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RESEARCH PROJECT TITLE

Enhancing Motorcycle Conspicuity Awareness in Iowa

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PRINCIPAL INVESTIGATOR

Konstantina Gkritza
Assistant Professor of Civil,
Construction, and Environmental
Engineering
Center for Transportation Research and
Education
Iowa State University
515-294-2343
nadia@iastate.edu

MORE INFORMATION

www.ctre.iastate.edu

PHOTO CREDITS

Minnesota Department of Public Safety
(DPS) and Iowa Department of Transportation (DOT)

CTRE

Iowa State University
2711 S. Loop Drive, Suite 4700
Ames, IA 50010-8664
515-294-8103

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Enhancing Motorcycle Conspicuity Awareness in Iowa

tech transfer summary

The inability of motorcycle riders to be seen by other drivers is thought to be an important factor associated with the risk of motorcycle crashes.

Objectives

- Research and analyze motorcycle conspicuity in Iowa with a view toward how to increase both rider and driver awareness of the issues
- Make recommendations regarding motorcycle conspicuity-related campaigns and interventions for Iowa

Problem Statement

Iowa's number of motorcycle registrations began increasing in 1999. Nearly 146,000 motorcycles were registered in 2006. From 1995 to 2005, motorcycle fatalities rose 46% in Iowa, while average traffic fatalities, overall, declined nearly 15%.

Previous studies in the United States and internationally suggest that low motorcycle conspicuity, or the inability of the rider to be seen by other drivers, is thought to be an important factor associated with the risk of motorcycle crashes. Nonetheless, research and findings on motorcycle conspicuity have been limited in the United States over the last two decades.

Given the safety and fatality implications, a need exists to study, communicate, and increase awareness of motorcycle conspicuity-related issues in Iowa.



How long does it take you to find the motorcycle rider in this photo? Now, look again! Where's the second rider? (Minnesota DPS)

Research Description and Methods

- Reviewed previous motorcycle-conspicuity studies, practices, and literature
- Compared single- and two-vehicle motorcycle crashes (using Iowa crash data from 2001 to 2008) and identified motorcycle-conspicuity factors that could potentially relate to motorcycle crashes
- Explored trends in motorcycle helmet use in Iowa, looking at observational roadside surveys conducted in 2006, 2008, and 2009
- Analyzed potential motorcycle-conspicuity factors by creating contingency tables and estimating chi-squared test statistics
- Identified the limitations of examining motorcycle conspicuity using only crash data analysis
- Recommended future data collection and studies
- Offered suggestions for the Iowa motorcycle manual and for safety and conspicuity-awareness campaigns

Summary of Key Findings

- A higher number of motorcycle crashes occur in June and July, and on weekends.
- 83% of two-vehicle crashes occur on urban roads and more than half occur at intersections.
- A higher proportion of two-vehicle, rather than single-vehicle, motorcycle crashes occur in daylight.
- The driver groups involved in the most crashes with motorcycle riders are either younger (under 30) or older (over 60).
- Helmet-use rates in both single- and two-vehicle crashes are very low on urban roads (22%); and helmet use was higher in daylight than when dark.

Research Limitations

- Potential conspicuity-related factors, such as rider clothing, motorcycle color, helmet color, and motorcycle type, were not available in the crash database.
- The speed information pertained to the speed limits on the roads where the crashes occurred, rather than the actual vehicle speeds upon colliding.
- Accurate information on motorcycle-miles-traveled that would be essential in comparing day versus night riding was either missing or of poor quality.



Helmet color and reflectivity at night (Iowa DOT)

Implementation Readiness

Iowa is one of the 39 states that include conspicuity in its motorcycle manual, listing eight important ways to increase conspicuity:

- Clothing
- Mirrors
- Headlight
- Head checks
- Signals
- Horns
- Brake lights
- Riding at night (headlight on)

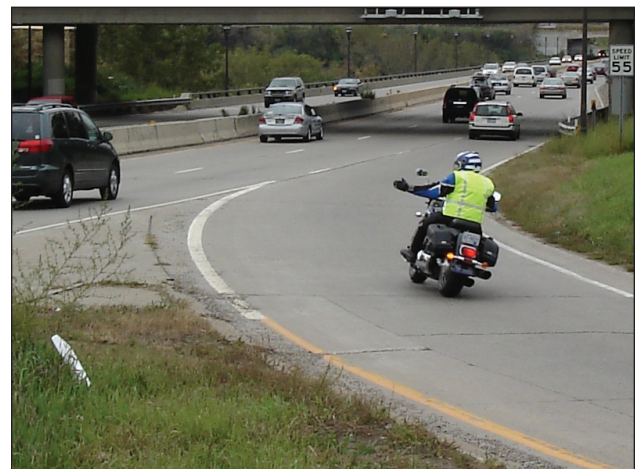
The Iowa DOT could also consider specifying the color of the helmet in the manual, such as yellow or lime yellow, since the bright color of the helmet can improve motorcycle conspicuity.

Moreover, the manual could emphasize the reflectivity of the frontal area of the motorcycle/rider, and the brightness contrast between the rider and their surroundings, which have been shown to be more significant factors to enhancing motorcycle conspicuity than bright clothing and headlight use alone.

The Iowa DOT could consider improving motorcycle training and education to enhance rider skills, especially for riders between 21 and 30 years old and between 41 and 50 years old. Also, awareness programs targeted specifically to younger and older vehicle drivers could be considered.

Safety campaigns are considered an effective way to improve safety on the roadways. Since helmet use can also improve conspicuity, safety campaigns could encourage drivers to wear helmets, especially when traveling in high motorcycle crash locations.

Finally, if crash data collection cannot be expanded to include information on other potential conspicuity-related factors, naturalistic driving studies could provide a promising avenue for such information to be collected for future research on motorcycle conspicuity.



Helmet color and reflectivity improve conspicuity (Minnesota DPS)