Early Estimate of Motor Vehicle Traffic Fatalities in 2016

Summary

A statistical projection of traffic fatalities for 2016 shows that an estimated 37,500 people died in motor vehicle traffic crashes. This represents an increase of about 6.9 percent as compared to the 35,092 fatalities reported to have occurred in 2015, as shown in Table 1. If these projections are realized, fatalities will be at the highest level since 2007 when 41,259 fatalities were reported to have occurred. Preliminary data reported by the Federal Highway Administration (FHWA) shows that vehicle miles traveled (VMT) in 2016 increased by about 74.6 billion miles, or about a 2.4-percent increase. Also shown in Table 1 are the fatality rates per 100 million VMT, by quarter. The fatality rate for 2016 increased to 1.18 fatalities per 100 million VMT, up from 1.13 fatalities per 100 million VMT in 2015. The fourth quarter of 2016 represents the ninth consecutive quarter with year-to-year increases in fatalities as well as the fatality rate. Fatalities are projected to have increased by 6.4 percent during the fourth quarter of 2016. Analysis to generate gross estimates of changes reveals increases in driver and pedestrian deaths for the Nation in 2016 as compared to 2015. Also, 9 out of 10 NHTSA regions are estimated to have increases in fatalities in 2016 as compared to 2015. The fatality counts for 2015 and 2016 and the ensuing percentage change from 2015 to 2016 will be further revised as the final file for 2015 and the annual reporting file for 2016 are available later this year. These estimates may be further refined when the projections for the first quarter of 2017 are released in late spring of 2017.

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/Half From the Prior Year					
2005	9,239	11,005	11,897	11,369	43,510
2006	9,558 [+3.5%]	10,942 [-0.6%]	11,395 [-4.2%]	10,813 [-4.9%]	42,708 [-1.8%]
2007	9,354 [-2.1%]	10,611 [-3.0%]	11,056 [-3.0%]	10,238 [-5.3%]	41,259 [-3.4%]
2008	8,459 [-9.6%]	9,435 [-11.1%]	9,947 [-10.0%]	9,582 [-6.4%]	37,423 [-9.3%]
2009	7,552 [-10.7%]	8,975 [-4.9%]	9,104 [-8.5%]	8,252 [-13.9%]	33,883 [-9.5%]
2010	6,755 [-10.6%]	8,522 [-5.0%]	9,226 [+1.3%]	8,496 [+3.0%]	32,999 [-2.6%]
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	7,335 [+7.0%]	8,765 [+7.2%]	9,708 [+10.3%]	9,284 [+4.2%]	35,092 [+7.2%]
2016†	8,150 [+11.1%]	9,500 [+8.4%]	9,975 [+2.8%]	9,875 [+6.4%]	37,500 [+6.9%]
Fatality Rate per 100 Million Vehicle Miles of Travel (VMT)					
2005	1.32	1.42	1.54	1.54	1.46
2006	1.35	1.41	1.47	1.44	1.42
2007	1.31	1.35	1.41	1.37	1.36
2008	1.22	1.25	1.33	1.32	1.26
2009	1.09	1.16	1.17	1.12	1.15
2010	0.98	1.09	1.18	1.14	1.11
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	1.15	1.10
2014	0.99	1.03	1.11	1.17	1.08
2015	1.02	1.08	1.19	1.18	1.13
2016†	1.11	1.16	1.21	1.25	1.18

†2016 statistical projections and rates based on these projections.
Source: Fatalities, 2005–2014 FARS Final File, 2015 FARS Annual Report File.   VMT: FHWA January 2017 Traffic Volume Trends for 2016 VMT, 2015.

Figure 1 shows the historical trend of the percentage change every quarter from the same quarter in the previous year, going back to 1976. NHTSA has fatality data going back to 1975, and the years during the early 1980s and 1990s are the

only two other periods with such significant consecutive quarters with declines as compared to the corresponding quarters of the previous years. Both of these periods had 11 consecutive quarters of declines.

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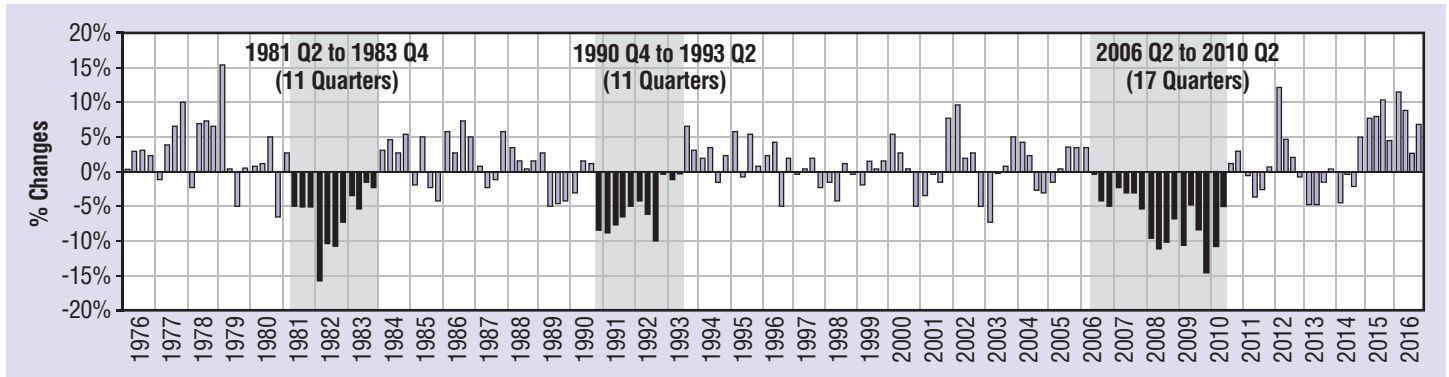

Breakdown of Estimated Changes

The significant changes projected to have occurred during 2016 have warranted a look into changes by categories (pedestrians, occupants, etc.) of interest. While NHTSA's FastFARS does not collect such detailed information, cases currently coded for 2016 into NHTSA's FARS were used to construct estimated changes along these categories. Also, NHTSA's methodology for estimating overall fatalities allows for the examination of regional changes.

Regional Differences

As discussed in a methodology Research Note (Statistical Methodology to Make Early Estimates of Motor Vehicle Traffic Fatalities, Report No. DOT HS 811 123), 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 regional estimates in 2016 with the reported 2015 counts, as depicted by the estimated percentage changes in Figure 2. Nine of 10 NHTSA Regions experienced increases during 2016 as compared to reported totals during 2015. The estimated regional year-to-year percentage changes shown in Figure 2 are subject to change as fatality counts for 2015 and 2016 are finalized.

Figure 2: Percentage Change in Estimated Fatalities in 2016 From Reported 2015 Fatality Counts, by NHTSA Region
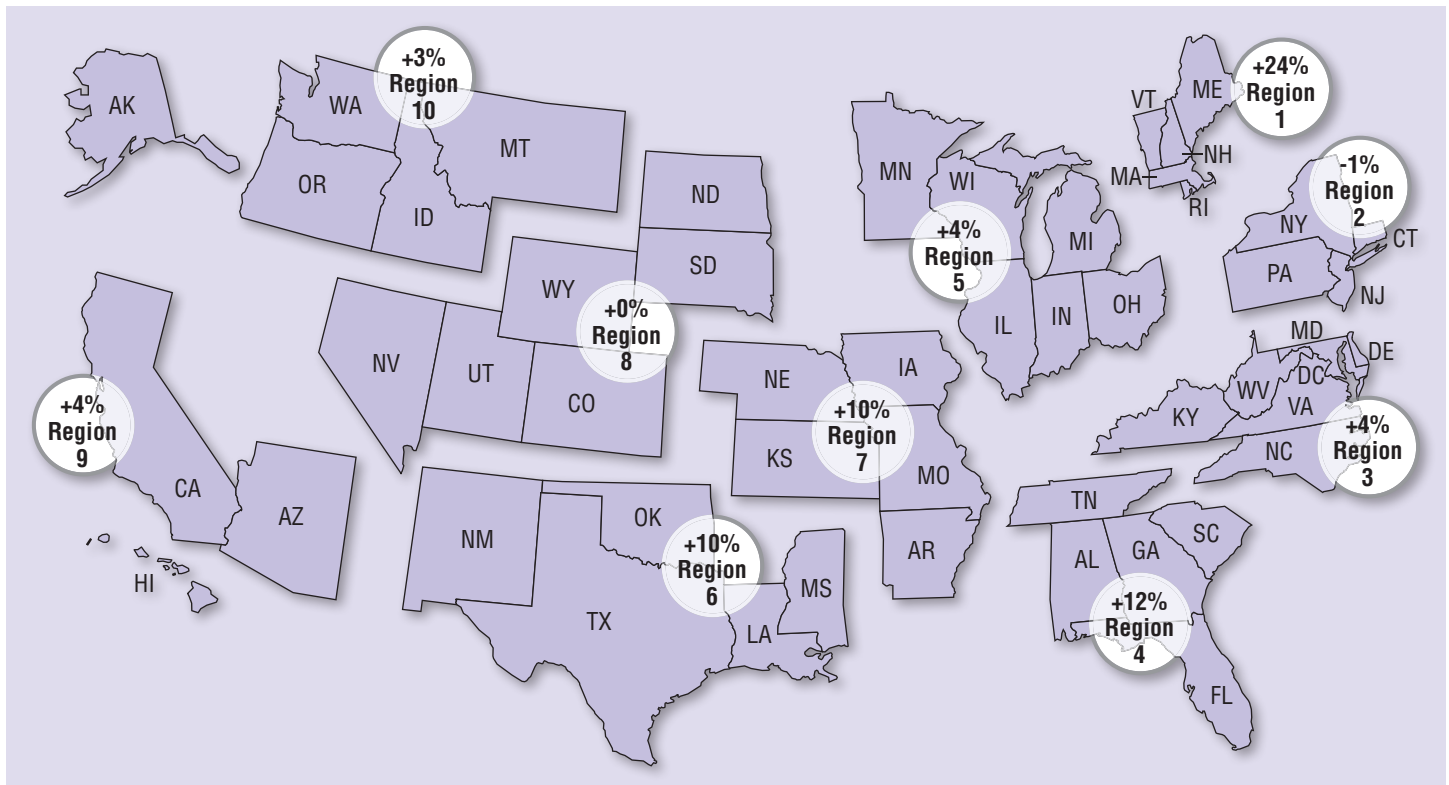
Estimated Changes by Sub-Categories

The input data streams used in the forecasting model are not reported by sub-categories of interest such as pedestrian and motorcyclist fatalities. Therefore, a statistical model-based approach is not feasible to generate estimates by sub-categories. However, cases currently coded for 2016 into NHTSA's FARS provide a basis for constructing gross estimates of fatalities by sub-categories.

Estimates based on the data coded thus far into NHTSA's FARS for 2016 reveals that most of the nation saw increases in pedestrian (8% increase) and motorcyclists (5% increase). Fatalities to drivers and passengers also increased (8% and 5%, respectively). These estimates are created by inflating current 2016 cases coded into NHTSA's Fatality Analysis Reporting System (FARS) to the estimated regional totals presented in this note for the overall fatalities. Essentially, ratio inflation factors, by NHTSA Region and month, are estimated and applied to the current 2016 cases coded thus far into FARS. These estimates are subject to change as more information gets coded into these cases as well as when more cases are entered into FARS and may also change subject to the revision of the overall fatality estimate for 2016.

Discussion

The National Highway Traffic Safety Administration is continuing to gather data on crash fatalities for 2015 and 2016 using information from police crash reports and other sources. It is too soon to speculate on the contributing factors or potential implications of any changes in deaths on our roadways. The final data for 2015 as well as the annual file for 2016 will be available later in 2017, which usually results in the revision of fatality totals and the ensuing rates and percentage changes.

In the last few years, since recording a significant increase of 11.8 percent during the first quarter of 2012, the magnitude of the increases steadily declined during each subsequent quarter. Fatalities are reported to have increased by about 4.7 percent in the second quarter and by about 2.1 percent in the third quarter of 2012. Subsequently, beginning with the fourth quarter of 2012, fatalities have declined in seven out of eight quarters (2013 Q4 was a marginal increase) until the 4.9-percent increase reported for the fourth quarter of 2014. Fatalities have increased nine consecutive quarters beginning with the fourth quarter of 2014. The fatality rates per 100 million in 2016 VMT, when compared to the rates for the corresponding quarters in 2015, are higher for all four quarters of 2016.

Data

The data used in this analysis comes from several sources: NHTSA's Fatality Analysis Reporting System (FARS), Fast-FARS (FF), and Monthly Fatality Counts (MFC); 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 2014 and FARS Annual Report file in 2015 are used. The FF program is designed as an Early Fatality Notification System to capture fatality counts from States more rapidly and in real-time. It aims to provide near-real-time notification of fatality counts from all jurisdictions reporting to FARS. The MFC data provides monthly fatality counts by State through sources that are independent from the FastFARS or FARS systems. MFCs from January 2003 up to February 2017 are used. MFCs are reported mid-month for all prior months of the year. In order to estimate the traffic fatality counts for the whole of 2016, 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 FF, the details of which are available in a companion Research Note. The methodology used to generate the estimates for 2016 is the same as the one used by NHTSA to project the increase in the fatalities for the whole of 2015 (Early Estimates of Motor Vehicle Traffic Fatalities in 2015, Report No. DOT HS 812 269).

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