Early Estimate of Motor Vehicle Traffic Fatalities in 2021

Summary

A statistical projection of traffic fatalities for 2021 shows that an estimated 42,915 people died in motor vehicle traffic crashes nationwide. This represents an increase of about 10.5 percent as compared to 38,824 fatalities reported in 2020, as shown in Table 1. This also represents the highest number of fatalities since 2005 and the highest annual percentage increase in the recorded history of data in the Fatality Analysis Reporting System (FARS). Preliminary data reported by the Federal Highway Administration (FHWA) show that vehicle miles traveled (VMT) in 2021 increased by about 325.2 billion miles, or about a 11.2-percent increase as compared to 2020. Also shown in Table 1 are the fatality rates per 100 million VMT, by quarter. The fatality rate for 2021 was 1.33 fatalities per 100 million VMT, marginally down from 1.34 fatalities per 100 million VMT in 2020. The fatality rates in Q2, Q3 and Q4 have declined, which represents the third consecutive decline in year-to-year quarterly fatality rate since Q4 of 2019. For the NHTSA Region differences, all 10 Regions are estimated to have increases in fatalities, and 3 of the 10 Regions are estimated to have increases in fatality rate per 100 million VMT in 2021 as compared to 2020. Also, most States are projected to have experienced increases. The fatality counts for 2020 and 2021 and the ensuing percentage change from 2020 to 2021 will be further revised as the final file for 2020 and the annual reporting file for 2021 are available later this year.

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

| Quarter	1st Quarter (Jan–Mar)	2nd Quarter (Apr–Jun)	3rd Quarter (Jul–Sep)	4th Quarter (Oct–Dec)	Total (Full Year)
Fatalities and Percentage Change in Fatalities for the Corresponding Quarter and Total From the Previous Year					
2011	6,726 [-0.4%]	8,227 [-3.5%]	8,984 [-2.6%]	8,542 [+0.5%]	32,479 [-1.6%]
2012	7,521 [+11.8%]	8,612 [+4.7%]	9,171 [+2.1%]	8,478 [-0.7%]	33,782 [+4.0%]
2013	7,166 [-4.7%]	8,207 [-4.7%]	9,024 [-1.6%]	8,496 [+0.2%]	32,893 [-2.6%]
2014	6,856 [-4.3%]	8,179 [-0.3%]	8,799 [-2.5%]	8,910 [+4.9%]	32,744 [-0.5%]
2015	7,370 [+7.5%]	8,823 [+7.9%]	9,805 [+11.4%]	9,486 [+6.5%]	35,484 [+8.4%]
2016	8,154 [+10.6%]	9,563 [+8.4%]	10,078 [+2.8%]	10,011 [+5.5%]	37,806 [+6.5%]
2017	8,301 [+1.8%]	9,460 [-1.1%]	10,081 [+0.0%]	9,631 [-3.8%]	37,473 [-0.9%]
2018	8,203 [-1.2%]	9,323 [-1.4%]	9,934 [-1.5%]	9,375 [-2.7%]	36,835 [-1.7%]
2019	7,832 [-4.5%]	9,193 [-1.6%]	9,994 [+0.6%]	9,336 [-0.4%]	36,355 [-1.3%]
2020	7,893 [+0.8%]	9,141 [-0.6%]	11,315 [+13.2%]	10,475 [+12.2%]	38,824 [+6.8%]
2021†	8,935 [+13.2%]	11,135 [+21.8%]	11,780 [+4.1%]	11,065 [+5.6%]	42,915 [+10.5%]
Fatality Rate per 100 Million Vehicle Miles Traveled (VMT)					
2011	0.98	1.09	1.18	1.17	1.10
2012	1.08	1.12	1.21	1.16	1.14
2013	1.04	1.07	1.17	1.16	1.10
2014	0.99	1.03	1.11	1.17	1.08
2015	1.03	1.08	1.20	1.21	1.15
2016	1.11	1.16	1.23	1.27	1.19
2017	1.12	1.13	1.21	1.20	1.17
2018	1.10	1.11	1.18	1.15	1.14
2019	1.05	1.09	1.18	1.14	1.11
2020	1.08	1.43	1.44	1.40	1.34
2021†	1.25	1.34	1.37	1.35	1.33

†2021 statistical projections and rates based on these projections.
Sources: Fatalities: 2011–2019 FARS Final File, 2020 FARS Annual Report File; VMT: FHWA December 2021 Traffic Volume Trends for 2020 and 2021 VMT.

Figure 1 shows the historical trend of the percentage change every quarter from the same quarter in the previous year, going back to 1979 (NHTSA has fatality data since 1975). The shading in the chart depicts the years during which 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 ending after the first quarter of 2017. 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.

Figure 1: Percentage Change in Fatalities in Every Quarter Compared to the Fatalities in the Same Quarter During the Previous Year
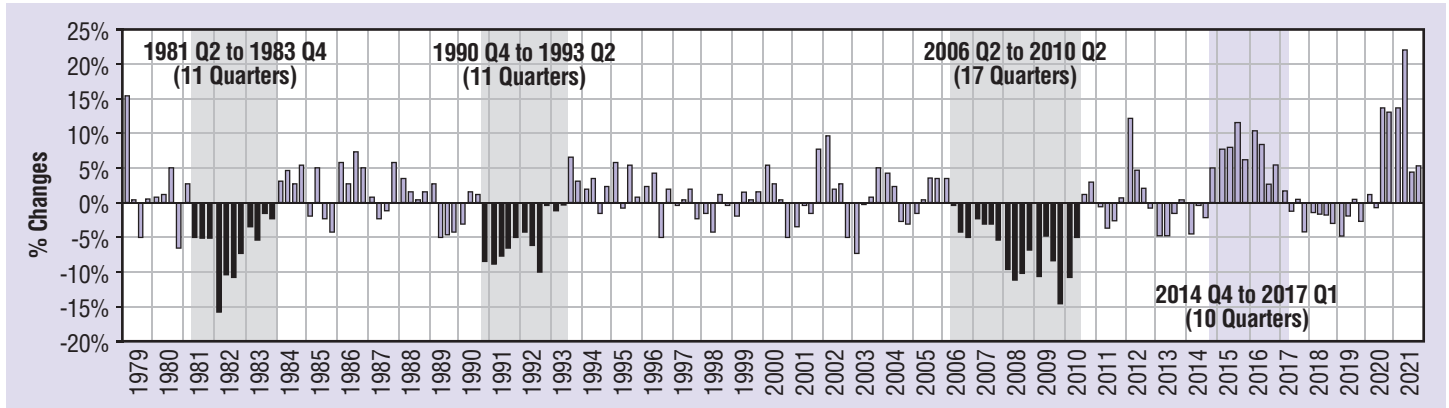
Sources: 1979–2019 FARS final file, 2020 FARS annual report file. 2021 statistical projections.

To examine the effect of the COVID-19 pandemic, the quarterly projections of fatalities, fatality rates, and VMT are further split into monthly estimates for 2020 and 2021. The stay-at-home orders started in mid-March 2020, followed by the first full month of stay-at-home measures that were in effect during April (the smallest VMT in this month). During May some States began to reopen in some way while almost all States partially reopened by June. After June, States continued to adapt their local and statewide COVID-19 guidelines and assess specific reopening and potential reclosing efforts accordingly. Table 2 shows that fatalities are projected to have decreased in February 2021 (February 2020 was a leap month) but increased in January and March–December 2021 (April and June are the months with the greatest and smallest increases in fatalities, respectively). The fatality rate per 100 million VMT shows an increase during January–March (1st quarter) 2021 (January is the month with the greatest increase in fatality rate) but a decrease during April–September & November–December (2nd to 4th quarter) of 2021, as compared to the corresponding month (quarter) in 2020.

Table 2: Fatalities, VMT, Fatality Rate by Month or Quarter in 2021, and the Percentage Change in Fatalities and VMT From The Corresponding Month or Quarter in 2020

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 2021 and Percentage Change in Fatalities for the Corresponding Month and Quarter From 2020																
2020	2,666	2,674	2,553	7,893	2,320	3,096	3,725	9,141	3,789	3,802	3,724	11,315	3,793	3,445	3,237	10,475
2021†	3,130 17.4%	2,585 -3.3%	3,220 26.1%	8,935 13.2%	3,570 53.9%	3,775 21.9%	3,790 1.7%	11,135 21.8%	3,875 2.3%	4,040 6.3%	3,865 3.8%	11,780 4.1%	4,085 7.7%	3,555 3.2%	3,425 5.8%	11,065 5.6%
Fatality Rate per 100 Million Vehicle Miles Traveled (VMT)/VMT (in Billion) and Percentage Change in VMT																
2020	1.02 260.8	1.10 242.7	1.13 226.6	1.08 730.1	1.38 167.6	1.40 221.0	1.49 250.3	1.43 638.9	1.43 265.5	1.43 265.1	1.23 268.8	1.44 788.1	1.42 266.6	1.45 238.3	1.34 241.5	1.40 746.4
2021†	1.35 231.0 -11.4%	1.21 213.0 -12.2%	1.19 269.5 18.9%	1.25 713.5 -2.3%	1.37 260.3 55.3%	1.33 284.5 14.6%	1.32 286.9 14.6%	1.34 831.7 31.2%	1.31 296.5 11.7%	1.41 287.4 8.4%	1.39 278.0 8.0%	1.37 861.9 9.4%	1.43 285.8 7.2%	1.33 267.6 12.3%	1.28 268.4 11.1%	1.35 821.8 10.1%

†2021 Statistical projections and rates based on these projections.
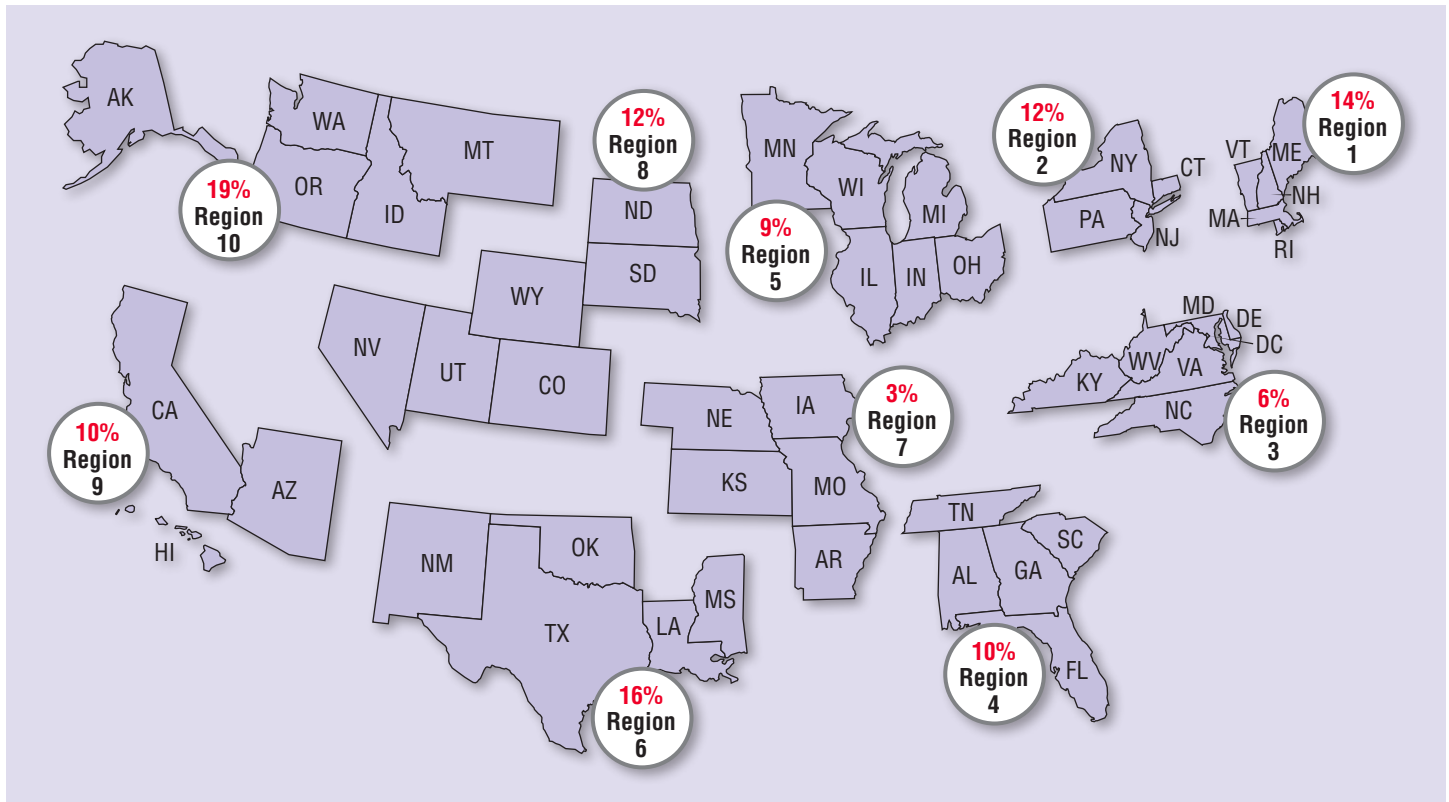Sources: Fatalities: 2020 FARS Annual Report File; VMT: FHWA December 2021 Traffic Volume Trends for 2020 and 2021 VMT.

Regional Differences

The statistical procedures employed in these projections were generated for each NHTSA administrative Region and were collated to create the national estimate. This allows for the comparison of Region estimates in 2021 with the reported 2020 counts. Figure 2 shows the percentage change in estimated fatalities in 2021 from the reported fatalities in 2020 by NHTSA Region; all 10 Regions experienced increases. Figure 3 shows the comparison of the estimated fatality rate per 100 million VMT in 2021 with the reported fatality rate per 100 million VMT in 2020, by NHTSA Region; 3 of the 10 Regions presented increases. These estimates by NHTSA Region shown in Figures 2 and 3 are subject to change as the FARS final files for 2020 and annual report file for 2021 are available later this year.

Figure 2: Percentage Change in Estimated Fatalities in 2021 From Reported Fatalities in 2020, by NHTSA Region

Sources: 2020 FARS annual report file, 2021 statistical projections. Puerto Rico is not included in Region 2.

Figure 3: Comparison of Estimated Fatality Rate in 2021 with Reported Fatality Rate in 2020, by NHTSA Region
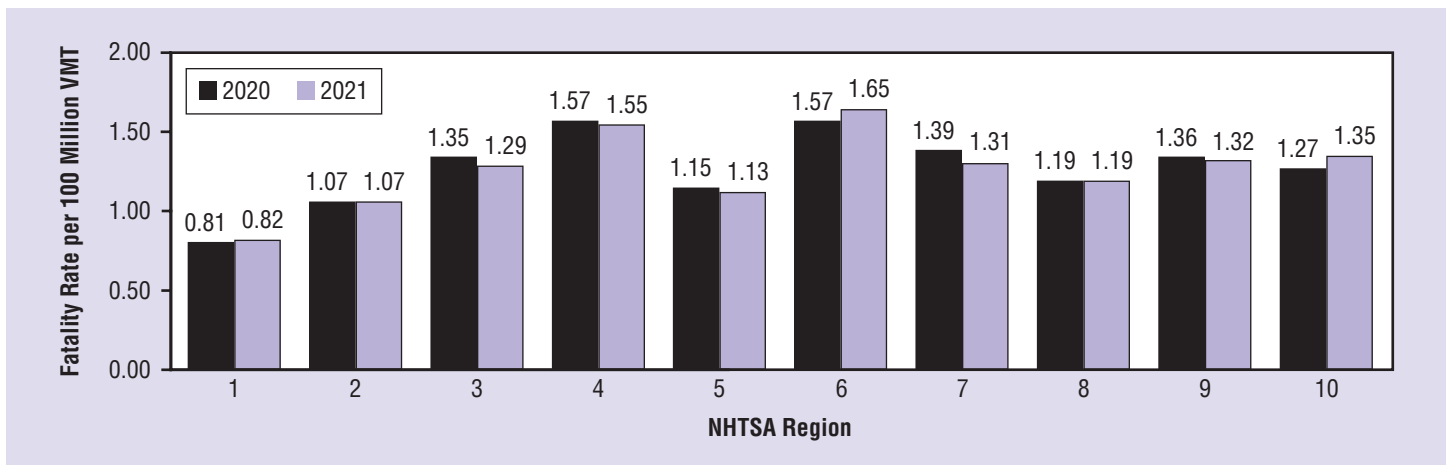
Source: FHWA December 2021 Traffic Volume Trends for 2020 and 2021 VMT. Puerto Rico is not included in Region 2.

State Differences

Given the significant changes in fatalities in 2020 and 2021, there has been significant interest in the traffic safety community in estimated changes at the State level to assess emerging trends. Subsequently, NHTSA has developed a methodology to generate such State-level estimates based on the distribution of estimated 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's estimate in 2021 with the reported 2020 fatality counts and the percentage change in 2021 from 2020; 44 States, the District of Columbia and Puerto Rico are projected to have experienced increases in fatalities in 2021 as compared to 2020, while 1 State remained unchanged and 5 States are projected to have had decreases. These estimates by State shown in Table 3 are subject to change as the FARS final files for 2020 and annual report file for 2021 are available later this year.

Table 3: Estimated Fatalities in 2021, and the Percentage Change in Estimated Fatalities From the Reported Fatalities in 2020, by State

State	2020	2021	Percent Change	State	2020	2021	Percent Change
Alabama	934	987	5.7%	Nebraska	233	218	-6.4%
Alaska	64	67	4.7%	Nevada	317	386	21.8%
Arizona	1,054	1,123	6.5%	New Hampshire	104	123	18.3%
Arkansas	638	690	8.2%	New Jersey	584	709	21.4%
California	3,847	4,258	10.7%	New Mexico	398	479	20.4%
Colorado	622	696	11.9%	New York	1,046	1,139	8.9%
Connecticut	295	327	10.8%	North Carolina	1,538	1,627	5.8%
Delaware	116	137	18.1%	North Dakota	100	102	2.0%
District of Columbia	36	39	8.3%	Ohio	1,230	1,351	9.8%
Florida	3,331	3,753	12.7%	Oklahoma	652	774	18.7%
Georgia	1,664	1,806	8.5%	Oregon	508	599	17.9%
Hawaii	85	95	11.8%	Pennsylvania	1,129	1,234	9.3%
Idaho	214	286	33.6%	Rhode Island	67	67	0.0%
Illinois	1,194	1,357	13.7%	South Carolina	1,064	1,144	7.5%
Indiana	897	930	3.7%	South Dakota	141	149	5.7%
Iowa	337	356	5.6%	Tennessee	1,217	1,318	8.3%
Kansas	426	433	1.6%	Texas	3,874	4,573	18.0%
Kentucky	780	794	1.8%	Utah	276	332	20.3%
Louisiana	828	976	17.9%	Vermont	62	77	24.2%
Maine	164	162	-1.2%	Virginia	850	968	13.9%
Maryland	567	542	-4.4%	Washington	560	652	16.4%
Massachusetts	343	413	20.4%	West Virginia	267	293	9.7%
Michigan	1,084	1,147	5.8%	Wisconsin	614	597	-2.8%
Minnesota	394	500	26.9%	Wyoming	127	113	-11.0%
Mississippi	752	755	0.4%	**U.S. Total***	**38,824**	**42,915**	**10.5%**
Missouri	987	1,016	2.9%	Puerto Rico	242	337	39.3%
Montana	213	243	14.1%				

*Unrounded State's Fatalities Estimate Summation (Puerto Rico is not Included).
Sources: 2020 FARS annual report file, 2021 statistical projections.

Discussion

During the COVID-19 pandemic, there were marked increases in fatalities and the fatality rate per 100 million VMT in 2020. This increased trend in fatalities continued into 2021 (the degree of increase was greatly reduced during June–December). The increased trend in fatality rate per 100 million VMT continued into the first quarter of 2021, but the fatality rate decreased in the second, third, and fourth quarters of 2021 compared to 2020. NHTSA is continuing to gather and finalize data on crash fatalities for 2020 and 2021 using information from police crash reports and other sources. The final files for 2020 and annual report file for 2021 will be available later this year, which 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 January 2003 to December 2019 and FARS annual report file in 2020 are used. 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 December 2021 are used. MFCs are reported mid-month for all prior months of the year. In order to estimate the traffic fatality counts for 2021, time series cross-section regression 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, $F\_Est_{st|mr}$, can be calculated in terms of the distribution of the fatalities by State st in Region r and the month m ($F_{st|mr}$): $F\_Est_{st|mr} = (F_{st|mr} / \sum_{all\ States\ in\ r} F_{st|mr}) \times F\_Est_{mr}$. For example, the estimated 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 and regional estimates for 2021 is the same as the one used by NHTSA to project the increase in the fatalities for the whole of 2020 (Early Estimates of Motor Vehicle Traffic Fatalities in 2020, Report No. DOT HS 813 115).

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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/