INJURY DATA BRIEF

Fatal Motor Vehicle Crashes in California (2016-2019)

California aims to have a transportation system that promotes health and safety. This data brief describes all fatal motor vehicle crashes (MVCs) that occurred in California from 2016-2019 and includes information on crashes involving pedestrians and cyclists. The goal of this brief is to share information that may be used to reduce fatal MVCs and ensure the health and safety of California residents and those visiting the State.

Data Brief Objectives

The California Highway Patrol reports fatal MVCs to the National Highway Traffic Safety Administration's Fatality Analysis Reporting System (FARS). To qualify as a FARS case, the following two criteria must be met according to the FARS Analytical User's Manual: (1) the crash involved a motor vehicle traveling on a trafficway customarily open to the public and (2) the crash must have resulted in the death of a motorist or non-motorist within 30 days of the crash.[1] Utilizing 2016-2019 FARS data, this data brief examined all fatal MVCs in California, including those involving pedestrians and cyclists. Both MVC rates and frequencies are provided for all MVCs, as well as those involving pedestrians and cyclists. Rates and frequencies are provided for each individual county (when possible) or by Caltrans Districts to identify potential variation by geographic area. Consideration was also given to counties containing Vision Zero communities. Please note that all incidence rates were calculated per 100,000 individuals.

Methods

FARS data from 2016-2019 were used to calculate rates (per 100,000 individuals) and frequencies of all fatal MVCs in California, as well as those involving pedestrians and cyclists. Rates and frequencies for MVCs were also calculated for each individual county and various geographic regions. To calculate incidence rates, fatal MVCs that occurred on roadways in the county or region (the numerator) was divided by the sum of the annual population estimate for 2016-2019 (the denominator). This result was multiplied by 100,000 to generate the incidence rates per 100,000 individuals. Please note that some rates and frequencies are not reported in order to adhere to the California Health and Human Services data de-identification guidelines.[2]

All Fatal Motor Vehicle Crashes in California from 2016-2019

From 2016-2019, 14,021 fatal MVCs occurred on California roadways. For this four-year time period, the State incidence rate for all fatal MVCs was 8.86 (i.e., 8.86 fatal MVCs occurred for every 100,000 individuals per year). Alpine County and San Francisco County had the highest and lowest fatal MVC incidence rates of 263.45 and 3.37, respectively. Please see Table 1 for rates for each county, which is organized in order of highest to lowest incidence rates.

Table 1. Incidence Rates for All Fatal MVCs in 2016-2019 by County.

COUNTY	FATAL MVCs	INCIDENCE RATE	COUNTY (Cont'd)	FATAL MVCs	INCIDENCE RATE
Alpine	12	263.45	Tulare	274	14.50
Sierra	*	*	San Joaquin	429	14.26
Trinity	29	54	San Bernardino	1,153	13.38
Colusa	32	36.41	El Dorado	98	13.14
Inyo	25	33.70	Stanislaus	288	13.11
Mono	17	31.25	Nevada	51	13.03
Amador	45	30.15	Kings	77	12.72
Plumas	22	29.92	Fresno	504	12.56
Mendocino	104	29.39	San Luis Obispo+	131	11.79
Del Norte	31	28.80	Yolo	103	11.76
Calaveras	49	27.47	Riverside	1,106	11.55
Siskiyou	48	27.15	Monterey+	179	10.15
Lassen	31	26.23	Napa	57	10.13
Tehama	66	25.63	Sacramento+	605	9.91
Mariposa	18	25.07	Solano	163	9.33
Glenn	28	24.45	Sonoma	156	7.80
Modoc	*	*	Placer	116	7.51
Lake	53	20.57	Santa Barbara+	128	7.12
Tuolumne	43	20.33	Santa Cruz+	78	7.12
Merced	217	19.63	San Diego+	944	7.10
Madera	115	18.37	Los Angeles+	2,853	6.98
Humboldt	94	17.44	Contra Costa	281	6.16
Yuba	53	17.27	Orange	750	5.88
Sutter	69	17.23	Santa Clara+	456	5.84
San Benito	41	16.96	Ventura	195	5.75
Shasta	116	16.31	Marin	57	5.44
Kern	575	16.02	Alameda+	337	5.09
Butte	135	15.15	San Mateo	135	4.36
Imperial	112	14.94	San Francisco+	120	3.37

*Suppressed due to small cell size per data de-identification guidelines.[2]

+Counties with Vision Zero communities.

Vision Zero Communities in California

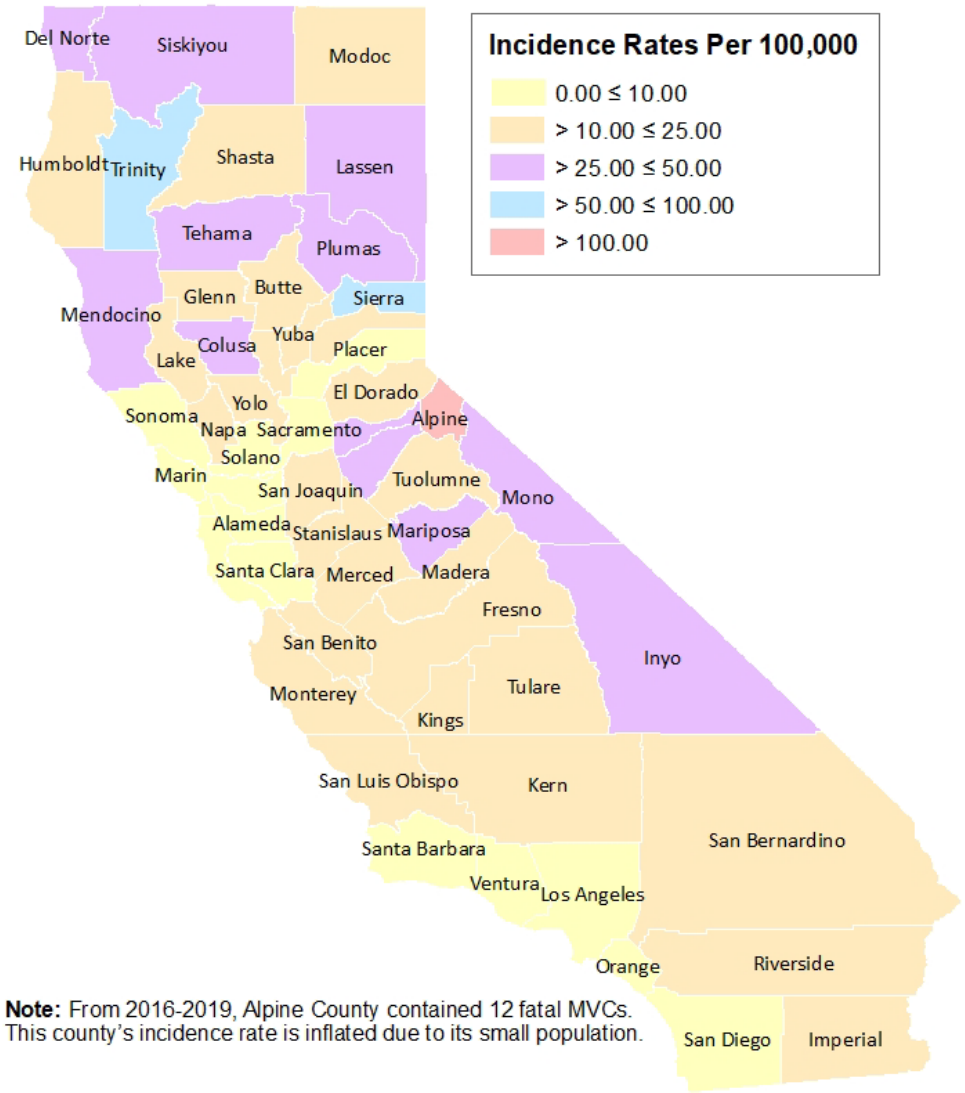
Vision Zero is an increasingly recognized term among road safety and injury prevention professionals and advocates. It is used to describe a jurisdiction's commitment to the application of proactive and systematic strategies to end all traffic-related fatalities and serious injuries. Agencies and their collaborative networks that embrace Vision Zero tend to operate from a core principle that traffic safety deaths are unacceptable and preventable, and that all aspects of the transportation system should be designed to anticipate human vulnerability and mistakes. Vision Zero communities support traffic safety culture that posits safety over speed and convenience. Vision Zero strategies directly overlap with what is known as the Safe System Approach, which is a transportation system designed so that when a human inevitably makes a mistake, that mistake is not fatal.

Alameda, Los Angeles, Monterey, Sacramento, San Diego, San Francisco, Santa Clara, San Luis Obispo, Santa Barbara, and Santa Cruz Counties have Vision Zero communities. Of the 10 counties with Vision Zero communities, San Luis Obispo and San Francisco Counties had the highest and lowest incidence rates of 11.79 and 3.37, respectively.

Seven out of the 10 counties with Vision Zero communities had incidence rates that were lower than the State rate (8.86), including San Francisco, which had the lowest MVC rate in the state. Los Angeles had the ninth lowest MVC rate in the state (6.98). The data suggest that the Vision Zero program may be making a positive contribution in these communities.

As seen in Figure 1, Southern California counties, most Central California counties, and Bay Area counties had lower incidence rates than other areas. Urban counties tended to have lower incidence rates than rural areas. Several rural counties had incidence rates that were substantially higher than the State rate. This pattern is consistent with research showing an elevated risk for fatal MVCs on rural roadways.[3]

Figure 1. Fatal MVC Incidence Rates Per 100,000 (2016-2019).



Note: From 2016-2019, Alpine County contained 12 fatal MVCs. This county's incidence rate is inflated due to its small population.

All Fatal Motor Vehicle Crashes involving Cyclists and Pedestrians in California from 2016-2019

The State incidence rates for fatal MVCs involving cyclists and fatal MVCs involving pedestrians are 0.40 and 2.60, respectively. To optimize the amount of information that can be shared in this brief while following data de-identification guidelines,[2] the incidence rates in Table 2 below are displayed by California Department of Transportation (Caltrans) Districts rather than by individual county. The majority of these Districts group multiple counties together. See Table 2 or Table 3 for a list of counties that are included in each district.

Table 2. Incidence Rates for Fatal MVC Crashes Involving Pedestrians in 2016-2019 by Caltrans District.

DISTRICT	COUNTIES WITHIN DISTRICT	FATAL MVCs INVOLVING PEDESTRIANS	INCIDENCE RATE
1	Del Norte, Humboldt, Lake, Mendocino	52	4.13
2	Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, Trinity	26	1.82
3	Butte, Colusa, El Dorado, Glenn, Nevada, Placer, Sacramento, Sierra, Sutter, Yolo, Yuba	322	2.81
4	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma	579	1.87
5	Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz	121	2.01
6	Fresno, Kern, Kings, Madera, Tulare	342	3.19
7	Los Angeles, Ventura	1,204	2.72
8	Riverside, San Bernardino	604	3.32
9	Inyo, Kern,[4] Mono	*	*
10	Alpine, Amador, Calaveras, Mariposa, Merced, San Joaquin, Stanislaus, Tuolumne	225	3.25
11	Imperial, San Diego	367	2.61
12	Orange	259	2.03

*Suppressed due to small cell size per data de-identification guidelines.[2]

Note: For this analysis, all MVCs that occurred in Kern County were included in District 6. This could result in a slight overestimation of MVCs in District 6 and a slight underestimation of MVCs in District 9.

Fatal MVCs involving pedestrians had substantially lower incidence rates than those for all fatal MVCs. From 2016-2019, Districts 1, 3, 6, 7, 8, 10, and 11 had incidence rates for fatal MVCs involving pedestrians that were higher than the State incidence rate of 2.60. District 1 (composed of Northern California rural counties) and District 2 (also composed of rural Northern California counties) had the highest and lowest incidence rates of 4.13 and 1.82, respectively. Overall, rates for fatal MVCs involving pedestrians were low across California.

Figure 2. Fatal MVCs Involving Pedestrians – Incidence Rates Per 100,000 (2016-2019).

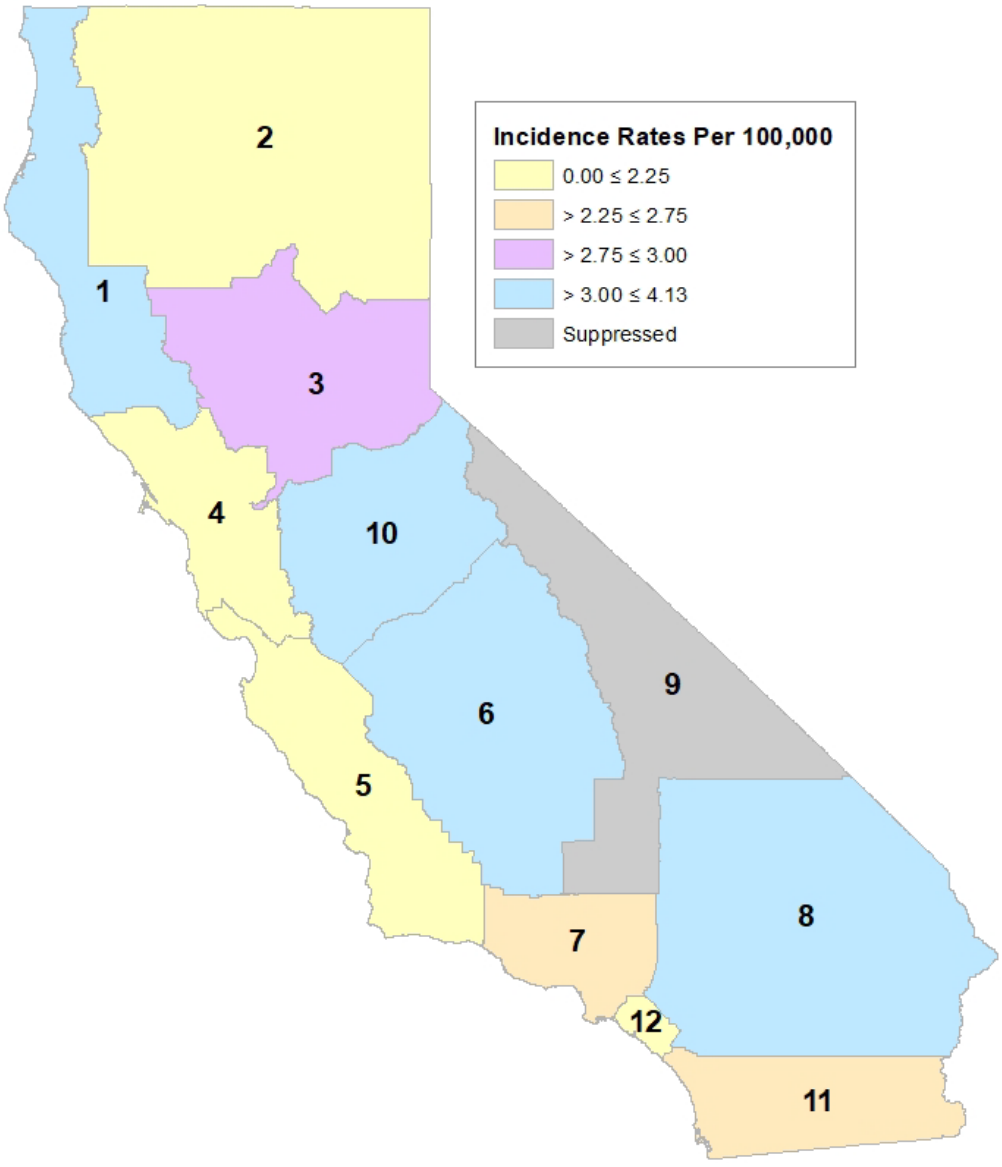


Table 3. Incidence Rates for Fatal MVC Crashes Involving Cyclists in 2016-2019 by Caltrans District.

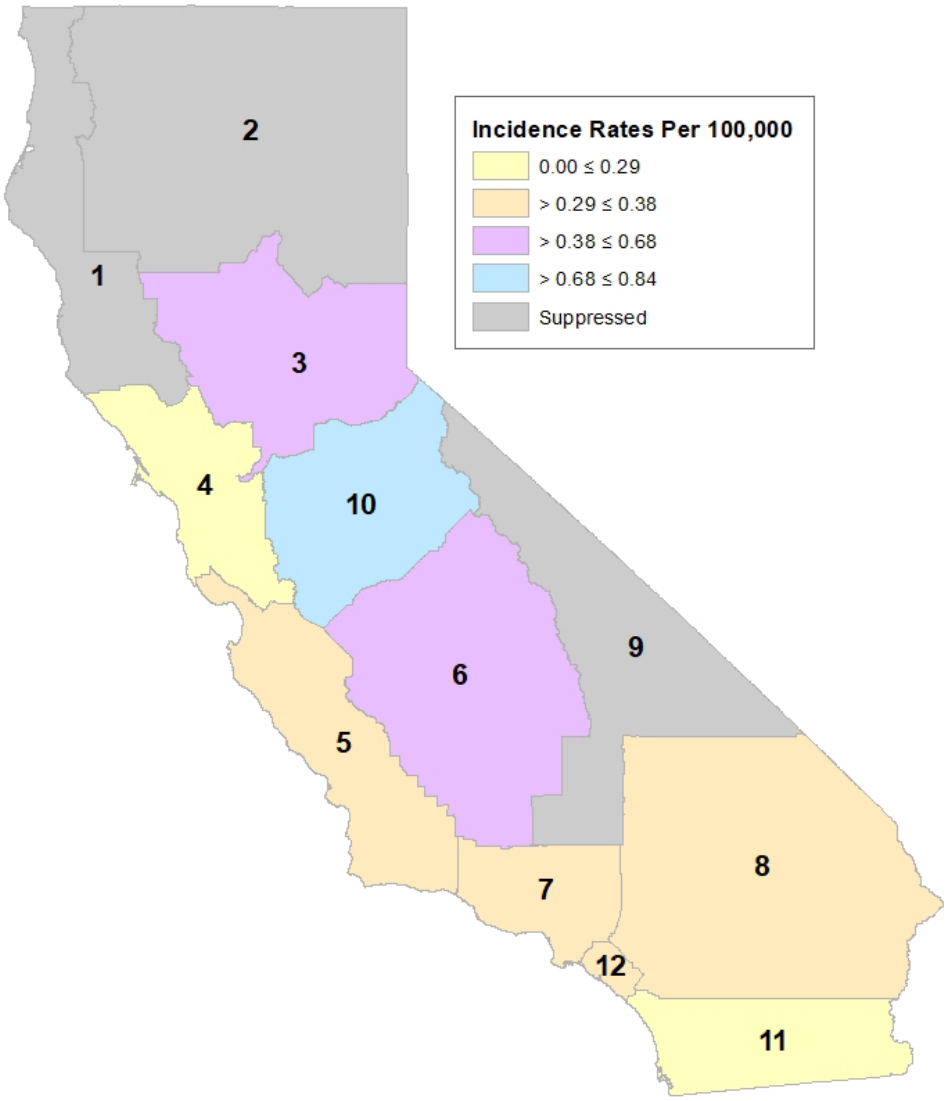
DISTRICT	COUNTIES WITHIN DISTRICT	FATAL MVCs INVOLVING CYCLISTS	INCIDENCE RATE
1	Del Norte, Humboldt, Lake, Mendocino	*	*
2	Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, Trinity	*	*
3	Butte, Colusa, El Dorado, Glenn, Nevada, Placer, Sacramento, Sierra, Sutter, Yolo, Yuba	78	0.68
4	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma	90	0.29
5	Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz	19	0.32
6	Fresno, Kern, Kings, Madera, Tulare	60	0.56
7	Los Angeles, Ventura	159	0.36
8	Riverside, San Bernardino	68	0.37
9	Inyo, Kern,[4] Mono	*	*
10	Alpine, Amador, Calaveras, Mariposa, Merced, San Joaquin, Stanislaus, Tuolumne	58	0.84
11	Imperial, San Diego	31	0.22
12	Orange	48	0.38

*Suppressed due to small cell size per data de-identification guidelines.[2]

Note: For this analysis, all MVCs that occurred in Kern County were included in District 6. This could result in a slight overestimate of MVCs in District 6 and a slight underestimate of MVCs in District 9.

Fatal MVCs involving cyclists had lower incidence rates than those for both fatal MVCs involving pedestrians and all fatal MVCs. From 2016-2019, Districts 3, 6, and 10 had incidence rates for fatal MVCs involving cyclists that were higher than the State rate of 0.40. District 10 (composed of Central California counties south of Sacramento and El Dorado Counties) and District 11 (composed of San Diego and Imperial Counties) had the highest and lowest incidence rates of 0.84 and 0.22, respectively. All districts had low incidence rates for fatal MVCs involving cyclists.

Figure 3. Fatal MVCs Involving Cyclists – Incidence Rates Per 100,000 (2016-2019).



Summary

The purpose of this data brief is to present information that may be used to reduce fatal MVCs, including those involving pedestrians and cyclists, and ensure the health and safety of California residents and those visiting the State. This report displays incidence rates for all fatal MVCs, fatal MVCs involving pedestrians, and fatal MVCs involving cyclists in California. Rates are broken down by county/district, as possible.

From 2016-2019, the State incidence rate for all fatal MVCs was 8.86. Many rural counties had higher fatal MVC rates than counties with urban/suburban areas. Areas with Vision Zero communities had lower MVC rates than other areas. Incidence rates for fatal MVCs involving pedestrians and cyclists were low across the state.

Prevention Strategies

Fatal MVCs can be prevented through implementation of strategies that address safety issues in areas that are prone to fatal crashes. For example, the National Highway Traffic Safety Administration (NHTSA) has identified risky behaviors that may contribute to fatal MVCs, including speeding and aggressive driving.[5] Prevention strategies focused on reduction of speeding and aggressive driving—especially in areas at elevated risk for fatal MVCs, such as rural counties—may be useful to prevent those deaths and promote healthy behavior and safer transportation systems.

Similarly, distracted driving (e.g., talking on the phone or texting on one's phone, using electronic devices, eating and/or drinking, and talking to passengers) may also contribute to fatal MVCs, and can be prevented. NHTSA has identified promising practices that may help deter distracted driving, such as building awareness of the fatal consequences of distracted driving and individual advocacy to discourage peers from driving distracted.[6]

Increasing evidence indicates that adopting a comprehensive Safe System Approach, through which multiple safeguards are employed to reinforce multiple layers of protection, has the greatest potential to lower fatal motor vehicle crash rates in California and make our roads safer for pedestrians, cyclists, and drivers.[7] Comparatively lower rates of MVC fatalities in counties with Vision Zero communities may indicate the following: (1) the value of adopting the Safe System Approach in regions in California that have not yet done so and (2) communities already committed to improving traffic safety can more easily adopt a Safe System Approach.

Limitations

Please note the following limitations exist within this report: (1) rates were calculated by occurrence and can include events for individuals who do not live in the county/district of occurrence; (2) inability to account for differences in exposure through vehicle miles traveled (VMT) or bike/walk trips; (3) lack of precise analysis of crash locations in rural counties/districts occurring on rural roadways; (4) inability to determine if lower MVC rates in Vision Zero counties are due to Vision Zero policies being implemented or if counties that are already focused on traffic safety are more likely to join the Vision Zero program; and (5) fatal MVCs are not the same as the number of MVC fatalities (i.e., multiple people could die in a single MVC).

Endnotes

[1] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813254, accessed September 19, 2022.
[2] https://www.dhcs.ca.gov/dataandstats/Documents/DHCS-DDG-V2.1-010821%20(1).pdf, accessed September 19, 2022.
[3] Zwerling C, Peek-Asa C, Whitten PS, Choi SW, Sprince NL, Jones MP. Fatal motor vehicle crashes in rural and urban areas: decomposing rates into contributing factors Injury Prevention 2005;11:24-28. DOI: http://dx.doi.org/10.1136/ip.2004.005959
[4] Eastern Kern County is within District 9.
[5] https://www.nhtsa.gov/risky-driving/speeding, accessed September 22, 2022.
[6] https://www.nhtsa.gov/risky-driving/distracted-driving, accessed September 22, 2022.
[7] https://www.ots.ca.gov/the-safe-system, accessed October 31, 2022.

Prepared by the Crash Medical Outcomes Data (CMOD) Project,
Injury and Violence Prevention Branch, California Department of Public Health.

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

Source Files: National Highway Traffic Safety Administration
Fatality Analysis Reporting System (FARS) 2016-2019 Final Files. Data retrieved June 2022 from https://www.nhtsa.gov/node/97996/251.