2016–2021

Texas Strategic Action Plan for Motorcycles

Texas A&M Transportation Institute

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Texas Department of Transportation

Acknowledgments

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Executive Summary

The 2016–2021 Texas Strategic Action Plan for Motorcycles delivers an integrated approach to identify implementable strategies and action steps to make Texas roadways, infrastructure, drivers, and riders safer for the motorcycling community. The plan was developed over a 9-month period from October 2015–June 2016 during the completion of the *Statewide Motorist Awareness and Motorcyclist Safety and Outreach Support* project, which was funded by the Texas Department of Transportation (TxDOT) (Project 2016-TTI-G-1YG-0030).

Several activities were completed in development of the plan. Activities included a review of motorcycle safety research and projects conducted in Texas since 2012, consideration of national and state-level strategic motorcycle safety plans and reports, analysis of motorcyclist fatality and injury crash data, evaluation of focus group data involving five motorcycle safety stakeholder populations, and analysis of survey data collected from motorcycle safety stakeholders. These activities culminated in the development of a list of potential countermeasures to improve motorcyclists' safety that were evaluated and prioritized by motorcycle safety experts and advocates.

The five-year plan includes detailed strategies and action steps to reduce the number of motorcycle fatalities, injuries, and crashes on Texas roadways. It provides guidance to key stakeholders involved in improving motorcycle safety, including TxDOT, the Texas Department of Public Safety – Motorcycle/ATV Safety Unit (TxDPS MSU), the Texas Motorcycle Safety Coalition (TMSC), peace officers, local agencies, motorcycle clubs/groups and independent riders, and motorcycle manufacturers and dealerships.

This is a dynamic plan, and as strategies are implemented, additional strategies can be identified, prioritized, and implemented. The goal of the plan is to focus limited funding and resources on areas with the greatest opportunity to reduce motorcycle fatalities, injuries, and crashes in Texas.

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Introduction

Motorcycling is an enduring mode of transportation for both work and pleasure used by millions of riders globally.

Motorcycling is an enduring mode of transportation for both work and pleasure used by millions of riders globally. Motorcycling offers several benefits compared to vehicles relative to work-related travel including fuel efficiency, the use of express lanes that improves mobility, and easier parking due to a motorcycle's size. As a recreational activity, motorcycling provides a sense of freedom, a chance to interact with nature's elements, and an opportunity to be part of a larger family of riders.

However, operating a motorcycle is more risky than operating a passenger vehicle. Motorcycling requires the rider to have a fine sense of balance, coordination, and awareness. When these senses are compromised, it is not uncommon to observe motorcycles involved in single vehicle roadway departure crashes. A motorcycle exposes the rider to environmental elements such as extreme weather conditions, road conditions, and other traffic that can conspire to reduce rider safety. Due to its narrow profile, a motorcycle is less visible and vulnerable to crashes in which drivers look but do not see a motorcycle. In the event of a crash, a motorcycle offers a rider no protection, a situation that is exacerbated by riders who do not wear appropriate personal protective gear. Too often motorcyclists are involved in fatal and serious injury crashes that could have easily been avoided.

As evidence of the risks involved in motorcycling, in 2015, there were 455 motorcyclist fatalities in Texas. The data are alarming because these fatalities accounted for 13 percent of all motor vehicle fatalities in the state but motorcycles only accounted for 2 percent of the registered motoring vehicles.[1] Despite experiencing two consecutive years of declines in motorcyclist fatalities from 2013–2015, motorcyclist safety remains a serious traffic safety challenge in Texas. It is because of this ongoing challenge that Texas should continue to seek innovative and evidence-based solutions to reduce the number of motorcyclist fatalities, injuries, and crashes.

[1]Federal Highway Administration - Policy and Governmental Affairs, Office of Highway Policy Information. (2015). *State Motor-Vehicle Registrations* – 2014. Retrieved from http://www.fhwa.dot.gov/policyinformation/statistics/2014/mv1.cfm.

Texas Motorcycle Strategic Action Plan

A central activity for addressing motorcyclist safety in Texas includes the identification of solutions and activities that can be implemented to address the motorcyclist safety problem. The first Strategic Action Plan (SAP) released in 2013 included a summary of crashes and crash contributing factors, and a list of key focus areas. This foundational document has guided Texas motorcycle safety efforts for motorcycle safety stakeholders in the intervening years.

The purpose of the 2016–2021 SAP is to expand the utility of the original SAP. The SAP serves to focus funding and resources on the areas that provide the greatest opportunity to reduce motorcyclist fatalities, serious injuries, and crashes. The SAP provides guidance to key stakeholders concerned with improving motorcyclist safety including those from engineering, law enforcement, education, emergency medical services (EMS), and judicial agencies. In addition, and with equal importance, are those key stakeholders in the riding and motorist communities including motorcycle clubs/groups, recreational riders, motorcycle dealers, automobile clubs, and motorists. This was accomplished by examining previous motorcyclist safety activities, bolstering the in-depth crash analysis and problem identification information, identifying and prioritizing key focus actions, identifying responsible stakeholders to be accountable for implementing the actions, and identifying time frames for accomplishing actions. The SAP supplements and expands upon the Strategic Texas Highway Safety Plan prepared by TxDOT and provides consistency with priority areas as set forth in the National Highway Traffic Safety Administration's (NHTSA) Uniform Guidelines for State Highway Safety Programs – No. 3.

The 2016–2021 SAP can serve as a guiding document to any motorcyclist safety stakeholder or advocate in Texas. The SAP is organized into four main sections including the Introduction, which provides an overview of the 2016–2021 SAP; the Overview of Motorcycle Safety Efforts, which provides brief summaries of recently funded motorcycle safety efforts in Texas; Texas Motorcycle Safety Data, which provides critical data on motorcycle safety; and Key Focus Areas, which identifies countermeasures to improve motorcyclist safety.

In light of the motorcycle safety challenges, several activities throughout Texas have sought to improve motorcyclist safety.

Overview Of Motorcycle Safety Efforts

In light of the motorcycle safety challenges, several activities throughout Texas have sought to improve motorcyclist safety. While motorcycle safety has always been a priority in the state, recent actions have significantly benefited and advanced the state's motorcycle safety program. As an example, in 2015, Senate Bill 754 was passed by the 84th Texas State Legislature, which effectively allowed a dedicated fund for motorcycle safety training and public awareness campaigns to be accessed and expended for that designated purpose. By 2016, TxDPS MSU had already received a portion of those funds and had purchased a new fleet of motorcycles for the basic rider course (BRC) and dedicated a portion of the funds to subsidize the cost of training courses, keeping course fees reasonable for riders to increase course participation and further increase motorcyclist safety.

In accordance with the Texas Highway Safety Plan, TxDOT implements a number of activities in alignment with national highway safety goals to reduce motorcycle-related fatalities and serious injuries. These activities focus on both riders and the motoring public. TxDOT continues to focus on motorcyclist safety through safety training, public awareness, public service announcements, and other outreach programs to enhance driver awareness of motorcyclists, such as the Share the Road and the newly launched There's a Life Riding on It safety campaigns and rider awareness, such as the Look Learn Live campaign. Additional TxDOT strategies to improve motorcyclist safety include:

- Improve education and awareness of motorcycle safety among law enforcement and emergency medical services personnel, educators, and state and local traffic engineers.
- Improve public information and education on motorcycle safety, including the value of wearing a helmet.
- Improve public information and education on the value of not operating a motorcycle while under the influence of alcohol and/or other drugs.
- Increase public information and education on motorists' responsibility pertaining to motorcycle safety.
- Increase rider education and training.

The TxDOT Motorcycle Safety Program has a concentrated but integrated approach to addressing motorcycle safety in Texas. TxDOT's dedication is not insignificant.

Using the above strategies to improve motorcyclist safety, each fiscal year, TxDOT selects and sponsors motorcycle safety projects that have the potential to impact the number of motorcyclist fatalities, injuries, and crashes. The TxDOT Motorcycle Safety Program has a concentrated but integrated approach to addressing motorcycle safety in Texas. TxDOT's dedication is not insignificant. See Table 1, which provides a fiscal summary for FY 2015–2017 projects funded through TxDOT's Motorcycle Safety Program.

	FY 2017 Planned	FY 2016 Award	FY 2015 Award
Federal Funds	$859,690.85	$1,090,623.86	$1,086,284.42
Local Match	$589,979.62	$647,770.83	$646,773.68
Project Total	$1,449,670.57	$1,738,394.69	$1,733,058.10

The following summarizes recent and present motorcycle safety activities in Texas. The identification of past and present motorcycle safety activities is important because it illustrates the dedication to motorcyclist safety in Texas and identifies the scope and range of activities. Project descriptions are formed by several elements including the project title, followed by a brief summary, the performing organization, the sponsor, and the year(s) in which the project was conducted.

Motorcyclists Safety Equipment Use Program – The project addressed the central issue of increasing rider protective gear use rates. Riders were surveyed to identify reasons why riders wear and do not wear various types of gear, what motivates their decisions, and what would motivate riders to increase protective gear use. With an understanding of rider attitudes, perceptions, social norms, and personal history, the project then developed an outreach program based on the survey results to the Texas motorcycling community to increase personal protective gear use.
Organization: Texas A&M Transportation Institute
Sponsor: Texas Department of Transportation
Year(s): 2015–Present

Comprehensive Analysis of Motorcycle Crashes in Texas: A Multi-Year Snapshot
This project involved the conduct of a comprehensive analysis of motorcycle crashes from 2010 – 2015. The project was designed to understand motorcycle crash complexity in order to prioritize points for crash intervention and ultimately to prevent motorcyclist fatalities and severe injuries in Texas. The analysis involved a variety of variables at the crash, vehicle, person, and environmental levels that were derived from traditional crash reports as well as other data sources.
Organization: Texas A&M Transportation Institute
Sponsor: Texas Department of Transportation
Year(s): 2015 – Present

Motorcycle Safety Public Education Campaign
This project addressed the need to raise awareness and educate motorists about looking twice for motorcycles. The campaign emphasized "there's a life riding on it" and sought to humanize motorcyclists by reminding drivers that the riders are dads, moms, and veterans. The campaign was conducted through television public service announcements, radio ads, billboard ads, gas station ads (at 111 gas stations), digital ads, and mobile ads. In addition to a general statewide media plan, ads were placed in six high fatality markets: Austin, Dallas/Fort Worth, Houston, El Paso, San Antonio, and Waco. The campaign included a kickoff press conference and six media and outreach events throughout the state. The campaign was also promoted through social media outlets such as Facebook and Twitter, including a custom "twibbon" profile picture that showed the individual on a motorcycle.
Organization: Sherry Matthews Advocacy Marketing
Sponsor: Texas Department of Transportation
Year(s): 2015 – Present

Statewide Motorist Awareness and Motorcyclist Safety Outreach and Support – This was a public education and information outreach project that aimed to raise motorists' knowledge of safely sharing the road with motorcyclists and rider safety awareness. The project consisted of several key activities. First, to educate motorists and motorcyclists, the project exhibited an outreach campaign booth at 15 motorist and motorcycle-specific events throughout the state. The campaign sought to educate motorists to Look Twice for Motorcycles and Share the Road, and to educate motorcyclists about the importance of gear use and the importance of riding sober. The campaign resulted in a significant online presence, which included www.LookLearnLive.org website and social media outlets like Facebook, Instagram, and Twitter. Under this project, the SAP was revised and maintained.

In addition to the above outreach activities, the project also involved facilitation of the TMSC. The TMSC was established in 2008 by individuals interested in forming a motorcycle safety working group that could collectively identify action steps to reduce the number of motorcyclist fatalities, serious injuries, and crashes. The TMSC membership is comprised of a multidisciplinary group of stakeholders from traffic and motorcycle safety, law enforcement, club and independent riders, and rider coaches and instructors.

The Texas Statewide Motorcycle Safety Forum serves as a platform to discuss opportunities and initiatives to reduce the likelihood of motorcycle fatalities, serious injuries, and crashes in Texas. The forum brings together stakeholders from around the state with backgrounds in engineering, traffic safety research, rider coaching and instructing, club members and independent riders, law enforcement, licensing, educators, and dealers. The open format of the forum allows for an exchange between all those involved in the motorcycle safety challenge to drive change.
Organization: Texas A&M Transportation Institute
Sponsor: Texas Department of Transportation
Year(s): 2006–Present

Observational Surveys of Restraint Use and Motorcycle Helmet Use – This project examined the number of motorcyclists who wore a helmet while operating a motorcycle. This information was collected through the use of observational surveys across the state, and it was used to approximate the state's voluntary helmet use rate.
Organization: Texas A&M Transportation Institute
Sponsor: Texas Department of Transportation
Year(s): 1993 – Present

The Texas Statewide Motorcycle Safety Forum serves as a platform to discuss opportunities and initiatives to reduce the likelihood of motorcycle fatalities, serious injuries, and crashes in Texas.

Motorcycle Safety Awareness Campaign (2014–2015)/Motorcycle Public Information and Education Campaign (2013) – This project addressed the critical need to raise public awareness and educate motorists about looking twice for motorcycles. The campaign was conducted in both English and Spanish to reach a wide audience. The campaign was supported by paid media, a statewide press release, social media, a six-stop community events tour where Texans were reminded to Share the Road and Look Twice for Motorcycles, and a series of motorcycle processions in partnership with local law enforcement and the Texas Patriot Guard. Media buys were placed in six key markets: Austin, Dallas-Fort Worth, El Paso, Houston-Galveston, Odessa-Midland, and San Antonio. The campaign included the use of billboards, radio, mobile, online banner ads, social media, gas station and convenience store pump toppers, and window clings. Total impressions in FY 2015 alone were over 121,238,000.
Organization: EnviroMedia Social Marketing
Sponsor: Texas Department of Transportation
Year(s): 2013–2015

Increasing Recruitment/Retention of Motorcyclist Safety Training Instructors – This project sought to improve the recruitment and retention process of motorcyclist safety training instructors. The project included coordinating eight statewide regional workshops, developing training videos, and expanding training accessibility to include online training for instructors. Pre- and post-workshop evaluations were conducted to evaluate the effectiveness of the workshops.
Organization: Texas A&M Transportation Institute
Sponsor: Texas Department of Transportation
Year(s): 2011–2015

Motorcycle Safety Awareness Public Information and Education Campaign – This campaign urged motorists to take extra precautions to safely share the road with motorcyclists. This project involved conducting a motorcycle awareness earned media effort, conducting a motorcycle awareness paid media campaign, and distributing materials announcing the motorcycle awareness campaign. Paid media targeted adult drivers from 18–44 year olds and was delivered in both English and Spanish to expand the campaign impact. From TV spots, traffic sponsorships, billboards, and interactive materials, there were an estimated 138,482,020 impressions made through this campaign.
Organization: Sherry Matthews Advocacy Campaign
Sponsor: Texas Department of Transportation
Year(s): 2012

Texas Law Enforcement Motorcycle Safety Awareness and Enforcement Training Course – This project educated law enforcement officers about motorcycle laws, safety issues, and enforcement strategies to aid in reducing motorcycle crashes and injuries. The course was developed first as a classroom-based curriculum and was later converted to a completely web-based training program with the goal of reaching a larger number of Texas peace officers more efficiently.
Organization: Texas A&M Transportation Institute
Sponsor: Texas Department of Transportation
Year(s): 2009–2012

The project summaries provide valuable information that motorcycle safety stakeholders can use to identify key focus areas for future work.

The project summaries provide valuable information that motorcycle safety stakeholders can use to identify key focus areas for future work. Collectively, the summaries indicate that:

- There is a strong and continuing interest in motorcyclist safety in Texas.
- Significant resources have been dedicated to motorcyclist safety in Texas.
- Projects to address motorcyclist safety have used diverse areas of expertise including education, outreach, and engineering.

Many of the projects emphasize the value of employing a diverse group of key stakeholders including state agencies, motorcycle safety advocacy groups, motorcycle rider groups, and riding enthusiasts.

Texas Motorcycle Safety Data

In light of the significant resources dedicated to and interest in Texas motorcycle safety activities, it is important to understand the scope of the motorcycle safety problem. Due to a finite amount of available resources, key stakeholders should be aware of the motorcycle problems of the greatest concern and implement targeted motorcycle safety activities that hold the greatest potential for reducing motorcyclist fatalities, injuries, and crashes.

In 2015, there were 455 motorcycle fatalities in Texas, representing 13 percent of all motor vehicle traffic fatalities in the state. Despite experiencing two consecutive years of declines in motorcycle fatalities (2013–2015), motorcycle crashes continue to pose a serious public health concern and economic liability in Texas. The challenge, moving forward, is how to continue reducing the number of motorcycle fatalities, injuries, and crashes in the state.

The motorcycle safety problem is not unique to Texas, but what makes the challenge unique in Texas is the combination of multiple factors. A significant factor is the rising Texas population. From July 2014 to July 2015, the city of Austin alone added over 19,000 people, and 5 of the 11 fastest growing cities in the nation were located in Texas (i.e., Georgetown, New Braunfels, Frisco, Pearland, and Pflugerville).[2] Second, there has been a significant increase in the number of motorcycle registrations, partly due to the rising population but also due the popularity of motorcycle riding. Third, the absence of a mandatory helmet law results in a significant percentage of riders who do not wear a helmet, which significantly increases the risk of serious injuries and fatalities. The challenge in addressing motorcyclist safety rests in understanding the nature and extent of the motorcyclist safety problem and then developing and deploying safety programs that can overcome the unique challenges in Texas.

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Data Sources

Understanding the nature and extent of the motorcyclist safety problem requires a review of relevant safety data. The 2016–2021 SAP references two data sources that are widely available and contain validated and reliable data for both vehicle and motorcycle crashes. The Crash Records Information System (CRIS) is maintained by TxDOT and contains crash data based on the Texas Peace Officer's Crash Report (CR-3) form filled out by law enforcement officers at each crash. In Texas, the term motorcycle includes police motorcycles, mopeds, scooters, motorbikes, three wheelers (ATV), and four wheelers. Unless otherwise noted, all Texas referenced crash data were obtained from CRIS.

The Fatality Analysis Reporting System (FARS) contains data derived from a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico. FARS crash data include those crashes that involve a motor vehicle traveling on a traffic way and result in the death of an occupant of a vehicle or a non-motorist. FARS data are collected from the coroner and medical examiner reports, police crash reports, state vehicle registration files, state driver licensing files, state highway department data, vital statistics, death certificates, hospital medical reports, and emergency medical service reports.

CRIS and FARS data may differ slightly due to reporting constraints. Unlike FARS data, CRIS data are continually updated as new crash information becomes available.

[2]U.S. Census Bureau. (2016). *Five of the nation's eleven fastest-growing cities are in Texas, Census Bureau reports*. Retrieved from http://www.census.gov/newsroom/press-releases/2016/cb16-81.html.

What Is the Extent of the Motorcycle Crash Problem?

Motorcycle Registrations – In 2001, there were 201,834 motorcycle registrations, and in 2014, that number climbed to 437,949, more than doubling over 13 years. The number of motorcycle registrations has not abated in recent years as evidenced by an increase from 419,722 to 437,949 registrations from 2010 to 2014, respectively, see Table 2. With more registered motorcycles on the road, reducing the number of fatal and incapacitating injuries becomes a greater challenge and remains a significant concern.

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Table 2. Fatality Rate per 100,000 Registered Motorcycles, 2010–2015

Year	Motorcycle Fatalities in Texas	Registered Motorcycles in Texas[3]	Fatality Rate*
2010	437	419,722	104.11
2011	491	430,422	114.07
2012	471	439,029	107.28
2013	503	438,960	114.59
2014	467	437,949	106.63
2015	455	N/A	N/A

*Rate per 100,000 registered motorcycles in Texas

Motorcyclist Fatalities – Motorcyclist safety represents a significant area for traffic safety improvement in the United States and in Texas. In the United States in 2014, there were 4,586 motorcyclist fatalities. Motorcyclist fatalities accounted for 14 percent of all motor vehicle fatalities across the nation in 2014. Nationally, the occupant fatality rate per 100 million vehicle miles traveled (VMT) for passenger vehicles was 0.85 in 2014, but in contrast, the motorcyclist fatality rate per 100 million VMT was 22.96.[4]

[3]Texas Department of Motor Vehicles. (2014). FY 2001–2014 Number of Passenger, Motorcycles & Pick-Up Trucks Registered Statewide. Retrieved from http://www.txdmv.gov/reports-and-data/cat_view/13-publications/25-reports-data/65-vehicle-titles-registration/229-number-of-vehicles-registered.

[4]2014 is the most recent year for which FARS data are available.
Fatality Analysis Reporting System, National Highway Traffic Safety Administration. (2016). Quick Facts 2014. Retrieved from https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812234.

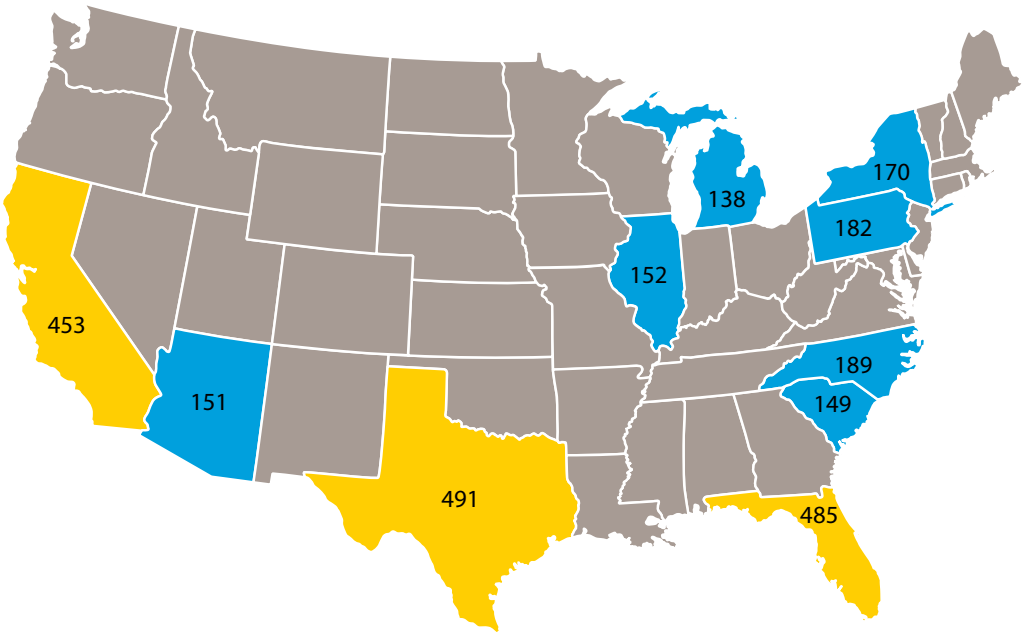

Figure 1. Top 10 States with Highest Number of Motorcycle Fatalities in 2013

With 491 motorcyclist fatalities in 2013, Texas led the nation with the greatest number of motorcyclist fatalities. Texas was followed closely by Florida and California with 485 and 453 fatalities, respectively. As indicated in Figure 1, Texas and these two other states recorded significantly more motorcyclist fatalities than the next seven states.

Table 3. Number of Motor Vehicle Fatalities in Texas, 2010–2015

	2010	2011	2012	2013	2014	2015
All motor vehicle fatalities in Texas	3,060	3,067	3,417	3,408	3,536	3,512
Motorcyclist fatalities in Texas	437	491	471	503*	467	455
% of all motor vehicle fatalities that involve motorcycles in Texas	14.2%	16.0%	13.7%	14.7%	13.2%	12.9%

Texas has experienced two consecutive years of decline in terms of both the total number of motorcyclist crash fatalities and the percent of motor vehicle traffic fatalities that involve motorcycles

In that same year, Texas motorcyclist crashes also accounted for 14 percent of all traffic fatalities. However, since 2013, Texas has experienced two consecutive years of decline in terms of both the total number of motorcyclist crash fatalities and the percent of motor vehicle traffic fatalities that involve motorcycles (see Table 3 for 2010–2015 data). While the number of all motor vehicle fatalities in Texas is continuing to rise, motorcyclist fatalities and the percent of motor vehicle fatalities that involved motorcycles have approached historic 6-year lows. In fact, motorcyclist fatalities represented just 12.9 percent of all motor vehicle fatalities in Texas in 2015.

Motorcyclist Incapacitating Injuries – Incapacitating injuries are any injury, other than a fatal injury, which prevents the injured person from walking, driving, or normally continuing the activities the driver was capable of performing before the injury occurred. The number of motorcyclist incapacitating injuries declined from 2014 to 2015 to a six-year low of 11.1 percent (see Table 4 for 2010–2015 data). In 2015, there were 1,737 motorcyclist incapacitating crashes in Texas, which represents the second lowest number of motorcyclist incapacitating crashes over the past six years. Motorcyclist incapacitating crashes accounted for 12.9 percent of all incapacitating motor vehicle crashes in Texas in 2015, which is the lowest percentage in the past six years.

Table 4. Number of Incapacitating Injuries in Texas, 2010–2015

	2010	2011	2012	2013	2014	2015
All incapacitating injuries in Texas	15,271	14,790	16,197	16,805	17,152	16,793
Motorcyclist incapacitating injuries in Texas	1,837	2,010	2,049	1,970	2,022	1,866
% of all motor vehicle incapacitating injures that involve motorcyclists in Texas	12.0%	13.5%	12.6%	11.7%	11.7%	11.1%

In Texas, the majority of all motor vehicle traffic fatalities occur in rural locations.

Where Do Texas Motorcyclist Fatalities and Injuries Occur?

Texas categorizes motor vehicle crashes as occurring either in an urban or a rural location. TxDOT defines *urban* as a location within the limits of a city or town having a population of 5,000 or more, and *rural* as a location that cannot be classified as urban.

Motorcyclist Fatalities – In Texas, the majority of all motor vehicle traffic fatalities occur in rural locations. In 2015, for example, there were a total of 1,647 fatal crashes in rural locations versus 1,475 fatal crashes in urban locations. However, with respect to motorcyclist fatalities, the opposite is true. In 2015, there were 262 motorcycle fatalities in urban locations and 193 motorcyclist fatalities in rural locations. Figure 2 illustrates the trend for greater urban fatalities since 2010.

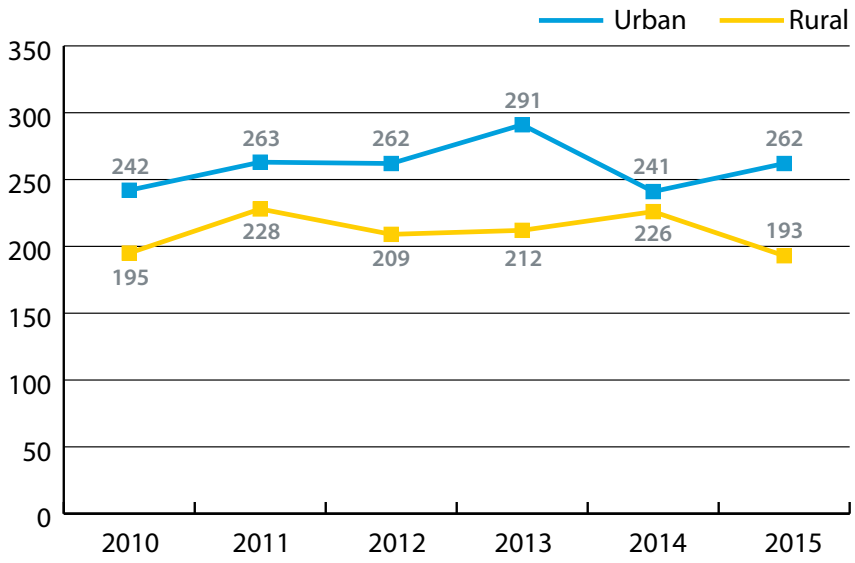

Figure 2. Urban and Rural Motorcyclist Fatalities in Texas, 2010–2015

Motorcyclist Incapacitating Injuries – Between 2010 and 2015 there was a slight increase in the number of motorcyclist incapacitating injuries from 1,837 to 1,866. As can be seen in Figure 3, overall, incapacitating injuries are significantly more common in urban compared to rural areas, and this difference continues to expand over time. In 2010, there were 257 more motorcycle incapacitating injuries sustained in urban than rural locations, but by 2015 the difference had nearly doubled to 484. Over the same time period, the number of incapacitating injuries in urban areas has increased whereas the opposite is true in rural areas.

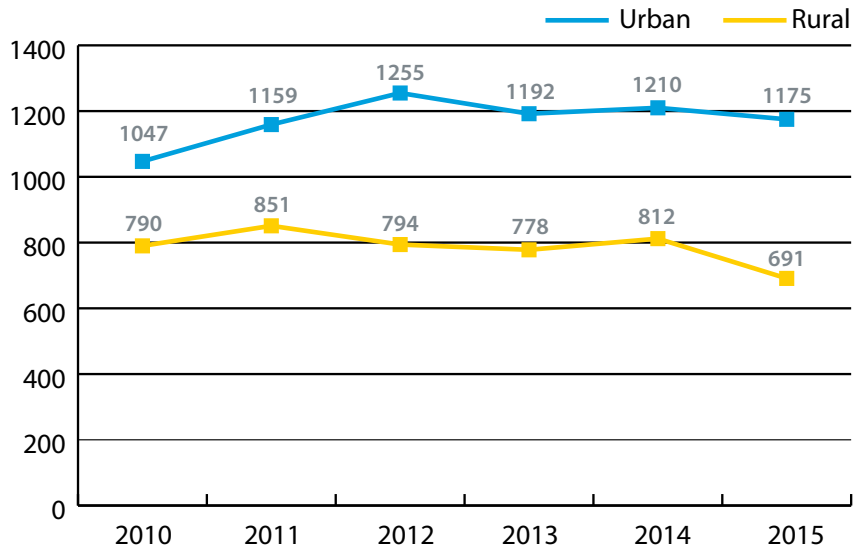

Figure 3. Urban and Rural Motorcyclist Incapacitating Injuries in Texas, 2010–2015

Which Counties Exhibit the Greatest Motorcyclist Fatal and Incapacitating Crashes?

Motorcyclist Fatal and Incapacitating Crashes – The State of Texas consists of 254 counties. Table 5 presents the 10 counties with the highest number of motorcyclist fatal and incapacitating crashes from 2010 – 2015. Harris County experienced the greatest number of motorcyclist fatal and incapacitating crashes. Houston, the most populous city in Texas, is located within Harris County.

Table 5. Top 10 Counties with Highest Motorcyclist Fatal and Incapacitating Crashes, 2010 – 2015

Rank (by Population)	County	Major City	Fatal and Incapacitating Motorcyclist Crashes
1	Harris	Houston	1,511
2	Dallas	Dallas	1,076
3	Tarrant	Ft. Worth	1,038
4	Bexar	San Antonio	710
5	Travis	Austin	650
6	Collin	Plano	364
9	Denton	Denton	340
8	El Paso	El Paso	293
11	Montgomery	Conroe	281
16	Bell	Killeen	280

Fatality Rates – While examining the number of fatalities can help to illustrate where motorcyclist fatalities are occurring in Texas, the information that is derived from this approach can be limited. Characteristically, the counties with the largest population sizes will also be the counties where the greatest number of motorcyclist fatalities occurs. However, by examining fatality rate, the proportion of motorcyclist fatalities per 100,000 residents in the county provides a more detailed understanding of location. This information can be used to direct motorcyclist safety activities to high risk areas.

While examining the number of fatalities can help to illustrate where motorcyclist fatalities are occurring in Texas, the information that is derived from this approach can be limited.

Table 6 identifies the top 10 counties with the highest motorcyclist fatality rate per 100,000 residents in the county in 2015.[5] Harrison County exhibited the highest motorcyclist fatality rate per 100,000 people with a rate of 10.2, meaning that for every 100,000 people, there were 10.2 motorcyclist fatalities in 2015.

Table 6. Top 10 Counties with Highest Motorcyclist Fatality Rate per 100,000 People, 2015

Rank (by Population)	County	Major City	Population	Fatalities	Motorcyclist Fatality Rate per 100,000 People
51	Harrison	Marshall	68,889	7	10.2
48	Henderson	Athens	81,372	7	8.6
88	Washington	Brenham	35,712	3	8.4
81	Kendall	Boerne	38,993	3	7.7
78	Cooke	Gainesville	40,075	3	7.5
28	Ector	Odessa	148,260	10	6.7
66	Val Verde	Del Rio	51,217	3	5.9
62	Kerr	Kerrville	53,262	3	5.6
41	Bowie	Texarkana	93,848	5	5.3
22	Smith	Tyler	225,731	9	4.0

There were more run-off-the-road motorcyclist fatal crashes in urban than rural locations from 2010–2015.

Run-Off-The-Road Crashes – In 2015, there were a total of 160 fatal run-off-the-road motorcyclist crashes and 484 run-off-the-road motorcyclist incapacitating crashes. Fatal run-off-the-road crashes involving motorcycles accounted for 36 percent of all fatal motorcyclist crashes in Texas in 2015. There were more run-off-the-road motorcyclist fatal crashes in urban than rural locations from 2010–2015. In contrast, in the same timeframe there were more run-off-the-road motorcyclist incapacitating crashes in rural than urban locations. Table 7 lists run-off-the-road fatal and incapacitating motorcyclist crashes from 2010 to 2015 for both rural and urban locations.

Table 7. Run-Off-The-Road Fatal and Incapacitating Motorcyclist Crashes, 2010–2015

Fatal Crashes				Incapacitating Crashes			
Year	Urban	Rural	Total	Year	Urban	Rural	Total
2010	73	57	130	2010	244	277	521
2011	88	84	172	2011	243	300	543
2012	78	79	157	2012	284	328	612
2013	101	75	176	2013	250	294	544
2014	88	78	166	2014	267	304	571
2015	74	66	160	2015	247	237	484

[5]Texas counties that experienced fewer than two motorcyclist fatalities were excluded from analysis because counties with very small populations that experienced a single motorcyclist fatality would skew fatality data and appear very high in the top 10 counties.

Head-On-Crashes – For the time period between 2010 and 2015, there were twice as many fatal head-on-crashes involving a motorcycle in rural versus urban locations with the exception of 2013 (Table 8). Incapacitating head-on crashes involving a motorcyclist predominately occurred in rural locations, but since 2012, more incapacitating head-on-crashes involving a motorcyclist have occurred in urban locations.

Table 8. Head-On Fatal and Incapacitating Motorcyclist Crashes, 2010–2015

Fatal Crashes				Incapacitating Crashes			
Year	Urban	Rural	Total	Year	Urban	Rural	Total
2010	5	20	25	2010	9	26	35
2011	3	20	23	2011	13	15	28
2012	7	16	23	2012	13	15	28
2013	12	16	28	2013	18	17	35
2014	6	18	24	2014	16	12	28
2015	6	16	22	2015	10	8	18

Intersection-Related Crashes – Table 9 indicates that fatal and incapacitating motorcyclist crashes occurred predominantly in urban locations from 2010 to 2015. Approximately twice as many intersection-related fatal motorcyclist crashes occurred in urban than rural areas; the same trend is observed for incapacitating crashes.

Table 9. Intersection-Related Fatal and Incapacitating Motorcyclist Crashes, 2010–2015

Fatal Crashes				Incapacitating Crashes			
Year	Urban	Rural	Total	Year	Urban	Rural	Total
2010	87	43	130	2010	392	144	536
2011	94	47	141	2011	418	173	591
2012	113	48	161	2012	419	129	548
2013	117	43	160	2013	451	162	613
2014	85	62	147	2014	462	183	645
2015	93	42	135	2015	445	156	601

Which Motorcyclists Are Being Killed and Injured?

Operators and Passengers

The majority of fatalities sustained from 2010 to 2015 were to the motorcycle operator. In 2015, for every 1 passenger on a motorcycle killed in Texas, there were 18 motorcycle operators killed. This condition has been remarkably consistent since 2010. Table 10 presents the number of Texas operator and passenger motorcyclist fatalities from 2010–2015.

The majority of fatalities sustained from 2010 to 2015 were to the motorcycle operator.

Table 10. Motorcyclist Operator and Passenger Motorcyclist Fatalities, 2010–2015

	2010	2011	2012	2013	2014	2015
Operator	403	460	447	468	434	432
Passenger	34	31	24	35	33	23
Total	437	491	471	503	467	455

Just as the majority of motorcyclist fatalities were sustained to the motorcycle operator, the majority of motorcyclist incapacitating injuries were also sustained to the operator. Table 11 lists the number of operator and passenger motorcyclist incapacitating injures from 2010–2015 in Texas.

Except in 2013, the riders in the 21–29 age group were most likely to be killed than any other age group from 2010–2015

Table 11. Motorcyclist Operator and Passenger Incapacitating Injuries, 2010–2015

	2010	2011	2012	2013	2014	2015
Operator	1,646	1,817	1,883	1,796	1,821	1,689
Passenger	191	193	166	174	201	177
Total	1,837	2,010	2,049	1,970	2,022	1,866

Motorcyclist Age

Motorcyclist Fatalities – Figure 4 illustrates riders killed by age group. Except in 2013, the riders in the 21–29 age group were most likely to be killed than any other age group from 2010–2015, and riders in either the 40–49 or 50–59 age groups were next likely to be killed.

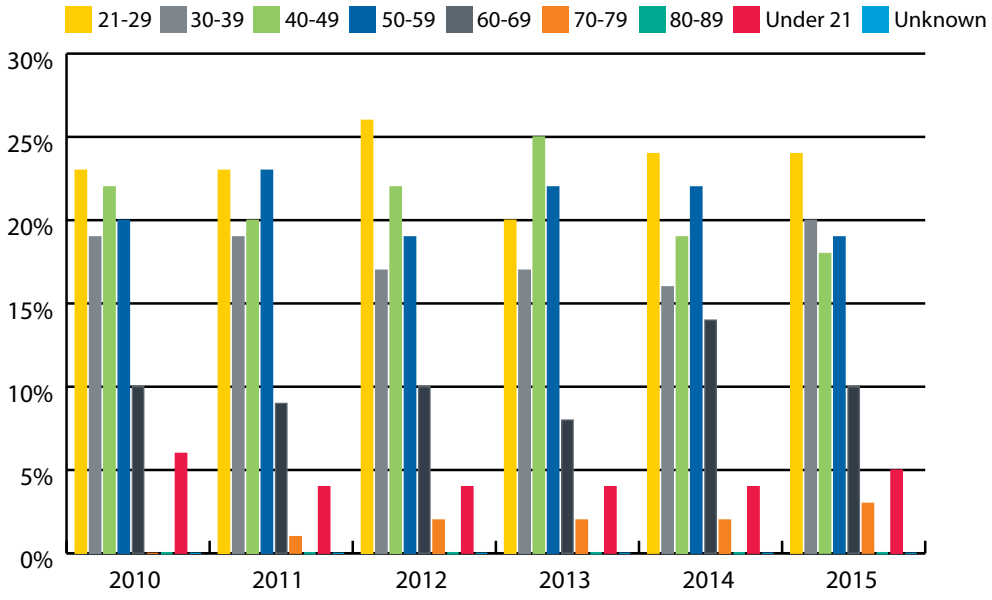

Figure 4. Age of Motorcyclists Killed, 2010–2015

Motorcyclist Incapacitating Injuries – Riders between the ages of 21–29 suffered more incapacitating injuries than any other age group of riders from 2011–2015. Only in 2010 did riders between the ages of 40–49 suffer more incapacitating injuries than 21–29 year-old-riders. Figure 5 illustrates the percentage of motorcyclists who suffered incapacitating injuries from 2010–2015 by age group. Identifying the age of riders killed and seriously injured in motorcyclist crashes can be used to guide the direction of motorcycle safety messages. With younger riders more frequently killed and injured in motorcycle crashes from 2010–2015, it is important to not only tailor the motorcycle safety message to this demographic but share the message via platforms that this age group uses.

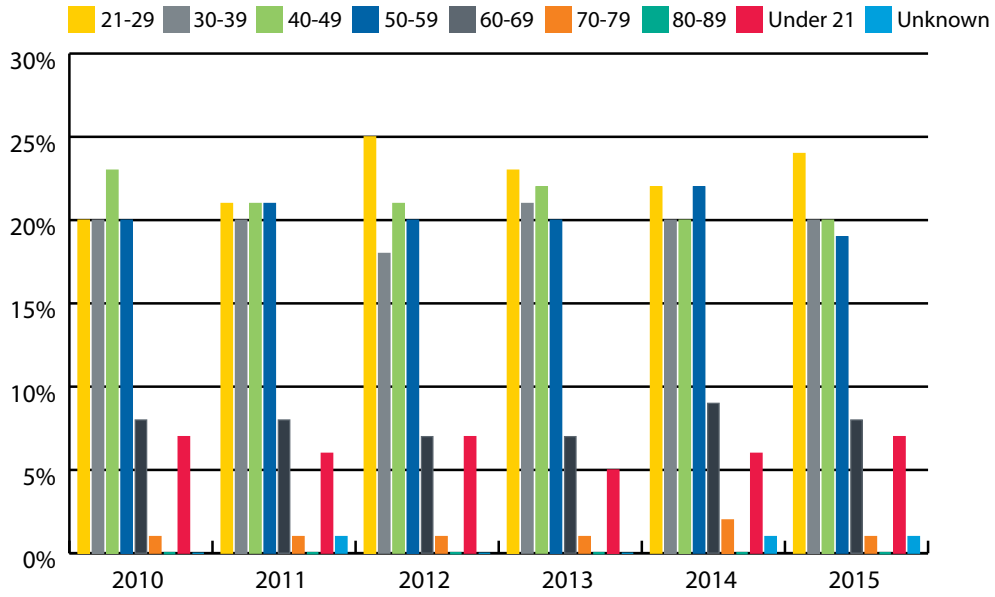

Figure 5. Age of Motorcyclists with Incapacitating Injuries, 2010–2015

From 2010–2015, riders killed and riders sustaining incapacitating injuries have predominantly been White.

Gender

Motorcyclist Fatalities and Incapacitating Injuries – From 2010–2015, riders killed and riders sustaining incapacitating injuries have predominately been male. In 2015, only 9 percent of riders killed and 13 percent of riders who sustained incapacitating injuries were female.

Ethnicity

Motorcyclist Fatalities and Incapacitating Injuries – From 2010–2015, riders killed and riders sustaining incapacitating injuries have predominantly been White. In 2015, 70 percent of riders killed where White, followed by 15 percent Hispanic, 12 percent Black, 1 percent Asian, and 2 percent were another ethnicity. This composition is similar to the percentage of riders who sustained incapacitating injuries in 2015: 74 percent were White, 17 percent were Hispanic, 10 percent were Black, 1 percent were Asian, and 1 percent were another ethnicity.

Are Riders Wearing Helmets?

Helmet Use and Age

Motorcyclist Fatalities – While there are some age and health insurance restrictions, Texas does not have a universal helmet law. Despite the absence of a universal helmet law, Texas has one of the highest voluntary helmet usage rates in the country at 66 percent. Yet, even with a high voluntary helmet usage rate, 54 percent of riders killed from 2010–2015 were not wearing a helmet. While wearing a helmet is not a failsafe for surviving a motorcycle crash, it does reduce the risk of head, brain, and facial injury across all crash severities.

In 2015, where helmet use was known:

- 26 percent of 50–59 year olds killed were not wearing a helmet.
- 21 percent of 40–49 year olds killed were not wearing a helmet.
- 21 percent of 30–39 year olds killed were not wearing a helmet.

Despite the absence of a universal helmet law, Texas has one of the highest voluntary helmet usage rates in the country at 66 percent.

Helmet Use and Gender

Motorcyclist Fatalities – From 2010–2015, where helmet use was known, 53 percent of female riders killed were not wearing a helmet compared to 51 percent of male riders. While the difference between male and female riders not wearing a helmet appears marginal, it was significant because only 132 of the 1,419 riders killed while not wearing a helmet were female.

Are Riders Taking the Basic Rider Course?

Motorcyclist Fatalities – From 2010–2014, motorcycle operators killed without a valid motorcycle license had hovered around 41 percent in Texas. However, in 2015, there was a notable increase in the percentage of motorcyclists killed without a valid motorcycle license or endorsement, rising to 47 percent. This increase is significant because over the past two years motorcycle fatalities have declined in Texas. Between 2011 and 2015, the number of motorcycle riders killed without a valid motorcycle license nearly doubled from 15 to 29. Table 12 lists the number and percentage of motorcyclists killed without a valid motorcycle license or any valid license between the years 2010 and 2015.

Table 12. Motorcycle Operator Fatalities by Driver's License Status, 2010–2015

	2010	2011	2012	2013	2014	2015
Total with M Class	218	247	235	256	238	213
Total w/o M Class	132	166	154	155	139	159
Unlicensed	18	15	14	24	28	29
No Data / Unknown*	11	12	15	5	8	3
Other / Out of State*	24	20	29	28	21	28
Total Motorcyclist Fatalities	**403**	**460**	**447**	**468**	**434**	**432**
% without a M Class or Unlicensed	41%	42%	42%	41%	41%	47%

* Categories are not used to calculate the % without an M-Class or Unlicensed

Are Motorcyclists Riding While Intoxicated?

Motorcyclist Fatalities and Incapacitating Injuries – All states have set a 0.08 percent blood alcohol concentration (BAC) as the legal limit for driving while intoxicated. In 2015, the average reported BAC of a motorcycle operator killed in a crash was 0.13, while the average BAC of a motorcyclist who sustained incapacitating injuries was 0.15. Both of these averages are nearly 1.5 times the legal limit, indicating that those who are choosing to ride after consuming alcohol and/or other drugs are consuming more than just one or two drinks.

Table 13. Average Reported Blood Alcohol Concentration for Motorcycle Operators, 2010–2015

Year	Motorcyclist Fatalities	Motorcyclist Incapacitating Injuries
2010	0.14	0.16
2011	0.15	0.16
2012	0.15	0.15
2013	0.15	0.15
2014	0.15	0.15
2015	0.13	0.15

From 2010–2015, more motorcycle riders were fatally injured while riding a cruiser than any other class of motorcycle.

What Type of Motorcycles are Involved in Crashes?

Motorcyclist Fatalities – From 2010–2015, more motorcycle riders were fatally injured while riding a cruiser than any other class of motorcycle, with 68 percent fatally injured while riding a Harley Davidson. Sport bikes made up the second largest type of motorcycles on which riders were fatally injured, with 33 percent fatally injured while riding a Suzuki. Since 2013, the percentage of riders fatally injured while on sport bikes has increased, jumping from 31 percent in 2014 to 38 percent in 2015.

When Do Motorcycle Crashes Occur?

Figure 6 depicts the total number of fatal and incapacitating motorcyclist crashes in Texas from 2010–2015. In nine out of 12 calendar months, fatal and incapacitating motorcycle crashes exceeded 100. Texas has a long riding season compared to other states, which means motorcyclists in Texas can ride any time of the year and crash any time of the year.

Time of day plays an important role in evaluating fatal crashes.

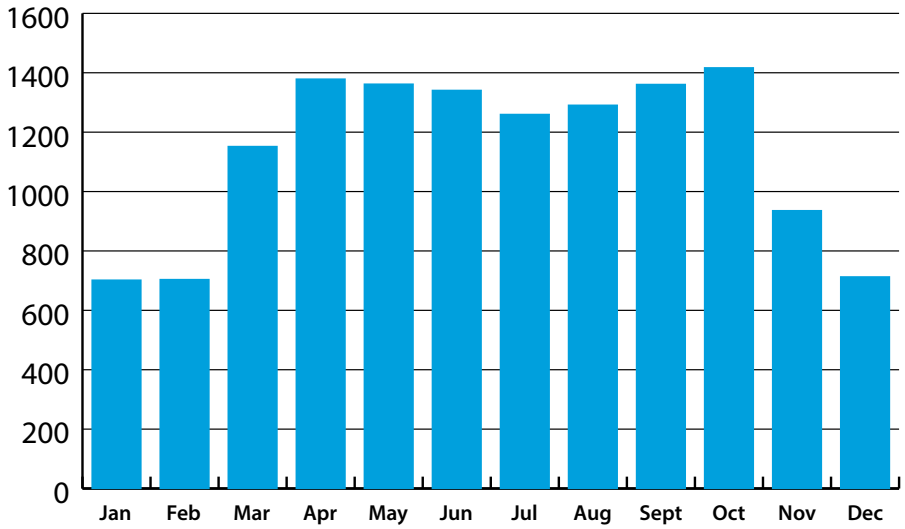

Figure 6. Fatal and Incapacitating Motorcyclist Crashes, 2010–2015

Time of Day

Time of day plays an important role in evaluating fatal crashes. Many risk factors are compounded at night, such as speeding and driving while intoxicated. Yet, when fatal and incapacitating motorcyclist crashes are evaluated together, a higher percentage of these crashes occurred during daylight each month of the year from 2010–2015.

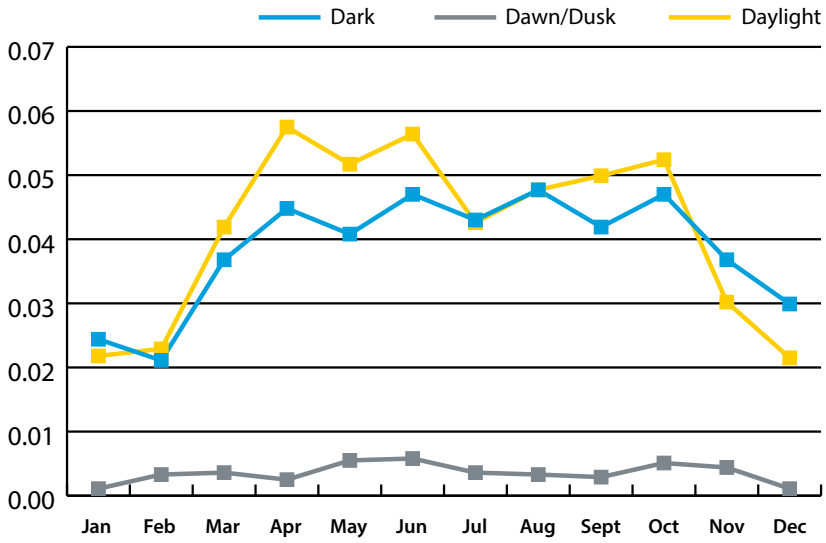

Figure 7. Fatal Motorcyclist Crashes and Time of Day, 2010–2015

Day of Week

While there many riders choose to commute to and from work, motorcycling remains a largely recreational activity in Texas. As such, motorcyclist fatalities occurred predominately over the weekends, with Fridays, Saturdays, and Sundays experiencing the greatest number of crashes. These three days have historically been the most dangerous days for motorcyclists each year from 2010–2015.

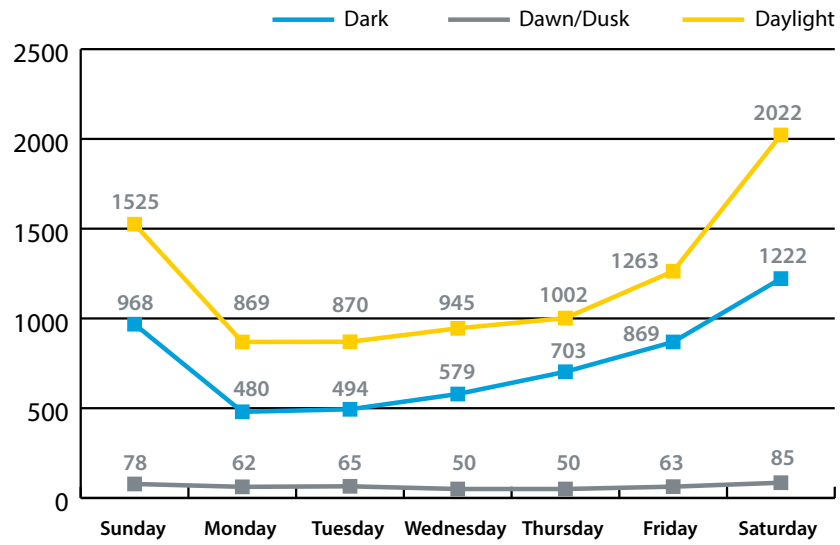

Figure 8. Fatal and Incapacitating Motorcyclist Crashes, 2010–2015

In 2015, motorcyclist fatalities accounted for nearly 13 percent of all motor vehicle fatalities in Texas.

Summary: What Does the Motorcycle Safety Problem Look Like?

In 2015, motorcyclist fatalities accounted for 13 percent of all motor vehicle fatalities in Texas. While the motorcycle safety challenge is not unique to the State of Texas, what makes it unique in Texas is an increase in the number of motorcycle registrations, the fast-growing population, and the absence of a motorcycle helmet law. Beyond these overarching factors, fatal and incapacitating motorcyclist injuries shared the following characteristics:

- Occurred predominantly in urban locations.
- Occurred more frequently in Harris, Dallas, and Tarrant Counties, but when fatality rate is taken into consideration, the most deadly counties for motorcyclists in 2015 were Harrison, Henderson, and Washington.
- Intersection-related crashes accounted for more crashes than head-on crashes.
- When the rider was the operator, young (between 21–29 year-old), White, and male.
- 54 percent of riders killed were not wearing a helmet in 2015.
- 47 percent of riders killed did not have a motorcycle endorsement or any valid license in 2015.
- Where alcohol was a factor, the average BAC of a motorcyclist operator killed in a crash was 0.13 in 2015.
- More riders were fatally and seriously injured while riding a cruiser.
- More crashes occurred over the weekend and during the daylight than any other time of day.

The purpose of reviewing the above motorcycle crash factors was to gain a better understanding of what, where, when, how, and why motorcyclist fatalities and injuries have occurred in Texas. By understanding some of the underlying or common motorcyclist crash factors, motorcycle safety stakeholders can select countermeasures and actions to improve motorcyclist safety.

Key Focus Areas

Improving motorcyclist safety remains a top priority for the State of Texas.

Improving motorcyclist safety remains a top priority for the State of Texas. Analyzing and understanding motorcyclist crash factors helps direct the state to the safety problem, but safety is a complex issue and typically there is no single solution or countermeasure that can completely address the safety problem.

Potential countermeasures vary in approach and can include an educational, enforcement, and/or engineering component. Potential countermeasures also vary in effectiveness, cost, and time to implement. Motorcycle safety stakeholders must weigh all these factors to prioritize countermeasures that hold the most promise for reducing motorcyclist fatalities, injuries, and crashes given available resources and existing constraints.

A central purpose of the 2016–2021 SAP is to identify unique countermeasures that can be used to improve motorcyclist safety in Texas. The information contained in the Overview of Motorcycle Safety Efforts and the Texas Motorcycle Safety Data sections were used in the process to identify countermeasures. The process consisted of two activities that included the conduct of focus groups and the administration of a survey.

Focus Groups

Development of Focus Groups

A number of strategic traffic safety documents were published after the 2013–2018 SAP released in 2013. These strategic documents included (1) the 2013 NHTSA's *Countermeasures that Work*, which served as a basic reference guide for state highway safety offices to select effective, evidence-based countermeasures, (2) the 2014 *Motorcycle Safety Program Technical Assessment for the State of Texas*, which was produced by a team of objective experts who recommended areas for improvement in the state's motorcycle safety program, and (3) the 2014 *Texas Strategic Highway Safety Plan*, which established statewide goals, objectives, and key emphasis areas for various traffic safety areas.

Each of the above documents was consulted to produce a list of potential countermeasures, strategies, and/or approaches motorcycle safety stakeholders could pursue to improve motorcycle safety in Texas. Many of the documents referenced similar potential countermeasures and strategies and were consolidated. As a result, a list of 55 unique countermeasures was produced. Each countermeasure was assigned to 1 of 11 categories, which were consistent with NHTSA's *Uniform Guidelines for State Highway Safety Programs* – No. 3.

To prioritize the list of countermeasures, five focus groups were conducted with motorcycle safety stakeholders. Focus groups were held in Austin and College Station, Texas. Focus groups consisted of 4–7 participants in each group to ensure that each stakeholder was given an equal opportunity to contribute. Each focus group involved a specific motorcycle safety stakeholder group. The five focus groups/stakeholder groups included:

- **Strategic Perspective** – State-level traffic safety stakeholders from TxDOT and TxDPS.
- **Local Perspective** – Community coalition leaders, area engineers, city traffic engineers, and curriculum directors of driving schools.
- **Law Enforcement** – State and local law enforcement officers.
- **Club and Independent Rider**s – Club/patch members and independent/riding enthusiasts.
- **Media** – State-level program managers and advertising agencies.

The five focus groups were chosen because each has the potential to impact motorcycle crashes in the state in a unique way. As an example, club and independent riders can promote voluntary helmet usage and promote safe riding behaviors among their brothers, sisters, and riding friends. Community coalitions can promote the motorcycle safety message to both motorcyclists and motorists throughout their local communities. Law enforcement officers are able to enforce the law and deter riders from engaging in risky behavior. Finally, state-level traffic safety stakeholders are able to identify and evaluate the motorcycle crash factors, and direct state resources to impact the problem.

Law enforcement officers are able to enforce the law and deter riders from engaging in risky behavior.

Each group reviewed a subset of the 55 countermeasures that were most relevant to their background and expertise. By necessity some countermeasures were reviewed by multiple focus groups. Each focus group ranked which countermeasure would make the greatest impact on reducing motorcycle crashes, fatalities, and injuries in Texas. Participants were instructed that countermeasures could be modified, combined, and/or added. As a result the list of countermeasures expanded from 55 to 60. Focus group participants were then asked to include information such as effectiveness, time, cost, and lead stakeholder. In consideration of time, focus groups only provided detail for the top three countermeasures in a category.

The 11 NHTSA categories and the prioritized list of countermeasures, as ranked by the five focus groups are included in the following tables. Each table includes the following elements for the three highest ranked countermeasures:

- **Rank** – The priority given to a certain countermeasure (1 = high, 10 = low).
- **Countermeasure** – A brief description of the countermeasure.
- **Effectiveness** – The potential that a countermeasure is able to reduce the number of motorcyclist fatalities, injuries, and crashes on Texas roadways. Not, somewhat, and highly effective are denoted by *, **, and ***, respectively.
- **Cost** – An estimate the approximate price to implement a countermeasure. Low, middle, and high cost are denoted by $, $$, and $$$, respectively.
- **Time** – An estimate of how long implementation of the countermeasure would take.
- **Lead Stakeholder** – An organization or group of individuals that could be responsible for leading the implementation of the countermeasure.
- **Milestones** – An action or event marking a significant change or stage in development; potential benchmarks that will be passed on the way to successful implementation of the countermeasure and could be used as measures to evaluate progress toward implementation.

Category I: Program Management

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Provide guidance and funding to TMSC to continue work: • Enlist support by formal and informal motorcycle groups on safety initiatives. • Ensure TMSC does not function as a lobbying organization.	**	$	2 years	TxDOT	• Reduction in the number of motorcyclist fatalities. • Increase number of events attended. • Increase TMSC participation. • Topic list included in TMSC meeting announcements.
2	Periodically revise SAP and develop SAP activity evaluations.	***	$	On-going	TxDOT	• Maintain deadlines on plan updates. • Results are used to apply for federal funding.
	Locate/increase funding sources for motorcycle safety outreach/education.	**/***	$	On-going	TxDOT	• Submit federal funding applications (deadline July 1).

Category II: Motorcycle Personal Protective Equipment

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Reinstatement of the mandatory motorcycle helmet law for all operators and passengers.	***	$$$	3-5 years	State Legislature Insurance organizations Helmet manufacturers First responders Medical groups Motorcycle groups	• Identify how other states have addressed implementation. • Identify key legislative activities needed to promote law. • Identify advocates. • Determine of the constituent, organization/ agency, and financial support need for implementation. • Conduct consumer research with Texans to identify critical issues (e.g., who is resistant? what will persuade them?). • Conduct a case study of previous legislation/ repeal activity. • Develop/deploy marketing effort to generate support that would prompt Congress to pass a law supporting mandatory helmet use. • Identify personal stories (parents who have lost children, etc.) that resonate with riders and include in marketing materials. • Conduct pre-post study to evaluate law efficacy.

Category II: Motorcycle Personal Protective Equipment (continued)

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
2	Conduct outreach and education on gear use: • Educate riders regarding conspicuity benefits. • Educate riders on consequences of not wearing personal protective equipment. • Provide education prior to purchasing a motorcycle. • Conduct additional education pushes to coincide with timely topics (e.g., riding seasons, weather-related issues).	**	$$	1-2 years	TxDOT TxDPS	• Establish/discover funds. • Conduct research to provide/establish data to support funding request for programs. • Identify successful countermeasures. • Develop supplemental material for existing course. • Develop and implement media campaign. • Conduct outreach on multiple social media platforms. • Conduct post-observational gear survey about campaign awareness and gear use via mailers, Biker Living magazine and other motorcycling-enthusiasts platforms, at dealerships/events, etc.
3	Provide training/ information to professionals: • Law enforcement on helmet violations. • Increase participation of EMS personnel in helmet-use advocacy. • Provide professionals with statistics and data (as scare-and-be-aware tactic).	**	$$	3-5 years	TxDPS TxDOT Texas Municipal Police Assoc. Dept. of State Health Services (agency for EMS)	• Develop training materials (What are we telling them – the laws, helmet standards, crash data). • Acquire/distribute helmets to training programs as teaching tools. • Determine the best method to contact/work with agencies (e.g., brochure, training session, online training). • Administer training programs. • Develop support/plan for stakeholder (e.g., law enforcement, EMS, communities) outreach. • Measure/evaluate professionals who have completed training. • Conduct long-term evaluation of injury/fatality trends.
4	Encourage dealer participation to incentivize helmet use (e.g., free helmet with bike purchase).					
5	Recognize motorcycle clubs that promote gear use.					

Category III: Motorcycle Operator Licensing

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Study reasons why riders do not obtain M license.	**	$	2 years	TxDPS	• Develop method to identify licensed and unlicensed riders (potentially via municipal court system citations). • Design and conduct survey to determine why riders do not obtain M license. • Generate report and share results with stakeholders.
2	Update driver licensing system to improve recording of BRC completion.	**	$$$	3–5 years	TxDPS	• Identify/establish process(es). • Collect and analyze data on BRC effectiveness. • Develop countermeasures to improve linked data.
3	Increase fines and penalties for riding without a motorcycle license (requires legislative change).	***	$	2 years	TxDOT TxDPS	• Research ways to encourage law enforcement to enforce motorcycle license law. • Develop plan to obtain law enforcement support. • Enhance law enforcement training on motorcycle licensing and safety implications of non-licensure. • Pass legislation for mandatory fines for non-licensure. • Develop/implement process to track license citation data.
4	Integrate information from Motorcycle Operator Manual (MOM) into BRC: • Make MOM accessible to BRC students – either send hyperlink, PDF, provide a printed copy during BRC, or develop an app for students to download. • Make additional copies of MOM available in TxDPS licensing offices.					
5	Create cross-reference between crash records and training (e.g., BRC, advanced rider course (ARC)/license status).					
6	Create a specific license level MA for those who have completed ARC; the additional license level might incentivize riders to enhance their training and skills by completing an advanced rider course, and it could serve as a mechanism for insurance agencies to offer additional discount. Legislatively, a trike designation on a license has already been accomplished.					
7	Eliminate the I moto license restriction (I-restriction only allows 15-year old individual to ride a motorcycle with 250 cubic centimeter piston displacement or less; at 16-years of age, the individual may apply to have the I-restriction removed).					
8	Evaluate maintaining the J and K motorcycle license restriction (J-restriction allows an individual to practice riding a motorcycle if a licensed driver who is 21 years of age or older is in sight and watching, and K-restriction allows an individual to ride mopeds but not motorcycles) since the applicant must request this restriction and has already met the minimum standards for full licensing.					
9	Eliminate on-street licensing tests for riders under 18.					
10	Establish expiration date of 1-year for MSB-8.					

Category IV: Motorcycle Rider Education and Training

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Create a web services data linkage between the TxDPS Motorcycle Safety Unit student record database and TxDOT's CRIS database.	**	$	2 years	TxDPS	• Create linkage. • Evaluate effectiveness of course completion, report results.
2	Perform in-depth analysis of crash data to identify significant crash causation factors and then prioritize and incorporate emphasis areas in problem statements, rider training curriculum, and public information campaigns.	***	$$$	2–3 years, On-going	TxDPS	• Establish crash data set for analysis. • Conduct data analysis. • Produce motorcycle safety fact sheet/annual report.
3	Improve rider coach recruiting/training process, quality control of sponsors.	**	$$	2 years	TxDOT TxDPS	• Revise rider coach preparation to accommodate more participant schedules and locations. • Examine subsidies for rider coach to attend training. • Research declining course enrollments. • Create a five year training forecast; developing recruiting material, streamlining recruiting/ training process. • Create a dedicated training facility for the state.
4	Identify rider training course performance measures to create an ongoing evaluation process (from crash data) and determine the value and course effectiveness.					
5	Conduct outreach to encourage participation in rider education and training programs.					
6	Establish a formal curriculum review and approval process.					
7	Conduct a comprehensive statewide quality assurance program that includes Rider Coach support and guidance, formal updates and technical assistance, peer review, and tougher compliance standards to assure conformity with state guidelines.					
8	Provide capital improvements including motorcycle purchase, range area, lease, etc.					
9	Expand 3-wheel rider courses and availability.					
10	Encourage and develop outreach to promote recurring training.					
11	Develop outreach to publicize 1-day riding course.					

Category V: DUI/DWI

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Incorporate motorcycle-specific driving under the influence/driving while intoxicated (DUI/DWI) messages into all current impaired driving campaign materials and enforcement activities.	***	$	1 year	TxDOT	• Develop materials to integrate with existing campaigns. • Incorporate motorcyclist fatality data into campaigns. • Present to rider groups; make it uncool to ride while under the influence. • Review crash data to evaluate efficacy of campaign.
2	Conduct motorcycle safety campaigns on DUI riding. Consider using free materials from NHTSA, Motorcycle Safety Foundation, American Motorcyclist Association, and the Texas A&M Transportation Institute.	**	$$	1 year	TxDOT	• Discover/establish funds to support campaigns during motorcycle safety awareness month. • Identify objectives and key messages. • Identify media to be deployed during campaigns. • Talk to organizations before materials are developed. • Develop materials.† • Evaluate awareness of campaign.
3	Identify areas overrepresented in DUI motorcycle crashes. Organize and conduct law enforcement saturations and operations in areas that are prevalent for alcohol-related fatalities.	***	$$	1 year	TxDPS TxDOT State/ Municipal/ County Police	• Identify overrepresented areas. • Identify responsible law enforcement agency(s). • Conduct enforcement saturations. • Compare crash fatalities before and after enforcement activity.
4	Encourage and recognize motorcycle groups that self-police on DUI/DWI (and have a culture of zero-tolerance for drinking and riding).					
5	Establish/increase funds to support motorcycle campaigns during motorcycle safety awareness month and during national mobilizations.					
6	Consider legislation to set a lower BAC for all vehicles.					

† Must be careful about crossing safety messages as federal funds are allocated for certain activities

Category VI: Legislation and Regulations

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1 (Tie)	Encourage reinstatement of the mandatory universal motorcycle helmet law for all operators and passengers	***	$$$	3-5 years	State Legislature Insurance organizations Helmet manufacturers First responders Medical groups Motorcycle groups	• Identify how other states have addressed implementation. • Identify key legislative activities needed to promote law. • Identify/aligned advocates. • Determine the constituent, organization/agency, and financial support need for implementation. • Conduct consumer research with Texans to identify critical issues (e.g., who is resistant? what will persuade them?). • Conduct a case study of previous legislation/repeal activity. • Develop/deploy marketing efforts to generate support that would prompt Congress to pass a law supporting mandatory helmet use. • Include in marketing materials personal stories (parents who have lost children, etc.) that resonate with riders. • Conduct pre-post study to evaluate law efficacy.
1 (Tie)	Seek guidance on legislation to require motorcycle training or endorsement to register a motorcycle.	***	$$	2-3 years	TxDPS TxDOT	• Conduct initial data analysis to support bill (including, identifying contacts within the affected agencies, coordinating and communicating possible processes/ policies/guidelines). • Identify representative to discuss bill idea. • With support from representative, research the idea and write/form the statute. • After bill has been written, find a sponsor. • Representative introduces the bill, and the bill goes to standing committee. • Committee researches, reviews, revises, and votes on bill. • Bill is reported, debated, and voted on; referred to Senate, and on to Governor to sign.
3	Monitor fund allocations to ensure that funds from motorcycle safety account continue to be used for allowable motorcycle safety tasks (e.g., training and awareness education).	***	$	On-going	TxDPS TxDOT	• Monitor fund allocations. • Produce regular (e.g., quarterly) report on fund use.

Category VII: Law Enforcement

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Develop data-driven countermeasures and implement selective enforcement where fatal and serious injury motorcycle crashes are occurring.	***	$$	3 years	International Association of Chiefs of Police (IACP) Texas Chiefs of Police TxDPS	• Develop memorandum of understandings between law enforcement agencies to increase the number of officers available to implement area-specific enforcement (e.g., for designated events). • Conduct data collection. • Conduct data analysis. • Identify strategic operations. • Share results and actionable information both internally and externally. • Monitor, evaluate, and make adjustments. • Prepare an outcome measures plan.
2	Identify motorcycle enforcement (e.g., impaired riding, proper license, excessive speed, helmet use for minors) as a specific component of enforcement grants.	***	$$	1 year	TxDOT	• Collect data to identify targeted enforcement areas. • Write/submit STEP grant proposal. • Develop strategies for enforcement.
3	Develop educational programs for justice system personnel/legislators on motorcycle laws.	**	$$	2 years	TxDOT Motorcycle Safety Foundation NHTSA Texas Department of Insurance	• Develop partnerships with key stakeholders (e.g., insurance industry). • Develop educational program. • Receive curriculum approval.
4	Train law enforcement in the detection of impaired riders (e.g., alcohol-impairment detection, enforcement, sanctions).					
5	Incorporate motorcycle-specific messages into current enforcement activities.					

Category VIII: Highway Engineering

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Encourage the use of motorcycle specific warning signs in construction zones and locations where road conditions could impact motorcycle operation.	***	$$	2 years	TxDOT	• Modify the Manual on Uniform Traffic Control Devices to encourage use of signs. • Implement sign countermeasure statewide. • Monitor/update as necessary.
2	Develop an awareness presentation/ training for state and local highway and traffic engineers to make them aware of roadway conditions that could impact motorcycle operation.	***	$$	3 years	TxDOT Texas A&M Engineering Extension Service (TEEX) College of Engineering at University of Texas at Arlington	• Develop curriculum. • Implement within TxDOT district offices. • Incorporate into Work Zone Traffic Control class or similar classes.
3	Encourage use of high-friction surface treatments where appropriate; identify areas where high-friction surface treatments would be most beneficial (i.e., high-crash intersections and curves).	**	$$$	On-going	TxDOT	• Identify and prioritize locations. • Treat locations. • Monitor/report number of locations treated. • Determine if there has been reduction in crashes as treated locations.
4	Continue to improve highway engineering (e.g., increased sign use, increased use of motorcyclist safe barriers, increased use of high-friction treatments).					
5	Improve consistent use of road surface warning signs in construction zones.					

Category IX: Motorcycle Rider Conspicuity and Motorcycle Awareness

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Increase rider education for preventative riding behaviors: • Communicate rider responsibility (not speeding, appropriate following distance, lane placement). • Increase course content on collision avoidance and roadway hazard. • Wearing high visibility gear.	**	$	2 years	Rider coaches	• Secure funding for education. • Develop key messages. • Research messages with rider community. • Develop materials. • Conduct outreach through rider clubs and Texas Confederation of Clubs and Independents (COIR). • Execute plan.
2	Conduct crash analysis: • Conduct crash analysis on multivehicle and intersection-related fatal motorcycle collisions. • Conduct crash analysis on geographic trends, driver-at-fault collision, and focus future activities on those areas.	***	$	1 year	TxDOT	• Pull crash data. • Analyze the data. • Determine next steps (findings/ implications). • Share with appropriate stakeholders.
3	Evaluate the Share the Road messages to determine effectiveness; modify and develop new material.	**	$	1 year	TxDOT	• Assess the strengths and weaknesses of campaign materials and strategies before or during campaign's implementation. • Measure effort and the direct output of campaign – what and how much was accomplished. • Measure effect and changes that result from campaign. • Measure long-term change, such as impact on motorcyclist fatalities, injuries, and crashes.

Category X: Communications Program

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Develop Texas-specific motorcycle safety materials for DUI.	**	$$	2 years	TxDOT	• Identify objectives and key messages. • Identify media to be deployed during campaigns. • Talk to organizations before materials are developed. • Develop materials. • Evaluate awareness of campaign.
2	Expand TMSC's contact database; use TMSC for peer-to-peer contact at community events.	**	$	1 year	TxDOT & TTI TMSC members Safety and awareness personnel	• Identify gaps in TMSC membership. • Identify recruiting message. • Develop and discuss regional meetings; need to share results with stakeholders throughout the state. • Identify how to contact/invite them to join the TMSC. • Verify contact information. • Develop a calendar of events (and direct them to how to volunteer). • Provide goals to member (reasons for their participation). • Recognize active members and their contributions.
3	Expand existing outreach plans using realistic and measurable goals for messages regarding sharing the road, licensing, etc.).	***	$	1 year	TxDOT	• Increase the market penetration of Share the Road and There's a Life Riding on It safety messages in early spring (as early as January/ February). • Develop Texas-specific campaigns.

Category XI: Program Evaluation and Data

Rank	Countermeasure	Effectiveness	Cost	Time	Lead Stakeholder(s)	Milestones
1	Continue in-depth analysis of crash data to identify crash causation factors; prioritize and incorporate emphasis in problem statements, rider training curriculum, and public information campaigns; based upon these data, bring stakeholders together to collaborate on key factors that each entity can advance; create a plan with measurable goals.	***	$	3-5 years	TxDOT	• Produce, report, and publish cleansed data.
2	Explore adding motorcycle-specific fields to crash report; identify needed fields (e.g., trike designation, type of helmet rider was wearing), compare and contrast 2- vs. 3-wheel motorcycle crashes.	**	$$	3 years	TxDOT	• Develop list of possible fields to add to CR-3 crash report form. • Work with law enforcement and insurance agencies to narrow possible fields, define language, and identify new fields. • Follow through formal approval process.
3	Develop evaluation protocols in concert with the creation of strategies and countermeasures that can determine the value and effectiveness of implemented strategies and countermeasures.	**	$$	1-2 years	TxDOT	• Complete annual evaluation.
4	Share and communicate the effectiveness of strategies and countermeasures so other organizations, agencies, and communities can use them as best practices and adapt for their use.					
5	Officer education on accurate data collection/reporting of motorcycle crashes (including explanation in narrative).					
6	Get Sun Microsystems (for analysis using CRASH data) out to more law enforcement agencies; make it more user-friendly (improve usability of tool).					

Survey

Development of Survey

The focus group activity identified over 60 countermeasures that can be used by motorcycle safety stakeholders to improve motorcyclist safety in Texas. The final activity within the 2016–2021 SAP entailed identifying a small number of the countermeasures that should be an immediate priority. This was accomplished by conducting a survey of motorcycle safety stakeholders. The survey was distributed at the Texas Statewide Motorcycle Safety Forum on May 20, 2016, in Austin, Texas. The forum was selected because attendees represented a broader range of motorcycle safety stakeholders compared to the five focus groups conducted earlier. The top-ranked countermeasure in each of the 11 categories and any other high ranked countermeasure around which group discussion was polarized were included in the survey. A total of 14 countermeasures were included on the survey. Survey participants were asked to rank the countermeasures according to what they perceived would have the greatest impact on reducing motorcycle crashes, fatalities, and injuries in Texas. Sixty-one surveys were completed and returned.

The focus group activity identified over 60 countermeasures that can be used by motorcycle safety stakeholders to improve motorcyclist safety in Texas.

The survey analyses entailed averaging the individual countermeasure rankings. However, the average ranking for each of the 14 countermeasures was between 5–10, making it difficult to prioritize countermeasures on this metric due to the small range. To address this situation, four scores of central tendency were then employed because they provide a broader description of the survey results and are less influenced by outliers. Mean score was calculated by averaging the rank scores for each countermeasure across survey respondents. A mean score of 1 indicates the countermeasure was ranked high on average, so the countermeasure was perceived to be a high priority.

A median score was calculated by ordering all rank scores from lowest to highest and then taking the score in the middle (i.e., 50 percent of the rankings were below while 50 percent were above this score). A lower median score indicates the countermeasure was perceived to be a high priority. The mode simply reflects the rank score recorded most often for each countermeasure, meaning that this was the rank score agreed upon most across surveys. Low modal scores also indicate that the countermeasure was perceived as a high priority. Range represents the difference between the highest and lowest rank scores for each countermeasure. A small range score indicates greater ranking consensus (best) while a large range indicates lower ranking consensus (poor). Central tendency scores could vary between 1 and 14 with 1 representing the highest rank and, subsequently, the highest priority. An examination of the central tendency scores indicated a natural grouping of the countermeasures into high, middle, and low priority categories. *The countermeasures presented below are the highest ranked from each category discussed above. The terms "high, medium, and low countermeasures" refer only to the ranking across the highest ranked items and should not be interpreted as a ranking across the more than 50 countermeasures.*

High Priority Countermeasures

Seek guidance on encouraging legislation to require motorcycle training or endorsement to register a motorcycle. The language for this countermeasure initially included requiring motorcycle training to purchase and/or register a motorcycle. Focus group participants perceived that inhibiting an individual from purchasing property was an infringement of rights whereas requiring motorcycle training for registering a motorcycle would better target the actual operator of the motorcycle.
Median: 4.5 **Median: 5.8** **Mode: 1** **Range: 13**

Update driver licensing system to improve recording of course completion. Currently, the Driver's License Division scans the MSB-8 completion cards and attaches the digital image to a driving record. Since this is a digital image, any review of the information must be done manually. This countermeasure was given a high priority because an update to the driver licensing system would allow information to be linked to other data files like vehicle registration, rider education, and crash data, and make data extraction review and analysis for research and developing traffic safety projects easier.
Mean: 5.9 **Median: 5** **Mode: 2** **Range: 13**

Educate riders on gear use (including conspicuity). While Texas does not have a helmet law, it has one of the highest helmet-usage rates of states without a universal helmet law at 66 percent. Despite high helmet-usage, novelty and bicycle helmets are frequently worn by motorcycle operators and riders. Texas must continue to educate riders on proper gear use, which includes wearing a DOT-approved helmet (that meet the Federal Motor Vehicle Safety Standard 218), and wearing protective equipment like goggles, gloves, pants, and high visibility jackets. Education must involve not just making riders aware that gear includes more than just a helmet, but convincing riders that gear is worth the financial cost because it can reduce crash injuries and save lives.
Mean: 5.6 **Median: 5** **Mode: 6** **Range: 13**

Continue in-depth analysis of crash data to identify crash causation factors. The results of an in-depth motorcycle crash analysis can be used to update BRC curriculum, inform instructors and riders of common crash causation factors, direct public information campaigns, and better inform personnel who make motorcycle safety funding decisions about the motorcycle safety challenge in Texas.
Mean: 6.1 **Median: 5** **Mode: 5** **Range: 13**

Despite high helmet-usage, novelty and bicycle helmets are frequently worn by motorcycle operators and riders.

Provide guidance to Texas Motorcycle Safety Coalition. The TMSC was formed in 2008 with the overall goal of reducing fatalities and injuries from crashes involving motorcycles in Texas. There are over 400 TMSC members across Texas. The TMSC has demonstrated the ability to communicate important rider-specific information and material, but a challenge has been how to keep members engaged, especially those who are unable to travel to meetings in person. Providing guidance to the TMSC will ensure that the coalition continues on the right path and does not function as a lobbying organization but serves to inform the motoring public and fellow motorcyclists.
Mean: 6.7 Median: 6 Mode: 3 Range: 13

Middle Priority Countermeasures

Develop data-driven countermeasures and implement selective enforcement where fatal and serious injury motorcycle crashes are occurring. Developing data-driven countermeasures and implementing selective enforcement where fatal and serious injury motorcycle crashes occur allow limited resources to be maximized. For instance, if data-driven approaches indicate that motorcycle crashes are occurring outside certain restaurants, peace officers can be dispatched to or near the area.
Mean: 8.0 Median: 8 Mode: 6 Range: 13

Communicate rider responsibility (i.e., not speeding, appropriate following distance, lane placement). Just as motorists share the road with riders, motorcyclists share the road with other vehicles. Educating riders to take rider responsibility by not speeding and tailgating and by not consuming alcohol and/or other drugs before riding makes the road safer for all users. Rider responsibility also involves proper lane placement that enables riders to be more visible to motorists.
Mean: 7.4 Median: 7 Mode: 7 Range: 13

Just as motorists share the road with riders, motorcyclists share the road with other vehicles.

Motorcycling is a risky form of transportation, and not wearing a helmet compounds that risk, which for some riders, is part of the appeal.

Improve rider coach recruiting/training process, and conduct a quality control of sponsors. This countermeasure was introduced by the club/patch member and independent rider focus group, where several rider coaches participated. The issue was raised that rider coach preparation often involves traveling to a central training location for a week at a time. Travel is not subsidized, which can make attracting and retaining good rider coaches difficult. Improving the rider coach recruiting/coaching process would include revising rider coach preparation to accommodate more participant schedules and location, examining subsidies for rider coaches to attend training/certification, research declining course enrollments, and create a 5-year training forecast for each community served.

Mean: 6.8 **Median: 6.5** **Mode: 2** **Range: 13**

Seek guidance to encourage legislation to reinstate the mandatory universal motorcycle helmet law for all operators and passengers. Of all the countermeasures examined, the countermeasure encouraging the reinstatement of a universal helmet law was the most polarizing in focus groups and the survey. Motorcycling is a risky form of transportation, and not wearing a helmet compounds that risk, which for some riders, is part of the appeal.

Mean: 7.6 **Median: 8.5** **Mode: 14** **Range: 13**

Low Priority Countermeasures

Develop Texas-specific motorcycle safety materials on driving under the influence. Texas is the largest state in the contiguous United States. Developing Texas-specific materials may receive more attention than general motorcycle safety materials. Development Texas-specific materials would serve to augment national campaigns. For example, May is motorcycle safety awareness month, in which all motorists are reminded to Share the Road with and be extra alert for motorcyclists, and motorcyclists are reminded to make themselves visible to motorists. For many motorcyclists, May is the first month of decent weather, but in Texas, the motorcycle season has arrived months ago.

Mean: 9.3 **Median: 10** **Mode: 12** **Range: 11**

Study reasons why riders do not obtain an M-license. Completion of the BRC and the intermediate riding clinic helps to ensure that there is some minimal standard of rider knowledge and skill on the roadway, yet a large percentage of the motorcycling community do not have a motorcycle-endorsement. The results of studying why riders do not obtain an M-license can be used to target messaging and encourage riders to enhance their skills. In focus group discussion, it became apparent that many riders choose not to complete the BRC course because of time, cost, and/or perceived skill level.

Mean: 9.1 **Median: 9** **Mode: 14** **Range: 13***

*(one survey was scored 15, although there were only 14 possible rankings)

Create a web services data linkage between TxDPS MSU student record database and TxDOT's CRIS. A web services data link between the TxDPS MSU student record database and TxDOT's CRIS would allow for easier data extraction and analysis. Establishing a data link would allow for more robust data analysis and crash pattern detection. For instance, analysis could indicate that riders from a particular riding school or region are crashing more often.

Mean: 9.6 **Median: 11** **Mode: 11** **Range: 12**

Incorporate motorcycle-specific DUI/DWI messages into all current impaired driving campaign materials and law enforcement activities. Motorcycling is a risky form of transportation, especially when combined with risky behavior like consuming alcohol. In focus group discussions, this countermeasure was often selected as a top priority within the DUI/DWI category because it was perceived as the easiest and most cost-effective countermeasure to implement. However, the state must be careful about potentially crossing safety messages, as federal funds are often allocated for certain, specific messaging.

Mean: 8.3 **Median: 9** **Mode: 11** **Range: 13**

Encourage the use of motorcycle-specific warning signs in construction zones and locations where road conditions could impact motorcycle operation. Certain roadway conditions that may not be hazardous to other roadway users can be a dangerous condition for motorcycles. Such conditions may include, but are not limited to, grooved pavement, abrupt lane changes, steel plates, and gravel. Use of motorcycle-specific warning signs in construction zones and hazardous road conditions would alert motorcyclists to these conditions.

Mean: 8.1 **Median: 8.5** **Mode: 11** **Range: 12**

Summary

In summary, countermeasures that involved training and education for motorcyclists, analyzing motorcycle crash data and upgrading technology systems, were prioritized the highest by motorcycle safety stakeholders. Motorcycle safety stakeholders perceived that by implementing and continuing to advance motorcyclist training and education, and analyzing motorcycle crash data and upgrading technology systems so that the infrastructure can support the crash data had the greatest potential for impacting the motorcycle safety challenge in Texas.

Certain roadway conditions that may not be hazardous to other roadway users can be a dangerous condition for motorcycles.

If Texas is going to continue to reduce the number of motorcyclist fatalities, injuries, and crashes in the state, it must seek an integrated approach and implement solutions that hold the greatest potential for positive change.

Conclusion

In summary, safe riding practices by motorcyclists and cooperation from all roadway users will contribute to reducing the number of motorcyclist fatalities, injuries, and crashes. Raising awareness among motorists to understand the safety challenges that motorcyclists face—such as size and visibility—is just one component in the motorcycle safety challenge. Equally important is educating riders to practice safe riding behaviors, such as lane placement, wearing a helmet and proper gear, and riding sober. If Texas is going to continue to reduce the number of motorcyclist fatalities, injuries, and crashes in the state, it must seek an integrated approach and implement solutions that hold the greatest potential for positive change. The 2016–2021 SAP provides guidance to motorcycle safety advocates in terms of countermeasures that can be enacted by one or more key stakeholders.

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