

Analysis of Motorcyclist Safety Data in Texas

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Center for Transportation Safety

Today's objectives

- Project Overview
- Data
- Questions



Project goal



Understand crash complexity



Prioritize points for intervention



Prevent death & injury

Our project

Crash database

Detailed analyses



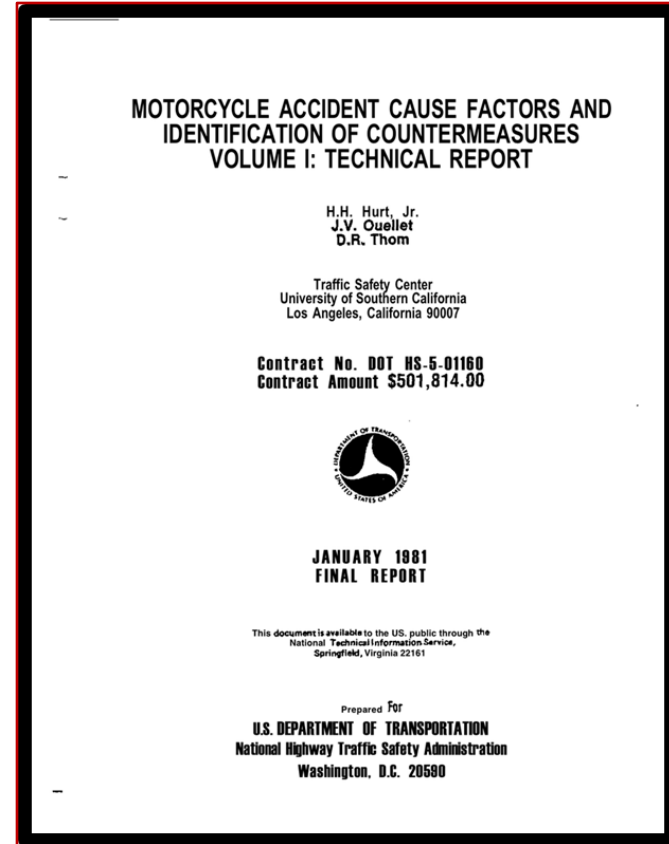
Crash database

- 2010 – 2015
- All crashes (all severities)
- Other sources
 - Registration data
 - VIN data (engine size)
 - License / training data (DPS)
 - Roadway structure (GEO HINI, RHiNo)



Statistical analysis

- Hurt Report
- Beyond traditional crash analyses
- VMT



Selected findings

Comprehensive Analysis of Motorcycle Crashes in Texas: A Multi-Year Snapshot

Report Number: 2016-TTI-G-1YG-0029

Submitted by the
TEXAS A&M TRANSPORTATION INSTITUTE

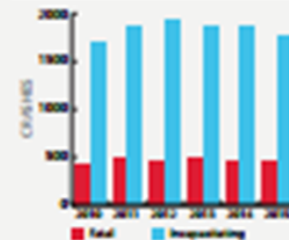


September 2016

MOTORCYCLE FACTS – CRASH OVERVIEW (2010-2015)



Motorcycle Crashes (2010-2015)



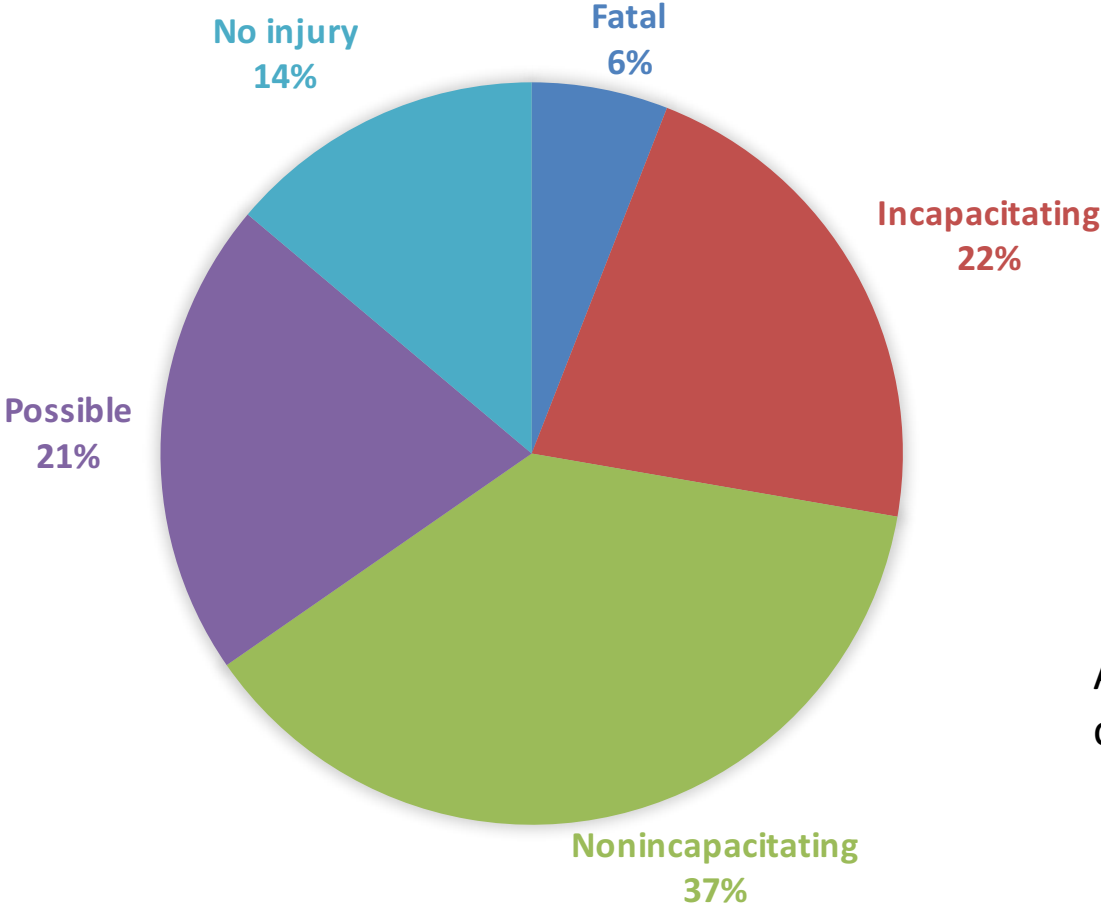
- The number of registered motorcycles doubled from 176,829 in 2008 to 448,898 in 2015. This dramatic increase suggests that crashes with motorcycles will continue to be a traffic safety issue.
- The counties with the most motorcycle registrations were Brews, Collin, Dallas, Denton, El Paso, Harris, Montgomery, Tarrant, and Travis, which corresponds to the most populated areas of Texas.
- In 2015, there were over 1,600 motorcycle crashes. The severity of those crashes were classified as:
 - 49% fatal injury.
 - 22% incapacitating injury.
 - 33% non-incapacitating injury.
 - 27% possible injury.
 - 16% no injury.
- The percentage of crashes classified as fatal or incapacitating is similar from 2010 to 2015.

Top Ten Counties

County	Population	Fatal and Incapacitating rates per 100,000 population
Tarrant	2,607,000	514.3
Denton	2,200,000	262.1
Dallas	1,340,000	250.0
Harris	2,400,000	141.7
Collin	240,000	121.5
Texas	27,470,000	114.8
Brews	24,000	94.8
Denton	65,700	88.8
El Paso	24,100	210.0
Travis	44,800	210.0
STATE TOTAL	27,470,000	84.4

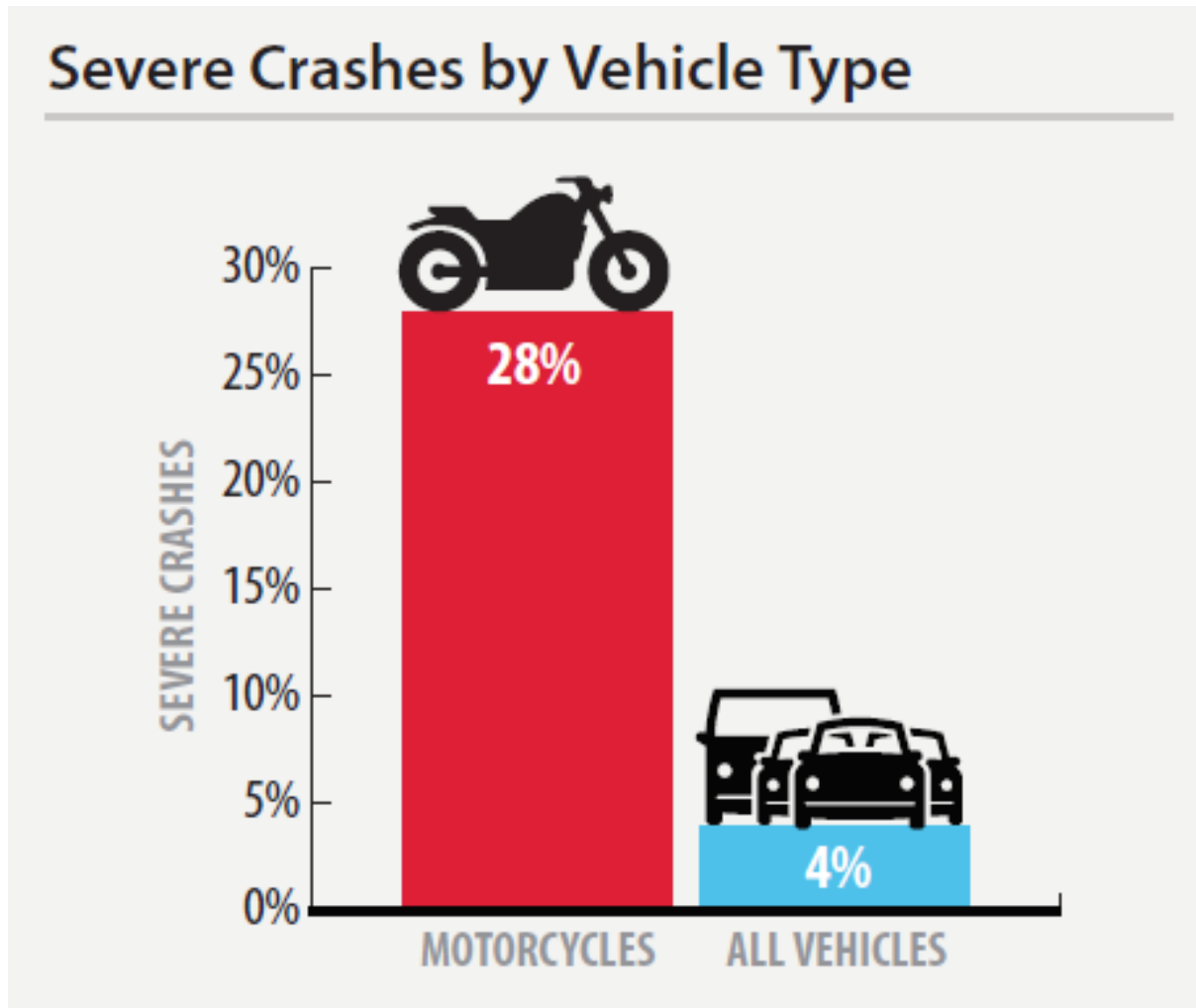
- Overall more crashes occur in urban areas (70%) but rural crashes are more serious. Of rural motorcycle crashes, 50% resulted in a fatal or incapacitating injury compared to 23% in urban areas.
- The rate of fatal or incapacitating motorcycle crashes was 8.4 per 100,000 population in 2015. Below are the counties with the highest rates of fatal and incapacitating motorcycle crashes as compared to the state in 2015.

Crash severity, 2015

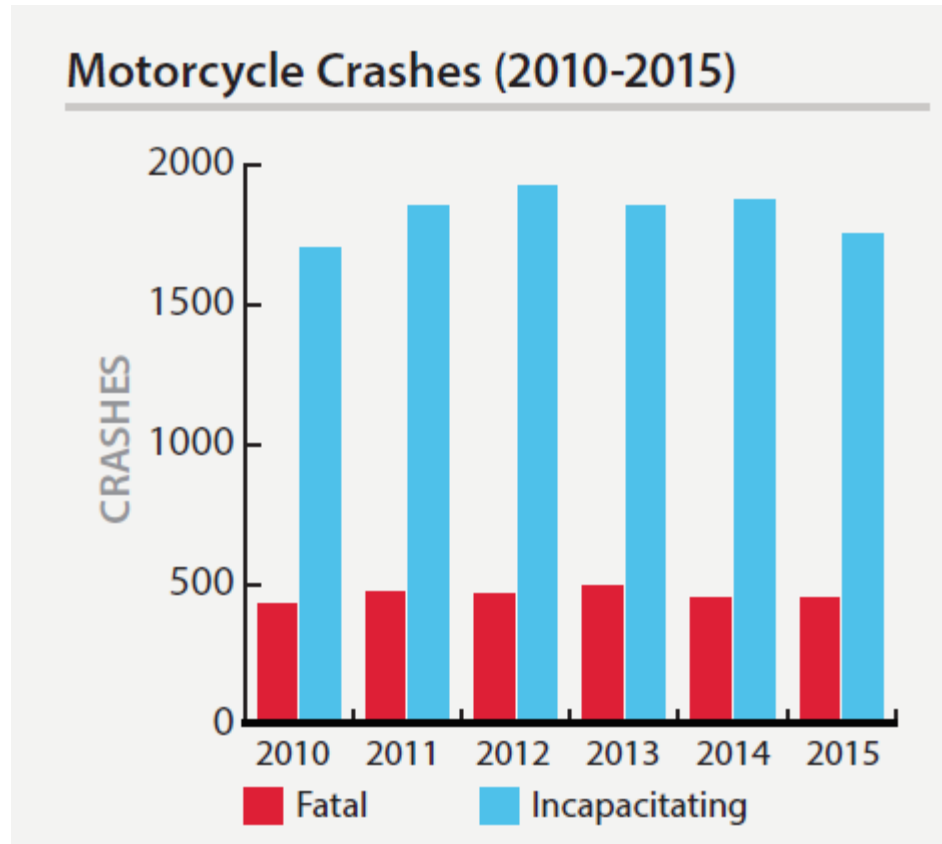


About 8,000
crashes per year

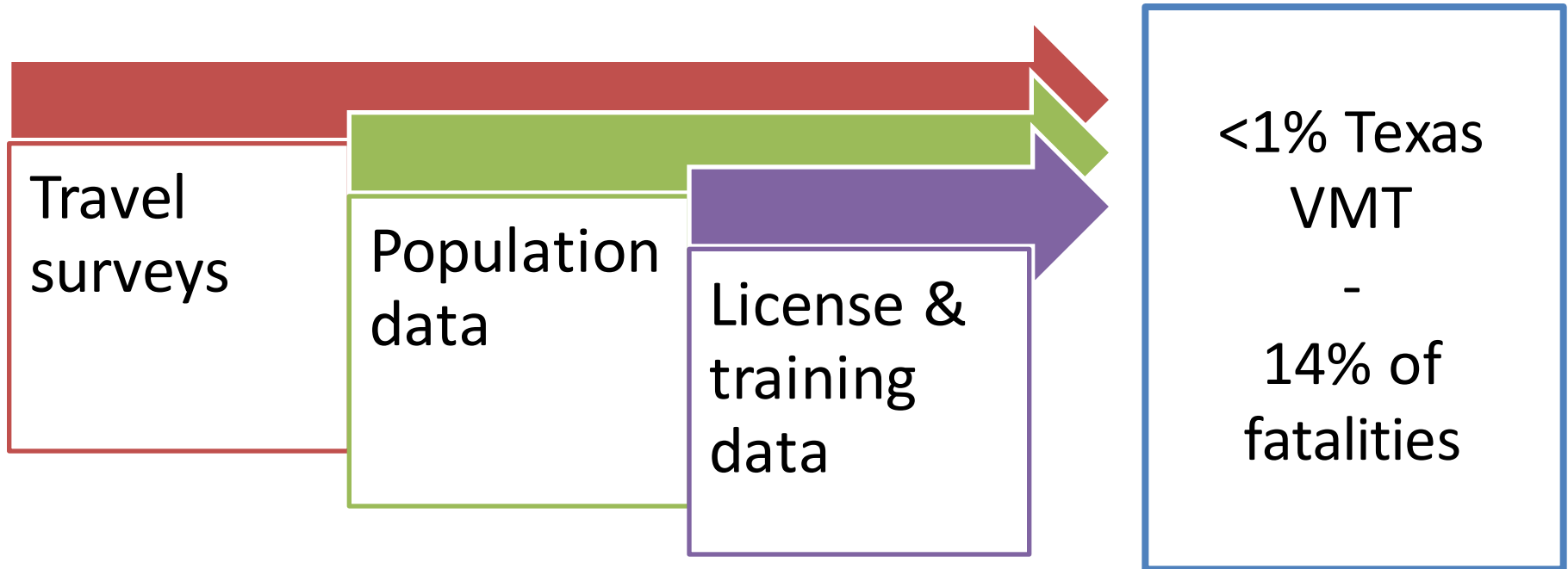
Crashes: motorcycle vs others



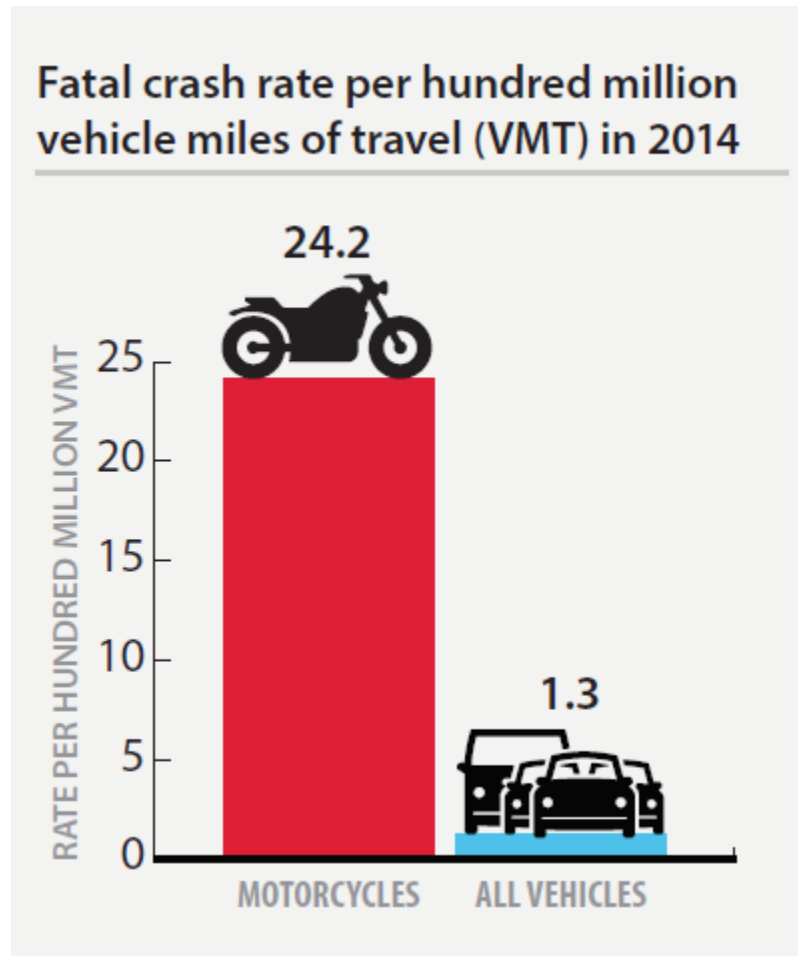
Crashes 2010-2015



VMT: How much are riders riding?



Rates: Motorcycles vs others



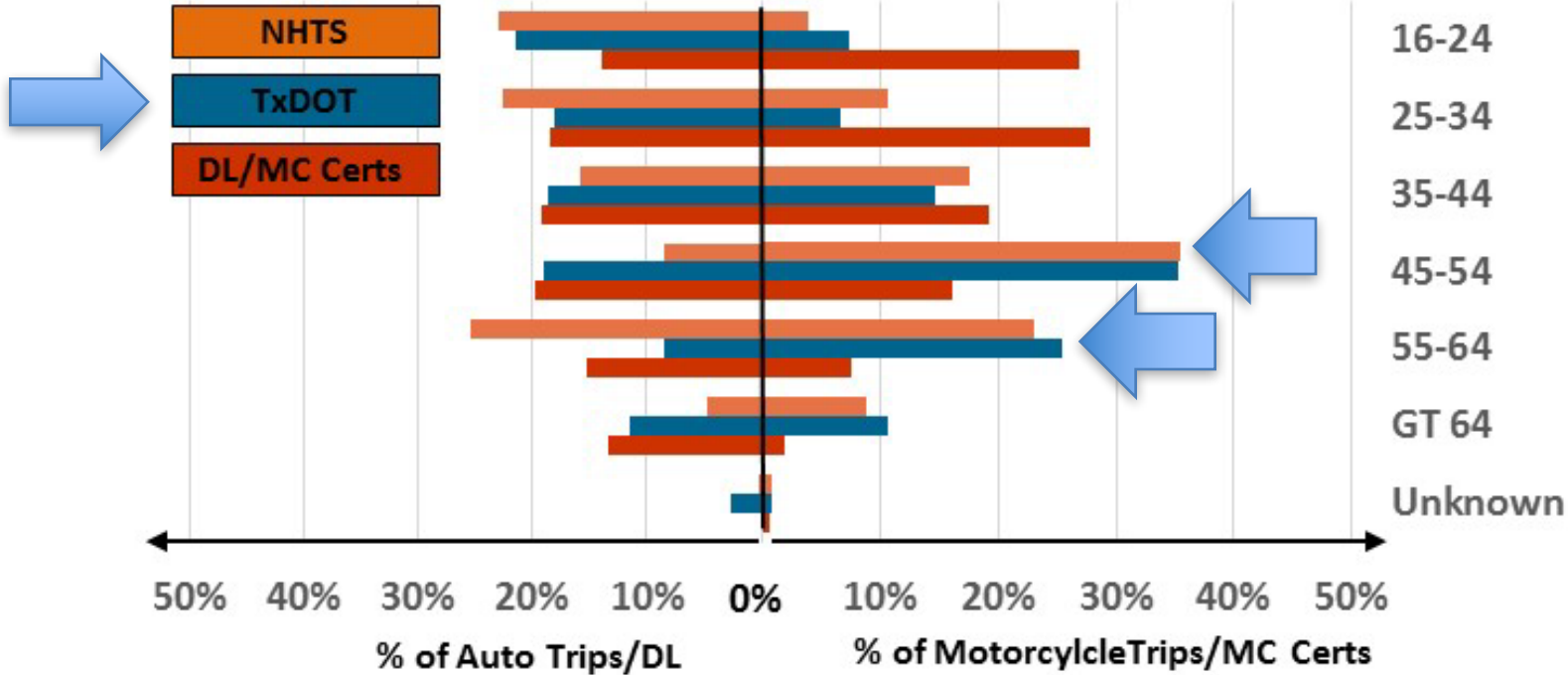
Rates: Motorcycles vs others

Crash and injury rates based on VMT for motorcycles versus all vehicles for Texas, 2014*

	Fatal Crash Rate	Incapacitating Crash Rate	Fatal and Incapacitating Crash Rate	Total Crash Rate
Motorcycles	24.2	100.1	124.3	464.8
All Vehicles	1.3	5.6	6.9	196.5
	Fatal injury Rate	Incapacitating Injury Rate	Fatal and Incapacitating Injury Rate	All injury rate
Motorcycles	25.1	108.6	133.7	439.5
All Vehicles	1.5	7.1	8.5	99.4

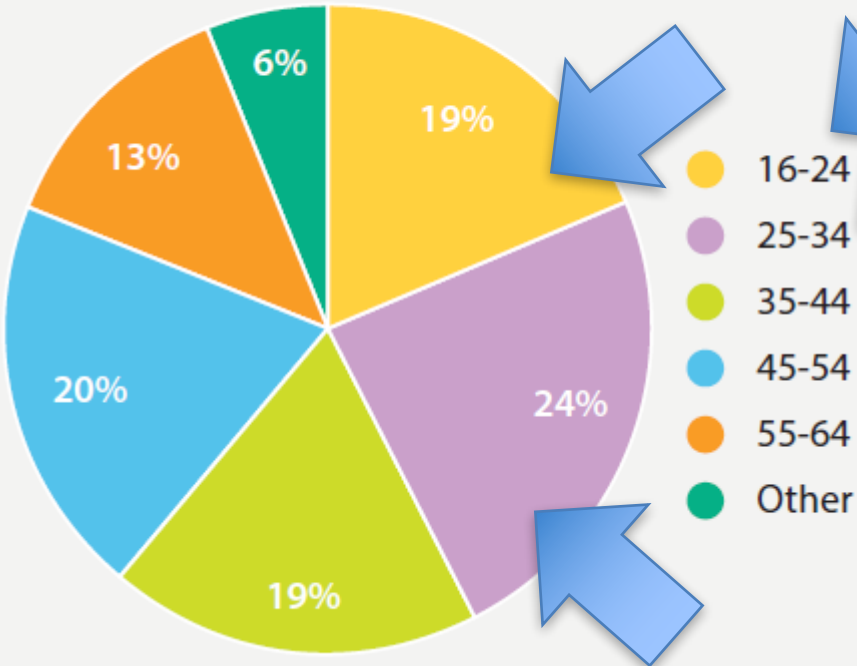
*Rate per hundred million VMT.

VMT by age

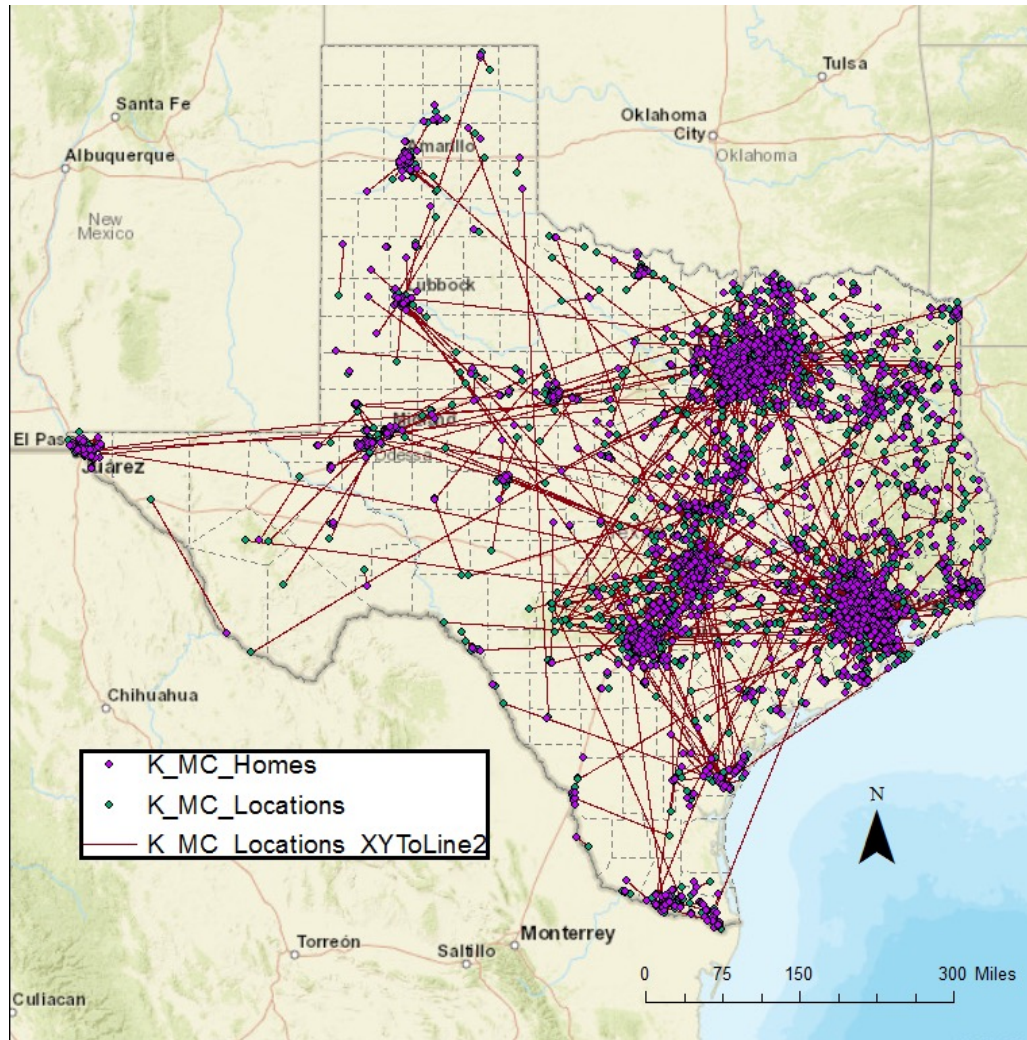


Riders

Riders Involved in Crashes by Age



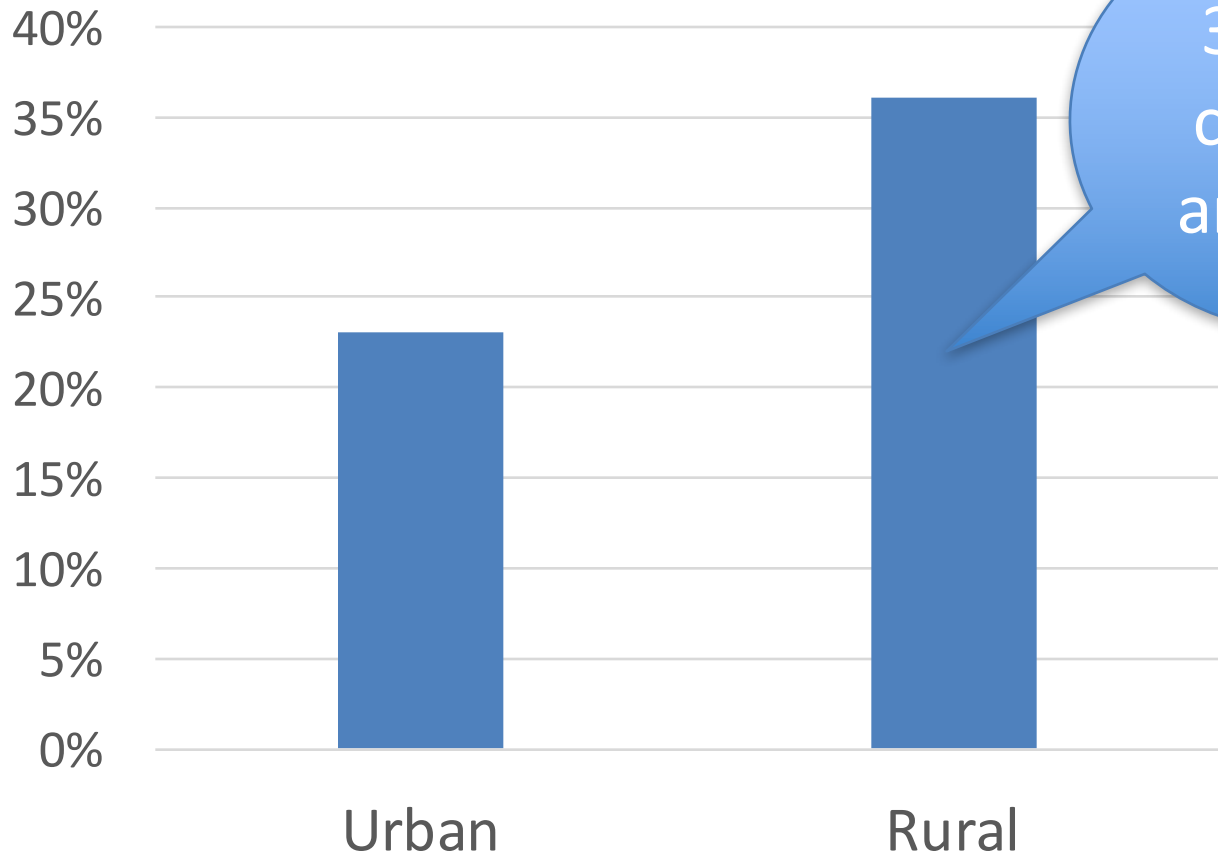
Motorcycle trips



75-80% of all motorcycle VMT is 50 miles or less per rider

Rural

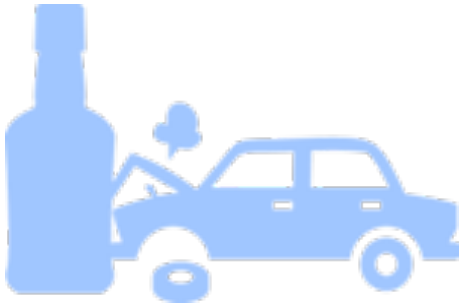
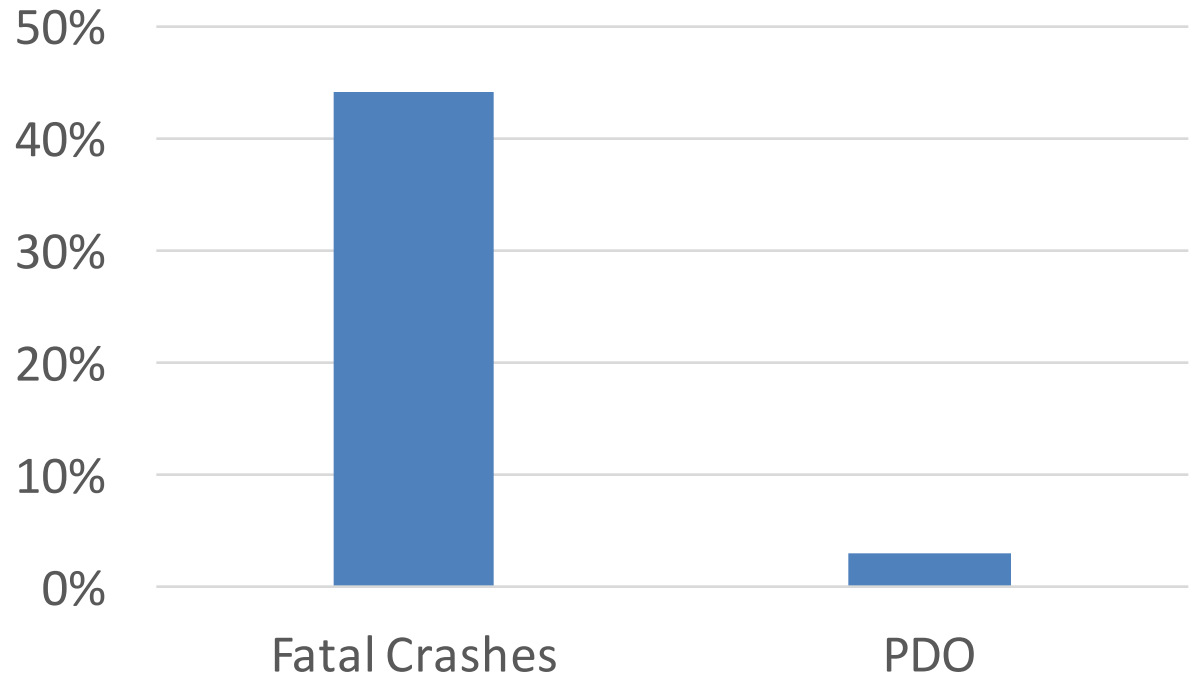
Fatal or incapacitating injuries



30% of
crashes
are rural

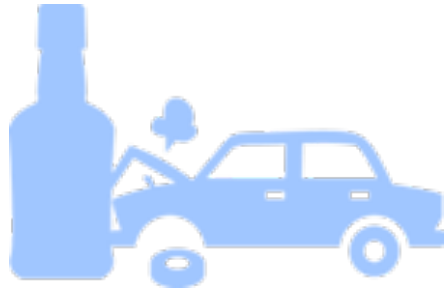
Impaired crashes

Percent Impaired Motorcycle Crashes

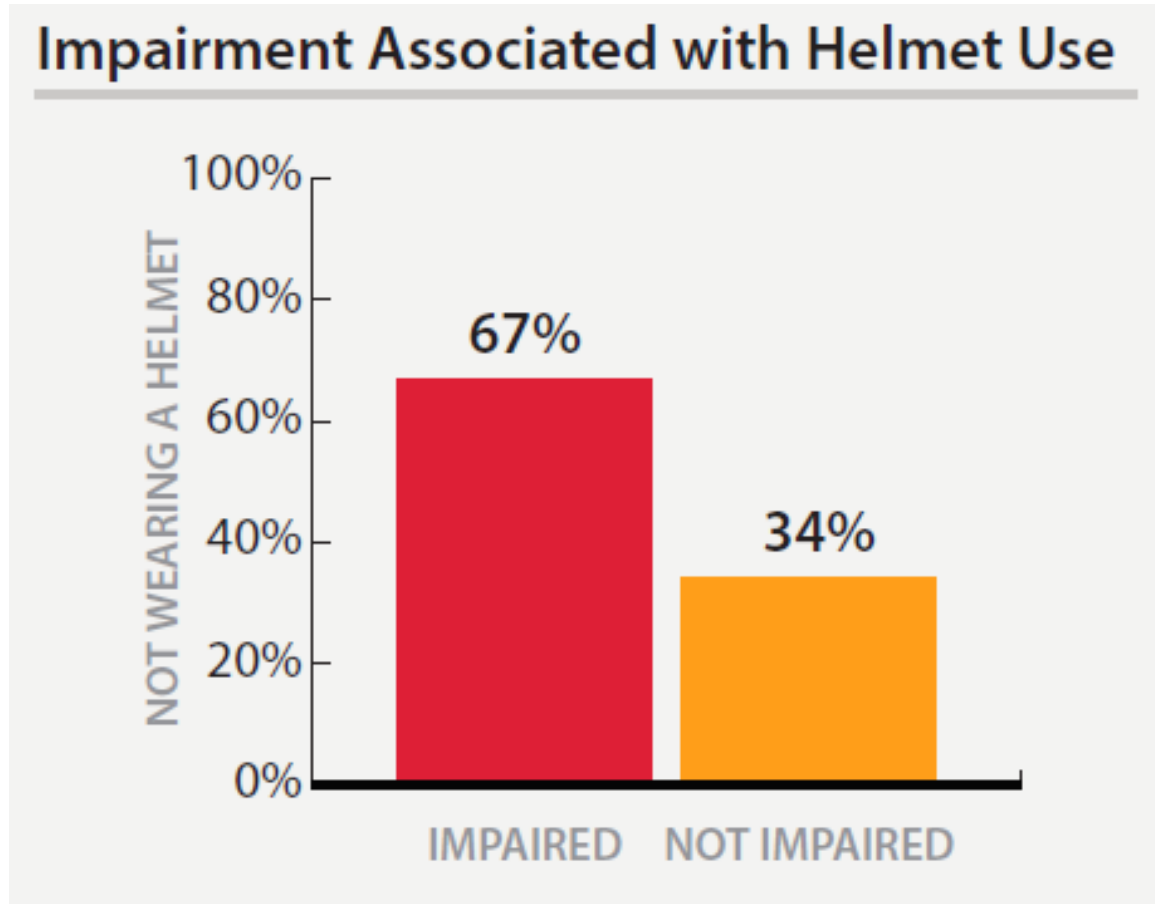


Impaired riders

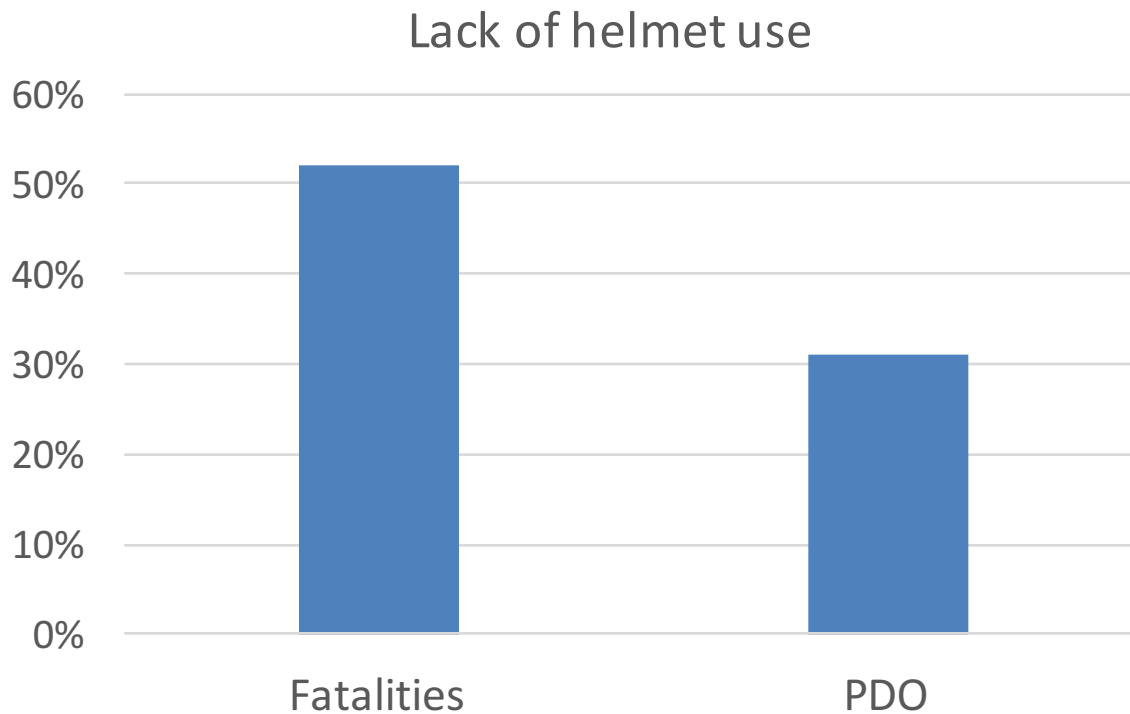
Fatal or incapacitating injury



Impairment & helmet use

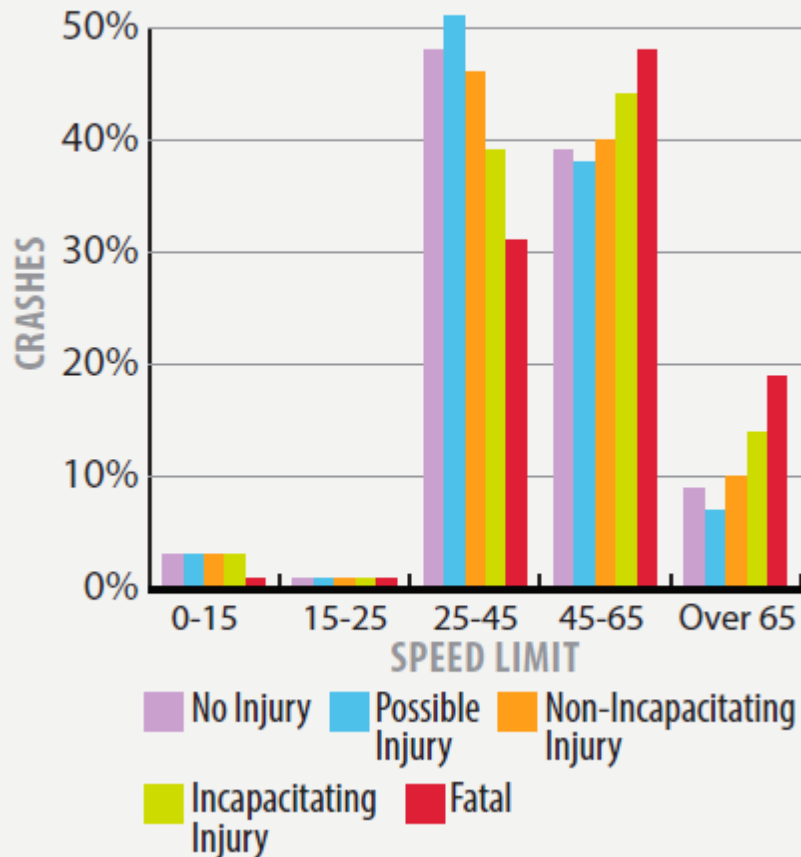


Helmet use & injury severity



Speed

Crash Severity by Speed Limit



Motorcycle crash type

SVROR

50%

65%

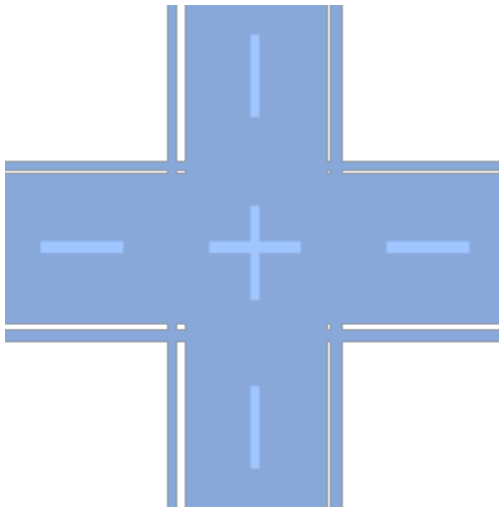
Overtaken

24%

Hit fixed object



Motorcycle crash type



25%

FTYROW-Left

M Endorsement



40%

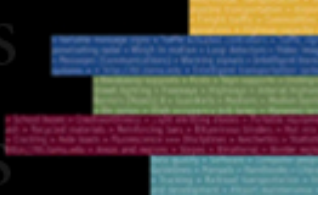
No M endorsement

Comparison with Hurt Report

Table A2: Comparison of findings with the Hurt Report.

Category	Potential Finding	Hurt Study	TTI Study	Note
Crash	1. About half of MC crashes involve a collision with a passenger automobile.	Yes	Yes	Section 5.2
	2. Among intersection crashes, left turns and failure to yield right of way are prominent factors.	Yes	Yes	Section 5.2.1 Section 5.2.2
	3. Most single MC crashes involve colliding with the roadway or a fixed object in the environment.	Yes	Yes	Section 5.3
	4. Curves with specific characteristics are overrepresented at single-vehicle crashes.	–	Yes	Section 5.3.1
	5. Other vehicles (parked car) play a non-contact role in single MC crashes.	No	Yes	Section 5.3
	6. Crash severity increases with speed and DUI factors.	Yes	Yes	Section 5.1
	7. MC crashes are likely to happen a very short distance from the trip origin.	Yes	Yes	Section 8.1.3
Environment	1. Collision with animals on the roadway is a factor in certain geographic areas.	–	Yes	Section 8.1.2
	2. Hot spots vary by time of year or season.	–	Yes	Section 8.1.1
Person	1. Younger MC riders are overrepresented.	Yes	No	Section 6.1
	2. Female MC riders are overrepresented.	Yes	No	Section 6.2
	3. DUI MC crashes may occur in closer proximity to alcohol outlets than non-DUI crashes.	–	Yes	Section 5.1.1.1
	4. Among DUI MC crashes, speeding violations are overrepresented.	–	Yes	Section 6.3.2
	5. MC riders in crashes who were without license or with license revoked are overrepresented.	Yes	Yes	Section 6.5
	6. MC drivers with training are overrepresented in crash data.	Yes	Yes	Section 6.6
	7. Injury severity is similar among those with and without training.	–	Yes	Section 6.6
	8. Crash-involved MC riders were significantly not wearing helmets at the time of the crash.	Yes	Yes	Section 6.7
	9. Injury severity is associated with helmet use.	–	Yes	Section 6.7
	10. Percentages of riders that had worn a helmet are different with age.	–	Yes	Section 6.7
Vehicle	1. Vehicle size may play a large role in MC crashes.	No	Yes	Section 7.1.1
	2. Vehicle color does not affect the possibility of motorcycles being involved crashes.	Yes	Yes	Section 7.1.2
	3. Engine size may contribute to crash risk.	Yes	No	Section 7.2
Weather	1. MC crashes occur under dry surface conditions.	–	Yes	Section 8.1
	2. Dark conditions may be associated with greater crash severity.	–	Yes	Section 8.1

Motorcycle Accident Cause Factors and Identification of Countermeasures, Volume 1: Technical Report, Hurt, H.H., Ouellet, J.V. and Thom, D.R., Traffic Safety Center, University of Southern California, Los Angeles, California 90007, Contract No. DOT HS-5-01160, January 1981 (Final Report).



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TTI Researchers Conduct Five-Year Analysis of Texas Motorcycle Crashes

Posted Dec 7, 2016

Researchers at the Texas A&M Transportation Institute recently completed a five-year analysis of Texas motorcycle crashes.







"The purpose of this project was to understand the complex nature of motorcycle crashes in Texas by constructing a motorcycle crash database and a multi-year analysis of these data with an emphasis on the prevention of fatal and incapacitating injury crashes," says Eva Shipp, Crash Analysis Program manager.



As part of the Texas Department of Transportation sponsored study, [Comprehensive Analysis of Motorcycle Crashes in Texas: A Multi-Year Snapshot](#), Shipp and her team created four fact sheets detailing their findings. These findings include:

- **Motorcycle crashes are more severe than other types of crashes.**
 - 28% of motorcycle crashes were fatal or incapacitating compared to 4% of non-motorcycle crashes.

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Out of all 14 @TxDOT program areas, motorcycle fatalities is the only one to see a decrease.




♥
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51s

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Up now: DJ from @TxDOT presents Overview of Current Motorcycle Numbers & Trends




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Up first: DJ Jeffries from TxDOT shares the latest stats and figures for TX and the news is good...




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Riders and Coalition members are pulling in for our Texas Motorcycle Safety Coalition meeting today!



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1h

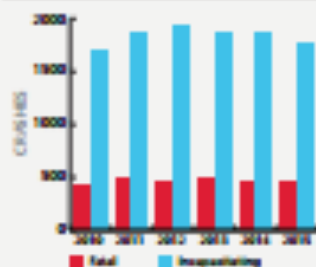




MOTORCYCLE FACTS – CRASH OVERVIEW (2010-2015)



Motorcycle Crashes (2010-2015)



Top Ten Counties

Counties	Population	Fatal and Incapacitating rates per 100,000 population
Texas	28,997	84.4
Harris	23,969	76.8
Dallas	23,891	76.1
Collin	23,863	74.7
El Paso	20,076	73.3
San Antonio	17,011	71.8
Travis	16,961	70.8
Denton	16,736	69.6
Coventry	14,118	73.9
Weslaco	11,196	72.7
STATE TOTAL	29,000,000	84.4

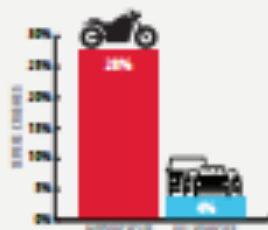
- The number of registered motorcycles doubled from 176,129 in 2000 to 448,891 in 2014. This dramatic increase suggests that crashes with motorcycles will continue to be a traffic safety issue.
- The counties with the most motorcycle registrations were Bexar, Collin, Dallas, Denton, El Paso, Harris, Montgomery, Tarrant, and Travis, which corresponds to the most populated areas of Texas.
- In 2015, there were over 3,200 motorcycle crashes. The severity of these crashes were classified as:
 - 6% fatal injury.
 - 27% incapacitating injury.
 - 38% non-incapacitating injury.
 - 27% possible injury.
 - 14% no injury.
- The percentage of crashes classified as fatal or incapacitating is similar from 2010 to 2015.
- Overall more crashes occur in urban areas (70%) but rural crashes are more serious. Of rural motorcycle crashes, 38% resulted in a fatal or incapacitating injury compared to 23% in urban areas.
- The rate of fatal or incapacitating motorcycle crashes was 8.4 per 100,000 population in 2015. Below are the counties with the highest rates of fatal and incapacitating motorcycle crashes as compared to the state in 2015.



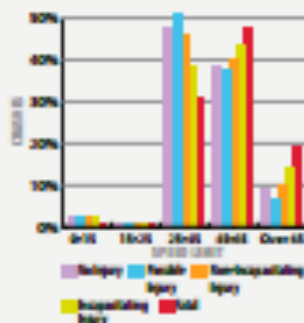
MOTORCYCLE FACTS – CRASH FACTORS (2010-2015)



Severe Crashes by Vehicle Type



Crash Severity by Speed Limit



- Motorcycle crashes are more severe than other types of crashes.
 - 28% of motorcycle crashes were fatal or incapacitating compared to 4% of non-motorcycle crashes.
 - 17% of motorcycle crashes result in only property damage compared to 67% of non-motorcycle crashes.
- Impairment is associated with motorcycle crash severity.
 - Of total motorcycle crashes, 44% involved an impaired rider. Of motorcycle crashes that resulted in only property damage, only 3% involved an impaired rider.
- Speeding is related to motorcycle crash severity.
 - 30% of fatal motorcycle crashes involved speeding as a contributing factor.
 - 7% of crashes that resulted in only property damage involved speeding as a contributing factor.
- About 30% of motorcycle crashes were single-vehicle crashes.
 - 48% involved the motorcycle overrunning.
 - 28% involved the motorcycle hitting a fixed object.
- Among multi-vehicle crashes at intersections, the most common contributing factor (23%) was failure to yield the right-of-way while turning left.
- Among motorcycle crashes occurring on curves, 70% occurred on those with a large radius (7000+ feet).
- Rural areas present unique crash risks for motorcycles (e.g., large vehicles).
 - Of animal-involved motorcycle crashes in rural areas, 33% were fatal or incapacitating. In urban areas, 10% of animal-involved motorcycle crashes were fatal or incapacitating.

NOTES

Miscellaneous motorcycle operators unless otherwise noted.
Impairment includes alcohol, drugs, or medication.
Severe injury is a fatal or incapacitating injury.