE

Even though motorcycle fatalities comprise a large percentage of traffic fatalities in the United States (more than 15%), comprehensive studies on motorcycle safety on the national level are lacking. According to the National Highway Traffic Safety Administration, the mean fatality crash rate for motorcycles is about five times higher than that for passenger cars. From 2015 on, the five-year rolling average of fatal motorcycle crashes per million population in Wyoming increased from 26 in 2015 to 32 in 2018. In 2018, there were 15 motorcycle fatalities in Wyoming. In Utah, the average motorcycle fatalities between 2015 and 2020 were 41 per year, which constituted about 15.1% of all highway fatalities, even though motorcycle vehicle miles traveled (VMT) represent less than 1% of all VMTs.

the RESEARCH

The goal of this study is to assess the characteristics of motorcycle safety in Wyoming and Utah, with the focus on fatal and severe injury crashes. The study first presents the descriptive statistics of motorcycle crash characteristics in Wyoming and Utah. These statistics show crash characteristics such as crash types, severities, locations, contributing factors, and other elements of importance. They show the current state of motorcycle safety and needs for improvements.

Multiple years of crash data from Wyoming and Utah are used to develop statistical safety models for motorcycle crashes. The data are organized by selected variables (crash characteristics, traffic, environmental conditions, and roadway characteristics) and imported into statistical software, RStudio. The developed statistical models show the significance of various contributing factors and variables, which are used to recommend countermeasures. Through both descriptive data analysis and statistical modeling, the study determined the major contributing factors for motorcycle crashes, with a focus on severe injury and fatal crashes. The contributing factors show the direction for needed improvements in the motorcycle safety area for the two states. Finally, the study recommends potential countermeasures for the reduction of severe and fatal motorcycle crashes.



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the FINDINGS

The most common factors affecting injury severity in motorcycle-related crashes include vehicle maneuver, driver action, junction relation, alcohol, animal, and speed involvement, and helmet use. The vicinity of intersections significantly increases the odds of injury crashes in all urban and rural multi-vehicle crashes, compared with no injury. Vehicle maneuvers such as overtaking/passing, changing lanes, and negotiating curves are also associated with a more severe crash outcome. Helmet use was generally found to reduce fatal and serious injuries in crashes, with some exceptions, where other factors were more significant.

the IMPACT

This research provides methodologies and models to be used by agencies in Wyoming and Utah (as well as beyond) in the safety assessment of roadway facilities from the motorcycle safety standpoint. Motorcycle safety research is currently lagging behind research for other modes, and this study provides processes for a better understanding of motorcycle safety. The study adds to the body of knowledge on motorcycle safety, crash characteristics, and crash contributing factors, as well as a better understanding of statistical models to be used for motorcycle safety assessment. It is expected that this will lead to better practices to manage motorcycle traffic and improve safety.

For more information on this project, download the Main report at <https://www.ugpti.org/resources/reports/details.php?id=1090>

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.



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