

0-6712: Evaluation of the Measures and the Development of a Plan to Reduce the Number and Mitigate the Severity of Crashes Involving Motorcyclists on Texas Highways

Background

Nearly one in seven people killed on Texas roadways each year is a motorcycle rider. This research project developed a statewide plan to reduce motorcycle crashes and injuries in Texas, which includes countermeasures and outreach activities to prevent and/or mitigate motorcycle crashes and associated injuries and fatalities in Texas. The plan provides a baseline from which the Texas Department of Transportation's (TxDOT's) districts and Traffic Operations Division can effectively measure and track implemented countermeasures and programs, and, if necessary, make changes to motorcycle safety efforts.

What the Researchers Did

The project included:

- A review of published literature on current and proposed countermeasures for reducing the incidence and/or severity of motorcycle-involved crashes and related injuries.
- A review of existing and emerging intelligent transportation systems and other advanced technologies for motorcycles and other vehicles.
- An analysis of Texas motorcycle crash and injury data.

- A statewide survey of Texas motorcycle riders that explored the demographics, riding histories, training and licensing status, use of protective gear, crash involvement, and attitudes toward various motorcycle safety countermeasures.

Researchers also identified countermeasures that reduce the risk of a crash from occurring and reduce the severity of injury in the event of a crash. They then developed a workshop in which motorcycle safety experts and advocates evaluated and prioritized potential crash countermeasures for implementation in Texas.

What They Found

Researchers found:

- Helmet use influences crash injury severity and greatly reduces the chances of fatal and incapacitating crashes.

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- When compared to multi-vehicle crashes, single-vehicle crashes are less likely to result in a fatality or incapacitating injury.
- Elderly riders are more susceptible to injury. Thus, they are more likely to be involved in high-severity crashes when compared to young riders.
- Crashes occurring between 8 p.m. and 6 a.m. are more severe than those between 6 a.m. and 8 p.m. The main reason could be attributed to the visibility of motorcycles during night hours. When the visibility is limited, the crash occurs at a higher speed, resulting in a high severity.
- Roadway curvature (both horizontal and vertical) has a strong correlation with motorcycle crash severity. These features were found to increase the likelihood of more severe crashes. Horizontal curves have a more pronounced effect than vertical curves on influencing crash severity.
- Riding under the influence of alcohol or drugs has a strong correlation with crash severity. Rider intoxication significantly increases the probability of a fatality, regardless of whether the crash occurred in an urban or rural area.
- Crashes occurring with overspeeding or lane indiscipline will be more severe than crashes without these two factors as primary contributors.
- Crashes occurring on high-standard roads (such as interstate, U.S., and state highways) tend to be more severe than those occurring on other roads (such as city streets and county roads). In rural areas, crashes on FM roads mostly result in fatal or incapacitating injuries.

What This Means

Researchers conclude:

- More efforts should be made to increase helmet use, alcohol or drug awareness, and enforcement of the zero tolerance law for motorcycle riders.
- Awareness should be created among elderly riders about their susceptibility to severe injuries when involved in a crash.
- Efforts should discourage riders from riding motorcycles between 8 p.m. and 6 a.m. If driving, they must take extreme caution by wearing high-visibility clothing.
- More efforts should be made to increase visibility at roadway segments involving horizontal and vertical curves in urban areas.
- Speed limits should be strictly enforced.
- In rural areas, improved design and more warning signs should be placed on FM roads indicating a motorcycle presence.
- The rider education program should include potential consequences of unsafe and aggressive riding. This should also include the consequences and dangers associated with drinking and riding, speeding, and unsafe maneuvers.

For More Information

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