

Motorcycles: Crash Trends, Conspicuity, and Interventions

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Advancements in vehicle technology and upgrades to traffic safety laws have reduced overall traffic crash fatalities and injury severity nationwide. The same cannot be said about motorcycle fatalities which have steadily increased since 1997.

Between 2002 and 2010, ND recorded 63 fatal crashes, 1490 injury crashes, and 324 property damage only (PDO) motorcycle crashes for a combined total of 1877 (Figure 1). Crashes peak in 2008 and reflect an 87.3% increase over 2002. When evaluating driver crash severity, data indicates 238 of these crashes were fatal or disabling. Although the overall number of crashes during this period was higher on urban roads, crashes were more severe on rural roads which had the largest share of fatalities, 76.2% (Figure 2). When considering multi-vehicle crashes, right-of-way (ROW) crashes represent 54% of the crashes. ROW crashes also result in more fatalities and injuries (Figure 3) than all other types (combining rear-end, head-on, sideswipe and rear-to-rear).



Figure 1: North Dakota Motorcycle Crashes, All Types

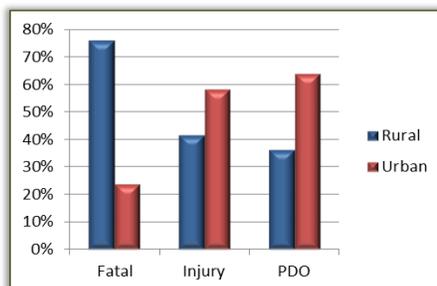


Figure 2: Crash Severity by Road Class, 2002 - 2010

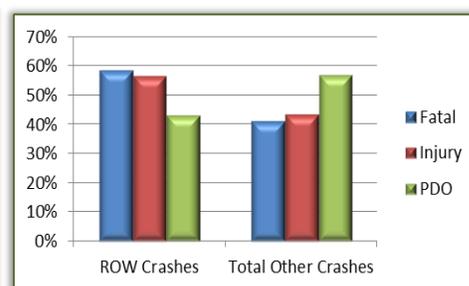


Figure 3: Comparison by Crash Type: ROW vs Other Types

Conspicuity—Research demonstrates that daytime running lights (DRLs) improve conspicuity, but the benefit is dependent on the background, as well as light intensity and color. Approximately 73% of ND crashes from 2002 to 2010 occurred during daylight hours; therefore, DRLs may have limited benefit with regard to the temporal factor. As with DRLs, reflective clothing offered some improved conspicuity, particularly at dusk. In addition, the larger the motorcycle frontal area, the greater the visual cue thereby enhancing other motorists' ability to judge distance and speed.

Training and Education—Despite proven benefits, 66% of motorcycle drivers involved in crashes in North Dakota were not wearing helmets. In annual fatalities, helmet use ranged from 0% to 23%. One-third of the ND motorcycle crashes during the most recent five years can be attributed to driver operation error, mishandling, and distraction. Almost half of the crashes involved no evasive action on the part of the motorcyclist. Additional research to realize improvement in these areas is essential to reducing the number and severity of motorcycle crashes.

Rider education and licensing can significantly reduce crash susceptibility and severity. Researchers reviewed best practices in a number of states to identify effective education and licensing programs (Baldi et al.). North Dakota placed in the top end of "medium" best practices with a composite score of 18 consisting of the following: program administration = 1 (mean 1.4), rider education = 12 (mean 9.3) and licensing = 5 (mean 3.9). While ND measured fairly well among the states reviewed, further initiatives could be considered in striving to implement all elements of the best practices model.

Summary—Motorcycle use brings increased risk to the operator simply by the nature of the machine. Other motorists are less likely to notice motorcycles, and their ability to accurately judge speed and traffic gaps are diminished when motorcycles are involved. Inadequate training may also present a hazard to the motorcyclist. Finally, when a crash occurs, the threat of injury or death is intensified by body exposure compared to that of other vehicle drivers.

Further efforts to improve motorcycle conspicuity would seem prudent. Renewed emphasis on education and training to ensure proper operation, reduced risk-taking, and sustained crash avoidance skills are also essential to reduce motorcycle crashes.



For more information contact:
Rural Transportation Safety and
Security Center
UGPTI, NDSU Fargo, ND 58105
Email: rtssc@ugpti.org
Phone: 701.231.7767