



Early Estimate of Motor Vehicle Traffic Fatalities For the First Half (January–June) of 2023

Summary

A statistical projection of traffic fatalities for the first half of 2023 shows an estimated 19,515 people died in motor vehicle traffic crashes, a decrease of about 3.3 percent as compared to 20,190 fatalities projected to have occurred in the first half of 2022, as shown in Table 1. The second quarter of 2023 represents the fifth consecutive quarterly decline in fatalities beginning with the second quarter of 2022. Preliminary data reported by the Federal Highway Administration (FHWA) show that vehicle miles traveled (VMT) in the first half of 2023 increased by about 35.1 billion miles, or about a 2.3-percent increase. Also shown in Table 1 are the fatality rates per 100 million VMT, by quarter. The fatality rate for the first half of 2023 decreased to 1.24 fatalities per 100 million VMT,

down from the projected rate of 1.31 fatalities per 100 million VMT in the first half of 2022. For the NHTSA Regional differences, eight Regions are estimated to have decreases in fatalities and the fatality rate per 100 million VMT in the first half of 2023 as compared to the first half of 2022. Also, 29 States are projected to have had decreases in fatalities. The actual counts for 2022 and 2023 and the ensuing percentage changes from 2022 to 2023 will be further revised as the annual reporting FARS files for 2022 are available later this year, as well as when the Final File for 2022 and the Annual Reporting File for 2023 are available next year. These estimates will be further refined when the projections for the first nine months of 2023 are released in late December.

Table 1: Fatalities and Fatality Rate by Quarter, First Half, Full Year, and the Percentage Change From the Corresponding Quarter, First Half or Full Year in the Previous Year

Year	1st Quarter (Jan–Mar)	2nd Quarter (Apr–Jun)	3rd Quarter (Jul–Sep)	4th Quarter (Oct–Dec)	Total (Full Year)	1st Half (Jan–Jun)
Fatalities and Percentage Change in Fatalities for the Corresponding Quarter and Total From the Previous Year						
2013	7,166 [-4.7%]	8,207 [-4.7%]	9,024 [-1.6%]	8,496 [+0.2%]	32,893 [-2.6%]	15,373 [-4.7%]
2014	6,856 [-4.3%]	8,179 [-0.3%]	8,799 [-2.5%]	8,910 [+4.9%]	32,744 [-0.5%]	15,035 [-2.2%]
2015	7,370 [+7.5%]	8,823 [+7.9%]	9,805 [+11.4%]	9,486 [+6.5%]	35,484 [+8.4%]	16,193 [+7.7%]
2016	8,154 [+10.6%]	9,563 [+8.4%]	10,078 [+2.8%]	10,011 [+5.5%]	37,806 [+6.5%]	17,717 [+9.4%]
2017	8,301 [+1.8%]	9,460 [-1.1%]	10,081 [+0.0%]	9,631 [-3.8%]	37,473 [-0.9%]	17,761 [+0.2%]
2018	8,203 [-1.2%]	9,323 [-1.4%]	9,934 [-1.5%]	9,375 [-2.7%]	36,835 [-1.7%]	17,526 [-1.3%]
2019	7,832 [-4.5%]	9,193 [-1.4%]	9,994 [+0.6%]	9,336 [-0.4%]	36,355 [-1.3%]	17,025 [-2.9%]
2020	7,901 [+0.9%]	9,164 [-0.3%]	11,358 [+13.6%]	10,584 [+13.4%]	39,007 [+7.3%]	17,065 [+0.2%]
2021	8,874 [+12.3%]	11,114 [+21.3%]	11,753 [+3.5%]	11,198 [+5.8%]	42,939 [+10.1%]	19,988 [+17.1%]
2022†	9,645 [+8.7%]	10,545 [-5.1%]	11,690 [-0.5%]	10,915 [-2.5%]	42,795 [-0.3%]	20,190 [+1.0%]
2023‡	8,995 [-6.7%]	10,520 [-0.2%]	—	—	—	19,515 [-3.3%]
Fatality Rate per 100 Million Vehicle Miles Traveled (VMT)						
2013	1.04	1.07	1.17	1.16	1.10	1.05
2014	0.99	1.03	1.11	1.17	1.08	1.01
2015	1.03	1.08	1.20	1.21	1.15	1.06
2016	1.11	1.16	1.23	1.27	1.19	1.14
2017	1.12	1.13	1.21	1.20	1.17	1.13
2018	1.10	1.11	1.18	1.15	1.14	1.11
2019	1.05	1.09	1.18	1.14	1.11	1.07
2020	1.08	1.43	1.44	1.42	1.34	1.25
2021	1.28	1.38	1.40	1.40	1.37	1.33
2022†	1.32	1.30	1.40	1.38	1.35	1.31
2023‡	1.20	1.27	—	—	—	1.24

†2022, 2023 statistical projections and rates based on these projections.

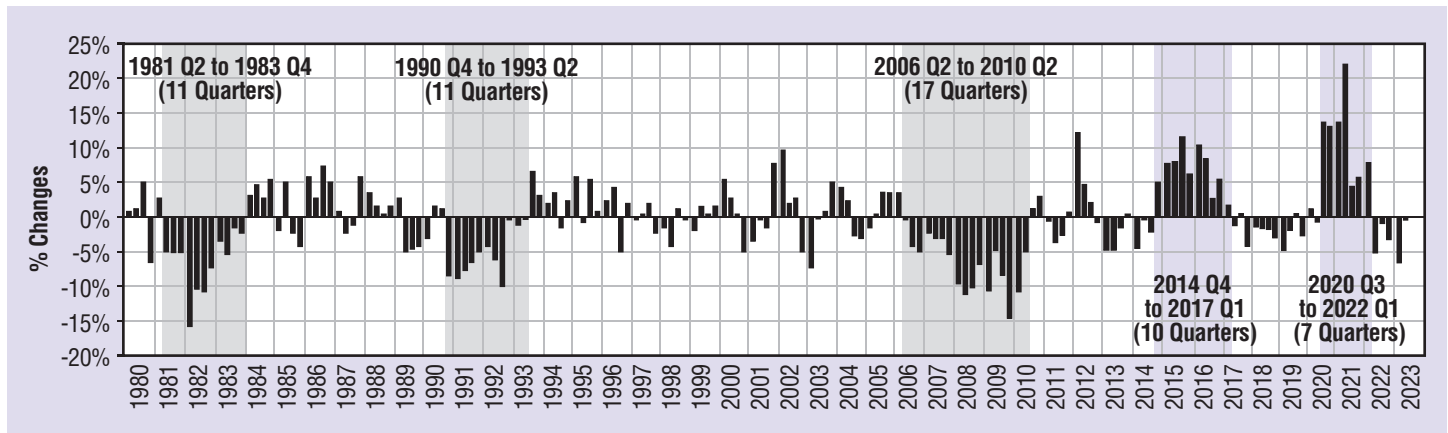
Sources: Fatalities: 2013–2020 FARS Final File, 2021 FARS Annual Report File.

VMT: FHWA June 2023 Traffic Volume Trends for 2022 and 2023 VMT.

Figure 1 shows the historical trend of the percentage change every quarter from the same quarter in the previous year, going back to 1980 (NHTSA has fatality data going back to 1975). The shading in the chart shows the years when there were significant numbers of consecutive quarters with increases/declines as compared to the corresponding quarters of the previous years. The declines during the early 1980s and 1990s lasted 11 consecutive quarters, while the most recent decline occurred over 17 consecutive quarters ending in the second quarter of 2010. More recently, the significant increases in fatalities occurred over 10 consecutive quarters end-

ing after the first quarter of 2017. In addition, fatalities increased seven consecutive quarters beginning with the third quarter of 2020, until the 5.1-percent decline seen in the second quarter of 2022. The third and fourth quarter of 2020 and the first and especially the second quarter of 2021 showed significant increases in fatalities as compared to the corresponding quarters of 2019 and 2020. The percentage increase in the second quarter of 2021 is actually the highest quarterly percentage increase in FARS data recorded history. The second quarter of 2023 represents the fifth quarterly decline in fatalities beginning with the second quarter of 2022.

Figure 1: Percentage Change in Fatalities in Every Quarter as Compared to the Fatalities in the Same Quarter During the Previous Year



Sources: 1980–2020 FARS Final File, 2021 FARS Annual Report File. 2022 and 2023 statistical projections.

The quarterly projections of fatalities, fatality rates, and VMT are further split into monthly estimates for 2022 and 2023, as shown in Table 2. In 2023 both fatalities and

the fatality rate per 100 million VMT show decreases in all months except for April, which showed an increase, as compared to the corresponding month in 2022.

Table 2: Fatalities, VMT, Fatality Rate by Month or Quarter in 2023, and the Percentage Change in Fatalities and VMT From the Corresponding Month or Quarter in 2022

Year	1st Quarter				2nd Quarter				3rd Quarter				4th Quarter			
	Jan	Feb	Mar	Total	Apr	May	Jun	Total	Jul	Aug	Sep	Total	Oct	Nov	Dec	Total
Fatalities in 2023 and Percentage Change in Fatalities for the Corresponding Month and Quarter From 2022																
2022†	3,230	3,045	3,370	9,645	3,230	3,680	3,635	10,545	3,860	3,900	3,930	11,690	4,015	3,450	3,450	10,915
2023†	3,015 -6.7%	2,900 -4.8%	3,080 -8.6%	8,995 -6.7%	3,360 4.0%	3,600 -2.2%	3,560 -2.1%	10,520 -0.2%								
Fatality Rate per 100 Million Vehicle Miles Traveled (VMT)/VMT (in Billion) and Percentage Change in VMT																
2022†	1.38 234.1	1.33 229.3	1.25 269.6	1.32 733.0	1.26 255.9	1.31 280.3	1.32 274.6	1.30 810.8	1.38 279.3	1.38 281.6	1.44 273.2	1.40 834.1	1.44 278.0	1.34 257.0	1.35 256.5	1.38 791.5
2023†	1.22 247.4 5.7%	1.24 233.7 1.9%	1.13 271.4 0.7%	1.20 752.5 2.7%	1.31 256.1 0.1%	1.25 287.3 2.5%	1.26 283.0 3.1%	1.27 826.4 1.9%								

†2022, 2023 statistical projections and rates based on these projections.

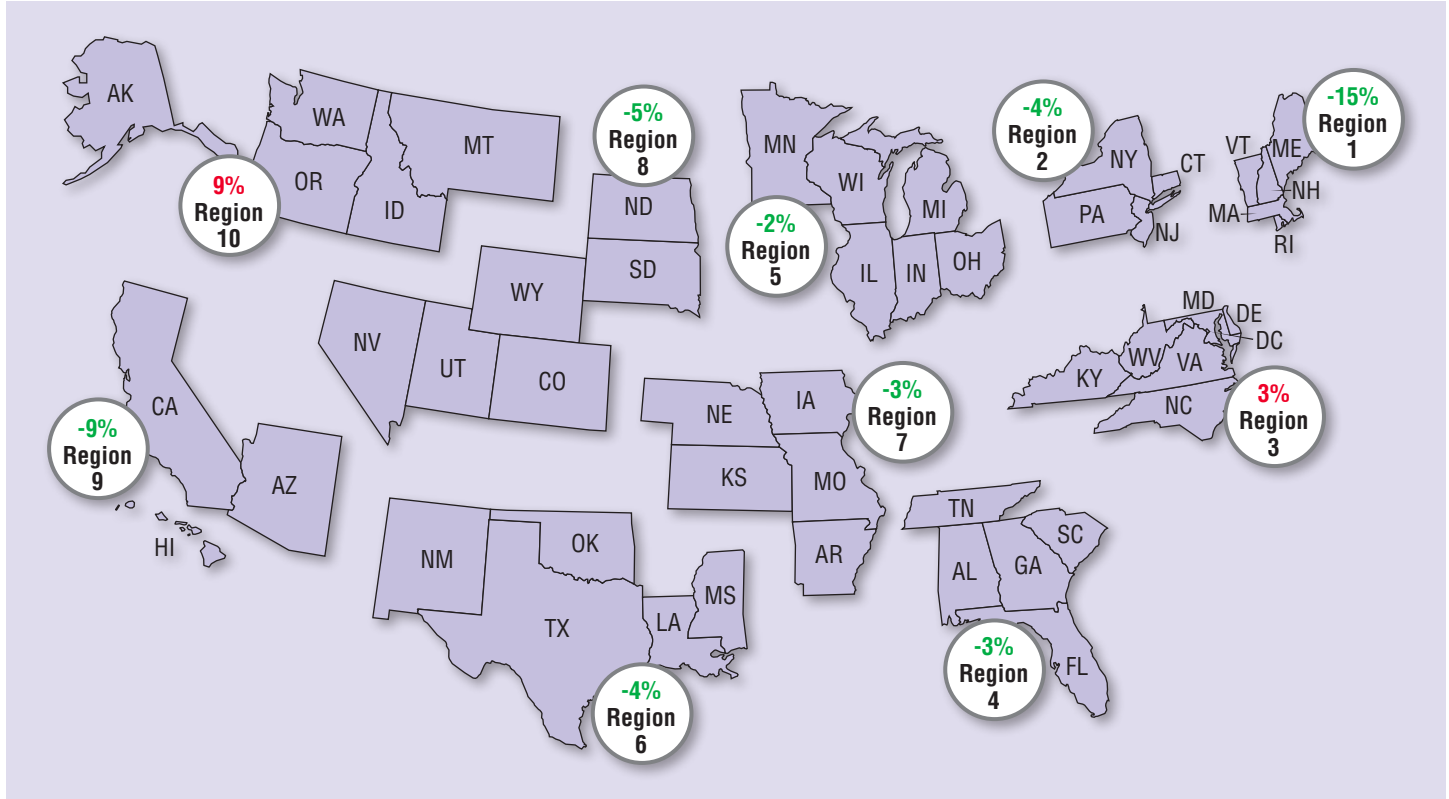
Sources: VMT: FHWA June 2023 Traffic Volume Trends for 2022 and 2023 VMT.

Regional Differences

The statistical procedures used in these projections were generated for each NHTSA administrative Region and were collated to create the national estimate. This allows for the comparison of Regional estimates in 2023 with the projected 2022 counts. Figure 2 shows the percentage change in estimated fatalities in the first half of 2023 from the projected fatalities in the same half of 2022 by NHTSA Region; eight Regions experienced decreases.

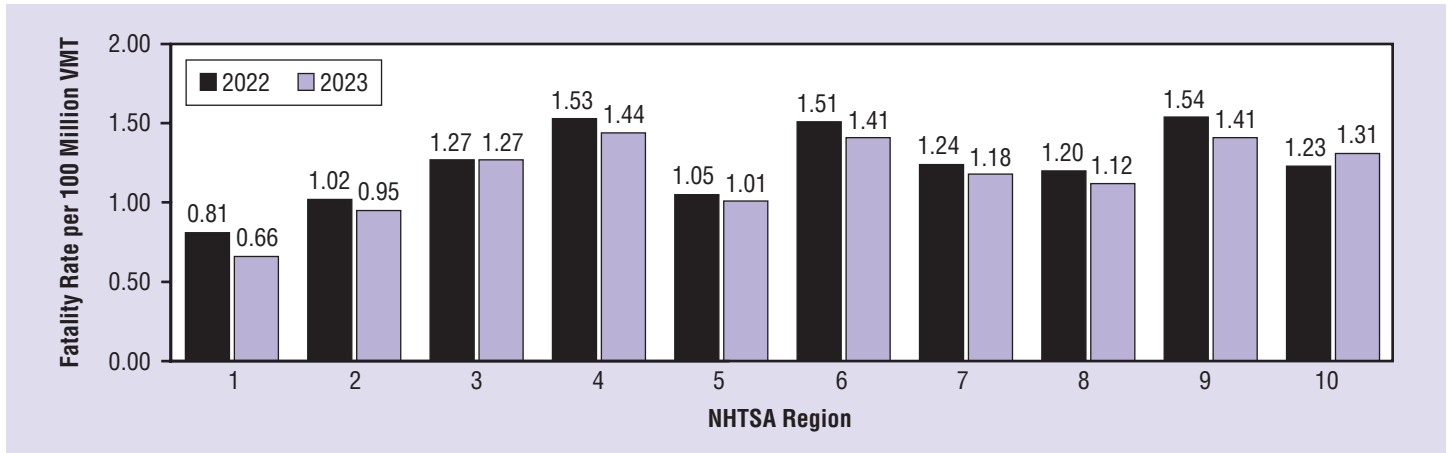
Figure 3 shows the comparison of the estimated fatality rate per 100 million VMT in the first half of 2023 with the projected fatality rate per 100 million VMT in the same half of 2022, by NHTSA Region; eight Regions presented decreases. These estimates by NHTSA Region shown in Figures 2 and 3 are subject to change as fatality counts for 2022 and 2023 are reported.

Figure 2: Percentage Change in Estimated Fatalities in the First Half of 2023 From the Projected First Half of 2022 Fatality Counts, by NHTSA Region



Sources: 2022 and 2023 statistical projections. Puerto Rico is not included in Region 2.

Figure 3: Comparison of Estimated Fatality Rate in the First Half of 2023 With Projected Fatality Rate in the First Half of 2022, by NHTSA Region



Source: FHWA June 2023 Traffic Volume Trends for 2022 and 2023 VMT. Puerto Rico is not included in Region 2.

State Differences

Given the significant interest in the traffic safety community in estimated changes at the State level to assess emerging trends, NHTSA developed a methodology in the third quarter of 2021 to generate such State-level estimates based on the most recent distribution of the fatalities by State in a NHTSA Region and the month (see “Data and Methodology” section for more details). Table 3 shows the comparison of State estimates in the first half of 2023 with the projected fatality counts in the first half of 2022 and the percentage change in 2023 as compared to

2022; 21 States, Puerto Rico, and the District of Columbia are projected to have experienced increases in fatalities in the first half of 2023 as compared to the first half of 2022, while 29 States are projected to have had decreases in fatalities. Also, the estimates of the fatality rate per 100 million VMT by State for the first half of 2022 and 2023 is presented in Table 3 of this report. These estimates by State shown in Table 3 are subject to change as fatality counts for 2022 and 2023 are reported, and as FHWA finalizes the State VMT estimates for 2022 and 2023.

Table 3: Estimated Fatalities in the First Half of 2023, and the Percentage Change in Estimated Fatalities From the Projected Fatalities in the First Half of 2022, by State. State Estimates of the Fatality Rate Per 100 M VMT in the First Half of 2022 and 2023 Are Also Presented.

State	Fatalities			Fatality Rate		State	Fatalities			Fatality Rate	
	2022	2023	Percent Change	2022	2023		2022	2023	Percent Change	2022	2023
Alabama	479	460	-4.1%	1.23	1.17	Nebraska	120	94	-21.6%	1.20	0.94
Alaska	33	24	-26.3%	1.20	0.88	Nevada	205	179	-12.4%	1.54	1.36
Arizona	627	655	4.5%	1.68	1.71	New Hampshire	64	55	-14.2%	1.01	0.84
Arkansas	281	290	3.2%	1.53	1.54	New Jersey	326	277	-14.9%	0.90	0.73
California	2,341	2,061	-12.0%	1.52	1.35	New Mexico	211	191	-9.5%	1.61	1.38
Colorado	342	325	-4.8%	1.33	1.23	New York	510	499	-2.2%	0.98	0.92
Connecticut	181	161	-11.0%	1.29	1.13	North Carolina	763	790	3.5%	1.35	1.35
Delaware	75	77	2.4%	1.45	1.48	North Dakota	39	43	9.7%	0.92	0.96
District of Columbia	15	25	64.9%	0.90	1.41	Ohio	568	602	6.0%	1.04	1.08
Florida	1,840	1,772	-3.7%	1.62	1.52	Oklahoma	326	272	-16.4%	1.48	1.21
Georgia	881	764	-13.3%	1.46	1.24	Oregon	253	276	9.4%	1.42	1.55
Hawaii	62	47	-24.0%	1.22	0.92	Pennsylvania	534	558	4.5%	1.07	1.09
Idaho	79	103	29.7%	0.85	1.08	Rhode Island	14	41	193%	0.38	1.07
Illinois	598	599	0.2%	1.23	1.21	South Carolina	516	521	1.0%	1.77	1.73
Indiana	447	422	-5.5%	1.17	1.08	South Dakota	48	51	6.1%	1.05	1.13
Iowa	150	171	14.1%	0.95	1.07	Tennessee	607	661	8.9%	1.49	1.58
Kansas	195	194	-0.6%	1.28	1.24	Texas	2,104	2,089	-0.7%	1.47	1.42
Kentucky	334	364	9.1%	1.43	1.49	Utah	151	127	-16.2%	0.92	0.76
Louisiana	428	375	-12.3%	1.54	1.34	Vermont	39	36	-8.7%	1.21	1.08
Maine	84	45	-46.6%	1.24	0.64	Virginia	467	441	-5.5%	1.20	1.10
Maryland	272	293	7.6%	0.98	1.04	Washington	349	368	5.3%	1.26	1.30
Massachusetts	196	161	-18.0%	0.67	0.53	West Virginia	122	125	2.6%	1.59	1.58
Michigan	528	492	-6.7%	1.13	1.03	Wisconsin	274	261	-4.8%	0.89	0.83
Minnesota	184	163	-11.7%	0.67	0.58	Wyoming	50	65	29.0%	0.96	1.28
Mississippi	344	342	-0.6%	1.75	1.73	U.S. Total*	20,190	19,515	-3.3%	1.31	1.24
Missouri	463	424	-8.3%	1.22	1.09	Puerto Rico	127	146	15%	–	–
Montana	69	81	16.8%	1.10	1.25						

*Puerto Rico is not included.

Sources: 2022 and 2023 statistical projections.

VMT: FHWA June 2023 Traffic Volume Trends for 2022 and 2023 VMT. Traffic Volume Trends for Puerto Rico is not available.

Discussion

During the COVID-19 pandemic, there were marked increases in fatalities and the fatality rate per 100 million VMT in 2020. The increased trend of fatalities in 2020 has continued into 2021 and the first quarter of 2022. The second, third, and fourth quarters of 2022, plus the first and the second quarter of 2023 have experienced a decline in fatalities after seven consecutive quarters of year-to-year increases in fatalities, since the third quarter of 2020. The increased trend of the fatality rate per 100 million VMT in 2020 has continued into the first quarter of 2021, decreased in the second, third, and fourth quarters of 2021, and increased again in the first quarter. There was a decrease in the second and the fourth quarters of 2022, and in the first and the second quarter of 2023. NHTSA is continuing to gather and finalize data on crash fatalities for 2021 and 2022 using information from police crash reports and other sources. The Final File for 2021 as well as the Annual Report File for 2022 will be available later this year that usually results in the revision of fatality totals and the ensuing fatality rates and percentage changes.

Data and Methodology

The data used in this analysis come from several sources: NHTSA's FARS, Early Notification (EN) data, and Monthly Fatality Counts (MFC) (the EN and MFC data are not available to the public); and from FHWA's VMT estimates. FARS is a census of fatal traffic crashes in the 50 States, the District of Columbia, and Puerto Rico. To be included in FARS, a crash must involve a motor vehicle traveling on a trafficway and must result in the death of at least one person (occupant of a vehicle or a nonoccupant) within 30 days of the crash. FARS Final Files from 2003 to 2020 and FARS Annual Report File in 2021 are used to obtain the monthly fatality counts. The EN program is designed as an Early Fatality Notification System to capture fatality counts from

States more rapidly and provide near-real-time notification of fatality counts from all jurisdictions reporting to FARS. The MFC data provide monthly fatality counts by State through sources that are independent from the EN or FARS systems. MFCs from January 2003 up to June 2023 are used. MFCs are reported midmonth for all prior months of the year. To estimate the traffic fatality counts for 2023, the time series cross-section regression (TSCSR) procedure was applied to analyze the data with both cross-sectional values (by NHTSA Region) and time series (by month), to model the relationship among FARS, MFC, and EN, the details of which are available in a Research Note (*Statistical Methodology to Make Early Estimates of Motor Vehicle Traffic Fatalities*, Report No. DOT HS 811 123). Furthermore, after the projected fatality counts for NHTSA Region r and the month m (F_Est_{mr}) are obtained, the estimated fatality counts for a State st in Region r and the month m ($F_Est_{st|mr}$) are calculated. Each State receives a proportion of the projected fatality counts for the Region using the most recent relative proportion of fatalities in each State st for Region r and month m found in the Early Notification data. This can be expressed as $F_Est_{st|mr} = (F_{st|mr} / \sum_{all\ States\ in\ r} F_{st|mr}) \times F_Est_{mr}$, where $F_{st|mr}$ is the latest fatal count in the Early Notification data for State st in Region r and month m . That is, the inflation rate for all States within a region is assumed to be the same as the inflation rate of that region. For example, the estimated motor vehicle traffic fatalities for Arizona in Region 9 (AZ, CA, HI) and the month m is: $F_Est_{AZ|m9} = (F_{AZ|m9} / (F_{AZ|m9} + F_{CA|m9} + F_{HI|m9})) \times F_Est_{m9}$.

The methodology used to generate the national, regional, and State-level estimates for the first half of 2023 is the same as the one used by NHTSA to project the motor vehicle traffic fatalities for the first quarter of 2023 (*Early Estimate of Motor Vehicle Traffic Fatalities for the First Quarter of 2023*, Report No. DOT HS 813 482).

The suggested APA format citation for this document is:

National Center for Statistics and Analysis. (2023, September). *Early estimate of motor vehicle traffic fatalities for the first half of 2023* (Crash•Stats Brief Statistical Summary, Report No. DOT HS 813 514). National Highway Traffic Safety Administration.

For questions regarding the information presented in this report, please contact NCSARequests@dot.gov. This Crash•Stats and other general information on traffic safety can be found at <https://crashstats.nhtsa.dot.gov/>



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