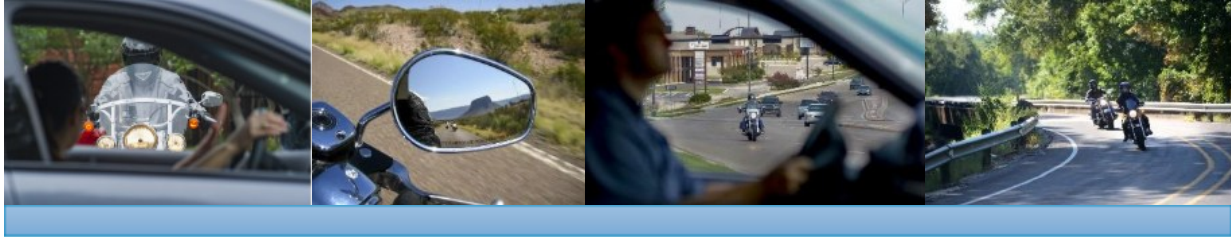


Statewide Motorist Awareness and
Motorcyclist Safety Outreach and Support
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Motorcycle Crashes in Texas 2016-2025: Trends and Contributing Factors Crash Analysis

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INTRODUCTION

In 2025, approximately 369,000 motorcycles were registered in Texas. Although motorcycles likely comprise a relatively small proportion (estimated to be less than 1 percent based on national estimates¹) of the total motor vehicles in operation and related vehicle miles of travel, motorcycle crashes account for a considerable proportion (14 percent in Texas in 2025) of all fatal crashes each year in Texas. In 2025, there were 559 motorcyclists (operators and passengers) who died on Texas roads. In that same year, motorcyclists sustained 2,465 suspected serious injuries.

Fatal and suspected serious injury crashes involving motorcycles generally declined from 2016 to 2019. However, these crashes increased substantially thereafter. From 2019 to 2023, fatal crashes increased from 408 to 591. Similarly during that same time period, suspected serious injury crashes increased from 1,708 to 2,363. After 2023, the numbers started to decrease. However, based on the most recent data for 2025, the numbers remained elevated at 561 fatal and 2,348 suspected serious injury crashes. These trends highlight the continued need to examine motorcycle crash patterns, rider characteristics, roadway conditions, licensing and training access, protective gear use, and other factors like unsafe driving behavior that may contribute to severe motorcycle crash outcomes.

Motorcyclists are at a considerably increased risk of sustaining a fatal or non-fatal injury due to a crash. There are several reasons for the overrepresentation of motorcyclist crashes, including:

- Operating requirements for a motorcycle
 - Ability to maintain balance
 - Coordination of actions and senses
 - Traction management
 - Acute awareness
- Motorcycle conspicuity
 - Size
- Motorcycle as an open environment
 - Heat
 - Cold
 - Poor weather and lighting conditions
 - No protection in a crash from roadway, fixed objects, and other potential hazards

Many of the injuries and fatalities sustained by motorcyclists are associated with high medical treatment and other costs that may also result in long-term consequences (e.g., morbidity)². In

¹ Federal Highway Administration (FHWA), *Highway Statistics 2024*, Table VM-1, *Annual Vehicle Distance Traveled in Miles and Related Data*.

² The Community Guide. Motor vehicle-related injury prevention: Use of motorcycle helmets, universal helmet laws. Available at: https://www.thecommunityguide.org/sites/default/files/assets/MVOI-Motorcycle-Helmets-Laws-Mandating-Use_1.pdf [14 pages]

addition, motorcycle riders who are diagnosed with a traumatic brain injury, spinal cord injury, or other serious injury may never achieve the same quality of life they enjoyed prior to the crash. These injuries impact not only on the motorcyclist but also their family members and friends.

Given the frequency of motorcycle crashes and their potential for notable costs in terms of loss of life as well as economic costs, there is an urgent need to continue to work diligently toward driving the frequency of these crashes toward zero. To this end, the purpose of this project was to understand the complex nature of motorcycle crashes in Texas with an emphasis on the prevention of fatal and suspected serious injury crashes.

METHODS

The crash data review focused on the years ranging from 2016 to 2025.

DATA SOURCES

The crash data review involved analyzing data from three sources for motorcycles: crash records, licensing records, and vehicle registration records. Each data source is described in detail below.

Motorcycle Crash Data (TxDOT)

The Texas Department of Transportation (TxDOT) collects, processes, records, and codes crash data submitted by law enforcement officers through the Texas Peace Officer's Crash Report. Information from these crash reports is entered into the Crash Records Information System (CRIS), which serves as the statewide electronic crash database. CRIS data from 2016 through 2025 were obtained and analyzed for this report. The data were extracted in June 2026. Both the free-text crash narrative and the structured data were examined.

For this analysis, motorcycle crashes were defined as crashes involving at least one motorcycle unit, including police motorcycles, or an operator or passenger of a motorcycle type vehicle. The crash data were used to examine overall motorcycle crash trends, injury severity, roadway characteristics, crash location, crash type, contributing factors, temporal patterns, and other variables relevant to motorcycle safety.

Motorcycle Registration Data

Motor vehicles are required to be registered annually with the State of Texas. The Texas Department of Motor Vehicles (TxDMV) maintains data on motor vehicle registrations by vehicle type. For this project, motorcycle registration data were obtained for 2020 through 2025. Each annual file represents a year-end snapshot of registered motorcycles in Texas. The registration data were used to compare motorcycle crash patterns with the number of registered motorcycles by geographic area. These data also supported the development of crash rates, including average motorcycle crashes per 1,000 motorcycle registrations.

Motorcycle Licensing Data

Texas driver licenses are issued by license class based on vehicle type, vehicle weight, and passenger capacity. In general, license classes include Class A, Class B, Class C, and Class M. The Class M license authorizes operation of motorcycles. Motorcycle riders can have another class in addition to their M Class. The Texas Department of Public Safety (TxDPS) maintains driver license data, including information related to motorcycle license holders. For this project, Class M license data were obtained for 2020 through 2025. Each annual file represents a year-end snapshot of Class M license holders in Texas.

The license data were used to compare motorcycle crash patterns with the number of licensed motorcycle operators by geographic area. These data also supported the development of crash rates, including average motorcycle crashes per 1,000 motorcycle license holders.

STATISTICAL METHODS AND PRIORITIZATION OF ISSUES

The statistical methods included traditional descriptive statistics including counts, percentages, means, medians, and ranges. Following the computation of descriptive statistics, issues were prioritized using a frequency and severity matrix. Frequent issues are those that were common across all crash severities. Severe issues were those where fatal (K) and suspected serious (A) crashes were overrepresented. An overrepresentation occurred when the proportion of KA crashes for that issue was above the overall proportion of KA motorcycle crashes for the state. Ultimately, issues that are both frequent and severe should be prioritized followed by issues that are either frequent or severe.

In addition to the analysis of the structured data fields, the team completed two subsequent analyses. First, the distance between the crash site and the riders' home address was computed to better understand if being unfamiliar with a specific roadway or the laws in Texas could contribute to high-risk driving behaviors and subsequent crashes in an area known for leisure rides. Second, the team used key word searches and natural language processing to examine the free-text crash narratives. The topics included use of gear other than helmets, information for crashes where no contributing factor was assigned, and lane splitting (also known as lane filtering and lane sharing).

SUMMARY OF PRIORITIZED KEY FINDINGS

PRIORITY ISSUES FOR MOTORCYCLE RIDERS

This section presents priority issues based on the frequency of those issues and/or their severity that may be most relevant to the development of outreach and education materials. Data to support this prioritization is in the following sections.

Table 1 describes priority issues and whether they are frequent, high severity, or both. In addition, the table contains emerging safety issues. Emerging safety issues are those wherein the data may be limited or anecdotal, but still strongly support that the issue be examined further and/or addressed before more data become available in the future.

Many of the issues presented in Table 1 are longstanding safety concerns. These include speed related issues, impairment, distraction, lack of proper licensing, failure to yield the right of way, rural roadways, overturning, curves, intersections, poor weather and lighting conditions, and poor visibility. Common crash days and times continue to include weekends and traditional commuting hours such as 5pm to 6pm. However, new topics include insufficient knowledge of lane splitting laws and riding in potentially unfamiliar, scenic areas.

Table 1. Frequency and Severity Matrix for Texas Motorcycle Crashes, 2016 to 2025.

Issue	High Frequency (This issue is a problem in a lot of crashes)	High Severity (This issue has a higher proportion of KA crashes)	Emerging Issue	Comments
Speeding/speed control/Speed related	yes	yes	no	None
Impairment	no	yes	no	None
Distraction	no	yes	no	Issue is likely under-reported, so the data don't show a high frequency, but these crashes are association with KA crashes when the motorcycle operator is distracted
Failure to yield right of way turning left or at a stop	yes	yes	no	None
No M license	yes	yes	no	None
Rural roadways	yes	yes	no	None
Overturning	yes	yes	no	None
Single vehicle crashes Hitting fixed object	yes	yes	no	None
Single vehicle crashes Hitting animal	no	yes	yes	None
Single vehicle crashes Hitting pedestrian	no	yes	no	100% of crashes involving a pedestrian are KA.

Issue	High Frequency (This issue is a problem in a lot of crashes)	High Severity (This issue has a higher proportion of KA crashes)	Emerging Issue	Comments
Multi-vehicle crash types Head-On	yes	yes	no	None
Multi-vehicle crash types Rear-End	yes	yes	no	None
Multi-vehicle crash types Left Turn	yes	yes	no	None
Curves (overall and speed control) Single Vehicle	yes	yes	no	None
Curves (overall and speed control) Multi-Vehicle	no	yes	no	None
Intersections (particularly making left turns)	yes	yes	no	None
Crashes Fri, Sat, Sun	yes	yes	no	None
Hours during and around 5 to 6 pm	yes	yes	no	None
Increase their visibility overall and especially under dark lighting	no	yes	no	None
Poor weather conditions especially fog, strong crosswinds etc.	no	yes	no	None
Animals in roadway, specifically deer and dogs	no	no	yes	Although not a high frequency issue, emerging evidence suggests it may be a higher severity issue and worthy of special attention in outreach and education programs especially in rural areas.

Issue	High Frequency (This issue is a problem in a lot of crashes)	High Severity (This issue has a higher proportion of KA crashes)	Emerging Issue	Comments
Lack of lane splitting education	no	no	yes	We may have people coming from other states that allow lane splitting; In Texas it remains illegal; drivers overall don't seem to understand the Texas laws: MC and non-MC; need to ask TxDOT to add a coded field to crash report; In addition, outreach and education may also benefit from discussing speed control and use of the outside lane.
People riding in areas (scenic, rural, curvy, high speed) where they are unfamiliar / don't live	no	yes	yes	Real and Edwards Counties are particularly problematic and the seat of the three sisters route. For example, 221 riders crashed in these two counties and only 3 lived there. Average distance from home to crash = 165 miles (range from 0.2-2,053; median = 35 miles)

PRIORITY ISSUES FOR CRASH RECORDS AND LAW ENFORCEMENT

Based on the review of crash narratives, two key themes emerged:

- The narratives provided no data on the use of gear beyond helmets. Helmet use is already included as a structured data field in the crash report.
- Lane splitting was noted directly (n=304) or indirectly (n=740) in the narrative for 1,044 crashes, which is likely to be an underestimate of the issue. The true involvement of lane splitting in crashes likely ranges between 914 to 2,171 crashes of all severities or about 110 to 220 events annually.
- There were 3,528 motorcycle crashes wherein no contributing factors were assigned to any unit/vehicle involved in the crash.

These findings support the following recommendations:

- Encourage the inclusion of a structured data field for lane splitting in the Texas crash report.
- Investigate the value of including a structured data field for gear use beyond helmet use.
- Investigate the phenomenon where contributing factors are not assigned to any of the vehicles for crashes involving motorcycles, particularly when the motorcycle operator loses control of the vehicle.

The review of the structured data presented above supports investigating with law enforcement whether targeted enforcement would be beneficial for preventing crashes:

- Known scenic routes with high potential for riders to be unfamiliar with the roadway and laws.
- Speed enforcement, particularly in rural areas.
- Lane splitting enforcement and education.
- M license citations.

DETAILED DESCRIPTION OF ANALYSIS FINDINGS

MOTORCYCLE LICENSES

In 2025, there were 1,088,771 Class M licensees in Texas. A Class M license authorizes an individual to operate a motorcycle. Nearly all Class M licensees also held another license class, including Class A, Class B, or Class C. Among Class M licensees, 9 percent also held a Class A license, 3 percent held a Class B license, and 88 percent held a Class C license.

Table 2 presents the distribution of license classes among individuals with a Class M license.

Table 2. Distribution of Class M Holders by License Class in Texas, 2025.

License Type	Number of M Licenses	Percent of M Licenses
AM	91,945	8.4%
BM	30,486	2.8%
CM	966,115	88.7%
M	225	<1%
Total	1,088,771	100%

Figure 1 displays the changes in motorcycle registrations by year for the most recent six years. Since 2020, the number of Class M licensees in Texas has remained above 1.07 million. The number increased from 2020 to 2021 to 1.18 million, declined in 2022 to 1.07 million, and then remained relatively stable through 2025 (1.09 million), increasing slightly each year after 2022.

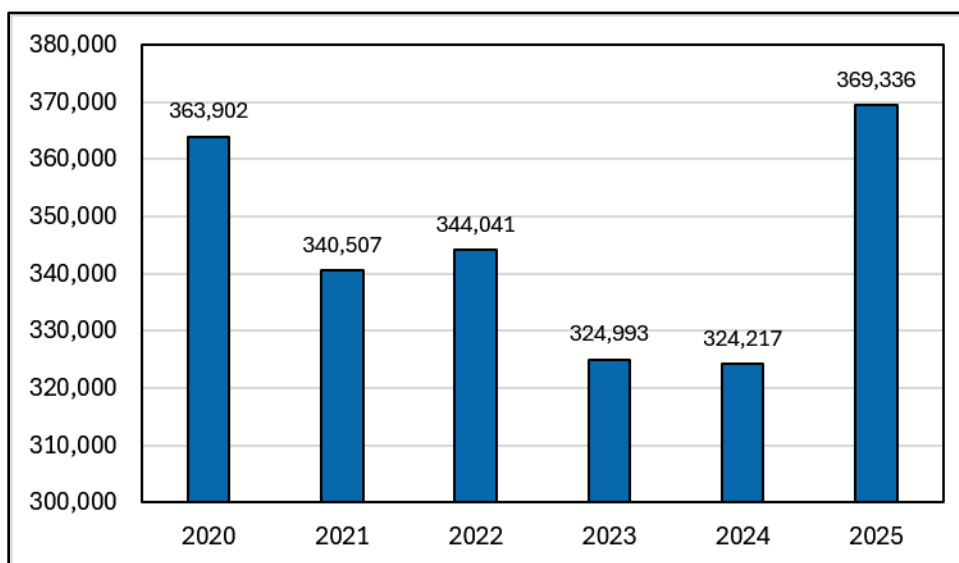


Figure 1. Annual Number of Motorcycle Licensees, 2020-2025.

Figure 2 displays the annual average number of motorcycle licensees by county in Texas from 2020 to 2025. The counties with the highest average number of motorcycle licensees were Harris, Tarrant, Bexar, Dallas, and Travis.

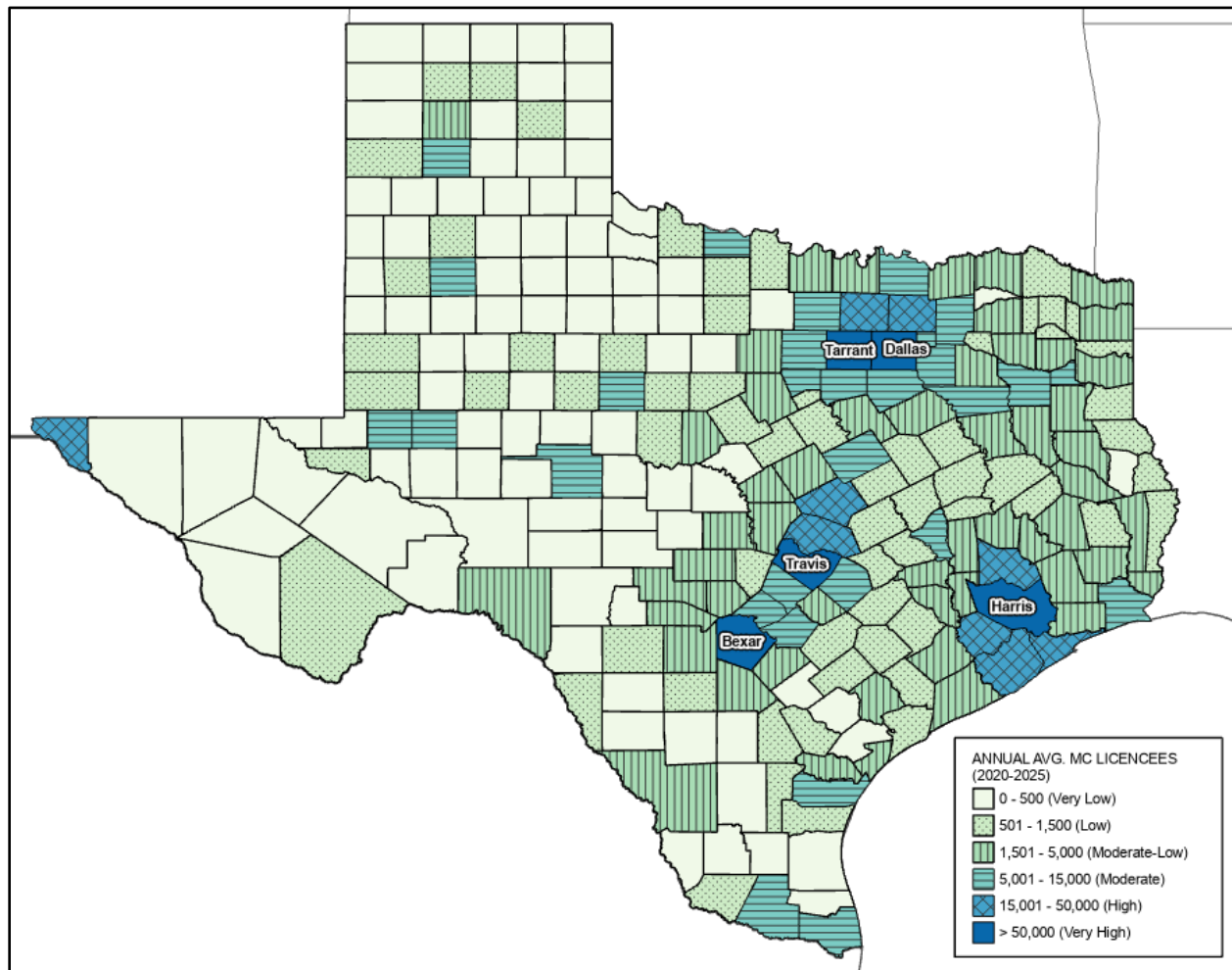


Figure 2. Annual Average Number of Motorcycle Licensees by County, 2020-2025.

MOTORCYCLE REGISTRATIONS

Based on data from TxDMV, the number of registered motorcycles has reduced compared to 10 years ago, from approximately 445,395 in 2014 to 363,902 in 2020. Figure 3 displays the changes in motorcycle registrations by year for the most recent six years.

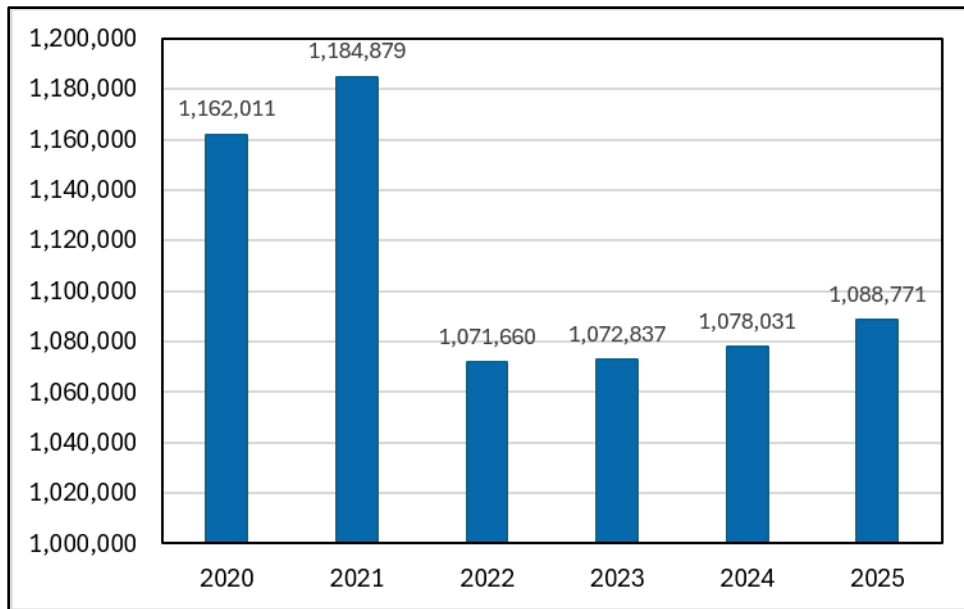


Figure 3. Annual Number of Motorcycle Registrations, 2020-2025.

Since 2020, the number of registered motorcycles in Texas has remained above 324,000. Registrations declined from 2021 through 2024 before increasing in 2025 to a level comparable to 2020. The reason for the decline in 2023 and 2024 may be due to changes in registration requirements due to the COVID-19 public health emergency that began in 2020. As of the end of 2025, approximately 65 percent of registered motorcycles had a model year older than 2010. Figure 4 displays the distribution of motorcycle registrations by county in Texas in 2025. The counties with the highest number of motorcycle registrations were Harris, Tarrant, Bexar, Dallas, and Travis.

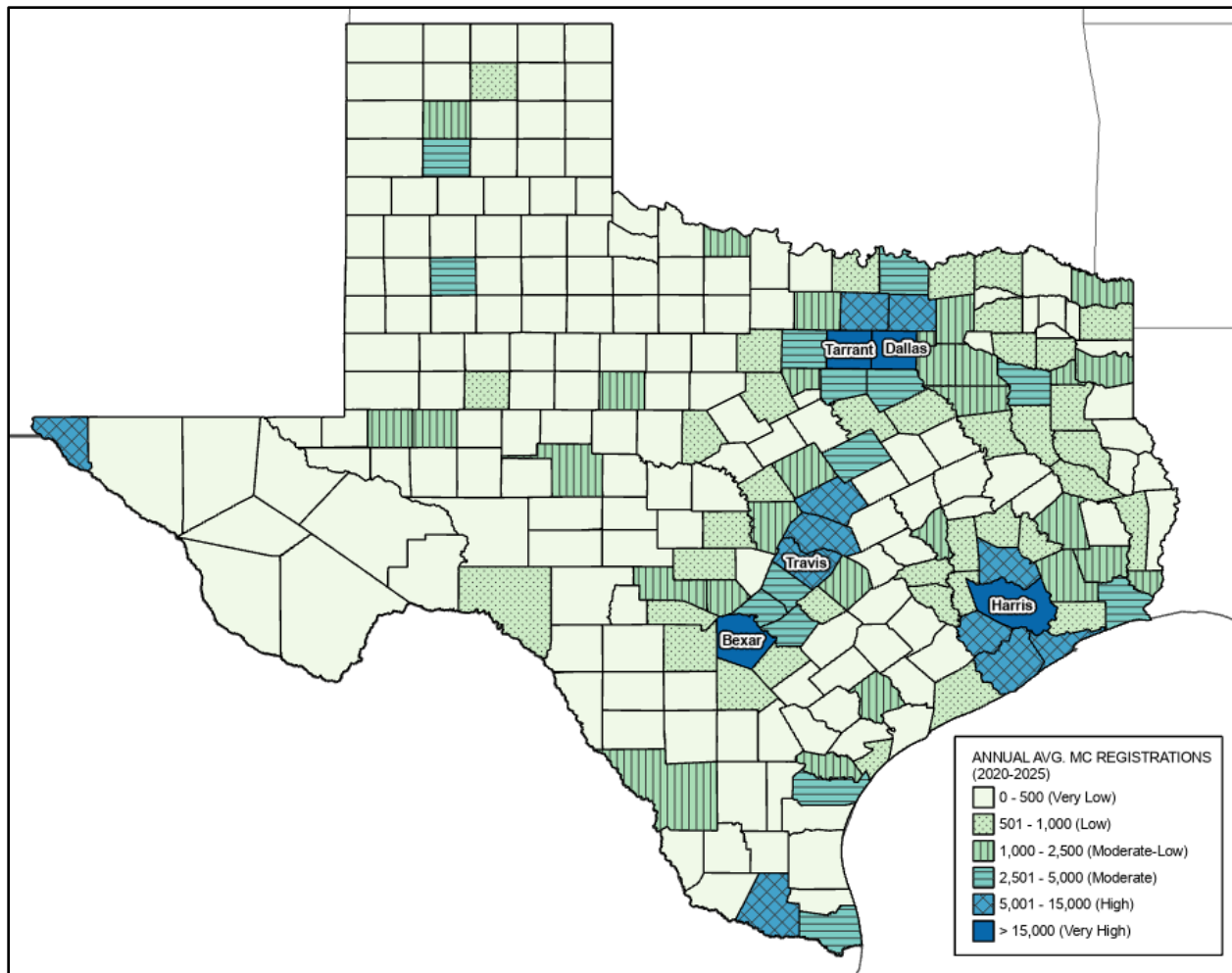


Figure 4. Annual Average Number of Motorcycle Registrations by County, 2020-2025.

LICENSING, REGISTRATION AND CRASHES

A cross tabulation of driver's license class and injury severity for motorcycle operators showed that 51 percent of fatally injured and 50 percent of motorcycle operators with suspected serious injuries were either unlicensed or held a driver license that did not include a Class M license. Table 3 presents the distribution of motorcycle operators by driver license class and injury severity.

Table 3. Motorcycle Operator Driver License Class by Injury Severity, 2016-2025.

Driver's License Class	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	Non-Injury (O)	Unknown Injury	Total
Class A	162	587	737	344	282	12	2,124
Class B	16	82	115	59	47	5	324
Class C	1,891	7,539	10,322	5,287	3,664	225	28,928
Class M	13	123	249	168	131	5	689
Class AM	223	837	1,135	602	477	19	3,293
Class BM	46	180	321	184	172	8	911
Class CM	1,801	7,643	12,154	6,653	5,461	233	33,945
Unlicensed	442	1,942	2,606	1,464	897	52	7,403
Other / Out of State	259	1,118	1,742	850	833	22	4,824
Unknown / Missing	41	308	340	263	243	1,451	2,646
Total	4,894	20,359	29,721	15,874	12,207	2,032	85,087

BASIC CRASH STATISTICS

From 2016 to 2025, there were 83,996 motorcycle crashes in Texas. Figure 5 shows the annual number of motorcycle crashes during this period. On average, approximately 8,400 motorcycle crashes occurred each year, with annual totals ranging from 7,481 to 9,030 crashes.

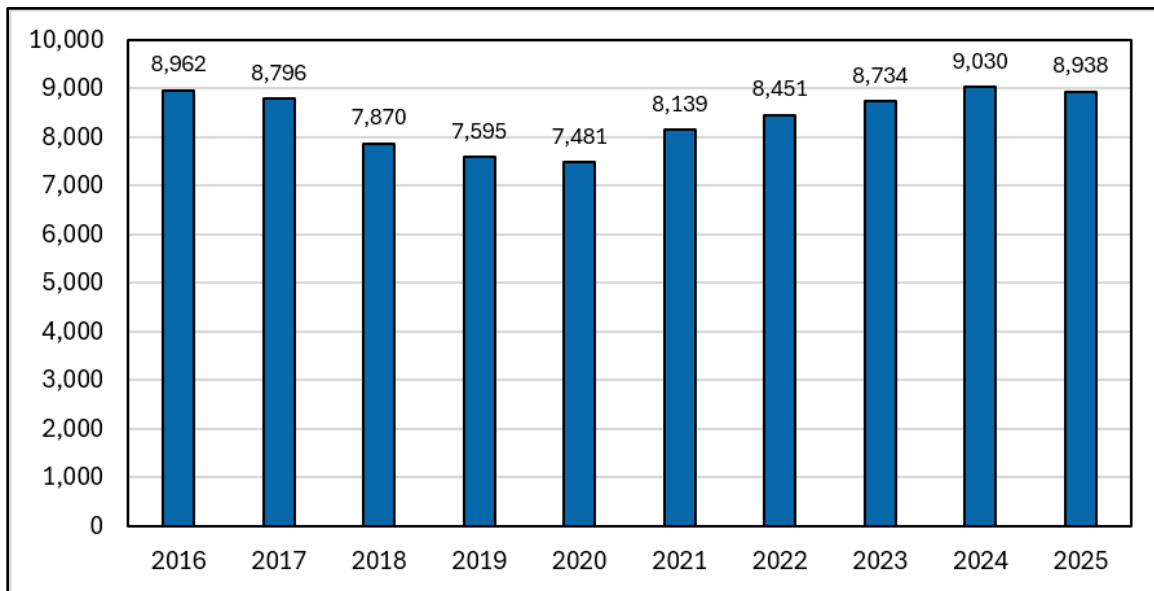


Figure 5. Annual Number of Motorcycle Crashes, 2016-2025.

Crash Severity

Crash severity is assigned based on the highest injury severity sustained by any individual involved in the crash. Severity is defined using the KABCO scale: killed/fatal Injury (K), suspected serious injury (A), suspected minor injury (B), possible injury (C), and non-injury (O).

Figure 6 and Table 4 show the distribution and number of motorcycle crashes by crash severity. From 2016 to 2025, there were 83,996 motorcycle crashes in Texas. Of these, 5,092 crashes, or 6 percent, were fatal, and 20,783 crashes, or 25 percent, involved a suspected serious injury.

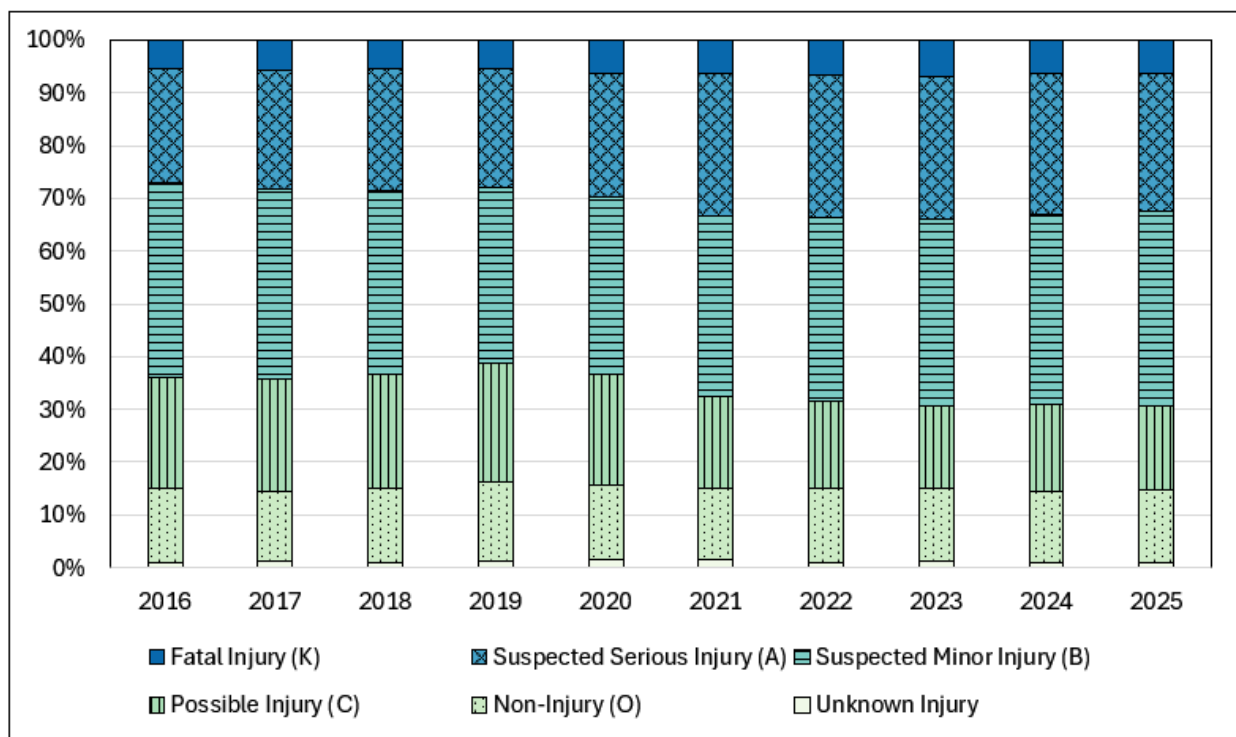


Figure 6. Distribution of Motorcycle Crashes by Crash Severity, 2016-2025.

Table 4. Count of Motorcycle Crashes by Crash Severity, 2016-2025.

Crash Severity	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Fatal Injury (K)	491	491	423	408	475	517	558	591	577	561	5,092
Suspected Serious Injury (A)	1,918	1,995	1,820	1,708	1,757	2,202	2,272	2,363	2,400	2,348	20,783
Suspected Minor Injury (B)	3,334	3,154	2,742	2,534	2,496	2,775	2,959	3,099	3,253	3,277	29,623
Possible Injury (C)	1,870	1,888	1,699	1,720	1,582	1,414	1,382	1,361	1,501	1,440	15,857
Non-Injury (O)	1,272	1,150	1,107	1,142	1,064	1,108	1,189	1,207	1,223	1,230	11,692
Unknown Injury	77	118	79	83	107	123	91	113	76	82	949
Total	8,962	8,796	7,870	7,595	7,481	8,139	8,451	8,734	9,030	8,938	83,996

It is important to note that Figure 6 and Table 4 do not specifically show the highest injury severity sustained by motorcycle riders. *However, a comparison of overall crash severity with the highest injury severity sustained by motorcycle riders indicates that, on an annual basis, approximately 96 percent of crash severity classifications align with the highest or a similar injury severity sustained by the motorcycle rider.*

Rider Severity

From 2016 to 2025, a total of 91,301 motorcycle riders, including operators and passengers, were involved in crashes in Texas. Of these riders, 5,141, or 6 percent, were killed, and 21,947, or 24 percent, sustained a suspected serious injury. Overall, the proportion of riders who sustained a fatal or suspected serious injury crash increased from 25 percent (K: 5.0%; A: 20.4%) in 2016 to 31 percent (K: 5.8%; A: 25.6%) in 2025. Figure 7 and Table 5 show the distribution and count of injury severities among motorcycle riders involved in crashes from 2016 to 2025.

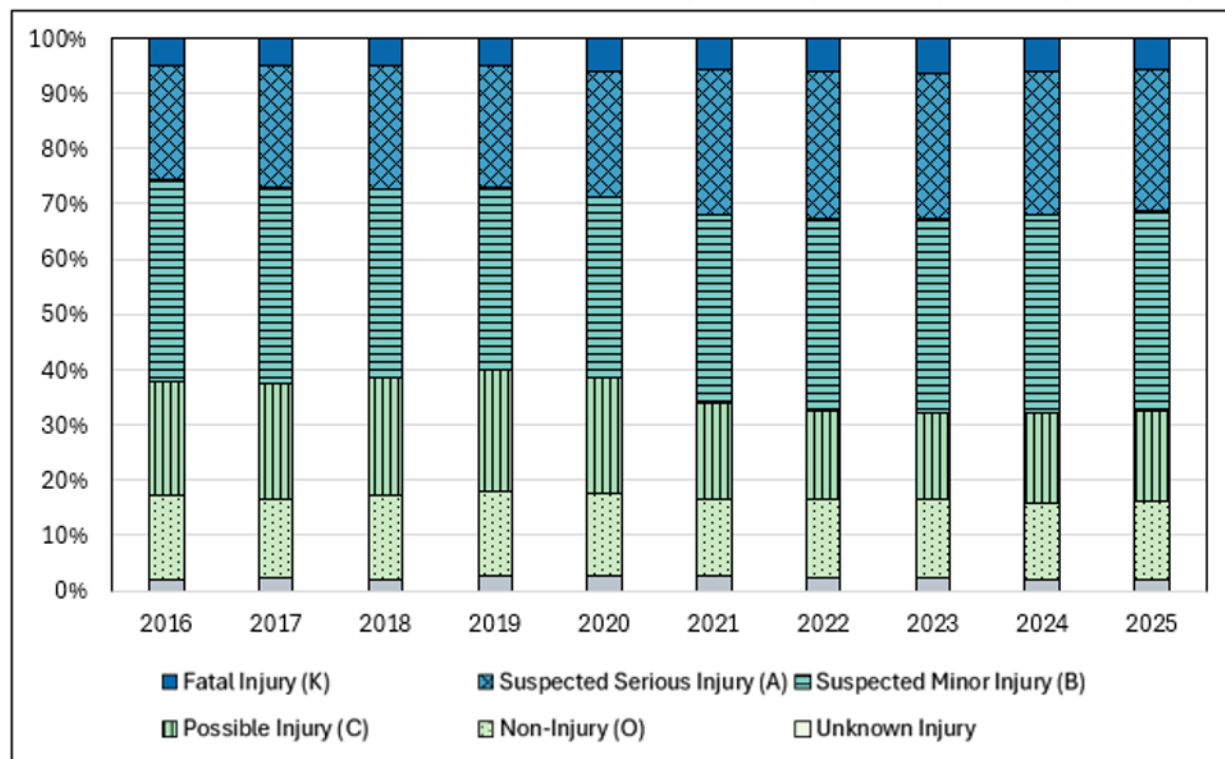


Figure 7. Distribution of Motorcyclist Operators and Passengers by Injury Severity, 2016-2025.

Table 5. County of Motorcyclist Operators and Passengers by Injury Severity, 2016-2025.

Crash Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Fatal Injury (K)	500	498	420	413	483	520	562	600	586	559	5,141
Suspected Serious Injury (A)	2,012	2,105	1,934	1,811	1,858	2,320	2,423	2,485	2,534	2,465	21,947
Suspected Minor Injury (B)	3,621	3,429	2,963	2,731	2,686	3,014	3,151	3,294	3,483	3,483	31,855
Possible Injury (C)	2,013	1,995	1,833	1,833	1,708	1,523	1,470	1,459	1,584	1,547	16,965
Non-Injury (O)	1,513	1,396	1,304	1,277	1,222	1,229	1,280	1,351	1,340	1,370	13,282
Unknown Injury	202	210	182	211	221	247	218	219	198	203	2,111
Total	9,861	9,633	8,636	8,276	8,178	8,853	9,104	9,408	9,725	9,627	91,301

Urbanization

To examine the relationship between urbanization and crash severity, crash severity was analyzed by year for rural and urban crashes, as defined by the population size of the area where the crash occurred. Areas with populations less than 5,000 were classified as rural, while areas with populations of 5,000 or greater were classified as urban.

Figure 8 and Table 6 and Figure 9 and Table 7 show the annual number of motorcycle crashes by severity for rural and urban areas, respectively. Overall, rural areas had a higher proportion of KA crashes compared to urban areas. In rural areas, 8 percent of crashes were fatal (n=2,080), and 31 percent involved a suspected serious injury (n=7,751). In comparison, urban areas had 5 percent fatal crashes (n=3,012) and 22 percent suspected serious injury crashes (n=13,032).

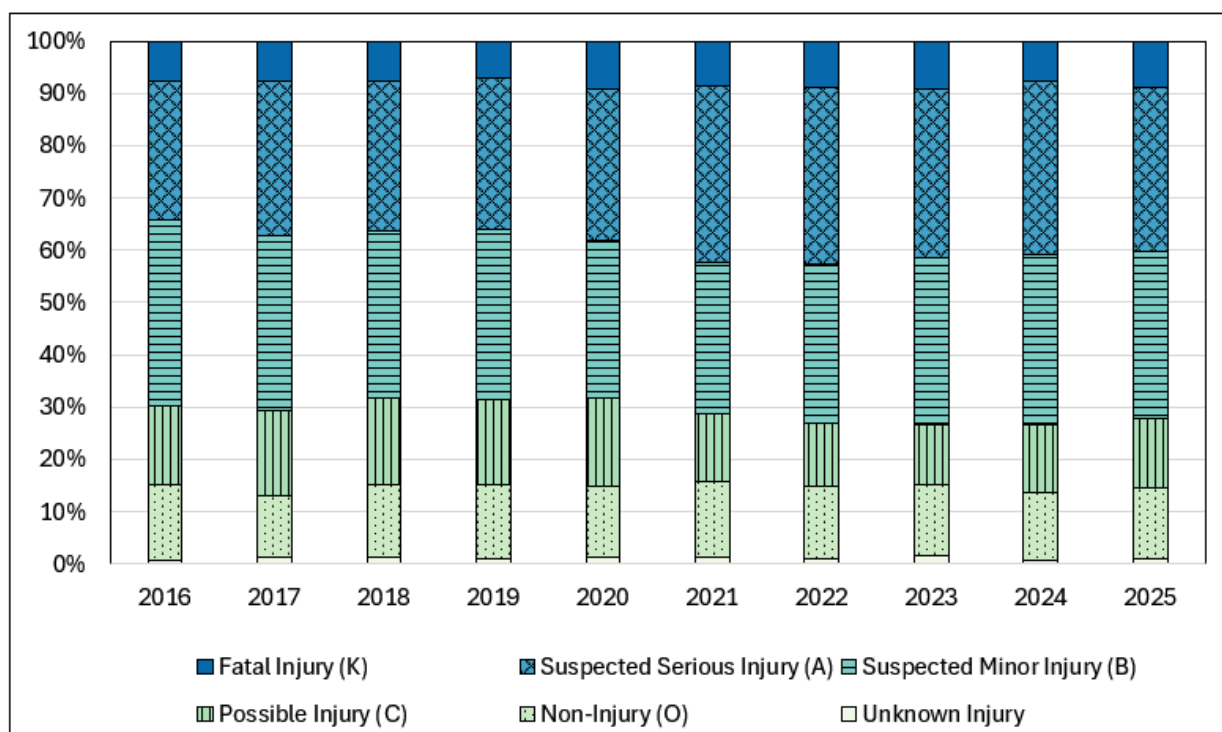


Figure 8. Frequency of Rural Motorcycle Crashes by Crash Severity, 2016-2025.

Table 6. Count of Rural Motorcycle Crashes by Crash Severity, 2016-2025.

Crash Severity	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Fatal Injury (K)	195	194	169	157	213	221	229	252	213	237	2,080
Suspected Serious Injury (A)	673	746	643	639	673	868	864	883	922	840	7,751
Suspected Minor Injury (B)	905	842	720	722	700	742	788	880	914	856	8,069
Possible Injury (C)	377	409	373	361	392	337	311	313	358	353	3,584
Non-Injury (O)	373	298	312	312	317	367	355	372	360	366	3,432
Unknown Injury	14	30	28	22	32	35	24	41	21	27	274
Total	2,537	2,519	2,245	2,213	2,327	2,570	2,571	2,741	2,788	2,679	25,190



Figure 9. Distribution of Urban Motorcycle Crashes by Crash Severity, 2016-2025.

Table 7. Count of Urban Motorcycle Crashes by Crash Severity, 2016-2025.

Crash Severity	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Fatal Injury (K)	296	297	254	251	262	296	329	339	364	324	3,012
Suspected Serious Injury (A)	1,245	1,249	1,177	1,069	1,084	1,334	1,408	1,480	1,478	1,508	13,032
Suspected Minor Injury (B)	2,429	2,312	2,022	1,812	1,796	2,033	2,171	2,219	2,339	2,421	21,554
Possible Injury (C)	1,493	1,479	1,326	1,359	1,190	1,077	1,071	1,048	1,143	1,087	12,273
Non-Injury (O)	899	852	795	830	747	741	834	835	863	864	8,260
Unknown Injury	63	88	51	61	75	88	67	72	55	55	675
Total	6,425	6,277	5,625	5,382	5,154	5,569	5,880	5,993	6,242	6,259	58,806

The analysis further examined KA motorcycle crashes by urbanization status. Figure 10 and Table 8. Count of KA Motorcycle Crashes by Urbanization Status, 2016-2025. Table 8 show the distribution of KA motorcycle crashes by urbanization status. Among these crashes, 62 percent occurred in urban areas (n = 16,044), and 38 percent occurred in rural areas (n = 9,831).

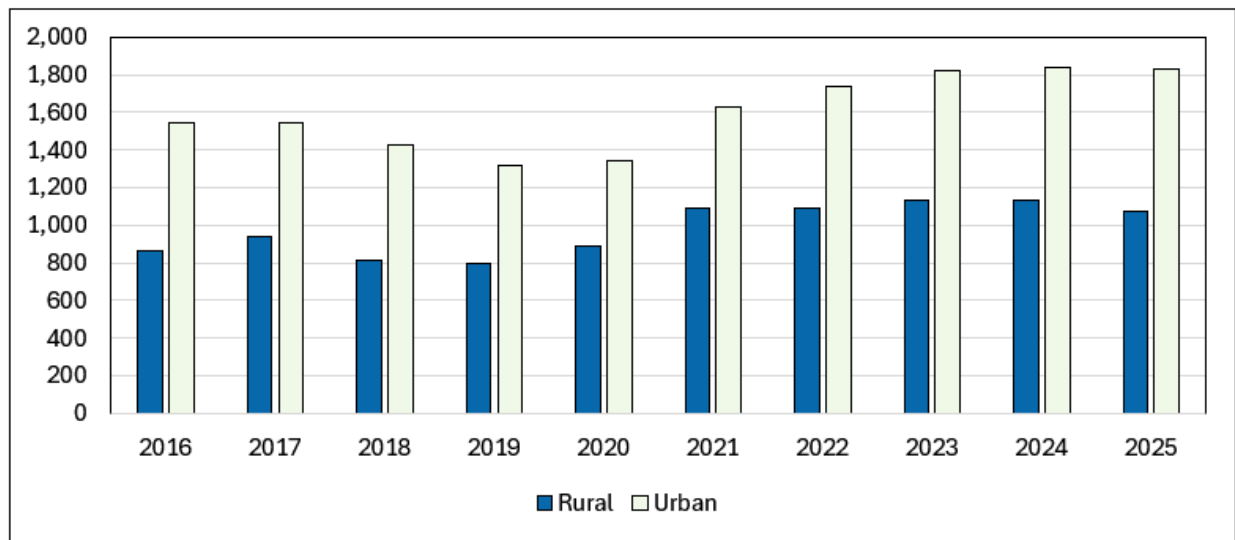


Figure 10. Distribution of KA Motorcycle Crashes by Urbanization Status, 2016-2025.

Table 8. Count of KA Motorcycle Crashes by Urbanization Status, 2016-2025.

Urbanization Status	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Rural	868	940	812	796	886	1,089	1,093	1,135	1,135	1,077	9,831
Urban	1,541	1,546	1,431	1,320	1,346	1,630	1,737	1,819	1,842	1,832	16,044
Total	2,409	2,486	2,243	2,116	2,232	2,719	2,830	2,954	2,977	2,909	25,875

POPULATION SIZE, REGISTRATIONS, AND LICENSEES

Population

Overall, the annual average motorcycle crash rate in Texas was about 28 per 100,000 population from 2020 to 2025. Table 9 and Table 10 present the 10 counties with the highest annual average crash counts and crash rates, respectively. Counties with the highest crash counts were largely located in metropolitan areas where populations concentrate. Harris County had the highest annual average number of crashes, with 1,241 crashes and an annual average crash rate of 25 per 100,000 population from 2020 to 2025.

In contrast, the counties with the highest crash rates were largely rural and had smaller population sizes. Real County, located near San Antonio, had the highest annual average motorcycle crash rate, at 884 crashes per 100,000 population from 2020 to 2025. Motorcycle crash rates by county were mapped to identify spatial trends. This analysis showed that rural areas outside large metropolitan areas tended to have higher motorcycle crash rates, as shown in Figure 11.

Table 9. Top 10 Counties by Annual Average Number of Motorcycle Crashes, 2020-2025.

County	Average Population	Annual Average Crashes	Annual Average Crash Rate Per 100,000
Harris	4,882,871	1240.7	25.4
Dallas	2,650,470	644.0	24.3
Bexar	2,102,699	621.8	29.6
Tarrant	2,190,842	573.2	26.2
Travis	1,357,855	381.8	28.1
El Paso	875,689	288.8	33.0
Collin	1,197,931	228.3	19.1
Denton	1,004,475	215.2	21.4
Montgomery	715,683	200.3	28.0
Hidalgo	906,125	155.0	17.1

Table 10. Top 10 Counties by Annual Average Motorcycle Crash Rate per 100,000 Population, 2020-2025.

County	Average Population	Annual Average Crashes	Annual Average Crash Rate Per 100,000
Real	2,791	24.7	883.9
Edwards	1,414	4.7	330.1
Borden	611	0.8	136.4
Briscoe	1,436	1.8	127.6
Jeff Davis	1,970	2.5	126.9
Bandera	22,345	25.7	114.9
Grimes	31,786	30.5	96.0
Menard	1,939	1.8	94.6
Hudspeth	3,505	3.2	90.4
McMullen	575	0.5	87.0

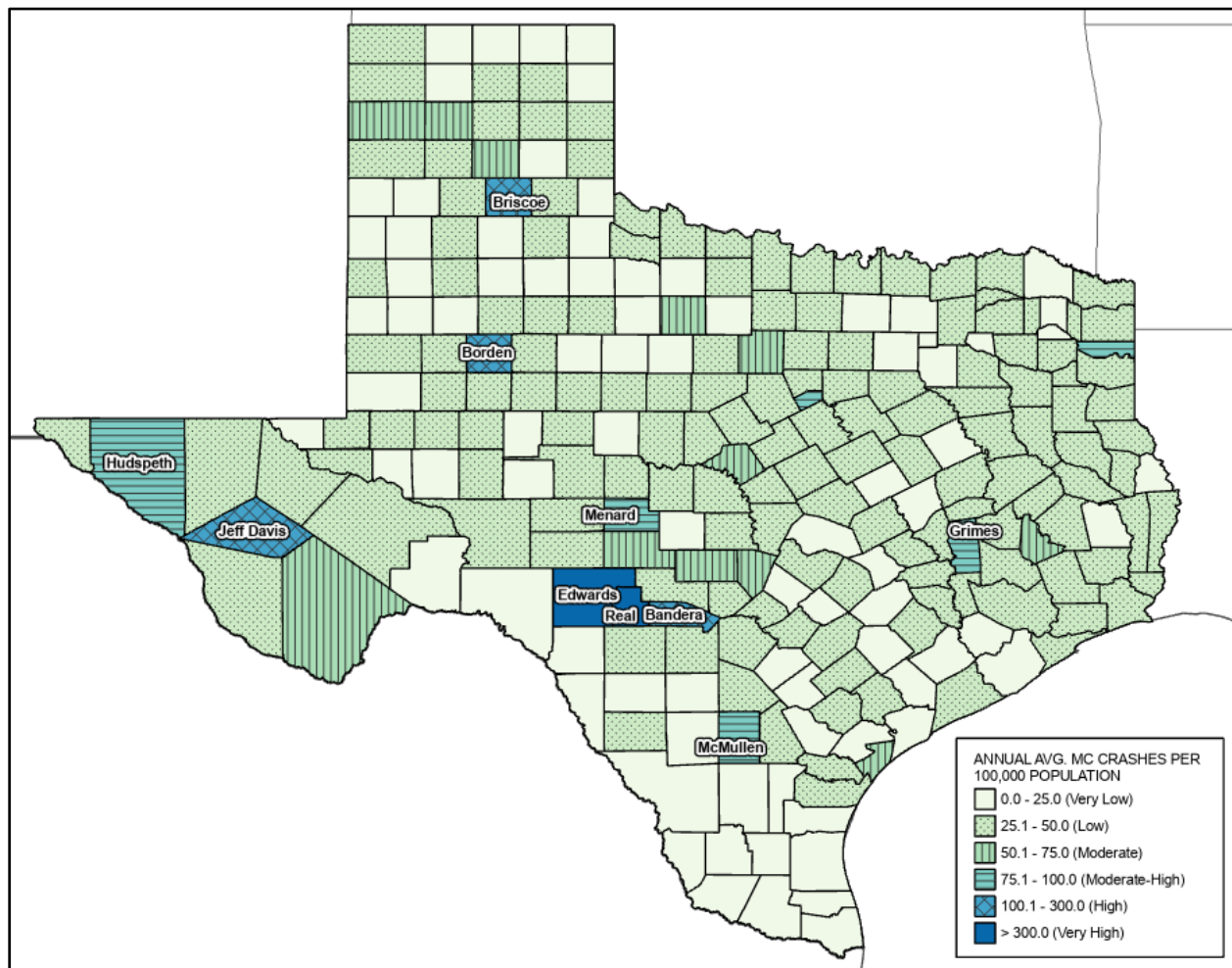


Figure 11. Annual Average Motorcycle Crashes Per 100,000 Population by County, 2020-2025.

Overall, the annual average rate of KA serious injury motorcycle crashes in Texas was nine crashes per 100,000 population from 2020 to 2025. Table 11 and Table 12 present the 10 counties with the highest counts and rates of KA motorcycle crashes, respectively. Counties with the highest crash counts were located primarily in large metropolitan areas. Harris County had the highest annual average number of KA motorcycle crashes, with 340 crashes and an annual average rate of 7 crashes per 100,000 population from 2020 to 2025.

In contrast, the counties with the highest crash rates were largely rural and had smaller population sizes. Real County had the highest annual average KA motorcycle crash rate, at 508 crashes per 100,000 population from 2020 to 2025. KA motorcycle crash rates by county were mapped to identify spatial trends. This analysis showed that rural areas outside large metropolitan areas tended to have higher rates of KA motorcycle crashes, as shown in Figure 12.

Table 11. Top 10 Counties by Annual Average Number of KA Motorcycle Crashes, 2020-2025.

County	Average Population	Annual Average KA Crashes	Annual Average KA Crash Rate Per 100,000
Harris	4,882,871	339.8	7.0
Dallas	2,650,470	216.0	8.1
Tarrant	2,190,842	180.8	8.3
Bexar	2,102,699	130.5	6.2
Travis	1,357,855	110.2	8.1
Collin	1,197,931	74.3	6.2
Montgomery	715,683	72.8	10.2
Denton	1,004,475	71.3	7.1
El Paso	875,689	67.8	7.7
Williamson	697,028	50.2	7.2

Table 12. Top 10 Counties by Annual Average KA Motorcycle Crash Rate Per 100,000 Population, 2020-2025.

County	Average Population	Annual Average KA Crashes	Annual Average KA Crash Rate Per 100,000
Real	2,791	14.2	507.6
Edwards	1,414	2.2	153.3
Jeff Davis	1,970	1.7	84.6
Briscoe	1,436	1.2	81.2
Bandera	22,345	15.7	70.1
McMullen	575	0.3	58.0
Armstrong	1,827	1.0	54.7
Borden	611	0.3	54.6
Hudspeth	3,505	1.8	52.3
Oldham	1,780	0.8	46.8

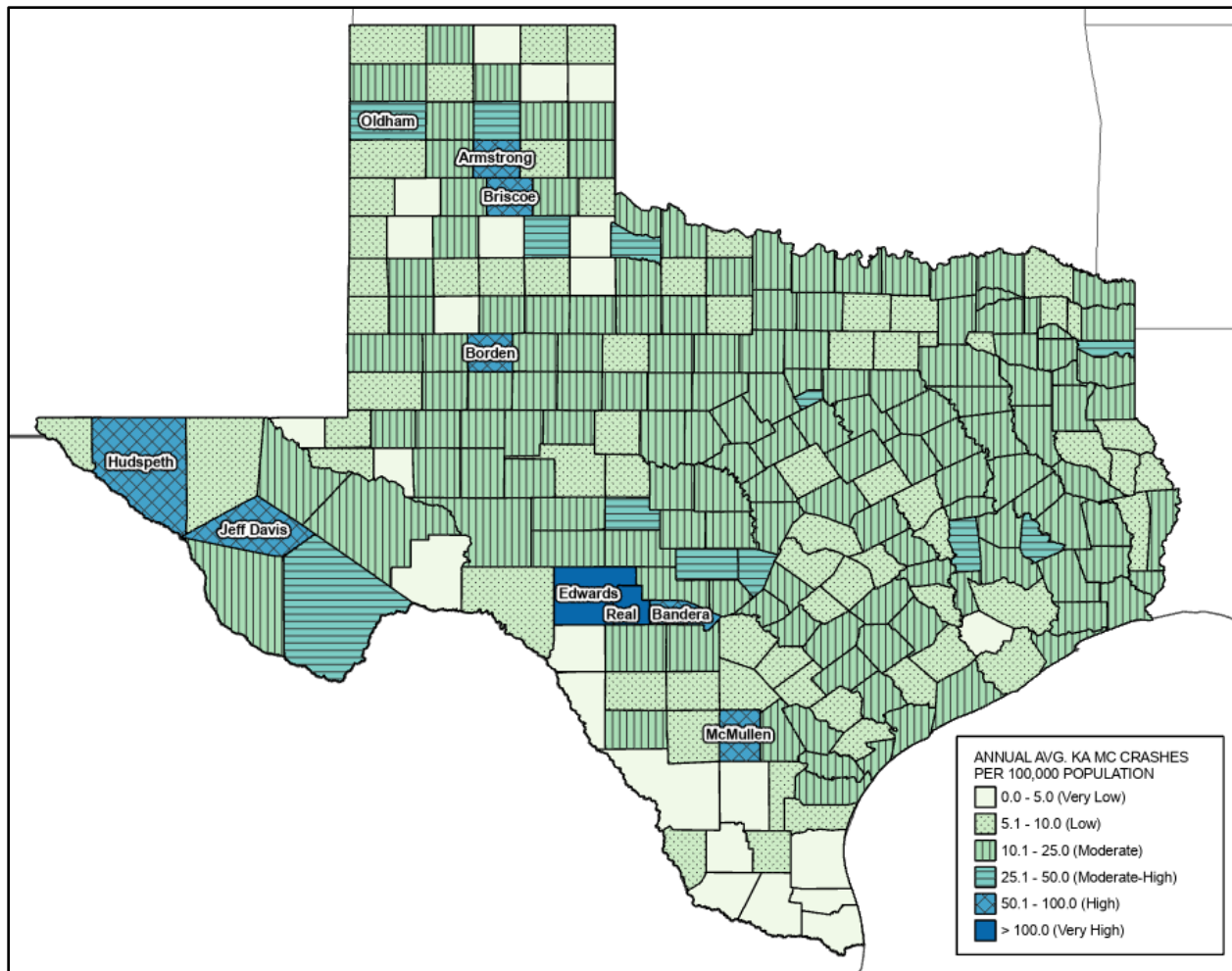


Figure 12. Annual Average KA Motorcycle Crash Rate Per 100,000 Population by County, 2020-2025.

Registrations

Overall, the annual average motorcycle crash rate in Texas was about 25 per 1,000 registered motorcycles from 2020 to 2025; the statewide KA crash rate for the same period was approximately 8 per 1,000 registered motorcycles. Rates of motorcycle crashes per registered motorcycle in all Texas counties were examined for both all motorcycle crashes and KA motorcycle crashes, as shown in Table 13 and Table 14. Real County had the highest annual average crash rate, with 245 motorcycle crashes per 1,000 registered motorcycles. Real County also had the highest annual average rate of KA motorcycle crashes, with 141 crashes per 1,000 registered motorcycles.

Table 13. Top 10 Counties by Annual Average Motorcycle Crash Rate Per 1,000 Registered Motorcycles, 2020-2025.

County	Average Motorcycle Registrations	Annual Average Crashes	Annual Average Crash Rate Per 1,000
Real	101	24.7	245.0
Borden	5	0.8	161.3
Briscoe	12	1.8	159.4
Menard	18	1.8	102.8
Hudspeth	32	3.2	97.9
Edwards	48	4.7	97.2
Grimes	509	30.5	59.9
McMullen	9	0.5	56.6
Jeff Davis	47	2.5	53.4
Glasscock	10	0.5	51.7

Table 14. Top 10 Counties by Annual Average KA Motorcycle Crash Rate Per 1,000 Registered Motorcycles, 2020-2025.

County	Average Motorcycle Registrations	Annual Average KA Crashes	Annual Average KA Crash Rate Per 100,000
Real	101	14.2	140.7
Briscoe	12	1.2	101.4
Borden	5	0.3	64.5
Hudspeth	32	1.8	56.7
Menard	18	0.8	46.7
Edwards	48	2.2	45.1
McMullen	9	0.3	37.7
Jeff Davis	47	1.7	35.6
Oldham	28	0.8	30.3
Grimes	509	13.5	26.5

Figure 13 shows the annual average crash rate per 1,000 motorcycle registrations by county in Texas from 2020 to 2025.

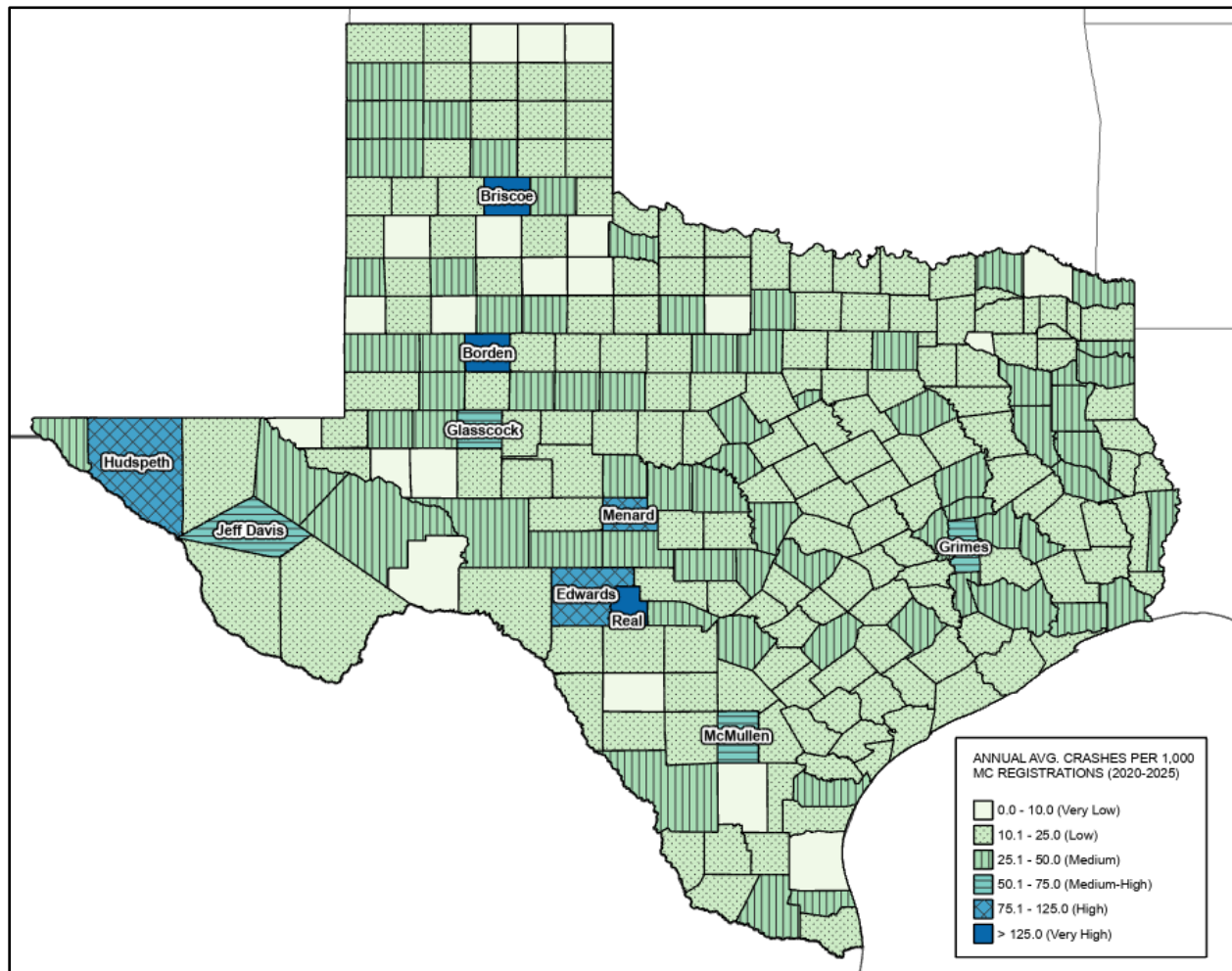


Figure 13. Annual Average Crash Rate Per 1,000 Motorcycle Registrations by County, 2020-2025.

Figure 14 shows the annual average KA motorcycle crash rate per 1,000 registered motorcycles by county in Texas from 2020 to 2025.

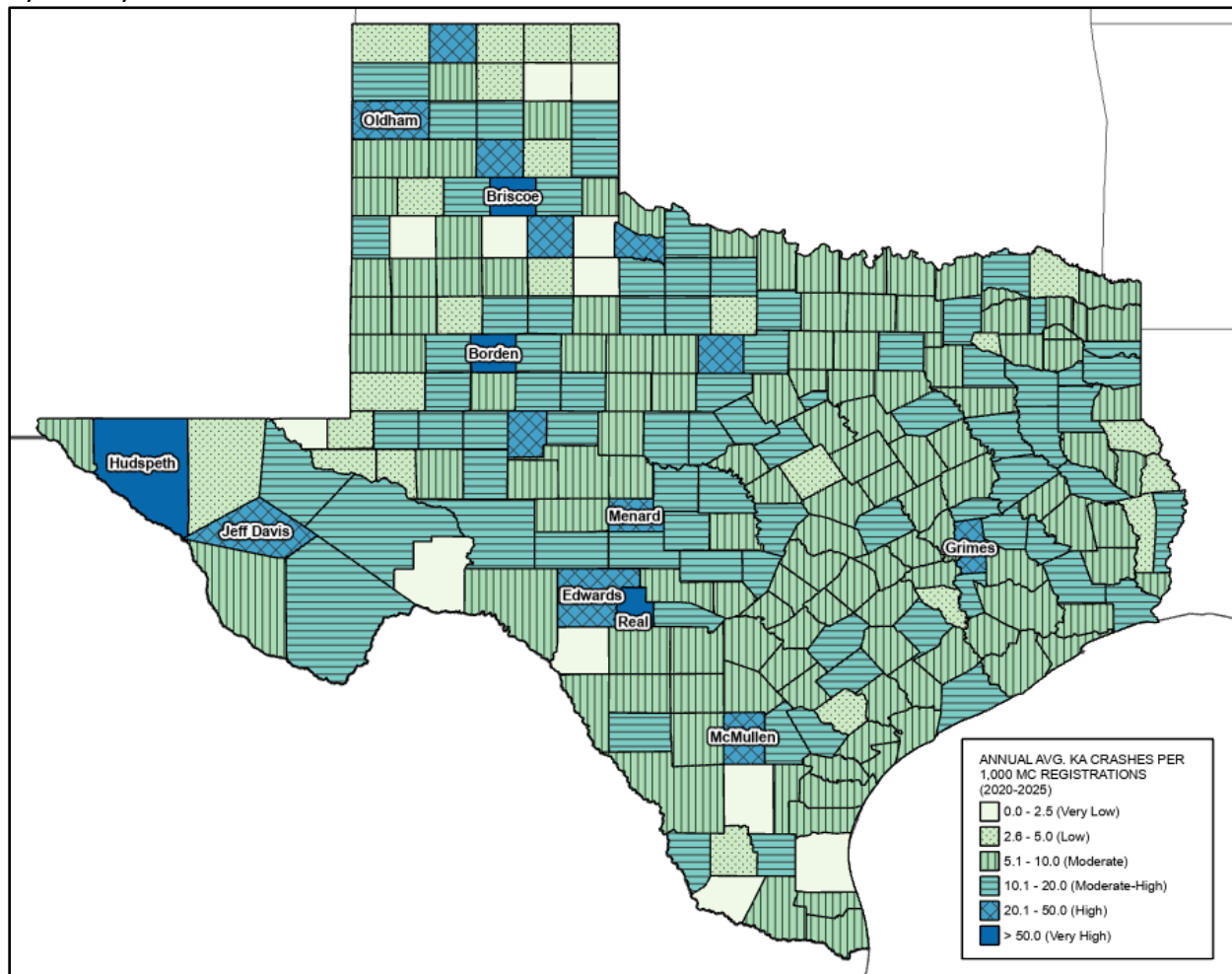


Figure 14. Annual Average KA Motorcycle Crash Rate Per 1,000 Motorcycle Registrations by County, 2020-2025.

Licenses

Overall, the annual average motorcycle crash rate in Texas was about 8 per 1,000 motorcycle licensees from 2020 to 2025; the statewide KA crash rate for the same period was approximately 3 per 1,000 motorcycle licensees. Rates of motorcycle crashes per motorcycle licensee in all Texas counties were examined for both all severity motorcycle crashes and KA motorcycle crashes, as shown in Table 15 and Table 16. Real County had the highest annual average crash rate, with 93 motorcycle crashes per 1,000 motorcycle licensees. Real County also had the highest annual average rate of KA motorcycle crashes, with 54 crashes per 1,000 motorcycle licensees.

Table 15. Counties by Annual Average Crashes Per 1,000 Motorcycles Licensees, 2020-2025.

County	Average Motorcycle Licensees	Annual Average Crashes	Annual Average Crash Rate Per 1,000
Real	264	24.7	93.4
Briscoe	57	1.8	32.4
Edwards	158	4.7	29.6
Borden	36	0.8	23.1
Hudspeth	139	3.2	22.8
Grimes	1,718	30.5	17.8
Reeves	308	5.2	16.8
Menard	111	1.8	16.6
Potter	4,454	68.2	15.3
Ector	5,248	75.0	14.3

Table 16. Top 10 Counties by Annual Average KA Motorcycle Crashes Per 1,000 Motorcycles Licensees, 2020-2025.

County	Average Motorcycle Licensees	Annual Average Fatal and KA Crashes	Annual Average Fatal and KA Crash Rate Per 1,000
Real	264	14.2	53.6
Briscoe	57	1.2	20.6
Edwards	158	2.2	13.7
Hudspeth	139	1.8	13.2
Jeff Davis	179	1.7	9.3
Borden	36	0.3	9.3
Oldham	99	0.8	8.4
McMullen	42	0.3	7.9
Grimes	1,718	13.5	7.9
Menard	111	0.8	7.5

Figure 15 shows the annual average crash rate per 1,000 motorcycle licensees by county in Texas from 2020 to 2025.

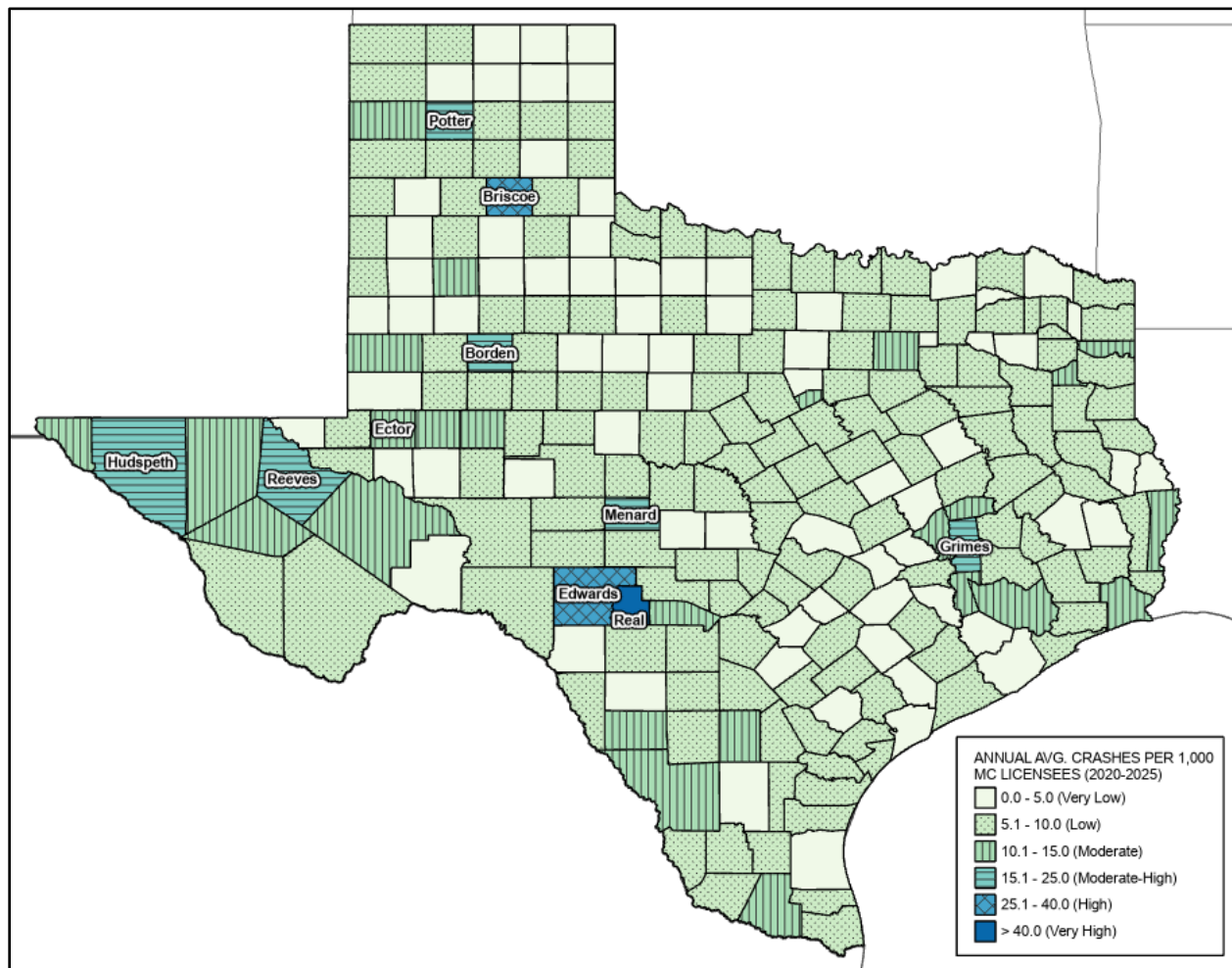


Figure 15. Annual Average Motorcycle Crash Rate Per 1,000 Motorcycle Licensees by County, 2020-2025.

Figure 16 shows the annual average KA motorcycle crash rate per 1,000 motorcycle licensees by county in Texas from 2020 to 2025.

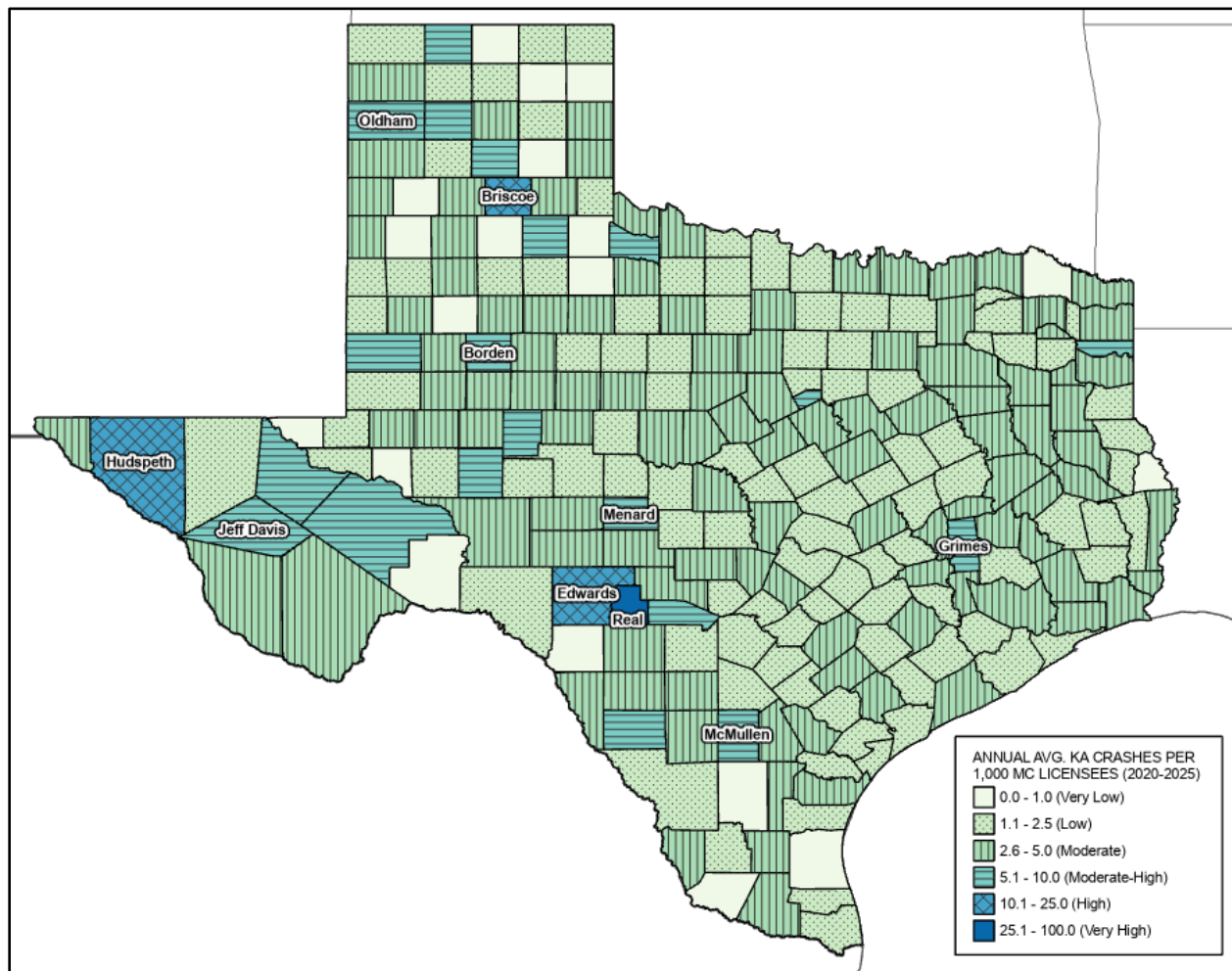


Figure 16. Annual Average KA Motorcycle Crash Rate Per 1,000 Motorcycle Licensees by County, 2020-2025.

MOTORCYCLE CRASH PATTERNS

Roadway Class

Roadway classifications as reported in CRIS were analyzed for KA motorcycle crashes from 2016 to 2025, as shown in Table 17. City streets accounted for the largest share of KA motorcycle crashes, at 30 percent, followed by U.S. and state highways at 28 percent and farm to market roads at 18 percent. When interstate highways and U.S. and state highways were combined, highway facilities accounted for the largest share of KA motorcycle crashes, representing approximately 42 percent of all such crashes from 2016 to 2025.

Table 17. KA Motorcycle Crashes by Roadway Class, 2016-2025.

Roadway Class	KA Crashes	% of Total
Interstate	3,449	13.3%
US & State Highways	7,285	28.2%
Farm to Market	4,744	18.3%
County Road	2,215	8.6%
City Street	7,883	30.5%
Tollway	291	1.1%
Other Roads	8	0.0%
TOTAL	25,875	100%

Additionally, highway system and route number fields reported in CRIS were used to identify specific highways and analyze KA motorcycle crashes from 2016 to 2025. Table 18 presents the top roadways associated with KA motorcycle crashes during this period. Among records with available roadway information, Interstate 45 in Harris County had the highest number of motorcycle KA crashes.

Table 18. Top 10 Roadways for Motorcycle KA Crashes, 2016-2025.

Derived Road	County	KA Crashes
IH0045	Harris	972
IH0010	Harris	670
IH0035	Bexar	516
IH0035	Dallas	485
IH0035	Travis	469
IH0610	Harris	465
SL0008	Harris	450
IH0410	Bexar	445
IH0635	Dallas	434
IH0010	Bexar	423

Time of Day

Figure 17 shows motorcycle crashes by time of day for all crash severities and KA crashes from 2016 to 2025. All severity motorcycle crashes increased throughout the day, with a pronounced peak during the late afternoon and early evening hours. This pattern suggests that overall crash frequency is may closely be associated with periods of higher travel activity.

KA crashes followed a similar but flatter pattern, indicating that severe motorcycle crashes were more broadly distributed throughout the day. The flatter pattern also suggests that KA

crashes may represent a larger share of motorcycle crashes during late night and early morning hours, even though total crash counts during those periods were lower.

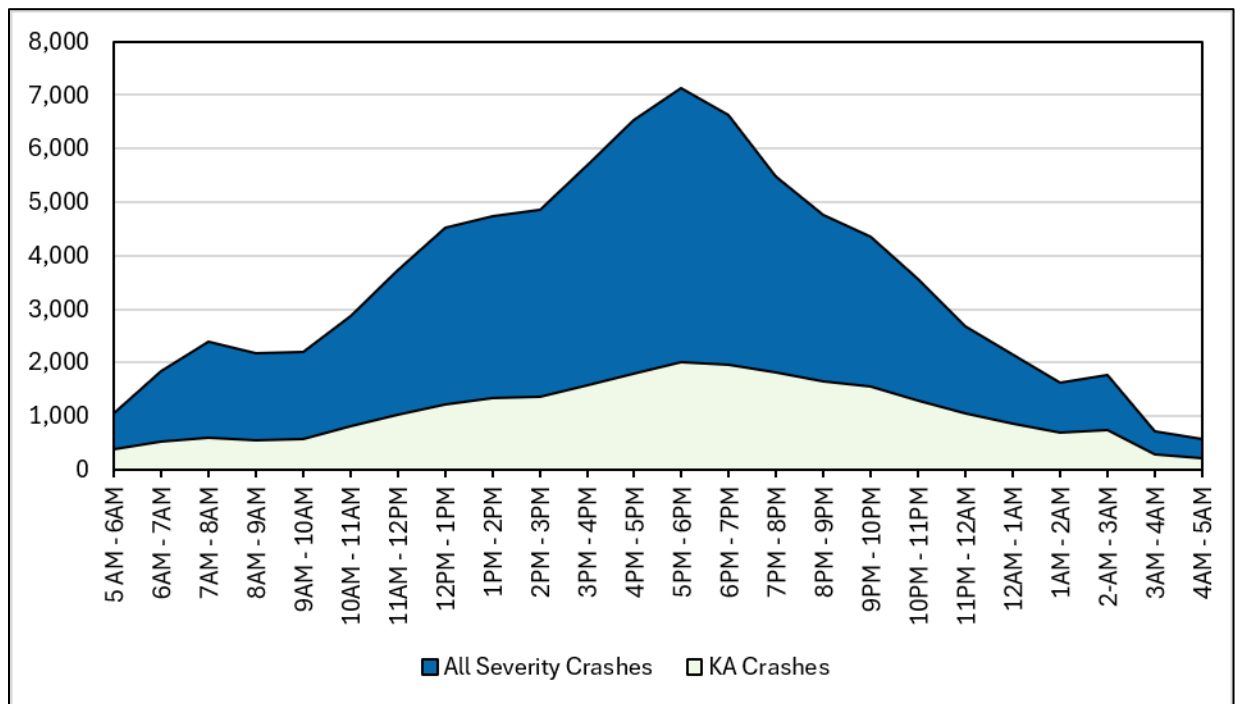


Figure 17. Motorcycle Crashes by Time of Day and Severity, 2016-2025.

Day of Week

As shown in Figure 18, most motorcycle crashes occurred on Friday through Sunday. From 2016 to 2025, 48 percent of motorcycle crashes occurred Monday through Thursday, while 52 percent occurred Friday through Sunday.

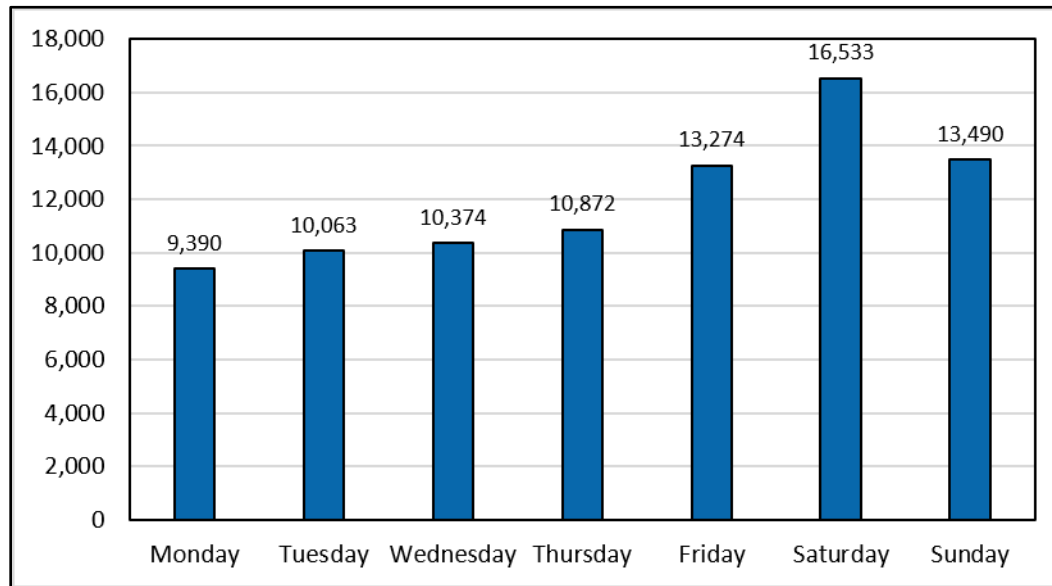


Figure 18. Motorcycle Crashes by Day of Week, 2016-2025.

Next, day of week was examined by crash severity.

Table 19 presents the percentage of motorcycle crashes by severity and day of week. Crashes occurring Friday through Sunday had a higher percentage of KA crashes compared to crashes occurring Monday through Thursday.

Table 19. Day of Week by Crash Severity, 2016-2025.

Day of Week	Fatal (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible (C)	Non Injury (O)	Unknown Injury	TOTAL
Monday	6.0%	23.2%	35.2%	20.3%	14.2%	1.1%	100%
Tuesday	5.5%	23.0%	35.7%	20.1%	14.7%	1.0%	100%
Wednesday	5.5%	23.2%	35.4%	19.9%	14.8%	1.2%	100%
Thursday	5.5%	23.8%	36.6%	19.0%	14.2%	0.9%	100%
Friday	5.8%	24.3%	34.9%	18.9%	15.1%	1.0%	100%
Saturday	6.3%	27.1%	34.8%	17.9%	12.8%	1.2%	100%
Sunday	7.4%	26.6%	34.8%	17.3%	12.4%	1.4%	100%
TOTAL	6.1%	24.7%	35.3%	18.9%	13.9%	1.1%	100%

Seasons

Seasonal differences in motorcycle crashes were examined by month. Seasons were defined as spring, March through May; summer, June through August; fall, September through November; and winter, December through February. Figure 19 shows the frequency of motorcycle crashes by season. Overall, motorcycle crashes were relatively evenly distributed across spring, summer, and fall, with 28 percent occurring in spring, 27 percent in summer, and 28 percent in fall. The lowest share of crashes occurred in winter, accounting for 17 percent of motorcycle crashes.

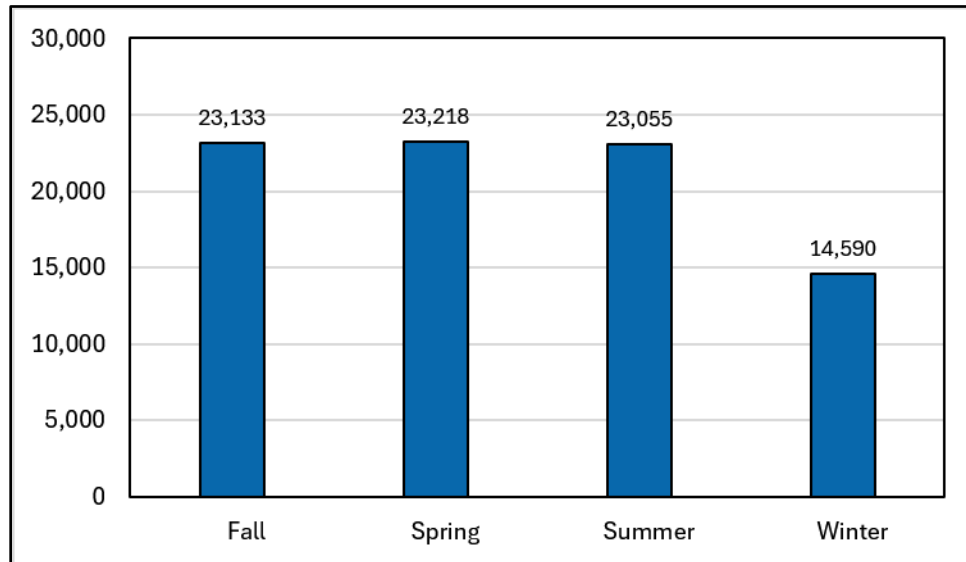


Figure 19. Frequency of Motorcycle Crashes by Season, 2016-2025.

Environmental Factors

Three variables were examined to provide insight into environmental conditions at the time of motorcycle crashes: weather conditions, surface conditions, and light conditions.

Weather Condition

Table 20 shows the frequency of motorcycle crashes by weather condition and crash severity. Approximately 85 percent of motorcycle crashes occurred under clear weather conditions, regardless of crash severity. The percent of KA crashes by weather condition category did not show a higher crash severity for worse weather conditions (e.g., ice). This could be because fewer vehicles overall travel during poor weather and drivers tend to use greater caution.

Table 20. Motorcycle Crashes by Weather Condition and Crash Severity, 2016-2025.

Weather Condition	All Severity Crashes	% of Total	KA Crashes	% of Total	% KA
Dry	79,007	94.1%	24,704	95.5%	31.3%
Wet	3,732	4.4%	882	3.4%	23.6%
Sand, Mud, Dirt	460	0.5%	126	0.5%	27.4%
Other (Explain In Narrative)	435	0.5%	107	0.4%	24.6%
Standing Water	192	0.2%	28	0.1%	14.6%
Unknown	125	0.1%	18	0.1%	14.4%
Ice	37	0.0%	9	0.0%	24.3%
Slush	6	0.0%	1	0.0%	16.7%
Snow	2	0.0%	0	0.0%	n/a
TOTAL	83,996	100%	25,875	100%	30.8%

Roadway Surface Condition

Table 21 shows the frequency of motorcycle crashes by roadway surface condition and crash severity. Most crashes occurred under dry surface conditions, regardless of severity. Dry conditions accounted for 94 percent of all motorcycle crashes and 95 percent of KA crashes. This finding is likely related to the fact that motorcycle travel generally occurs more often during favorable weather and roadway conditions. Overall, the distribution of roadway surface conditions did not vary substantially by crash severity. However, there was some variation in the percentage of KA crashes by individual roadway surface condition category. Fog (38%) and crosswinds (42%) had a substantially higher proportion of KA crashes versus crashes occurring in clear conditions.

Table 21. Motorcycle Crashes by Roadway Surface Condition and Crash Severity, 2016-2025.

Roadway Surface Condition	All Severity Crashes	% of Total	KA Crashes	% of Total	% KA
Clear	71,637	85.3%	22,178	85.7%	31.0%
Cloudy	9,592	11.4%	3,047	11.8%	31.8%
Rain	2,168	2.6%	458	1.8%	21.1%
Fog	259	0.3%	99	0.4%	38.2%
Unknown	131	0.2%	14	0.1%	10.7%
Severe Crosswinds	127	0.2%	53	0.2%	41.7%
Other (Explain in Narrative)	40	0.0%	16	0.1%	40.0%
Blowing Sand/Snow	18	0.0%	4	0.0%	22.2%
Sleet/Hail	17	0.0%	2	0.0%	11.8%
TOTAL	83,996	100%	25,875	100%	30.8%

Lighting Condition

Table 22 shows the frequency of motorcycle crashes by lighting condition and crash severity. Most crashes occurred during daylight, regardless of severity. Daylight conditions accounted for 64 percent of all motorcycle crashes and 58 percent of KA crashes. Notably, KA crashes accounted for a higher percentage of crashes under dark lighting conditions compared to crashes across all severities. Certain lighting conditions had a higher proportion of KA crashes. Dark (36%) and dusk/dawn (37%) both had a higher proportion of KA crashes versus daylight conditions (28%).

Table 22. Motorcycle Crashes by Lighting Condition and Crash Severity, 2016-2025.

Lighting Condition	All Severity Crashes	% of Total	KA Crashes	% of Total	% KA
Daylight	53,947	64.2%	14,971	57.9%	27.8%
Dark	27,846	33.2%	10,120	39.1%	36.3%
Dusk/Dawn	2,081	2.5%	760	2.9%	36.5%
Unknown	90	0.1%	11	0.0%	12.2%
Other (Explain In Narrative)	32	0.0%	13	0.1%	40.6%
TOTAL	83,996	100%	25,875	100%	30.8%

SINGLE VEHICLE AND MULTIPLE-VEHICLE MOTORCYCLE CRASHES

Approximately 56 percent of motorcycle crashes involved multiple vehicles (n = 46,694), while 44 percent involved a single motor vehicle (n = 37,302). Table 23 shows single vehicle and multi-vehicle motorcycle crashes by crash severity, and Table 24 presents the corresponding percentage distribution. Single vehicle motorcycle crashes had higher percentages of KA as well as B crashes, compared to multi-vehicle crashes.

Table 23. Number of Motorcycle Crashes by Single Vehicle and Multi-Vehicle Status and Crash Severity, 2016-2025.

Crash Type	Fatal (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	Non-Injury (O)	Unknown Injury	Total
Multi-Vehicle	2,749	10,693	14,869	9,480	8,766	137	46,694
Single Vehicle	2,343	10,090	14,754	6,377	2,926	812	37,302
TOTAL	5,092	20,783	29,623	15,857	11,692	949	83,996

Table 24. Percentage Distribution of Motorcycle Crashes by Single Vehicle and Multi-Vehicle Status and Crash Severity, 2016-2025.

Crash Type	Fatal (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	Non-Injury (O)	Unknown Injury	Total
Multi-Vehicle	5.9%	22.9%	31.8%	20.3%	18.8%	0.3%	100%
Single Vehicle	6.3%	27.0%	39.6%	17.1%	7.8%	2.2%	100%
TOTAL	6.1%	24.7%	35.3%	18.9%	13.9%	1.1%	100%

Collision Type, First Harmful Event and Object Struck

Single Vehicle Crashes

A total of 37,302 motorcycle crashes, or 44 percent, were classified as single vehicle crashes. Of the KA crashes, 48 percent were classified as single vehicle crashes. Among these crashes, more than 90 percent involved motorcycles traveling straight, as shown in Table 25.

Table 25. Collision Type for Single vehicle Motorcycle Crashes by Crash Severity, 2016-2025.

Collision Type	All Severity Crashes	Percent	KA Crashes	Percent
Going Straight	34,354	92.1%	11,755	94.5%
Turning Right	1,322	3.5%	303	2.4%
Turning Left	1,376	3.7%	338	2.7%
Backing	91	0.2%	0	0.0%
Other	159	0.4%	37	0.3%
TOTAL	37,302	100%	12,433	100%

Looking at the first harmful event, 58 percent of all severity single vehicle motorcycle crashes involved an overturned motorcycle, and 30 percent involved a collision with a fixed object, as shown in Table 26. Among KA crashes, 50 percent involved an overturned motorcycle, and 39 percent involved a collision with a fixed object. In terms of the most severe first harmful event, in 100 percent of crashes involving a pedestrian the crash was KA. Others that ranked high were fixed object (76%) and animal (61%).

Table 26. First Harmful Event for Single Vehicle Motorcycle Crashes by Crash Severity, 2016-2025.

Harmful Event	All Severity Crashes	% of Total	KA Crashes	% of Total	Percent KA
Overtaken	15,357	57.8%	6,209	49.9%	40.4%
Fixed Object	6,292	29.7%	4,803	38.6%	76.3%
Animal	1,121	4.8%	685	5.5%	61.1%
Parked Car	981	3.2%	201	1.6%	20.5%
Other Object	637	2.4%	241	1.9%	37.8%
Other Non-Collision	279	1.1%	147	1.2%	52.7%
Pedestrian	121	0.6%	121	1.0%	100.0%
Pedalcyclist	77	0.3%	25	0.2%	32.5%
RR Train	4	0.0%	1	0.0%	25.0%
TOTAL	24,869	100%	12,433	100%	50.0%

For crashes in which the first harmful event involved striking a fixed object, the 10 most frequently struck object types are shown in Table 27. These object types accounted for 85 percent of all fixed objects struck. The type of fixed object struck does not appear to substantially affect crash severity, as the percentage distribution by object type was similar across the two severity levels shown in Table 27.

In terms of the crash severity for specific types of objects, the most severe was hitting a guardrail, wherein 56 percent of crashes involving a guardrail resulting in a KA injury. The second most severe object was hitting a tree, shrub, or landscaping (51 percent).

Table 27. Object Types Struck in Motorcycle Crashes by Crash Severity, 2016-2025.

Object Struck	All Severity Crashes	% of Total	KA Crashes	% of Total	Percent KA
Hit Curb	2,587	23.3%	999	20.8%	38.6%
Hit Median Barrier	1,993	18.0%	826	17.2%	41.4%
Hit Fence	873	7.9%	377	7.8%	43.2%
Hit Guardrail	670	6.0%	372	7.7%	55.5%
Ditch	652	5.9%	230	4.8%	35.3%
Hit Tree, Shrub, Landscaping	635	5.7%	326	6.8%	51.3%
Hit Other Fixed Object	619	5.6%	254	5.3%	41.0%
Hit Highway Sign	546	4.9%	265	5.5%	48.5%
Hit Concrete Traffic Barrier	496	4.5%	230	4.8%	46.4%
Hit Hole In Road	313	2.8%	75	1.6%	24.0%
TOTAL	9,385	84.6%	3,954	82.3%	42.1%

Multi-Vehicle Crashes

A total of 46,694 motorcycle crashes, or approximately 56 percent of all motorcycle crashes, were classified as multi-vehicle crashes. Left-turn crashes were the most common collision type, accounting for 33 percent of all severity multi-vehicle crashes and 41 percent of KA crashes, as shown in Table 28.

Table 28. Multi-Vehicle Motorcycle Crashes by Collision Type and Injury Severity.

Collision Type	All Severity Crashes	% of Total	KA Crashes	% of Total	Percent KA
Angle Crash	8,946	19.2%	2,620	19.5%	29.3%
Backing Crash	227	0.5%	6	0.0%	2.6%
Head On Crash	1,131	2.4%	569	4.2%	50.3%
Left Turn Crash	15,287	32.7%	5,553	41.3%	36.3%
Other	226	0.5%	57	0.4%	25.2%
Parking Crash	6	0.0%	1	0.0%	16.7%
Rear End Crash	14,848	31.8%	3,370	25.1%	22.7%
Right Turn Crash	209	0.4%	27	0.2%	12.9%
Sideswipe	5,814	12.5%	1,239	9.2%	21.3%
TOTAL	46,694	100%	13,442	100%	28.8%

Rear end crashes were the second most common collision type, representing 32 percent of all severity crashes and 25 percent of KA crashes. Passenger vehicles were involved in the majority of these crashes. Approximately 80 percent of the other vehicles involved in rear-end crashes were either four-door passenger cars, sport utility vehicles (SUVs), or pickup trucks (data not shown). Four-door passenger cars were the most common vehicle type, representing 40 percent of all-severity rear-end crashes and 36 percent of KA rear end crashes. SUVs and pickup trucks each accounted for approximately one-fifth of rear end crashes.

Among the non-motorcycle vehicles involved in rear end crashes, the contributing factor "None" was assigned to 60 percent of vehicles in all severity crashes and 67 percent of vehicles in KA crashes. Among motorcycles involved in rear end crashes, the contributing factor "None" was assigned to 30 percent of motorcycles in all severity crashes and 38 percent of motorcycles in KA crashes (data not shown). Although contributing factors do not necessarily establish fault or crash responsibility, the findings indicate that investigating officers identified a contributing factor for motorcycles more frequently than for the other vehicles involved in rear end crashes. In many rear-end crashes, the lead vehicle may simply have been struck from behind, resulting in no contributing factor being assigned to that vehicle. Additionally, note that contributing factors are assigned separately to each vehicle, so multiple vehicles in the same crash can each have one or more contributing factors, or none at all.

Angle crashes followed, accounting for approximately 19 percent of crashes in both severity groups. The higher proportion of left turn and head on crashes among KA crashes suggests that these collision types are more strongly associated with severe crash outcomes than their share of all severity crashes would indicate.

With respect to the more severe crash collision type, over half of head on crashes are KA. The second most severe was left turn crashes (36%) followed by angle crashes (29%).

Curve Relation

Roadway curves can present unique safety challenges for motorcycle riders. These challenges include limited sight distance, variations in speed limits, sudden changes in speed, and differences in curve radii. As a result, curves may require different levels of rider attention and skill depending on roadway geometry and operating conditions. Motorcycles are particularly vulnerable on curves because they are less stable than vehicles with more than two wheels, and safely navigating curves requires greater control and maneuvering skill.

From 2016 to 2025, 11,623 of the 37,302 single vehicle motorcycle crashes occurred on curves, accounting for 31 percent of single vehicle crashes as shown in Table 29. In comparison, 6 percent of multi-vehicle motorcycle crashes occurred on curves, as shown in Table 30. Curve involvement was even higher among KA single vehicle crashes, at 39 percent, compared to 8 percent for KA multi-vehicle crashes.

Table 29. Curve Related Single Vehicle Motorcycle Crashes by Severity, 2016-2025.

Roadway Alignment	All Severity	% of Total	KA	% of Total	% KA
Straight	25,480	68.3%	7,518	60.4%	29.5%
Curve	11,623	31.2%	4,857	39.0%	41.8%
Other	183	0.5%	51	0.4%	27.9%
Unknown	16	0.0%	7	0.1%	43.8%
TOTAL	37,302	100%	12,433	100%	33.3%

Table 30. Curve Related Multi-Vehicle Motorcycle Crashes by Severity, 2016-2025.

Roadway Alignment	All Severity	% of Total	KA	% of Total	% KA
Straight	43,805	93.8%	12,409	92.3%	28.3%
Curve	2,789	6.0%	1,018	7.6%	36.5%
Other	72	0.2%	10	0.1%	13.9%
Unknown	28	0.1%	5	0.0%	17.9%
TOTAL	46,694	100%	13,442	100%	28.8%

Single vehicle crashes involving a curve are the most severe with 42 percent of these crashes being KA. A lower proportion, 37 percent, of multi-vehicle crashes on curves were KA. Finally, an even lower proportion of single (30%) and multi-vehicle crashes (28%) were on straight roads were KA (data not shown).

For single vehicle motorcycle crashes that occurred on curves, contributing factors assigned to the motorcycle unit were examined to better understand potential rider behavior and operating conditions associated with these crashes. As shown in Table 31, “Unsafe Speed” was the most frequently assigned contributing factor for both all severity crashes and KA crashes. “Unsafe Speed” accounted for 27 percent of all severity single vehicle curve related crashes and 29 percent of KA crashes.

“Failed to Control Speed” was the second most common contributing factor, accounting for 16 percent of all severity crashes and 14 percent of KA crashes. “Failed to Drive in a Single Lane” was also frequently assigned and represented a larger share of KA crashes than all severity crashes, increasing from 11 percent to 14 percent.

Overall, these findings suggest that speed related factors and lane control are key issues in single vehicle motorcycle crashes on curves. The higher percentage of unsafe speed and failure to drive in a single lane among KA crashes indicates that these factors may be particularly important for severe curve related motorcycle crashes.

Table 31. Top 3 Contributing Factor Assigned to the Motorcycle Unit in Single Vehicle Curve Related Crashes by Crash Severity, 2016-2025.

Contributing Factor	All Severity	% of Total	Contributing Factor	KA Crashes	% of Total
Unsafe Speed	4,181	27.1%	Unsafe Speed	2,033	29.2%
Failed To Control Speed	2,473	16.1%	Failed To Control Speed	985	14.1%
Failed To Drive in Single Lane	1,709	11.1%	Failed To Drive in Single Lane	955	13.7%

Intersection Relation

Intersection involvement differed substantially by crash type and was consistent with the collision patterns observed among multi-vehicle crashes. Nearly half of multi-vehicle motorcycle crashes were intersection related, including 47 percent of all severity crashes and 49 percent of KA crashes, as shown in Table 32.

This finding aligns with the high proportion of left-turn and angle crashes among multi-vehicle crashes, particularly left-turn crashes, which accounted for 41 percent of KA multi-vehicle crashes.

These patterns suggest that intersection conflict points and turning movements are key concerns for severe multi-vehicle motorcycle crashes. In contrast, most single vehicle motorcycle crashes were not intersection related, including 84 percent of KA crashes. This indicates that severe single vehicle motorcycle crashes were more commonly associated with roadway segments rather than intersection conflicts.

Table 32. Intersection Related Motorcycle Crashes by Single Vehicle and Multi-Vehicle Status and Severity, 2016-2025.

Intersection Relation	Single Vehicle Crash				Multi-Vehicle Crash			
	All Severity	Percent	KA	% of Total	All Severity	Percent	KA	% of Total
No	30,010	80.5%	10,469	84.2%	24,882	53.3%	6,868	51.1%
Yes	7,292	19.5%	1,964	15.8%	21,812	46.7%	6,574	48.9%
TOTAL	37,302	100%	12,433	100%	46,694	100%	13,442	100%

To further examine intersection related multi-vehicle motorcycle crashes, contributing factors were analyzed separately for the non-motorcycle unit and the motorcycle unit involved in the crash. This analysis helps distinguish between factors assigned to the other driver and factors assigned to the motorcycle operator.

For the non-motorcycle unit, the top contributing factors were primarily related to right of way violations, as shown in Table 33. The most common factor was “Failed to Yield Right of Way - Turning Left,” which accounted for 14 percent of units involved in all severity multi-vehicle intersection crashes and 20 percent of units involved in KA crashes. “Failed to Yield Right of Way - Stop Sign” was the second most common factor, accounting for 11 percent of units involved in all severity crashes and 13 percent of units involved in KA crashes. These findings indicate that turning and crossing conflicts involving other vehicles were strongly associated with severe motorcycle crashes at intersections.

Table 33. Top 3 Contributing Factor Assigned to the Non-Motorcycle Unit in Multi-Vehicle Intersection Related Crashes by Crash Severity, 2016-2025.

Contributing Factor	All Severity	% of Total	KA Crashes	% of Total	% KA
Failed to Yield Right of Way - Turning Left	3,791	14.0%	1,686	20.1%	44.4%
Failed to Yield Right of Way - Stop Sign	2,963	11.0%	1,081	12.9%	36.5%
Driver Inattention	2,543	9.4%	626	7.5%	24.6%

For the motorcycle unit, the top contributing factors were more related to speed control and rider attention, as shown in Table 34. “Failed to Control Speed” was the most common factor, accounting for 10 percent of motorcycle units involved in all severity crashes and 9 percent of units involved in KA crashes. “Driver Inattention” accounted for 5 percent of motorcycle units

involved in all severity crashes and 6 percent of units involved in KA crashes. Among KA crashes, “Speeding (Overlimit)” was also among the top three contributing factors, accounting for 5 percent of the motorcycle units involved in multi-vehicle intersection crashes.

Table 34. Top 3 Contributing Factor Assigned to the Motorcycle Unit in Multi-Vehicle Intersection Related Crashes by Crash Severity, 2016-2025.

Contributing Factor	All Severity	% of Total	Contributing Factor	KA Crashes	% of Total
Failed To Control Speed	2,341	9.5%	Failed To Control Speed	699	9.0%
Driver Inattention	1,235	5.0%	Driver Inattention	425	5.5%
Other (Explain in Narrative)	901	3.7%	Speeding (Overlimit)	420	5.4%

Overall, the results suggest that severe multi-vehicle intersection crashes often involve a combination of right of way conflicts by other drivers and speed or attention related factors by motorcycle operators. The higher percentage of left turn failure to yield among KA crashes highlights the importance of left turn conflicts as a key emphasis area for motorcycle safety at intersections.

Area Type

Table 35 compares the distribution of single vehicle and multi-vehicle motorcycle crashes by rural and urban area type for both all severity crashes and KA crashes. Overall, urban areas accounted for the majority of motorcycle crashes, particularly multi-vehicle crashes. Among single vehicle crashes, 60 percent occurred in urban areas and 40 percent occurred in rural areas. In comparison, 78 percent of multi-vehicle crashes occurred in urban areas, while 22 percent occurred in rural areas. This pattern suggests that multi-vehicle motorcycle crashes were more concentrated in urban areas, likely due to higher traffic volumes, greater intersection density, and increased interaction with other vehicles.

Table 35. Single Vehicle and Multi-Vehicle Motorcycle Crashes by Urbanization Status and Crash Severity, 2016-2025.

Area Type	Single Vehicle Crash				Multi-Vehicle Crash			
	All Severity	% of Total	KA	% of Total	All Severity	% of Total	KA	% of Total
Rural	15,008	40.2%	5,953	47.8%	10,182	21.8%	3,878	28.9%
Urban	22,294	59.8%	6,480	52.1%	36,512	78.2%	9,564	71.1%
TOTAL	37,302	100%	12,433	100%	46,694	100%	13,442	100%

However, rural areas accounted for a larger share of severe crashes than of all crashes. Among single vehicle crashes, rural areas represented 40 percent of all severity crashes but 48 percent of KA crashes. Similarly, among multi-vehicle crashes, rural areas represented 22 percent of all severity crashes but 29 percent of KA crashes.

Additionally, single vehicle crashes were more common in rural areas than multi-vehicle crashes. Rural areas accounted for 40 percent of all single vehicle motorcycle crashes, compared to 22 percent of all multi-vehicle motorcycle crashes. This difference was more pronounced among KA crashes, where rural areas accounted for 48 percent of single vehicle crashes compared to 29 percent of multi-vehicle crashes.

Table 36 presents motorcycle operator DUI status by urbanization status for single vehicle and multi vehicle crashes by motorcycle operator injury severity from 2016 to 2025. Overall, motorcycle operators involved in single vehicle crashes were more likely to be identified as driving under the influence (DUI) than motorcycle operators involved in multi vehicle crashes, regardless of urbanization status. Among motorcycle operators with injuries of all severities, DUI was identified in 10 percent of operators involved in rural single vehicle crashes and 8 percent of operators involved in urban single vehicle crashes, compared with 7 percent and 4 percent, respectively, for operators involved in rural and urban multi vehicle crashes. Among motorcycle operators who sustained fatal or suspected serious (KA) injuries, DUI was identified in 19 percent of operators involved in both rural and urban single vehicle crashes. In contrast, DUI was identified in 17 percent of operators involved in rural multi vehicle crashes and 12 percent of operators involved in urban multi vehicle crashes.

Table 36. Single Vehicle and Multi-Vehicle Motorcycle Crashes by Urbanization Status, Motorcycle Operator DUI Status and Injury Severity, 2016-2025.

Area Type & Injury Severity	DUI	% DUI
Rural single vehicle: All severities	1,582	10.5%
Urban single vehicle: All severities	1,820	8.3%
Total single vehicle: All severities	3,402	9.2%
Rural single vehicle: KA	1,079	18.9%
Urban single vehicle: KA	1,170	18.9%
Total single vehicle: KA	2,249	18.9%
Rural multi-vehicle: All severities	758	7.1%
Urban multi-vehicle: All severities	1,374	3.7%
Total multi-vehicle: All severities	2,132	4.4%
Rural multi-vehicle: KA	660	16.9%
Urban multi-vehicle: KA	1,096	11.6%
Total multi-vehicle: KA	1,756	13.2%

These findings suggest that DUI was consistently more prevalent among motorcycle operators involved in single vehicle crashes than multi-vehicle crashes, while rural areas exhibited a higher prevalence of DUI than urban areas among motorcycle operators involved in multi-vehicle crashes.

County

Table 37 and Table 38 present the counties with the highest number of single vehicle motorcycle crashes for all severity crashes and KA crashes, respectively, from 2020 to 2025. Harris County recorded the largest number of single vehicle motorcycle crashes for both all severity crashes (2,506) and KA crashes (761), followed by Bexar, Dallas, Tarrant, and Travis counties. These counties also experienced the largest number of multi-vehicle motorcycle crashes, reflecting their larger populations and greater motorcycle activity. Among the counties with the highest numbers of single vehicle crashes, the proportion of motorcycle crashes that were single vehicle generally ranged from 34 to 42 percent.

Table 37. Top 10 Counties by All Severity Single Vehicle Motorcycle Crashes, 2020-2025.

County	Single Vehicle Crash	% Single Vehicle	Annual Average Single Vehicle Crash Rate Per 100,000
Harris	2,506	33.7%	8.6
Bexar	1,446	38.8%	11.5
Dallas	1,335	34.5%	8.4
Tarrant	1,263	36.7%	9.6
Travis	887	38.7%	10.9
El Paso	663	38.3%	12.6
Collin	579	42.3%	8.1
Denton	522	40.4%	8.7
Montgomery	501	41.7%	11.7
Galveston	373	41.3%	17.2

Table 38. Top 10 Counties by All Severity Single Vehicle Motorcycle Crashes, 2020-2025.

County	Single Vehicle Crashes	% Single Vehicle	Annual Average Single Vehicle KA Crash Rate Per 100,000
Harris	761	37.3%	2.6
Dallas	480	37.0%	3.0
Tarrant	431	39.7%	3.3
Bexar	318	40.6%	2.5
Travis	263	39.8%	3.2
Collin	200	44.8%	2.8
Montgomery	185	42.3%	4.3
Denton	183	42.8%	3.0
El Paso	160	39.3%	3.0
Bell	131	43.8%	5.6

Table 39 and Table 40 present the counties with the highest annual average single vehicle motorcycle crash rate per 100,000 population, for all severity and KA crashes, respectively. Several rural counties had a substantially higher proportion of single vehicle motorcycle crashes than the statewide average. Real County had the highest percentage of single vehicle crashes for both all severity crashes and KA crashes (95%), followed by counties such as Edwards, Briscoe, Borden, Bandera and Jeff Davis. These findings indicate that while the largest numbers of single vehicle motorcycle crashes occurred in the state's most populous counties, single vehicle crash rate by population was higher in less populous and rural counties, and single vehicle crashes comprised a much larger share of motorcycle crashes in several rural counties. Among the counties with the highest annual average single vehicle crash rate by population, the proportion of motorcycle crashes that were single vehicle generally ranged from 82 to 100 percent.

Table 39. Top Ten Counties by All Severity Single Vehicle Motorcycle Crash Rate by Population, 2020-2025.

County	Single Vehicle Crash	% Single Vehicle	Annual Average Single Vehicle Crash Rate Per 100,000
Real	140	94.6%	836.1
Edwards	26	92.9%	306.5
Borden	5	100.0%	136.4
Briscoe	11	100.0%	127.6
Jeff Davis	14	93.3%	118.5
Bandera	114	74.0%	85.0
Grimes	151	82.5%	79.2
Menard	9	81.8%	77.4
Hudspeth	16	84.2%	76.1
Kimble	17	100.0%	64.4

Table 40. Top Ten Counties by KA Single Vehicle Motorcycle Crash Rate by Population, 2020-2025.

County	Single Vehicle Crash	% Single Vehicle	Annual Average Single Vehicle KA Crash Rate Per 100,000
Real	81	95.3%	483.7
Edwards	12	92.3%	141.5
Briscoe	7	100.0%	81.2
Jeff Davis	9	90.0%	76.2
Bandera	74	78.7%	55.2
Borden	2	100.0%	54.6
Hudspeth	10	90.9%	47.6
Armstrong	5	83.3%	45.6
Grimes	69	85.2%	36.2
Motley	2	100.0%	32.2

Roadway Class

Table 41 shows that motorcycle crash patterns varied by roadway class, crash type, and severity. City streets accounted for the largest share of crashes overall, particularly among multi-vehicle crashes.

For single vehicle crashes, KA crashes were more concentrated on farm to market roads than all severity crashes, increasing from 18 percent to 22 percent. For multi-vehicle crashes, KA crashes were more concentrated on U.S. and state highways, increasing from 28 percent to 31 percent, and on farm to market roads, increasing from 12 percent to 15 percent. Interstate crashes remained relatively consistent across crash type and severity.

Table 41. Single Vehicle and Multi-Vehicle Motorcycle Crashes by Roadway Class and Crash Severity, 2016-2025.

Roadway Class	Single Vehicle Crash				Multi-Vehicle Crash			
	All Severity	% of Total	KA	% of Total	All Severity	% of Total	KA	% of Total
Interstate	4,974	13.3%	1,682	13.5%	6,534	14.0%	1,767	13.1%
US & State Highways	9,095	24.4%	3,108	25.0%	12,973	27.8%	4,177	31.1%
Farm To Market	6,804	18.2%	2,766	22.2%	5,491	11.8%	1,978	14.7%
County Road	3,967	10.6%	1,435	11.5%	2,546	5.5%	780	5.8%
City Street	11,986	32.1%	3,293	26.5%	18,639	39.9%	4,590	34.1%
Tollway	437	1.2%	141	1.1%	504	1.1%	150	1.1%
Other Roads	39	0.1%	8	0.1%	7	0.0%	0	0.0%
TOTAL	37,302	100%	12,433	100%	46,694	100%	13,442	100%

Posted Speed Limit

Posted speed limit was examined by crash type and severity, as shown in Table 42. For both single vehicle and multi-vehicle crashes, the largest share of crashes occurred on roadways with posted speed limits between 45 and 65 mph. This speed limit group accounted for 41 percent of all single vehicle crashes and 43 percent of KA single vehicle crashes. For multi-vehicle crashes, this group accounted for 40 percent of all crashes and 43 percent of KA crashes. Lower speed facilities generally represented a slightly smaller share of KA crashes than all severity crashes. Similarly, the proportion of KA crashes for each speed category increased as the speeds increased. For example, among single vehicle crashes, 30% occurring in the 0 to 35 mph category were KA versus 39% in the 65+ mph category (data not shown). Among multi-vehicle crashes, 22% in the 0 to 35 mph category were KA versus 38% in the 65+ mph category. These findings suggest that higher posted speed limits are likely associated with more severe motorcycle crash outcomes for both single vehicle and multi-vehicle crashes.

Table 42. Single Vehicle and Multi-Vehicle Motorcycle Crashes by Posted Speed Limit and Crash Severity, 2016-2025.

Crash Speed Limit Group	Single Vehicle Crash				Multi-Vehicle Crash			
	All Severity	% of Total	KA	% of Total	All Severity	% of Total	KA	% of Total
0-35 mph	6,449	17.3%	1,918	15.4%	6,622	14.2%	1,457	10.8%
5-45 mph	8,238	22.1%	2,419	19.5%	14,543	31.1%	3,769	28.0%
45-65 mph	15,090	40.5%	5,343	43.0%	18,350	39.3%	5,744	42.7%
65 mph or more	6,538	17.5%	2,515	20.2%	5,632	12.1%	2,142	15.9%
Unknown	987	2.6%	238	1.9%	1,547	3.3%	330	2.5%
TOTAL	37,302	100%	12,433	100%	46,694	100%	13,442	100%

Lighting Condition

Table 43 shows that dark lighting conditions were overrepresented among KA motorcycle crashes for both single vehicle and multi-vehicle crashes. Among single vehicle crashes, the share occurring in dark conditions increased from 38 percent for all severity crashes to 43 percent for KA crashes. A similar pattern was observed for multi-vehicle crashes, where the share occurring in dark conditions increased from 30 percent to 36 percent. In contrast, daylight crashes accounted for a lower share of KA crashes than all severity crashes in both crash groups. These findings suggest that dark lighting conditions are an important emphasis area for severe motorcycle crashes, particularly single vehicle crashes.

Table 43. Single Vehicle and Multi-Vehicle Motorcycle Crashes by Lighting Condition and Crash Severity, 2016-2025.

Lighting Condition	Single Vehicle Crash				Multi-Vehicle Crash			
	All Severity	% of Total	KA	% of Total	All Severity	% of Total	KA	% of Total
Dusk / Dawn	856	2.3%	303	2.4%	1225	2.6%	457	3.4%
Dark	14,002	37.5%	5,347	43.0%	13,844	29.6%	4,773	35.5%
Daylight	22,370	60.0%	6,763	54.4%	31,577	67.6%	8,208	61.1%
Unknown	52	0.1%	10	0.1%	38	0.1%	1	0.0%
Other (Explain in Narrative)	22	0.1%	10	0.1%	10	0.0%	3	0.0%
TOTAL	37,302	100%	12,433	100%	46,694	100%	13,442	100%

Time of Day

Table 44 and Table 45 compare single vehicle and multi-vehicle motorcycle crashes by time of day for all severity crashes and KA crashes, respectively, from 2016 to 2025. For all severity crashes, the largest number of motorcycle crashes occurred during the afternoon and early evening hours, generally between 3 PM and 7 PM. In contrast, KA motorcycle crashes remained relatively high later into the evening. During these periods, multi-vehicle crashes outnumbered single vehicle crashes, with single vehicle crashes accounting for less than 50 percent of crashes. However, the proportion of single vehicle crashes increased during the late evening and overnight hours. Beginning at 11 PM for all severity crashes and 10 PM for KA crashes, single vehicle crashes accounted for more than half of all motorcycle crashes and exceeded 60 percent between midnight and 5 AM. These findings indicate that while the overall number of crashes peaks during the afternoon and evening, motorcycle crashes occurring late at night and during the early morning hours are more likely to involve a single vehicle, particularly among KA crashes.

Table 44. Single Vehicle and Multi-Vehicle All Severity Motorcycle Crashes by Time of Day, 2016-2025.

Crash Hour	Single Vehicle Crashes	Percent of Total	Multi-Vehicle Crashes	Percent of Total	Percent Single Vehicle
5 AM - 6AM	524	1.4%	526	1.1%	49.9%
6AM - 7AM	731	2.0%	1,108	2.4%	39.7%
7AM - 8AM	899	2.4%	1,492	3.2%	37.6%
8AM - 9AM	871	2.3%	1,297	2.8%	40.2%
9AM - 10AM	988	2.6%	1,223	2.6%	44.7%
10AM - 11AM	1,310	3.5%	1,562	3.3%	45.6%
11AM - 12PM	1,639	4.4%	2,093	4.5%	43.9%
12PM - 1PM	1,903	5.1%	2,608	5.6%	42.2%
1PM - 2PM	2,026	5.4%	2,707	5.8%	42.8%
2PM - 3PM	2,128	5.7%	2,731	5.8%	43.8%
3PM - 4PM	2,340	6.3%	3,352	7.2%	41.1%
4PM - 5PM	2,523	6.8%	4,007	8.6%	38.6%
5PM - 6PM	2,618	7.0%	4,506	9.7%	36.7%
6PM - 7PM	2,575	6.9%	4,043	8.7%	38.9%
7PM - 8PM	2,364	6.3%	3,109	6.7%	43.2%
8PM - 9PM	2,133	5.7%	2,630	5.6%	44.8%
9PM - 10PM	1,990	5.3%	2,357	5.0%	45.8%
10PM - 11PM	1,780	4.8%	1,784	3.8%	49.9%
11PM - 12AM	1,525	4.1%	1,162	2.5%	56.8%
12AM - 1AM	1,350	3.6%	798	1.7%	62.8%
1AM - 2AM	1,082	2.9%	545	1.2%	66.5%

Crash Hour	Single Vehicle Crashes	Percent of Total	Multi-Vehicle Crashes	Percent of Total	Percent Single Vehicle
2-AM - 3AM	1,133	3.0%	630	1.3%	64.3%
3AM - 4AM	482	1.3%	246	0.5%	66.2%
4AM - 5AM	388	1.0%	178	0.4%	68.6%
TOTAL	37,302	100.0%	46,694	100.0%	44.4%

Table 45. Single Vehicle and Multi-Vehicle KA Motorcycle Crashes by Time of Day, 2016-2025.

Crash Hour	Single Vehicle Crashes	Percent of Total	Multi-Vehicle Crashes	Percent of Total	Percent Single Vehicle
5 AM - 6AM	178	1.4%	194	1.4%	47.8%
6AM - 7AM	197	1.6%	330	2.5%	37.4%
7AM - 8AM	230	1.8%	370	2.8%	38.3%
8AM - 9AM	214	1.7%	343	2.6%	38.4%
9AM - 10AM	282	2.3%	288	2.1%	49.5%
10AM - 11AM	402	3.2%	401	3.0%	50.1%
11AM - 12PM	493	4.0%	534	4.0%	48.0%
12PM - 1PM	524	4.2%	694	5.2%	43.0%
1PM - 2PM	633	5.1%	701	5.2%	47.5%
2PM - 3PM	664	5.3%	691	5.1%	49.0%
3PM - 4PM	724	5.8%	852	6.3%	45.9%
4PM - 5PM	764	6.1%	1,032	7.7%	42.5%
5PM - 6PM	812	6.5%	1,201	8.9%	40.3%
6PM - 7PM	834	6.7%	1,138	8.5%	42.3%
7PM - 8PM	844	6.8%	981	7.3%	46.2%
8PM - 9PM	742	6.0%	906	6.7%	45.0%
9PM - 10PM	716	5.8%	841	6.3%	46.0%
10PM - 11PM	661	5.3%	628	4.7%	51.3%
11PM - 12AM	643	5.2%	404	3.0%	61.4%
12AM - 1AM	564	4.5%	289	2.1%	66.1%
1AM - 2AM	458	3.7%	236	1.8%	66.0%
2-AM - 3AM	511	4.1%	229	1.7%	69.1%
3AM - 4AM	205	1.6%	92	0.7%	69.0%
4AM - 5AM	138	1.1%	67	0.5%	67.3%
TOTAL	12,433	100.0%	13,442	100.0%	48.1%

Day of Week

Table 46 and Table 47 compare single vehicle and multi-vehicle motorcycle crashes by day of week for all severity crashes and KA crashes, respectively, from 2016 to 2025. For both crash severity groups, the largest number of single vehicle and multi-vehicle motorcycle crashes occurred on Friday through Sunday. However, the proportion of single vehicle crashes was less than 50 percent from Monday through Friday but exceeded 50 percent on Saturday and Sunday, indicating that single vehicle motorcycle crashes were relatively more common on weekends.

Table 46. Single Vehicle and Multi-Vehicle All Severity Motorcycle Crashes by Day of Week, 2016-2025.

Day of Week	Single Vehicle Crashes	Single Vehicle Percent of Total	Multi-Vehicle Crashes	Multi-Vehicle Percent of Total	Total Percent Single Vehicle
Monday	3,979	10.7%	5,411	11.6%	42.4%
Tuesday	3,978	10.7%	6,085	13.0%	39.5%
Wednesday	4,235	11.4%	6,139	13.1%	40.8%
Thursday	4,441	11.9%	6,431	13.8%	40.8%
Friday	5,549	14.9%	7,725	16.5%	41.8%
Saturday	8,097	21.7%	8,436	18.1%	49.0%
Sunday	7,023	18.8%	6,467	13.8%	52.1%
TOTAL	37,302	100.0%	46,694	100.0%	44.4%

Table 47. Single Vehicle and Multi-Vehicle KA Motorcycle Crashes by Day of Week, 2016-2025.

Day of Week	Single Vehicle Crashes	Single Vehicle Percent of Total	Multi-Vehicle Crashes	Multi-Vehicle Percent of Total	Total Percent Single Vehicle
Monday	1,217	9.8%	1,526	11.4%	44.4%
Tuesday	1,215	9.8%	1,653	12.3%	42.4%
Wednesday	1,281	10.3%	1,702	12.7%	42.9%
Thursday	1,388	11.2%	1,792	13.3%	43.6%
Friday	1,832	14.7%	2,157	16.0%	45.9%
Saturday	2,927	23.5%	2,592	19.3%	53.0%
Sunday	2,573	20.7%	2,020	15.0%	56.0%
TOTAL	12,433	100.0%	13,442	100.0%	48.1%

Demographics

Age

Table 48 and Table 49 present single vehicle and multi-vehicle motorcycle crashes by motorcycle operator age group and injury severity from 2016 to 2025. Motorcycle operators aged 21 to 44 years accounted for the largest number of crashes across all injury severity levels for both single vehicle and multi-vehicle crashes, representing approximately 55 percent and 58 percent of all motorcycle operators, respectively. Operators aged 45 to 64 years accounted for the second largest share of crashes, followed by operators aged 15 to 20 years. Motorcycle operators younger than 15 years and those aged 80 years and older represented a relatively small proportion of crashes.³

Although operators aged 21 to 44 years accounted for the largest number of fatal and suspected serious injury (KA) crashes, this age group also represented the largest share of motorcycle operators involved in crashes overall. The age distributions for single vehicle and multi-vehicle crashes were generally similar, although single vehicle crashes accounted for a slightly greater proportion of crashes among operators aged 45 years and older.

Table 48. Single Vehicle Motorcycle Crashes by Motorcycle Operator Age Group and Injury Severity, 2016-2025.

Motorcycle Operator Age Group	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	Non-Injury (O)	Unknown Injury	TOTAL
Under 15 Years	4	38	62	29	27	3	163
15-20 Years	114	549	1,309	548	306	14	2,840
21-44 Years	1,131	5,318	8,431	3,632	1,852	169	20,533
45-64 Years	758	3,130	4,080	1,804	954	51	10,777
65-79 Years	178	630	748	313	145	9	2,023
Over 80 Years	15	21	31	10	3	2	82
Unknown/ Missing	6	20	38	44	48	529	685
TOTAL	2,206	9,706	14,699	6,380	3,335	777	37,103

³ Individuals with missing age information or who were aged 100 years or older were categorized into the "Unknown/Missing" age group.

Table 49. Multi-Vehicle Motorcycle Crashes by Motorcycle Operator Age Group and Injury Severity, 2016-2025.

Motorcycle Operator Age Group	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	Non-Injury (O)	Unknown Injury	TOTAL
Under 15 Years	5	79	95	40	40	5	264
15-20 Years	215	963	1,508	856	748	34	4,324
21-44 Years	1,520	6,177	9,036	5,616	5,107	259	27,715
45-64 Years	785	2,866	3,724	2,507	2,405	83	12,370
65-79 Years	150	502	585	414	434	9	2,094
Over 80 Years	10	14	25	11	15	2	77
Unknown/ Missing	3	52	49	50	123	863	1,140
TOTAL	2,688	10,653	15,022	9,494	8,872	1,255	47,984

Gender

Table 50 and Table 51 present motorcycle operator gender by injury severity. Motorcycle operators involved in crashes were predominantly male, accounting for approximately 92 percent of single vehicle crashes and 94 percent of multi-vehicle crashes. Female operators represented approximately 7 percent and 5 percent of single vehicle and multi-vehicle crashes, respectively. The gender distribution was consistent across injury severity levels, indicating that motorcycle crashes in Texas disproportionately involved male operators regardless of crash type.

For both single and multi-vehicle crashes, the percentage of crashes that were KA was lower when the motorcycle operator was female. For example, KA crashes among female operators accounted for 28.3% and 24.1% of single and multi-vehicle crashes, respectively. Among male operators, KA crashes accounted by 32.8% and 28.4% of single and multi-vehicle crashes, respectively (data not shown).

Table 50. Single Vehicle Motorcycle Crashes by Motorcycle Operator Gender and Injury Severity, 2016-2025.

Motorcycle Operator Gender	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	Non-Injury (O)	Unknown Injury	TOTAL
Male	2,134	9,088	13,616	5,893	3,129	347	34,207
Female	70	617	1,070	479	178	14	2,428
Unknown/ Missing	2	1	13	8	28	416	468
TOTAL	2,206	9,706	14,699	6,380	3,335	777	37,103

Table 51. Multi-Vehicle Motorcycle Crashes by Motorcycle Operator Gender and Injury Severity, 2016-2025.

Motorcycle Operator Gender	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	Non-Injury (O)	Unknown Injury	TOTAL
Male	2,606	10,158	14,202	8,957	8,410	640	44,973
Female	82	488	815	527	433	24	2,369
Unknown/ Missing	0	7	5	10	29	591	642
TOTAL	2,688	10,653	15,022	9,494	8,872	1,255	47,984

Contributing Factors

Distraction

Distraction is identified as crashes in which a driver operating a unit is assigned one of the following contributing factors:

- Distraction In Vehicle,
- Driver Inattention,
- Cell/Mobile Phone Use,
- Cell/Mobile Device Use – Talking,
- Cell/Mobile Device Use – Texting,
- Cell/Mobile Device Use – Other,
- Cell/Mobile Device Use – Unknown.

Table 52 and Table 53 present motorcycle operator distraction by age group for single vehicle and multi-vehicle crashes by motorcycle operator injury severity from 2016 to 2025. Overall, motorcycle operators involved in single vehicle crashes were more likely to be identified as distracted than motorcycle operators involved in multi-vehicle crashes. Among motorcycle operators with injuries of all severities, distraction was identified in 10 percent of operators involved in single vehicle crashes and 6 percent of operators involved in multi-vehicle crashes. Among motorcycle operators who sustained fatal or suspected serious (KA) injuries, distraction was identified in 9 percent of operators involved in single vehicle crashes and 5 percent of operators involved in multi-vehicle crashes.

Although the proportion of all motorcycle operators who were distracted was relatively low at 10 percent for single vehicle crashes and 6 percent for multi-vehicle crashes, the percentage of distracted crashes that were KA was high. Among single vehicle distracted crashes, 29.8 percent were KA while 23.9 percent of multi-vehicle distracted crashes were KA (data not shown).

Table 52. Single Vehicle Motorcycle Crashes by Motorcycle Operator Age Group, Distraction Status and Injury Severity, 2016-2025.

Motorcycle Operator Age Group	Distracted	% Distracted
All severities: Under 15 Years	19	11.7%
All severities: 15-20 Years	285	10.0%
All severities: 21-44 Years	1,918	9.3%
All severities: 45-64 Years	1,082	10.0%
All severities: 65-79 Years	198	9.8%
All severities: Over 80 Years	6	7.3%
All severities: Unknown/Missing	65	9.5%
All severities: TOTAL	3,573	9.6%
KA: Under 15 Years	3	7.1%
KA: 15-20 Years	45	6.8%
KA: 21-44 Years	568	8.8%
KA: 45-64 Years	377	9.7%
KA: 65-79 Years	67	8.3%
KA: Over 80 Years	3	8.3%
KA: Unknown/Missing	2	7.7%
KA: TOTAL	1,065	8.9%

Table 53. Multi-Vehicle Motorcycle Crashes by Motorcycle Operator Age Group, Distraction Status and Injury Severity, 2016-2025.

Motorcycle Operator Age Group	Distracted	% Distracted
All severities: Under 15 Years	36	13.6%
All severities: 15-20 Years	320	7.4%
All severities: 21-44 Years	1,672	6.0%
All severities: 45-64 Years	735	5.9%
All severities: 65-79 Years	157	7.5%
All severities: Over 80 Years	4	5.2%
All severities: Unknown/Missing	123	10.8%
All severities: TOTAL	3,047	6.4%
KA: Under 15 Years	10	11.9%
KA: 15-20 Years	77	6.5%
KA: 21-44 Years	372	4.8%
KA: 45-64 Years	211	5.8%
KA: 65-79 Years	48	7.4%
KA: Over 80 Years	1	4.2%
KA: Unknown/Missing	8	14.5%
KA: TOTAL	727	5.4%

Across most age groups, the percentage of distracted motorcycle operators was relatively consistent. Among motorcycle operators aged 15 to 79 years with injuries of all severities, approximately 9 to 10 percent of operators involved in single vehicle crashes were identified as distracted, compared with 6 to 7 percent of operators involved in multi-vehicle crashes. Among motorcycle operators who sustained KA injuries, distraction was identified in approximately 7 to 10 percent of operators involved in single vehicle crashes and 5 to 7 percent of operators involved in multi-vehicle crashes. Although the youngest and oldest age groups exhibited some variation, these findings should be interpreted with caution because of the relatively small number of operators in those age groups.

Driving Under the Influence of Alcohol and Drugs

A driving under the influence crash is identified as a crash in which the driver operating a unit had a blood alcohol concentration greater than zero, a positive substance test, or was assigned one of the following contributing factors:

- Had Been Drinking
- Taking Medication (Explain in Narrative)
- Under Influence – Alcohol
- Under Influence – Drug

Table 54 and Table 55 present motorcycle operator DUI status by age group for single vehicle and multi-vehicle crashes by motorcycle operator injury severity from 2016 to 2025. Overall, motorcycle operators involved in single vehicle crashes were more likely to be identified as driving under the influence (DUI) than motorcycle operators involved in multi-vehicle crashes. Among motorcycle operators with injuries of all severities, DUI was identified in 9 percent of operators involved in single vehicle crashes and 4 percent of operators involved in multi-vehicle crashes. Among motorcycle operators who sustained KA injuries, DUI was identified in 19 percent of operators involved in single vehicle crashes and 13 percent of operators involved in multi-vehicle crashes.

Although the proportion of all motorcycle operators who were impaired was relatively low at 9 percent for single vehicle crashes and 4 percent for multi-vehicle crashes, the percentage of impaired crashes that were KA was high. Among single vehicle impaired crashes, 66.1 percent were KA while 82.4 percent of multi-vehicle impaired crashes were KA (data not shown).

Table 54. Single Vehicle Motorcycle Crashes by Motorcycle Operator Age Group, DUI Status and Injury Severity, 2016-2025.

Motorcycle Operator Age Group	DUI	% DUI
All severities: Under 15 Years	18	2.6%
All severities: 15-20 Years	2,051	10.0%
All severities: 21-44 Years	1,105	10.3%
All severities: 45-64 Years	105	5.2%
All severities: 65-79 Years	3	3.7%
All severities: Over 80 Years	1	0.6%
All severities: Unknown/Missing	119	4.2%
All severities: TOTAL	3,402	9.2%
KA: Under 15 Years	4	15.4%
KA: 15-20 Years	1,316	20.4%
KA: 21-44 Years	761	19.6%
KA: 45-64 Years	82	10.1%
KA: 65-79 Years	3	8.3%
KA: Over 80 Years	1	2.4%
KA: Unknown/Missing	82	12.4%
KA: TOTAL	2,249	18.9%

Table 55. Multi-Vehicle Motorcycle Crashes by Motorcycle Operator Age Group, DUI Status and Injury Severity, 2016-2025

Motorcycle Operate Age Group	DUI	% DUI
All severities: Under 15 Years	2	0.8%
All severities: 15-20 Years	128	3.0%
All severities: 21-44 Years	1,305	4.7%
All severities: 45-64 Years	598	4.8%
All severities: 65-79 Years	80	3.8%
All severities: Over 80 Years	3	3.9%
All severities: Unknown/Missing	16	1.4%
All severities: TOTAL	2,132	4.4%
KA: Under 15 Years	2	2.4%
KA: 15-20 Years	112	9.5%
KA: 21-44 Years	1,071	13.9%
KA: 45-64 Years	495	13.6%
KA: 65-79 Years	71	10.9%
KA: Over 80 Years	3	12.5%
KA: Unknown/Missing	2	3.6%
KA: TOTAL	1,756	13.2%

The prevalence of DUI also varied by age group. Among motorcycle operators aged 15 to 20 years and 21 to 44 years with injuries of all severities, approximately 10 percent of operators involved in single vehicle crashes were identified as DUI, compared with 3 to 5 percent of operators involved in multi-vehicle crashes. Among motorcycle operators who sustained KA injuries, 20 percent of operators aged 15 to 20 years and 21 to 44 years involved in single vehicle crashes were identified as DUI, compared with 10 to 14 percent of operators involved in multi-vehicle crashes. Motorcycle operators aged 45 years and older generally had lower percentages of DUI involvement, although DUI remained more common among operators who sustained KA injuries than among operators with injuries of all severities. Results for operators younger than 15 years and those aged 80 years and older should be interpreted with caution because of the relatively small number of operators in those age groups.

Speeding

Speeding is identified by crashes where the driver operating unit is assigned any of the following contributing factors:

- Failed To Control Speed
- Unsafe Speed
- Speeding (Overlimit)

Table 56 and Table 57 present motorcycle operator speeding status by age group for single vehicle and multi-vehicle crashes by motorcycle operator injury severity from 2016 to 2025. Overall, motorcycle operators involved in single vehicle crashes were substantially more likely to be identified as speeding than motorcycle operators involved in multi-vehicle crashes. Among motorcycle operators with injuries of all severities, speeding was identified in 41 percent of operators involved in single vehicle crashes and 22 percent of operators involved in multi-vehicle-crashes. Among motorcycle operators who sustained KA injuries, speeding was identified in 48 percent of operators involved in single vehicle crashes and 29 percent of operators involved in multi-vehicle crashes.

The percentage of all motorcycle operators who engaged in a high risk speeding behavior was higher for single vehicle crashes at 41 percent than for multi-vehicle crashes at 22 percent. The percentage of speed-related crashes that were KA was also high. Among single vehicle speed-related crashes, 38.1% percent were KA while 36.4 percent of multi-vehicle speed-related crashes were KA (data not shown).

Table 56. Single Vehicle Motorcycle Crashes by Motorcycle Operator Age Group, Speeding Status and Injury Severity, 2016-2025.

Motorcycle Operator Age Group	Speeding	% Speeding
All severities: Under 15 Years	1,401	49.3%
All severities: 15-20 Years	8,846	43.1%
All severities: 21-44 Years	3,788	35.1%
All severities: 45-64 Years	660	32.6%
All severities: 65-79 Years	22	26.8%
All severities: Over 80 Years	81	49.7%
All severities: Unknown/Missing	314	45.8%
All severities: TOTAL	15,112	40.7%
KA: Under 15 Years	380	57.3%
KA: 15-20 Years	3,432	53.2%
KA: 21-44 Years	1,603	41.2%
KA: 45-64 Years	301	37.3%
KA: 65-79 Years	12	33.3%
KA: Over 80 Years	22	52.4%
KA: Unknown/Missing	12	46.2%
KA: TOTAL	5,762	48.4%

Table 57. Multi-Vehicle Motorcycle Crashes by Motorcycle Operator Age Group, Speeding Status and Injury Severity, 2016-2025.

Motorcycle Operate Age Group	Speeding	% Speeding
All severities: Under 15 Years	1,377	31.8%
All severities: 15-20 Years	6,542	23.6%
All severities: 21-44 Years	1,965	15.9%
All severities: 45-64 Years	308	14.7%
All severities: 65-79 Years	17	22.1%
All severities: Over 80 Years	47	17.8%
All severities: Unknown/Missing	314	27.5%
All severities: TOTAL	10,570	22.0%
KA: Under 15 Years	479	40.7%
KA: 15-20 Years	2,515	32.7%
KA: 21-44 Years	714	19.6%
KA: 45-64 Years	102	15.6%
KA: 65-79 Years	3	12.5%
KA: Over 80 Years	14	16.7%
KA: Unknown/Missing	18	32.7%
KA: TOTAL	3,845	28.8%

The prevalence of speeding varied considerably by age group. Motorcycle operators younger than 21 years exhibited the highest percentages of speeding. Among operators with injuries of all severities, speeding was identified in 49 percent of operators younger than 15 years and 43 percent of operators aged 15 to 20 years who were involved in single vehicle crashes, compared with 32 percent and 24 percent, respectively, for operators involved in multi-vehicle crashes. Among motorcycle operators who sustained KA injuries, speeding was identified in more than one-half of operators younger than 15 years (57 percent) and operators aged 15 to 20 years (53 percent) involved in single vehicle crashes. The prevalence of speeding generally declined with increasing age, although speeding remained more common among operators involved in single vehicle crashes than among operators involved in multi-vehicle crashes across nearly all age groups. Results for operators younger than 15 years and those aged 80 years and older should be interpreted with caution because of the relatively small number of operators in these age groups.

DISTANCE FROM CRASHES IN SCENIC AREAS TO THE MOTORCYCLE OPERATOR'S ADDRESS

Texas is home to many scenic routes that attract motorcycle enthusiasts. Although these routes can be quite enjoyable, many of the riders on them may be unfamiliar with the area or Texas roadways. To shed light on this issue, a popular area known as the Three Sisters was selected. Real and Edwards Counties are the seat of the Three Sisters. Therefore, all crashes occurring in these two counties were selected, then the home address was geocoded using ArcGIS Pro. Google Maps was used to compute the distance between the crash site and the home address.

The vast majority of motorcycle riders who crashed in the Three Sisters (n=216) area lived outside the area. Only 3 crashes occurred wherein the rider lived within Real or Edwards counties. Motorcycle operators lived as far north as the border between Minnesota and Ontario, as far east as New York, and as far south as Mexico. The most western address was still within Texas. On average the distance between the crash site and home address was 165 miles with a median value of 34.8 miles. The minimum and maximum distance was 0.02 and 2,053 miles, respectively.

EXAMINING SPEED-RELATED ISSUES IN MOTORCYCLE CRASHES VERSUS NON-MOTORCYCLE

To better understand how speed may be influencing motorcycle crashes, the frequency of contributing factors related to speed behaviors was computed for motorcycle involved versus non-motorcycle involved crashes as displayed in Table 58. Speeding over limit was relatively rare among all crashes. However unsafe speed was more common and much higher for motorcycle crashes at 10.1 percent. Finally, failed to control speed was the highest for both types of crashes at 18.5 percent for motorcycle crashes and 21.6 percent for non-motorcycle crashes.

Table 58. Comparing Speed-Related Behaviors Among Motorcycle Versus Non-Motorcycle Crashes, 2020-2025.

Speed-Related Behavior	Motorcycle Involved Crash %	Non-Motorcycle Involved Crash %
Speeding over limit	2.0%	0.4%
Unsafe speed	10.1%	3.8%
Failed to control speed	18.5%	21.6%

CRASH NARRATIVE ANALYSIS

Crash narratives were analyzed to supplement the structured fields available in CRIS and to identify information that may not be consistently captured through coded variables alone. Narrative text can provide additional context on crash circumstances, rider behavior, protective gear use, and the sequence of events leading to a crash.

For this project, both rule-based methods and machine learning methods were used. Rule-based methods were used to (1) identify evidence of helmet and other protective gear use and (2) possible lane splitting related crashes. The analysis used a combination of keyword-based searches to flag narratives for further review. *Unfortunately, there was insufficient information in the crash narrative to inform the use of gear.* However, the analysis of the lane splitting issue was informative. Machine learning methods were used to (1) identify event patterns among crashes without any assigned contributing factors or with the factor assigned as only “other” and (2) identify topics associated with lane splitting.

Rule-Based Analysis of Lane Splitting

A rule-based narrative screening procedure was developed to identify possible motorcycle lane splitting activity in crash narratives. The screening included direct references, such as “lane splitting” or “split lane,” as well as indirect references, such as “sharing lanes”, “traveling between lanes”, “between vehicles”, or “between traffic” (see Table 59).

Table 59. Keywords Used to Identify Lane Splitting.

Direct Keywords (n=304 crashes)	Indirect Keywords (n=740 crashes)
filter(ed/ing) between	between lane(s)
filter(ed/ing) through traffic	between stopped vehicle(s)
filter(ed/ing) traffic	between traffic
lane filtering	between two vehicle(s)
lane split	between vehicle(s)
lane splitting	disregard(ed/ing) lane(s)
split lane(s)	improper(ly) pass(ed/ing)
split the lane(s)	lane sharing
splitt(ed/ing) lane(s)	pass(ed/ing) between
	riding between lane(s)
	sharing lane(s)
	squeez(ed/ing) between
	travel(ed/ing) between lane(s)
	travell(ed/ing) between lane(s)
	weav(ed/ing)
	zigzagg(ed/ing)

Because lane splitting is not captured through a dedicated structured field in CRIS, the narrative review was compared with the motorcycle contributing factor “Failed to Drive in Single Lane.” This contributing factor is related to lane movement but is broader than lane splitting and may include other behaviors, such as unsafe lane changes.

All Severity Crashes

The keyword-based screening found that lane splitting related language was uncommon. Among all severity motorcycle crashes where “Failed to Drive in Single Lane” was not assigned, approximately 1.1 percent of narratives contained potential lane splitting references, including 0.3 percent with direct references and 0.8 percent with indirect references. Among crashes where the motorcycle was assigned “Failed to Drive in Single Lane,” approximately 4.6 percent contained potential lane splitting references, including 2.3 percent with direct references and 2.3 percent with indirect references. Most narratives did not contain lane splitting related language.

Manual validation showed that direct lane splitting references were highly reliable. All reviewed cases with direct references contained narrative information describing lane splitting activity. Indirect references were also useful but less definitive. Among crashes without the “Failed to Drive in Single Lane” flag, 81.9 percent of reviewed indirect reference cases were consistent with lane splitting. Among crashes with the flag, 85.7 percent of reviewed indirect reference cases were consistent with lane splitting. A small share of cases without lane splitting keywords also contained lane splitting information, suggesting that the keyword rules missed some

crashes where officers used wording not captured by the screening logic. Based on the validated keyword flags, approximately 914 crashes contained narrative evidence consistent with lane splitting. This included about 725 crashes among motorcycles not assigned “Failed to Drive in Single Lane” and about 189 crashes among motorcycles assigned that contributing factor, as shown in Table 60.

Table 60 also presents lower and upper range estimates of motorcycle crashes with narrative evidence consistent with lane splitting. The lower range estimate is based only on validated keyword flags, while the upper range estimate also accounts for potential missed cases identified through review of narratives without lane splitting keywords.

Table 60. Lane Splitting Narrative Screening Results by “Failed to Drive in a Single Lane” Status for All Severity Motorcycle Crashes, 2016-2025.

Group	Estimate Type	Calculation	Estimated Lane-Splitting Cases
MC Not Assigned “Failed to Drive in Single Lane”	Lower range estimate based on validated keyword flags only	Direct: $207 \times 100\% = 207$ Indirect: $633 \times 81.9\% = 51$	725
MC Assigned “Failed to Drive in Single Lane”	Lower range estimate based on validated keyword flags only	Direct: $97 \times 100\% = 97$ Indirect: $107 \times 85.7\% = 92$	189
All Motorcycle Crashes	Lower Range Estimate TOTAL	725 + 189	914
MC Not Assigned “Failed to Drive in Single Lane”	Upper range estimate including missed no keyword cases	Keyword Estimate: 725 Missed No Keyword Cases: $76,273 \times 1.4\% = 1,068$ Total: $725 + 1,068$	1,793
MC Assigned “Failed to Drive in Single Lane”	Upper range estimate including missed no keyword cases	Keyword Estimate: 189 Missed No Keyword Cases: $4,400 \times 4.3\% = 189$ Total: $189 + 189$	378
All Motorcycle Crashes	Upper Range Estimate TOTAL	1,793 + 378	2,171

When the small share of lane splitting cases identified in the no keyword validation sample was extrapolated to the full dataset, the estimated total increased to approximately 2,171 lane splitting crashes. This broader estimate included about 1,793 crashes among motorcycles not assigned “Failed to Drive in Single Lane” and about 378 crashes among motorcycles assigned that contributing factor.

Overall, the lane splitting screening procedure provided more value than the protective gear

screening procedure because it helped identify a behavior that is not directly captured by a dedicated structured field. Based on the validated keyword flags and the expanded estimate including missed no keyword cases, the estimated number of lane splitting crashes ranged from approximately 914 to 2,171 crashes. This represented about 1.1 percent to 2.7 percent of the 81,717 motorcycle crashes with narratives reviewed.

KA Crashes

Among KA motorcycle crashes where “Failed to Drive in Single Lane” was not assigned, approximately 1.6 percent of narratives contained potential lane splitting references, including 0.4 percent with direct references and 1.2 percent with indirect references. Among crashes where the motorcycle was assigned “Failed to Drive in Single Lane,” approximately 3.7 percent contained potential lane splitting references, including 1.5 percent with direct references and 2.2 percent with indirect references. As in all severity crashes case, most narratives for KA crashes did not contain lane splitting related language.

Manual validation showed that direct lane splitting references were highly reliable. Almost all reviewed cases with direct references contained narrative information describing lane splitting activity. Indirect references were also useful. Among crashes without the “Failed to Drive in Single Lane” flag, 87.9 percent of reviewed indirect reference cases were consistent with lane splitting. Among crashes with the flag, 88.6 percent of reviewed indirect reference cases were consistent with lane splitting.

Among crashes without the “Failed to Drive in Single Lane” flag, a small share of cases without lane splitting keywords also contained lane splitting information, suggesting that the keyword rules missed some crashes where officers used wording not captured by the screening logic. Based on the validated keyword flags, approximately 404 KA crashes contained narrative evidence consistent with lane splitting. This included about 332 crashes among motorcycles not assigned “Failed to Drive in Single Lane” and about 72 crashes among motorcycles assigned that contributing factor, as shown in Table 61.

Table 61 presents lower and upper range estimates of motorcycle crashes with narrative evidence consistent with lane splitting. The lower range estimate is based only on validated keyword flags, while the upper range estimate also accounts for potential missed cases identified through review of narratives without lane splitting keywords.

Table 61. Lane Splitting Narrative Screening Results by “Failed to Drive in a Single Lane” Status for KA Motorcycle Crashes, 2016-2025.

Group	Estimate Type	Calculation	Estimated Lane-Splitting Cases
MC Not Assigned “Failed to Drive in Single Lane”	Lower range estimate based on validated keyword flags only	Direct: $86 \times 97.8\% = 84$ Indirect: $282 \times 87.9\% = 248$	332
MC Assigned “Failed to Drive in Single Lane”	Lower range estimate based on validated keyword flags only	Direct: $30 \times 100\% = 30$ Indirect: $47 \times 88.6\% = 42$	72
All Motorcycle Crashes	Lower Range Estimate TOTAL	332 + 72	404
MC Not Assigned “Failed to Drive in Single Lane”	Upper range estimate including missed no keyword cases	Keyword Estimate: 332 Missed No Keyword Cases: $22,693 \times 1.7\% = 386$ Total: $332 + 386$	718
MC Assigned “Failed to Drive in Single Lane”	Upper range estimate including missed no keyword cases	Keyword Estimate: 72 Missed No Keyword Cases: $2,079 \times 3.1\% = 64$ Total: $72 + 64$	136
All Motorcycle Crashes	Upper Range Estimate TOTAL	718 + 136	854

When the small share of lane splitting cases identified in the no keyword validation sample was extrapolated to all KA crashes with narratives, the estimated total increased to approximately 854 lane splitting crashes. This broader estimate included about 718 crashes among motorcycles not assigned “Failed to Drive in Single Lane” and about 136 crashes among motorcycles assigned that contributing factor.

Overall, the lane splitting screening procedure provided more value than the protective gear screening procedure because it helped identify a behavior that is not directly captured by a dedicated structured field. Based on the validated keyword flags and the expanded estimate including missed no keyword cases, the estimated number of lane splitting crashes ranged from approximately 404 to 854 crashes. This represented about 1.6 percent to 3.4 percent of the 25,217 KA motorcycle crashes with narratives reviewed.

Machine Learning Analysis Using Topic Modeling

Topic modeling was used to identify common patterns and potential contributing factors within the crash narratives. Topic modeling is a text analysis technique that groups narratives based on similar words and phrases and identifies the main themes that appear across a large collection of text. This approach was more appropriate than a word cloud because a word cloud

mainly shows which words occur most frequently, without considering how those words are related or what they represent in context.

Patterns Among Crashes Assigned No or Other Contributing Factors

One goal of this project was not simply to identify frequently used words, but *to discover meaningful crash-related themes and contributing factors, such as unsafe lane changes, failure to yield, or animal-related crashes*. Therefore, topic modeling provided a more useful way to organize and interpret the information contained in the narratives. Table 62 displays the available number of crash narratives used for this analysis.

Table 62. Narrative Sample Sizes for Analysis of Contributing Factors.

Category	N
All	81,717
CF = "None" (0) as the only contributing factors for all units	3,438
CF = "Other" (74) as the only contributing factors for all units	4,589
CF = "None" (0) as the only contributing factors for non-motorcycle unit(s)	17,573
CF = "Other" (74) as the only contributing factors for non-motorcycle unit(s)	851
CF = "None" (0) as the only contributing factors for motorcycle	27,005
CF = "Other" (74) as the only contributing factors for motorcycle	5,816

For the full dataset, topic modeling identified four main themes as shown in Figure 20. Topic 0 represents general crash contributing factors, with phrases related to *lost control*, *speed*, *failure to yield*, and *turning movements*. Topic 1 also captures roadway and vehicle-movement factors, particularly *lane position*, *left turns*, and *loss of control*. Topics 2 and 3 are more clearly defined and represent animal-related crashes: Topic 2 is dominated by *deer-related crashes*, while Topic 3 primarily represents *dog-related crashes*.

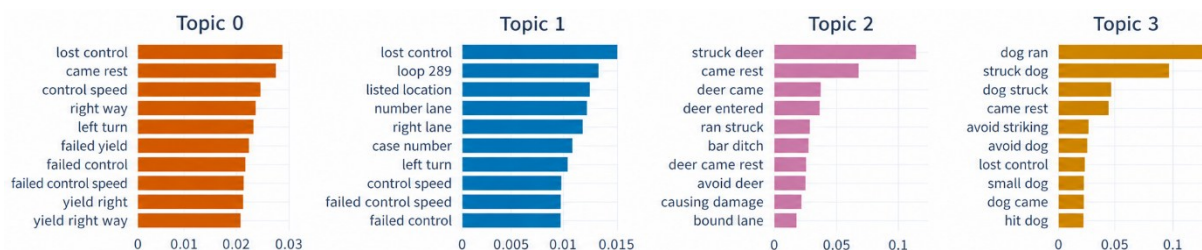


Figure 20. Topic Modeling for the Full Dataset of Crashes.

For crashes assigned “None” as the contributing factor for all units, topic modeling was applied to the narratives to determine whether additional contributing factors or crash circumstances could be identified from the text. The results show several potentially meaningful patterns as shown in Figure 21. Topics 0 and 4 are primarily related to lane position and turning movements, including phrases such as *right lane*, *left lane*, *outside lane*, and *left turn lane*. Topics 2 and 3 contain phrases related to *loss of control*, along with roadway or directional information. Topic 1, however, appears to be dominated by location and facility names rather

than a clear contributing factor. These results suggest that the narratives may contain useful information about contributing circumstances even when no contributing factor is recorded in the structured data, although some topics reflect locations or other contextual information rather than actual contributing factors.

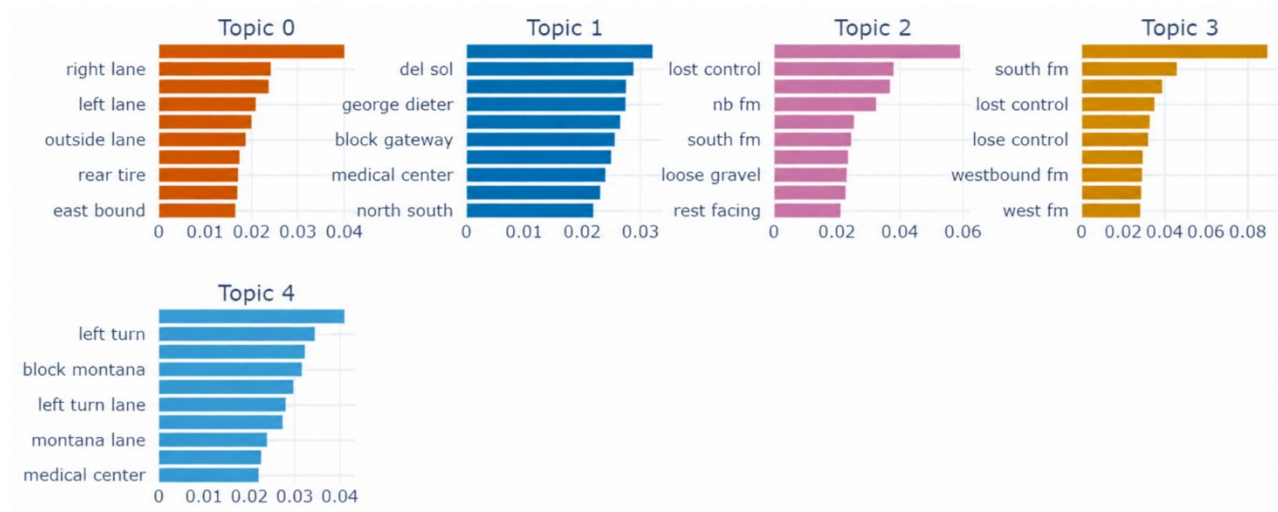


Figure 21. Topic Modeling for Crashes with No Assigned Contributing Factors.

For crashes where “Other (Explain in Narrative)” was the only contributing factor recorded for all units, topic modeling identified a more consistent pattern in the narratives as shown in Figure 22. Across all three topics, loss of control appears as a prominent theme, with phrases such as *lost control*, *lose control*, and *causing to lose control*. The topics also include roadway and directional information, such as *left lane*, *right lane*, *loose gravel*, and *bar ditch*. This suggests that some crashes coded broadly as “Other” in the structured data may contain more specific information in the narratives, particularly circumstances related to loss of vehicle control and roadway conditions.

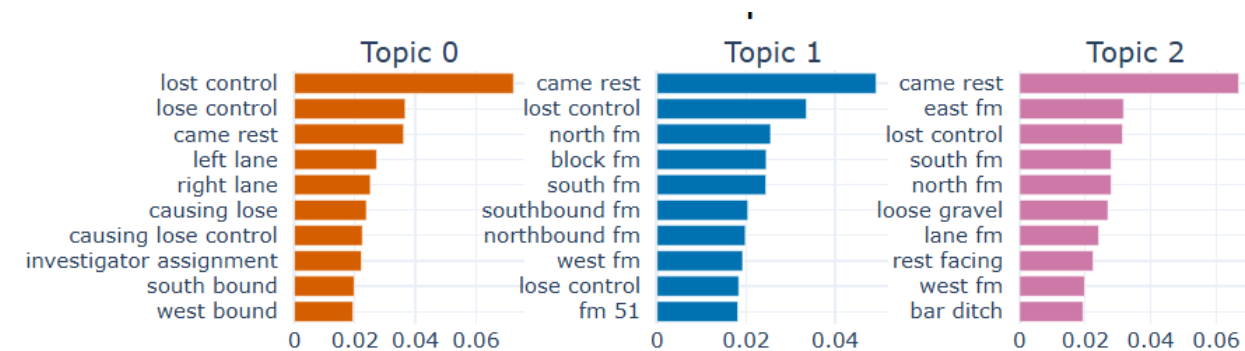


Figure 22. Topic Modeling for Crashes Only Assigned Contributing Factors of “Other.”

For crashes where “Other” was the only contributing factor recorded for the non-motorcycle unit(s), topic modeling identified several more specific circumstances in the narratives as shown

in Figure 23. Topic 0 includes traffic-control and driving-related factors such as *red light*, *control speed*, *failed control speed*, and *failed control*, along with turning and lane movements. Topic 1 includes *lost control* as well as intersection-related terms such as *stop sign* and *struck right*. Topic 2 is largely related to lane position and turning movements, with *left lane*, *right lane*, *center lane*, *middle lane*, and *turn left*, while *lost control* also appears. These results suggest that narratives may provide more specific information about the circumstances or potential contributing factors for non-motorcycle units that are coded only as “Other” in the structured data.



Figure 23. Topic Modeling for Crashes Only Assigned Contributing Factors of “Other” to the Non-Motorcycle.

For crashes where “Other” was the only contributing factor recorded for the motorcycle unit, loss of control is the most consistent theme across the identified topics as shown in Figure 24. Phrases such as *lost control*, *lose control*, and *loose gravel* appear frequently, along with lane and roadway-related terms such as *left lane*, *right lane*, and *bar ditch*. Some topics also contain location or report-related information that does not represent a clear contributing factor. Overall, the results suggest that loss of motorcycle control, potentially associated with roadway conditions or maneuvering, may be an important circumstance hidden within crashes broadly coded as “Other.”



Figure 24. Topic Modeling for Crashes Only Assigned Contributing Factors of “Other” to the Motorcycle.

Across the filtered categories, the topic patterns showed some clear differences. For crashes with “None” as the contributing factor for all units, the narratives were relatively diverse, with

themes related to lane position, turning movements, and loss of control, as well as some location-related information. When “Other” was the only contributing factor for all units, the topics were more consistent and were strongly dominated by loss of control, with some references to roadway conditions such as loose gravel and ditches. When “Other” applied only to the non-motorcycle unit(s), the narratives showed more traffic-control and driving-behavior themes, including red lights, speed control, stop signs, turning, and lane movements. In contrast, when “Other” applied to the motorcycle unit, loss of control was the strongest and most consistent theme, along with roadway-condition and lane-related terms. These differences suggest that the broad “Other” category may represent different underlying circumstances depending on whether it is assigned to the motorcycle or the other involved vehicle.

Patterns Among Crashes Involving Lane Splitting or Related Lane Behaviors

With respect to using machine learning to better understand lane splitting, the following phrase patterns were used to identify candidate narratives for each lane behavior:

- Lane filtering: Searched for direct references to lane filtering or descriptions of moving/passing between stopped vehicles or through traffic.
- Lane splitting: Searched for lane splitting or white-lining, as well as descriptions of riding, traveling, or passing between lanes, vehicles, cars, or traffic, or along a lane line. The pattern allows related phrases to occur within 50 characters of each other.
- Lane sharing: Searched for lane sharing or descriptions of two vehicles using the same lane, including sharing the same lane, side-by-side in the same lane, alongside another vehicle, or passing within the same lane.

The narratives were first filtered using keywords and phrases related to filtering, splitting, and sharing, including movement or passing between vehicles and traveling side-by-side. Broader phrases were used because these behaviors may be described in the narratives without explicitly using the terms lane filtering, lane splitting, or lane sharing. Topic modeling of the filtered narratives identified two main themes, mostly related to "speed, loss of control", "lane position, lane changes" as shown in Figure 25.

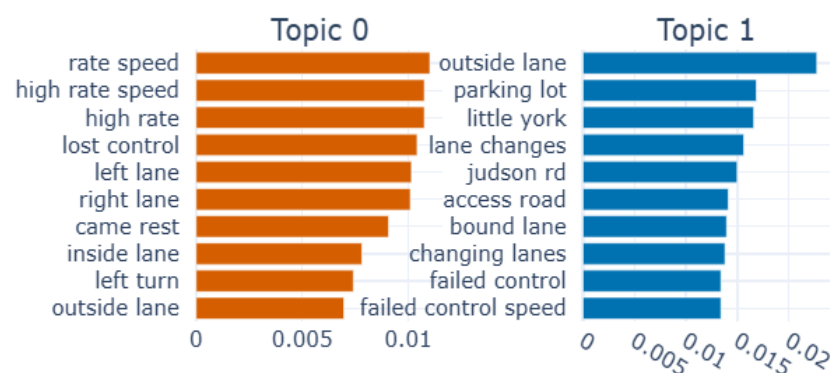


Figure 25. Topic Modeling for Lane Behaviors.

SUMMARY

This report presented an in-depth analysis of motorcycle crashes occurring on Texas public roadways from 2016 to 2025. All analyses are based on secondary data sources including crash records, vehicle registrations, and driver licenses. Consequently, there are inherent limitations in that the quality and completeness of the data is dependent upon how the data were originally collected and entered into the respective databases. The limitation of greatest concern is that crash records are entered by different law enforcement officers attending the crash scene. Training, tenure on-the-job and other factors may influence how well data are collected and their completeness. It is important to note that the crashes in these analyses all occurred on public roadways only and resulted in an injury or property damage valued at \$1000 or greater.

Despite inherent limitations, the Texas crash records are a complete census of these crash events allowing for examining the frequency of crashes over time as well as identifying the contributing factors and circumstances of greatest concern. Issues that are common and/or associated with crashes of greater severity are of primary concern for outreach and education efforts. There was sufficient evidence in the crash narrative to support concentrated attention on the issue of lane splitting, from an outreach, education, and enforcement perspective, but also from a crash reporting perspective. Additional crash reporting issues included a lack of fields for gear use beyond helmets, along with training to ensure that vehicles or units are assigned all relevant contributing factors.

Finally, the following safety concerns were identified as priorities for outreach and education or enforcement efforts:

- Speed-related risk behaviors;
- Operator distraction;
- Operator impairment;
- Failure to yield right of way;
- Lack of appropriate licensure;
- Rural roadways;
- Intersections;
- Curves, including speed control;
- Safe riding in hazardous weather conditions;
- Increasing conspicuity in dark or low lighting;
- Lane splitting laws and crash risks;
- Increasing signage or other efforts in/around scenic drives in Texas; and
- Assisting/educating law enforcement on how to code contributing factors for vehicles that lose control.