

# MPC-369

January 1, 2012 – December 31, 2012

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## **Project Title:**

ND Motor Crash Analysis and Rider Assessment for Improved Conspicuity

## **University:**

North Dakota State University

## **Principal Investigator:**

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## **Research Needs:**

Advancements in vehicle technology and upgrades to traffic safety laws have produced dramatic nationwide reductions in overall traffic crash fatalities and injury severity over the last few decades. The same cannot be said about motorcycle fatalities where there have been steady increases since 1997 (FARS). Between 2002 and 2010, North Dakota experienced 1877 motorcycle crashes including 63 fatal, 1490 injury, and 324 property damage only (PDO) crash events. When evaluating crash severity over the most recent five years, there have been an average 48 serious injury – including fatal and disabling crashes – per year.

Improving motorcycle safety requires a multifaceted approach. Safety standards for vehicle performance (eg. anti-lock brakes), infrastructure upgrades (eg. lighting, road markings, signage), communication and behavioral safety measures (eg. improved helmet use, educational materials, novice and experienced rider training) are all part of this approach (USDOT 2007). While these areas are all vital to reducing motorcycle crash incidence, this project will focus on driver awareness in motorcycle conspicuity with particular attention to right-of-way (ROW) crashes. Research has shown this to be a critical factor in motorcycle crash risk (Pai 2011, Gershon et. al 2012, Tunnicliff et. al 2011). When considering multi-vehicle motorcycle crashes between 2002 and 2010, ROW crashes represented the greatest share at 53.7%. In addition, in the previous five years, the frequency of citations issued for failing to yield was greater for vehicle drivers (86.2%) than motorcyclists (13.8%).

Two factors frequently involved in ROW crashes are: 1) failure to detect the motorcycle, and where detection occurs, 2) an inability to accurately judge the distance (gap) and speed of the motorcycle (Pai 2009). In the majority of ND motorcycle crashes, diminished visibility affecting

detection and gap/speed assessment was not related to weather conditions. Crash records from 2002 to 2010 reflect 82.4% of crashes occurred under “clear” weather conditions. Understanding the dynamics of ROW crashes is integral to reducing the crash incidence attributable to these factors.

### **Research Objectives:**

1) Provide insight regarding the dynamics of motorcycle crashes relating to ROW breaches in multi-vehicle crashes, 2) raise awareness in both motorcyclists and the general motoring public of motorcycle conspicuity issues, and 3) offer recommendations for ROW crash reduction measures.

### **Research Methods:**

The research method will utilize an online survey aimed at registered and licensed motorcyclists. The survey will gather information on practices and perceptions of motorcycle users under all operating conditions. A statistical analysis of motorcycle crash records will be conducted to quantify the relationship between conspicuity and crashes relating to environmental factors and driver error. In addition, driver experience and participation in formal motorcycle rider education will be considered in the analysis, as allowed, through NDDOT driver record and motorcycle program participation data.

### **Expected Outcomes:**

The online survey will provide information regarding driver perceptions related to conspicuity and crash risk, as well as, broader elements in motorcycle crash risk such as riding habits, training and education. The knowledge gained in this research will provide valuable information to assist in enhanced risk identification, potential reduction of motorcycle crash events, and motorcycle safety education program materials.

### **Relevance to Strategic Goals:**

- SAFETY

This project is relevant to the Safety goal outlined in the DOT Strategic Plan for reducing transportation related fatalities and injuries through safer motorcycle operation. A research report providing a summary of findings will be disseminated among ND traffic safety officials and will serve as an information resource to guide future motorcycle crash reduction initiatives.

### **Educational Benefits:**

Not Applicable

**Work Plan:**

<u>Task</u>	<u>Completion Date</u>
1. Literature Search	2 <sup>nd</sup> month
2. Survey Development	4 <sup>th</sup> month
3. Survey Analysis	6 <sup>th</sup> month
4. Crash Records Review	7 <sup>th</sup> month
5. Draft Report	10 <sup>th</sup> month
6. Final Report	11 <sup>th</sup> month
7. Dissemination of Results to ND Traffic Safety Officials	12 <sup>th</sup> month

**Total Project Cost: \$10,000**

**MPC Request:** \$5,000

**Match:** \$5,000, sources include NDSU returned indirect costs, in-kind match from the NDDOT, West Fargo PD, and Area Motorcycle Groups – who will post the survey.

**TRB Keywords:** Motorcycle, Conspicuity, Safety

**References:**

U.S. Department of Transportation, 2007, Action Plan to Reduce Motorcycle Fatalities, DOT HS 810 855.

Pai, Chih-Wei, Motorcycle right-of-way accidents – A literature review, 2011 *Accident Analysis and Prevention*, 43: 971-982.

Gershon, Pnina, Ben-Asher, Noam, and Shinar, David. 2012. Attention and search conspicuity of motorcycles as a function of their visual context, *Accident Analysis and Prevention*, 44: 97-103.

Tunnicliff, Deborah J. et al., 2011, Understanding the factors influencing safe and unsafe motorcycle rider intentions. *Accident Analysis and Prevention*, 44: 23-31.