Berkeley Safe Transportation Research and Education Center

OTS CALIFORNIA OFFICE OF TRAFFIC SAFETY

TRAFFIC SAFETY FACTS

# Bicycle Safety

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## PROBLEM IDENTIFICATION AND DATA ANALYSIS

Bicycling is becoming more popular across the country, for commuting, exercise, and leisure. However, in the event of a traffic crash between a motor vehicle and a bicyclist, the bicyclist is the more vulnerable party and more likely to be injured or killed. In 2020, there were 938 bicyclists killed in a traffic crash in the United States. American Indian/ Alaska Native persons had the highest per capita rate of bicyclists deaths, followed by Black and Hispanic persons; the differential was smaller than for other categories of traffic deaths by race.

In citing concern about the level of bicycle fatalities, the Governors Highway Safety Association (GHSA) identified key recommendations for improving safety, including collection of better crash data, increased training for law enforcement to understand laws designed to protect bicyclists, partnerships with bicycling and community organizations regarding safety messaging and public education campaigns about infrastructure improvements.

The United States Department of Transportation uses the Safe System Approach to work towards zero roadway fatalities and serious injuries. The Safe System Approach recognizes that people may make unsafe decisions and designs a system with many redundancies in place to protect everyone, especially the most vulnerable road users. The Federal Highway Administration names safe road users, safe vehicles, safe speeds, safe roads, and post-crash care as key elements of a Safe System. These elements together create multiple layers of protection to improve safety.

Analyses presented in the bicycling program area include fatal and serious injuries to bicyclists, other cyclists, and passengers on bicycles. Bicycle crashes are defined as crashes where one or more victims is a bicyclist, other cyclist, or bicycling passenger.

## KEY FINDINGS

### NATIONAL DATA

- Bicycling fatalities increased 9.2 percent from 859 in 2019 to 938 in 2020 (see Figure 1).
- Bicycle fatalities represented 2.4 percent of the total number of traffic fatalities in 2020.
- In 2020, 17.4 percent of bicyclists killed in a traffic crash had a BAC of .08 g/dL or higher.

**Figure 1: Bicycling Fatality Trends, Nationwide and California, 2016-2020**


Source: FARS 2016 – 2019 Final File, 2020 ARF

## CALIFORNIA DATA

- In California, bicycle fatalities decreased 9.8 percent from 143 fatalities in 2019 to 129 fatalities in 2020.
- Bicycle fatalities represented 3.4 percent of the total number of traffic fatalities in 2020 in California.
- In 2020 17.8 percent of bicyclists killed in a traffic crash had a BAC of .08 g/dL or higher.
- Bicyclists are required to follow the California Vehicle Code while riding on California roadways. Unless prohibited, bicyclists are allowed to ride in travel lanes. In the 2021 California Traffic Safety Survey, only 62.2 percent of drivers surveyed believed it is legal for bicyclists to ride on roadways when there is not a bicycle lane present, a significant reduction ($p<0.01$) from 80.2 percent in 2019.

### Fatal and Serious Injury Bicycle Crashes by County

- Bicycle fatalities were highest in Fresno, Orange, Riverside, San Diego, San Joaquin, and Santa Clara counties. Per capita, bicycle fatalities were similarly high in Fresno and San Joaquin, along with in Butte, Humboldt, Lake, Napa, Tulare, and Yolo counties. Thirty counties had zero bicycle fatalities (see Figure 4).
- Similar to fatalities, bicycle serious injuries were highest in Los Angeles, Orange, San Diego, and Santa Clara counties, in addition to Alameda, Sacramento, and Santa Barbara counties. Per capita, bicycle serious injuries were highest in Alpine, Humboldt, Marin, Mono, Sierra, San Luis Obispo, Santa Barbara, and Santa Cruz counties. Nine counties reported zero bicycle serious injuries.
- Nine counties reported no bicycle fatalities or serious injuries.

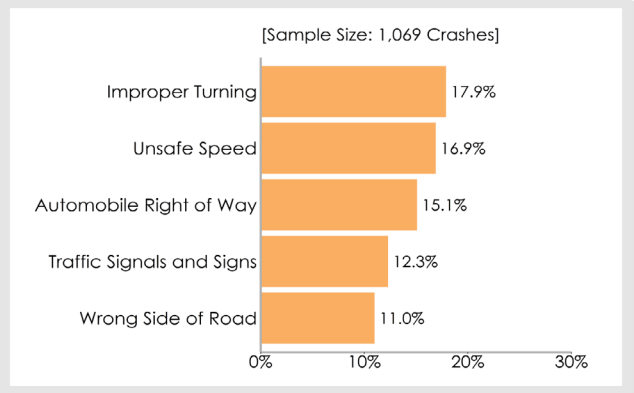
### Primary Crash Factors of Bicycling Fatal and Serious Injury Crashes

- The top five primary crash factors for bicycling fatal and serious injury crashes were improper turning (17.9 percent), unsafe speed (16.9 percent, automobile right-of-way (15.1 percent), traffic signals and signs (12.3 percent), and wrong side of the road (11.0 percent) (see Figure 2). The primary crash factor does not indicate which party is at fault.

### Crash Types for Bicycling Fatal and Serious Injury Crashes

- The top bicycle fatal and serious injury crash types were broadside (29.7 percent) followed by non-specified "other" crashes (26.9 percent) (see Figure 3).

**Figure 2: Top Five Primary Crash Factors for Bicycle Fatal and Severe Injury Crashes, 2020**




Source: Provisional SWITRS 2020

### Time and Day of Bicycling Fatal and Serious Injuries

- Of bicycling deaths, 45.0 percent occurred at night, between 6pm and midnight. The largest proportion of bicycling deaths occurred on Friday and Sunday (17.1 percent and 17.8 percent, respectively).
- Similarly, 42.4 percent of bicycling serious injuries occurred at night, between 6pm and midnight with another 34.1 percent occurring between 9am and noon. The largest proportion of bicycling serious injuries occurred on Tuesday and Friday (15.0 percent and 16.2 percent, respectively).

### Bicycling Fatal and Serious Injury Victim Demographics

- Of bicyclists killed in traffic crashes, 80.6 percent were male. Across most age groups, more male bicyclists died than female bicyclists. The age groups with the highest number of bicyclist fatalities were age 55 to 64 (27.1 percent), followed by the 35 to 44 and the 45 to 54 age groups (15.5 percent and 16.3 percent, respectively).
- Similarly, of bicyclists seriously injured in a traffic crash, 84.2 percent were male. Across all age groups, more male bicyclists were seriously injured than female bicyclists. Similarly, the age group with the highest number of bicyclist serious injuries was age 55 to 64 (19.1 percent), followed by the 25 to 34 and 45 to 54 age groups (17.4 percent and 16.5 percent, respectively).

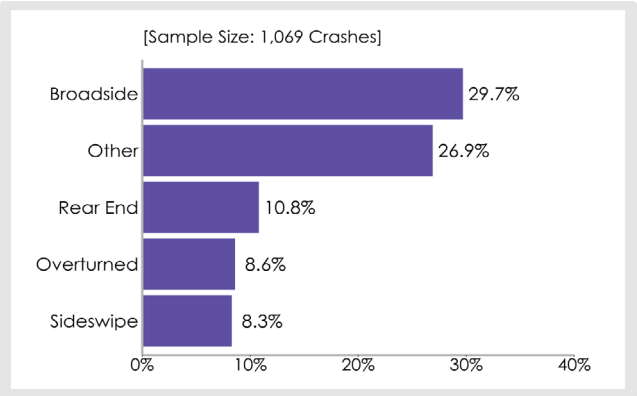
## CALIFORNIA DATA

- Race was unknown in FARS for 45.0 percent, or 58 of the bicyclist fatalities. Of the 71 fatalities with a known race, about 81.8 percent were white.

### Crash Location for Fatally-Injured Bicycling Victims

- The vast majority (89.1 percent) of bicyclist fatalities occurred in urban areas compared to 10.9 percent in rural areas.
- Of bicyclist fatalities, 42.6 percent occurred on non-interstate principal arterials followed by non-interstate minor arterials and non-interstate collector roads (25.6 percent and 22.5 percent, respectively).

**Figure 3: Top Five Crash Types for Bicycle Fatal and Serious Injury Victims, California, 2020**




Source: Provisional SWITRS 2020

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## COUNTY TABLE: BICYCLE ROAD USERS

### Figure 4: Bicycle User Fatalities and Serious Injuries, by Number and Rate, 2020

| County | Population | Fatalities | Serious Injuries | Fatal & Serious Injuries (FSI) | FSI per 100K Population |
|---|---|---|---|---|---|
| Alameda | 1,681,700 | 2 | 37 | 39 | 2.32 |
| Alpine | 1,199 | 0 | 1 | 1 | 83.40 |
| Amador | 40,506 | 0 | 0 | 0 | 0.00 |
| Butte | 211,216 | 2 | 9 | 11 | 5.21 |
| Calaveras | 45,277 | 0 | 2 | 2 | 4.42 |
| Colusa | 21,826 | 0 | 0 | 0 | 0.00 |
| Contra Costa | 1,166,669 | 4 | 27 | 31 | 2.66 |
| Del Norte | 27,745 | 0 | 1 | 1 | 3.60 |
| El Dorado | 191,282 | 0 | 5 | 5 | 2.61 |
| Fresno | 1,008,860 | 8 | 15 | 23 | 2.28 |
| Glenn | 28,822 | 0 | 1 | 1 | 3.47 |
| Humboldt | 136,514 | 2 | 9 | 11 | 8.06 |
| Imperial | 178,537 | 0 | 5 | 5 | 2.80 |
| Inyo | 18,977 | 0 | 1 | 1 | 5.27 |
| Kern | 907,021 | 4 | 21 | 25 | 2.76 |
| Kings | 153,085 | 0 | 2 | 2 | 1.31 |
| Lake | 68,099 | 1 | 3 | 4 | 5.87 |
| Lassen | 32,025 | 0 | 0 | 0 | 0.00 |
| Los Angeles | 10,012,474 | 24 | 199 | 223 | 2.23 |
| Madera | 156,519 | 1 | 1 | 2 | 1.28 |
| Marin | 262,410 | 0 | 27 | 27 | 10.29 |
| Mariposa | 17,123 | 0 | 0 | 0 | 0.00 |
| Mendocino | 91,602 | 0 | 0 | 0 | 0.00 |
| Merced | 280,873 | 0 | 12 | 12 | 4.27 |
| Modoc | 8,703 | 0 | 0 | 0 | 0.00 |
| Mono | 13,185 | 0 | 1 | 1 | 7.58 |
| Monterey | 439,008 | 1 | 13 | 14 | 3.19 |
| Napa | 138,433 | 1 | 7 | 8 | 5.78 |
| Nevada | 102,392 | 0 | 1 | 1 | 0.98 |
| Orange | 3,184,513 | 14 | 58 | 72 | 2.26 |
| Placer | 405,308 | 0 | 8 | 8 | 1.97 |
| Plumas | 19,666 | 0 | 0 | 0 | 0.00 |
| Riverside | 2,421,480 | 8 | 32 | 40 | 1.65 |
| Sacramento | 1,585,666 | 5 | 39 | 44 | 2.78 |
| San Benito | 64,110 | 0 | 1 | 1 | 1.56 |
| San Bernardino | 2,181,983 | 6 | 24 | 30 | 1.38 |
| San Diego | 3,303,736 | 7 | 73 | 80 | 2.42 |
| San Francisco | 870,985 | 1 | 31 | 32 | 3.67 |
| San Joaquin | 780,676 | 9 | 16 | 25 | 3.20 |
| San Luis Obispo | 282,996 | 1 | 16 | 17 | 6.01 |
| San Mateo | 763,497 | 2 | 24 | 26 | 3.41 |
| Santa Barbara | 448,659 | 2 | 37 | 39 | 8.69 |
| Santa Clara | 1,933,516 | 8 | 55 | 63 | 3.26 |
| Santa Cruz | 272,360 | 0 | 16 | 16 | 5.88 |
| Shasta | 181,881 | 0 | 5 | 5 | 2.75 |
| Sierra | 3,233 | 0 | 1 | 1 | 30.93 |
| Siskiyou | 44,091 | 0 | 1 | 1 | 2.27 |
| Solano | 453,405 | 1 | 3 | 4 | 0.88 |
| Sonoma | 489,880 | 1 | 24 | 25 | 5.10 |
| Stanislaus | 553,995 | 3 | 17 | 20 | 3.61 |
| Sutter | 100,751 | 0 | 4 | 4 | 3.97 |
| Tehama | 65,643 | 0 | 2 | 2 | 3.05 |
| Trinity | 16,135 | 0 | 0 | 0 | 0.00 |
| Tulare | 473,482 | 5 | 7 | 12 | 2.53 |
| Tuolumne | 55,500 | 0 | 1 | 1 | 1.80 |
| Ventura | 844,545 | 4 | 22 | 26 | 3.08 |
| Yolo | 216,544 | 2 | 8 | 10 | 4.62 |
| Yuba | 81,468 | 0 | 0 | 0 | 0.00 |
| **Total** | **39,541,786** | **129** | **925** | **1,054** | **2.67** |

Source: FARS ARF 2020; Provisional SWITRS 2020; California Department of Finance 2021.

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