Berkeley SafeTREC
SAFE TRANSPORTATION RESEARCH AND EDUCATION CENTER

OTS CALIFORNIA OFFICE OF TRAFFIC SAFETY

TRAFFIC SAFETY FACTS

Motorcycle Safety

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INTRODUCTION

Crashes involving motorcycles are a major traffic safety concern in the United States. Since motorcyclists are susceptible to injury during crashes, they comprise a disproportionate share of all injured and killed vehicle occupants. In 2018, motorcyclists were 27 times more likely than passenger car occupants to be fatally injured in a traffic crash, per vehicle miles traveled. The primary countermeasures used to address this problem have included motorcycle helmet laws and other helmet-oriented programs, rider training and licensing programs, vehicle enhancements, including anti-lock braking technology, rider conspicuity programs, campaigns to increase other road users' awareness of motorcycles, and campaigns to reduce impaired riding.

The National Occupant Protection Use Survey (NOPUS) reported that 71.0 percent of motorcyclists in the United States wore a DOT-compliant helmet in 2018, higher than the 65.2 percent found in 2017. In states with a universal helmet law, which requires all motorcyclists to use a helmet, the known helmet use rate among fatally injured motorcyclists ranged from 62 percent to 97 percent in 2018. In states without a universal helmet law, the rate was lower and ranged widely from 19 percent to 58 percent in 2017. In California, which has a universal helmet law, the known helmet use rate among fatally injured California motorcyclists in 2019 was high (93.9 percent). NHTSA estimates that helmets saved 287 lives in California in 2017, and 16 additional lives could have been saved if all motorcyclists wore helmets.

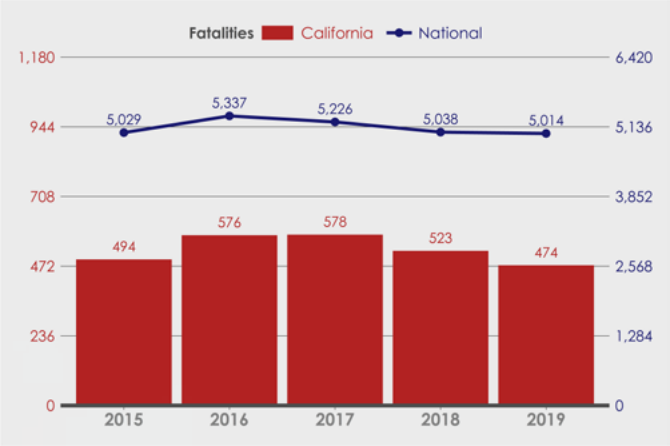
Historically, road safety efforts focused on changing human behaviors to prevent crashes. The Safe System approach reframes efforts to save lives by expecting crashes to happen and focusing attention on reducing the severity of injuries when a crash occurs. By understanding the nuances of motorcycle crashes, transportation professionals can better address every aspect of crash risks and implement multiple layers of protection to ensure that everyone traveling on California roadways will go safely. Analyses presented in the motorcycle program area include fatal and serious injuries to drivers and passengers riding two- and three-wheel motorcycles, mopeds, motorized scooters, motorized bicycles, off-road motorcycles, and other motor-driven cycles. Motorcycle crashes are defined as a crash where one or more victims is a motorcycle driver or passenger.

KEY FINDINGS

NATIONAL DATA

- In 2019, there were 5,014 motorcyclists killed on public roadways in the United States. This number reflects a 0.5 percent decrease from 2018, when 5,038 motorcyclists were killed (see Figure 1).
- In 2019, drivers of all vehicle types saw declines in the number of alcohol-impaired drivers involved in fatal crashes compared to 2018, except for motorcyclists, who saw a 14.7 percent increase. In 2018, motorcyclists had higher percentages of alcohol impairment than other motor vehicle drivers involved in fatal crashes – 25 percent of motorcyclists involved in fatal crashes were alcohol-impaired, compared to 21 percent of passenger car drivers.
- Over one-quarter (28 percent) of motorcyclists involved in fatal crashes in 2018 were not properly licensed.

Figure 1: Motorcycle Fatality Trends, Nationwide and California, 2015-2019



Source: FARS 2015-2018, FARS ARF 2019

KEY FINDINGS

CALIFORNIA DATA

State-level Analysis

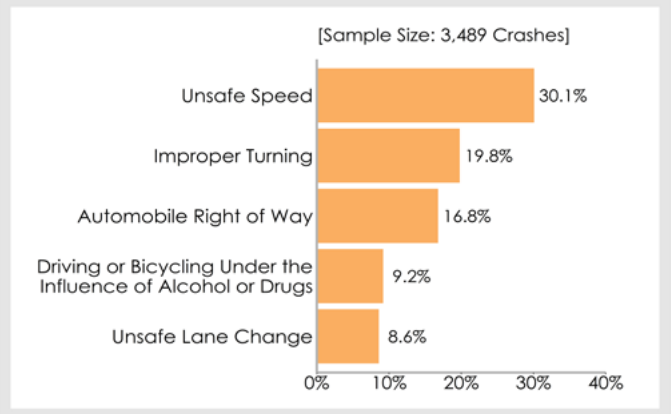
The figures in this section refer to drivers and passengers of motorcycles fatally and seriously injured in a crash in California in 2019. These numbers are the products of UCB SafeTREC analysis.

- Motorcycling is popular in California; the state recorded the second highest number of motorcyclist fatalities in the nation in 2018. From 2015 to 2019, the state has seen a 4.0 percent decrease in motorcyclist fatalities from 494 to 474.
- Of all motorcyclist fatalities in 2019, 6.0 percent (or 28) of motorcyclists were not wearing helmets. This is an improvement from the 6.6 percent unhelmeted fatality rate in 2018.

Fatal and Serious Injury Motorcycle Crashes by County

- Los Angeles, San Diego, Riverside, San Bernardino, and Orange counties in Southern California, followed by Alameda, Sacramento, and Santa Clara counties in Northern California, had the highest number of fatal and serious injuries among motorcyclists (see Figure 5).
- The rural counties of Alpine and Sierra had the highest rates of fatal and serious injuries per 100K population by county, followed by Trinity, Tuolumne, Mariposa, Inyo, Plumas, and Mono counties.

Figure 2: Top Five Primary Crash Factors for Motorcycle Fatal and Serious Injury Crashes, California, 2019

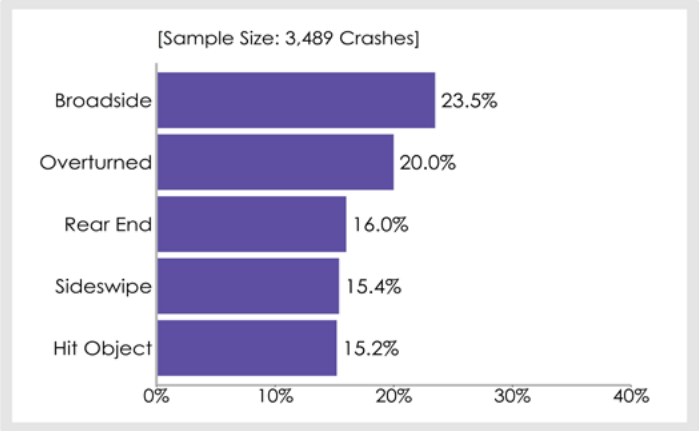


Source: Provisional SWITRS 2019

Primary Crash Factors of Motorcycle Fatal and Serious Injury Crashes

- Unsafe speed (30.1 percent), followed by improper turning (19.8 percent), and right-of-way violations by automobiles (16.8 percent), were the most frequent primary crash factors for fatal and serious injury motorcycle crashes (see Figure 2).

Figure 3: Top Five Crash Types for Motorcycle Fatal and Serious Injury Victims, California, 2019



Source: Provisional SWITRS 2019

Crash Types for Motorcycle Fatal and Serious Injury Crashes

- Broadside crashes (23.5 percent) and overturned crashes (20.0 percent) were the most frequent crash types for fatal and serious injury motorcycle crashes (see Figure 3).

Motorcycle Fatal and Serious Injury Crash Victim Demographics

- The vast majority (91.5 percent) of fatal and serious motorcycle crash victims were males. The age category with the greatest number of victims, men or women, was ages 25 to 34, comprising 29.1 percent of all victims.
- Race was not reported for 26.6 percent of the motorcyclist fatalities. Of the 348 fatalities with a known race, 83.9 percent (or 292) were white.

Crash Location for Motorcycle Crash Victims

- Over two-thirds (69.2 percent) of motorcycle crash fatal and serious injuries occurred in urban areas, compared to 29.7 percent on rural roads. Only 17.1 percent of travel took place on rural roads.
- Over one-third (38.2 percent) of all motorcycle crash fatalities occurred on non-interstate principal arterials. The next most common locations for motorcycle crash fatalities were non-interstate minor arterials (26.4 percent) and non-interstate collectors (15.4 percent).

CALIFORNIA DATA *(continued)*

Time and Day of Motorcycle Crash Fatal and Serious Injuries

- The number of fatally and seriously injured motorcyclists is markedly higher between 3pm and 6pm, comprising 24.8 percent of the fatal and serious motorcyclist injuries that occurred in 2019 (see Figure 4).
- Motorcyclist fatalities and serious injuries were elevated during the day on Saturdays and Sundays between noon and 6pm, accounting for 23.2 percent of fatal and serious injuries in 2019. Overall, fatal and serious injuries were highest on Saturday and Sunday, followed by Friday; these three days accounted for 52.1 percent of motorcyclist fatalities and serious injuries.

Figure 4: Top Five Crash Types for Motorcycle Fatal and Serious Injury Victims, California, 2019

	MON	TUE	WED	THU	FRI	SAT	SUN	TOTAL
Midnight-3AM	18	5	10	10	13	36	52	144 [4.0%]
3-6AM	10	21	19	15	20	10	11	106 [2.9%]
6-9AM	58	57	54	57	65	31	27	349 [9.7%]
9AM-Noon	40	47	46	46	57	105	112	453 [12.5%]
Noon-3PM	67	54	76	76	107	172	157	709 [19.6%]
3-6PM	97	126	121	118	140	139	154	895 [24.8%]
6-9PM	67	81	114	88	118	94	89	651 [18.0%]
9PM-Midnight	34	30	27	36	49	76	41	293 [8.1%]
Unknown	0	0	1	2	4	2	1	10 [0.3%]
TOTAL	391 [10.8%]	421 [11.7%]	468 [13.0%]	448 [12.4%]	573 [15.9%]	665 [18.4%]	644 [17.8%]	3,610 [100.0%]

FSI Num+% 0 1 - 12 13 - 36 37 - 57 58 - 102 103 - 172

Source: Provisional SWITRS 2019

REFERENCES

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COUNTY TABLE: MOTORCYCLE SAFETY

Figure 5: Motorcycle Fatalities and Serious Injuries, by Number and Rate, 2019

County	Population	Fatalities	Serious Injuries	Fatal & Serious Injuries (FSI)	FSI per 100K Population
Alameda	1,668,965	13	136	149	8.93
Alpine	1,123	1	4	5	445.24
Amador	37,724	1	8	9	23.86
Butte	214,532	3	24	27	12.59
Calaveras	44,403	0	14	14	31.53
Colusa	22,045	0	3	3	13.61
Contra Costa	1,147,269	9	73	82	7.15
Del Norte	27,207	2	2	4	14.70
El Dorado	188,818	5	29	34	18.01
Fresno	1,018,437	15	40	55	5.40
Glenn	29,072	0	1	1	3.44
Humboldt	133,820	2	23	25	18.68
Imperial	188,962	3	11	14	7.41
Inyo	18,463	0	8	8	43.33
Kern	909,697	17	70	87	9.56
Kings	153,522	1	10	11	7.16
Lake	64,080	2	9	11	17.17
Lassen	28,972	0	4	4	13.81
Los Angeles	10,210,966	96	823	919	9.00
Madera	157,686	4	16	20	12.68
Marin	260,969	1	23	24	9.20
Mariposa	17,842	0	8	8	44.84
Mendocino	88,125	4	18	22	24.96
Merced	281,592	10	29	39	13.85
Modoc	9,458	0	3	3	31.72
Mono	13,585	0	5	5	36.80
Monterey	443,397	1	30	31	6.99
Napa	139,874	4	19	23	16.44
Nevada	97,808	3	16	19	19.43
Orange	3,195,197	33	160	193	6.04
Placer	394,626	3	36	39	9.88
Plumas	18,450	0	7	7	37.94
Riverside	2,428,464	37	209	246	10.13
Sacramento	1,548,760	21	126	147	9.49
San Benito	62,051	3	4	7	11.28
San Bernardino	2,176,150	39	169	208	9.56
San Diego	3,346,937	49	309	358	10.70
San Francisco	897,114	3	60	63	7.02
San Joaquin	767,935	13	64	77	10.03
San Luis Obispo	277,276	3	29	32	11.54
San Mateo	776,002	6	35	41	5.28
Santa Barbara	452,066	5	31	36	7.96
Santa Clara	1,960,932	13	95	108	5.51
Santa Cruz	272,185	4	26	30	11.02
Shasta	177,620	7	18	25	14.07
Sierra	3,127	1	8	9	287.82
Siskiyou	44,000	1	7	8	18.18
Solano	439,990	4	29	33	7.50
Sonoma	495,058	2	40	42	8.48
Stanislaus	554,212	2	51	53	9.56
Sutter	102,808	1	7	8	7.78
Tehama	65,163	1	11	12	18.41
Trinity	13,374	2	11	13	97.20
Tulare	477,731	11	30	41	8.58
Tuolumne	52,557	4	20	24	45.66
Ventura	844,213	8	58	66	7.82
Yolo	220,723	0	17	17	7.70
Yuba	78,061	1	10	11	14.09
Total	**39,761,195**	**474**	**3,136**	**3,610**	**9.08**

Source: FARS ARF 2019, Provisional SWITRS 2019, California Department of Finance 2020

Funding for this program was provided by a grant from the California Office of Traffic Safety, through the National Highway Traffic Safety Administration.