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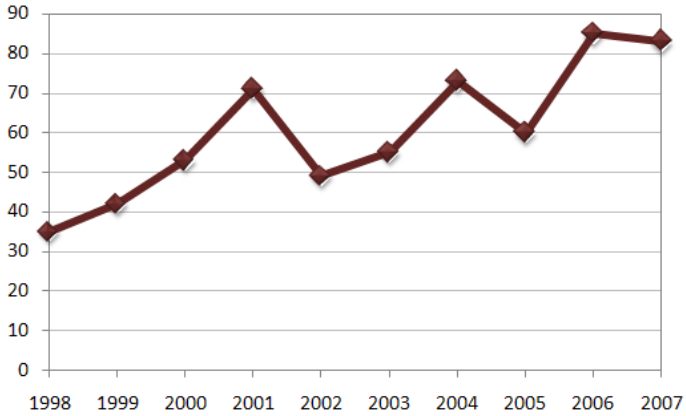
New Jersey Department of Transportation
Bureau of Research

Technical Brief

New Jersey Motorcycle Fatality Rates

Background

Fatal motorcycle crashes have been increasing in recent years, more than doubling since 1998. In 2007, there were 84 fatal motorcycle crashes in New Jersey. There are approximately 2,700 motorcycle crashes in New Jersey each year.



Motorcycle Fatalities in New Jersey from 1998 to 2007

The goal of this research program was to investigate causes of motorcycle crashes and develop recommendations for reducing the number and severity of motorcycle crashes in New Jersey. Recommendations include a revision of the testing and training processes, increased motorcycle awareness amongst drivers, increased safety awareness amongst motorcyclists, and investigation of roadways identified as hazardous.

Research Objectives and Approach

Rowan University and Virginia Tech were contracted by the New Jersey Department of Transportation to study motorcycle crashes in New Jersey. The objective of this project was to investigate and develop recommendations to reduce the number and severity of motorcycle crashes in New Jersey. To accomplish this objective, the research team (1) assembled previous research regarding motorcycle training and motorcycle-guardrail collisions, (2) developed and implemented a survey to motorcyclists, RiderCoaches, and motorcycle dealerships in New Jersey, (3) analyzed trends national and state-wide trends in fatal motorcycle collisions, (4) conducted in-depth investigations of sites where motorcycle collisions with roadside objects occurred, and (5) located and analyzed high-risk crash sites across the state.

Findings

NJ Training and Testing Procedures. The testing and training procedures in New Jersey were analyzed based on the results of the survey, literature, and crash data. The testing and training processes in New Jersey should be reevaluated for the following reasons:

1. Many people complete the motorcycle road exam on a motorcycle with a small engine displacement (< 500cc) or a scooter (typically around 50-100cc). However, most fatal crashes occur on motorcycles with an engine displacement larger than 500cc.
2. The current exam requires motorcyclists to complete a series of turns, weaves and stops at slow speeds, most of which would not be a realistic road situation.

Analysis of Fatal Crash Characteristics. The research team analyzed data from the 1998-2007 Fatality Analysis Reporting System (FARS), comparing crash characteristics between the United States and New Jersey. The primary findings are summarized below:

1. The characteristics of fatal motorcycle crashes in New Jersey were consistent with national motorcycle crash characteristics.
2. Nearly half of all fatal crashes in New Jersey were single vehicle crashes. Thus, fatal motorcycle crashes cannot be blamed exclusively on car drivers, as half the crashes did not involve another vehicle.
3. Over half of all fatalities in New Jersey included another vehicle. Hence, there is a need for improved diver awareness of motorcycles and improved conspicuity of motorcycles.
4. Males aged 31-50 are most likely to be fatally injured in motorcycle crash. Moreover, drivers of motorcycles who were fatally injured, or whose passenger was fatally injured, were most likely to hold a valid license and not be intoxicated at the time of the crash.
5. Motorcycles involved in crashes were most likely to be motorcycles that have an engine size of 750 cubic centimeters or larger.
6. Motorcycling is a fair weather mode of transportation. Most fatal crashes occurred during fair weather conditions and during the daylight. The highest percentage of crashes occurred during the summer.

Field Inspection of Roadside Object Collisions. The research team visited 110 roadside object crash sites with a total of 118 accidents occurring across these locations. Crashes with guardrails, concrete barriers, trees, and poles were investigated. Each site visited was supplemented with an analysis of satellite imagery and the police report for the motorcycle crash. A novel data set of roadway characteristics of crash sites was developed and analyzed. The main findings of this component are as follows:

1. Overall, the roadways tended to be free from defects such as potholes, cracks, or patches. However, at many of the sites contaminants such as sand or gravel were noted to be either in the roadway or in the shoulder.
2. The majority of the crashes investigated occurred on curves. Approximately 60% of the curves were marked with warning signage. Moreover, almost three-quarters of the guardrail collisions investigated occurred on curves.
3. There were several locations investigated where multiple crashes occurred. These are also candidates for guardrail modifications or additional signage since they have proven to be hazardous to motorcyclists.

Identified High Risk Sites in NJ. High risk locations for motorcyclists were determined using New Jersey crash data from 2006-2008. This analysis, which is commonly performed for passenger vehicles, is now being applied to motorcycles to determine possible locations where further investigations should take place. Crash sites were also mapped using Google Earth Pro. A total of four different methods were used to identify high risk sites:

1. Frequency of motorcycle involvement in a collision
2. Frequency of motorcycle occupant involvement in a collision
3. Number of seriously injured persons involved in a motorcycle crash
4. 5-4-3-2-1-1 ranking based on KABCO scale

The research team identified the top 25 sites of the motorcycle crashes in New Jersey using several metrics of severity. Four sites to particularly note are:

1. NJ 23 northbound between mileposts 18.0 and 18.18. This is the most dangerous site according to all metrics used, having a 5-4-3-2-1-1 score of 28 and crashes involving 7 motorcycles and 8 riders.
2. I-95 around milepost 54. In both the northbound and southbound directions there were 13 motorcycles and 14 riders involved in crashes at this site.
3. I-78 East, mileposts 56.5-57.4, and I-78 West, mileposts 54.4 - 54.1. Each location involves 7 motorcycles and 7 riders.
4. Rt. 579, between mileposts 36.23 and 37 (pictured above). There were 7 crashes involving 7 motorcyclists in this area.

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A final report is available online at: http://www.state.nj.us/transportation/refdata/research/. If you would like a copy of the full report, send an e-mail to: Research.Bureau@dot.state.nj.us.

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