

Don't Assume a Higher Volume of Drivers on the Road Caused the Record Increase in Crashes and Fatalities.

The long-term declining trend in vehicle crashes should have continued despite the 3.3% increase of drivers on the road.

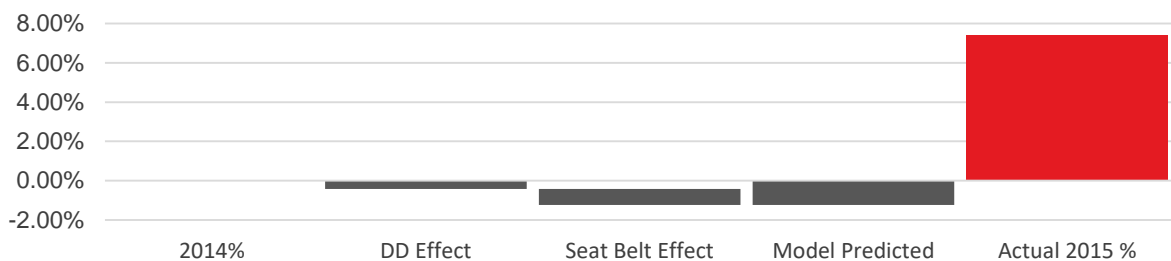


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INTRODUCTION

By incorporating previous safety trends like increased seat belt use and a decrease in drunk driving rates, crashes should have declined, but there was a significant spike in both crashes and fatalities.

In 2015, there was an unexplained increase in fatalities of 8.63%. According to the National Highway Traffic Safety Administration, nationwide in 2015, 3,477 people were killed in distracted driving crashes and an estimated 391,000 were injured in motor vehicle crashes involving distracted drivers.



We ran a regression analysis for fatalities relative to trends in seat belt usage and Drunk Driving fatalities and confirmed this significant relationship. The regression predicts a decrease in fatalities of 1.23% for 2015, but the actual data shows an increase of 7.4%. Thus, the true unexplained increase in fatalities is 8.63%.

In 2015 there was an unexplained fatality increase of 8.63%

SUMMARY OF CONTENT

- By all standards, the roads are more dangerous. There are higher crash rates, fatality rates, and increased vehicular-related pedestrian deaths as well as more miles driven.
- The spike in crashes is occurring despite positive mitigating factors such as a continued reduction in rates of drunk driving, increase use of seat belts and the introduction of a whole new generation of vehicle safety improvement (i.e. Automatic Braking Systems, back up cameras, forward collision warning system, lane departure warning system, better road infrastructures, etc.).
- The traditional explanation that this is due to more drivers on the road does not hold. After we adjust for vehicle miles travelled, the dangerous trend persists.
- There are clearly other factors at play causing an increase in auto crashes and fatalities.
- Over the same time frame analyzed below, smartphone ownership has exploded from 52% to 88% and is known to greatly impair driving ability.

Crashes per Year Relative to Vehicle Miles Travelled: The rate should stay the same.

We looked at the relationship between yearly crashes and vehicle miles travelled (VMT) since 1994. VMT incorporates many factors including population growth (more drivers on the road), economic growth, gas prices, etc. as VMT looks at how many total miles were driven in a given year no matter what the reason. The rate of crashes and fatalities should be consistent whether the miles driven increases or decreases. (i.e. as VMT goes up, the total number of crashes would go up in proportion. If 4 crashes happen every 10,000 miles then roughly 8 crashes would be expected for 20,000 miles). The data below reports a different story: While from 1994 to 2011, CVMT decreased, starting from 2012 the rate has been increasing. This suggests that new crash causes emerged in 2012

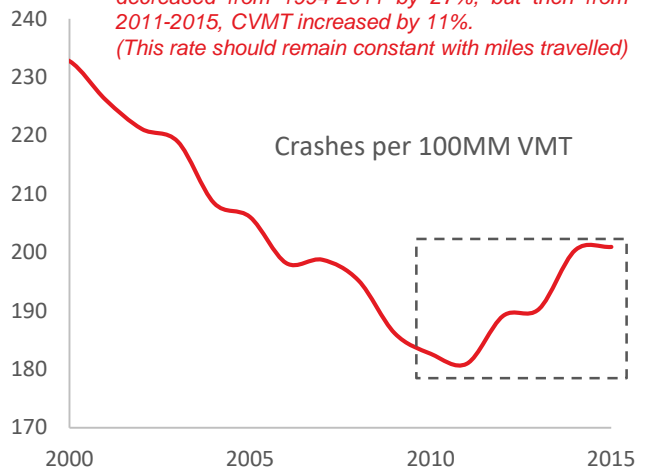
TABLE 1

Increase in Crash per Vehicle Miles travelled starting in 2012 – reversing the decreasing trend each year since 1995.

Year	Crashes	VMT (100MM)	Crashes per 100MM VMT
1994	6,496,000	23,580	275
1995	6,699,000	24,230	276
1996	6,770,000	24,840	273
1997	6,624,000	25,520	260
1998	6,335,000	26,280	241
1999	6,279,000	26,900	233
2000	6,394,000	27,470	233
2001	6,323,000	27,960	226
2002	6,316,000	28,560	221
2003	6,328,000	28,900	219
2004	6,181,000	29,650	208
2005	6,159,000	29,890	206
2006	5,973,000	30,140	198
2007	6,024,000	30,310	199
2008	5,811,000	29,770	195
2009	5,505,000	29,570	186
2010	5,419,000	29,670	183
2011	5,338,000	29,500	181
2012	5,615,000	29,690	189
2013	5,687,000	29,880	190
2014	6,064,000	30,260	200
2015	6,296,000	31,332	201

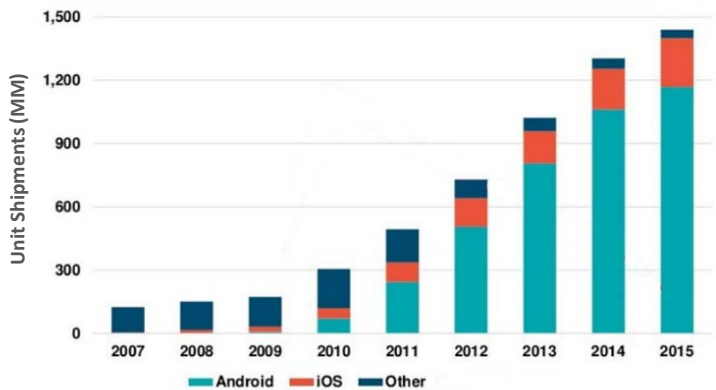
18-year trend of decreasing CVMT Reversed.

The “rate” of Crashes per Vehicle Miles travelled decreased from 1994-2011 by 27%, but then from 2011-2015, CVMT increased by 11%. (This rate should remain constant with miles travelled)



Note Smartphone Ownership since the iPhone’s 2007 Introduction.

Smartphone Unit Shipments by Operation System, Global, 2007-2015



A State Farm survey found that 52% of respondents in 2011 owned a smartphone, and 88% owned one in 2015. This increase in cell phone ownership happened at the same time period when we saw an increase in the crash rate starting in 2012.

Source: Morgan Stanley research, May 2016

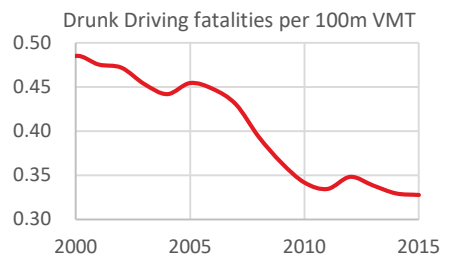
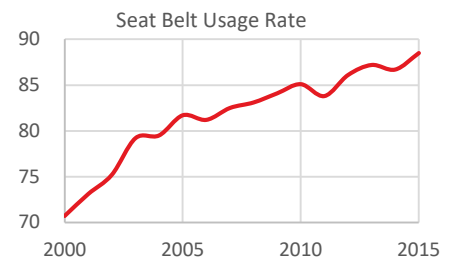
Alarming Trend in Fatalities.

We looked at the relationship between yearly fatalities and VMT since 1994. The fatalities per VMT went down each year from 1994 to 2011. After which, it began to increase again in 2012. While the 2015 increase in the fatalities per VMT is not dramatic, if we add in other factors contributing to fatalities, deaths due to drunk driving and seat belt usage, the change is actually quite significant. From 2014 to 2015 seat belt usage went up and the rate of deaths due to drunk driving (DVMT) went down. As such, we would have expected a decrease in the fatality per VMT rate which we did not see.

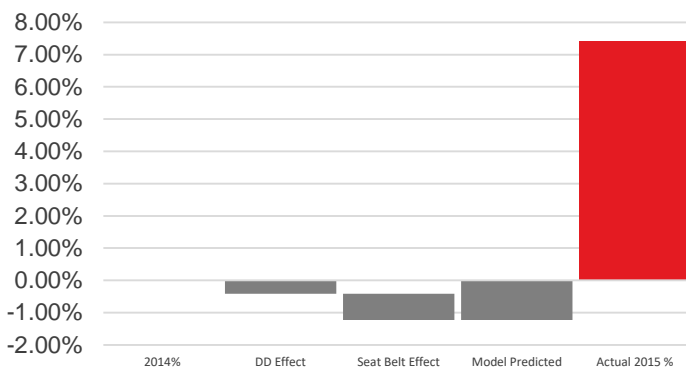
TABLE 2

Increase in fatalities per VMT in 2015 even while seat belt usage increased and the death due to drunk driving per VMT decreased

Year	Fatalities	VMT (100MM)	Fatalities per 100MM VMT	Seat Belt Usage Rate	Deaths due to Drunk Driving	DD per 100MM VMT
1994	40,716	23,580	1.73		13,390	0.568
1995	41,817	24,230	1.73		13,478	0.556
1996	42,065	24,840	1.69		13,451	0.542
1997	42,013	25,520	1.65		12,757	0.500
1998	41,501	26,280	1.58		12,546	0.477
1999	41,717	26,900	1.55		12,555	0.467
2000	41,945	27,470	1.53	71	13,324	0.485
2001	42,196	27,960	1.51	73	13,290	0.475
2002	43,005	28,560	1.51	75	13,472	0.472
2003	42,884	28,900	1.48	79	13,096	0.453
2004	42,836	29,650	1.44	80	13,099	0.442
2005	43,510	29,890	1.46	82	13,582	0.454
2006	42,708	30,140	1.42	81	13,491	0.448
2007	41,259	30,310	1.36	83	13,041	0.430
2008	37,423	29,770	1.26	83	11,711	0.393
2009	33,883	29,570	1.15	84	10,759	0.364
2010	32,999	29,670	1.11	85	10,136	0.342
2011	32,479	29,500	1.10	84	9,865	0.334
2012	33,782	29,690	1.14	86	10,336	0.348
2013	32,894	29,880	1.10	87	10,110	0.338
2014	32,675	30,260	1.08	87	9,967	0.329
2015	35,092	31,332	1.12	89	10,265	0.328

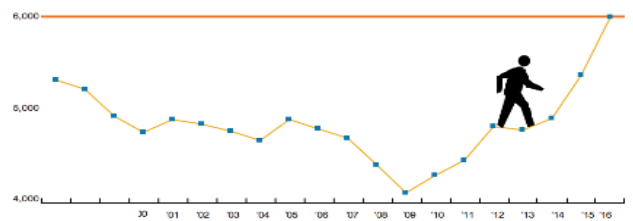


Regression: Unexplained increase in fatalities of 8.63%



In 2015 there was an unexplained fatality increase of 8.63%

2016 could be the first year in more than two decades with 6,000* pedestrian deaths.



*Source: GHSA, based on preliminary data for 2016

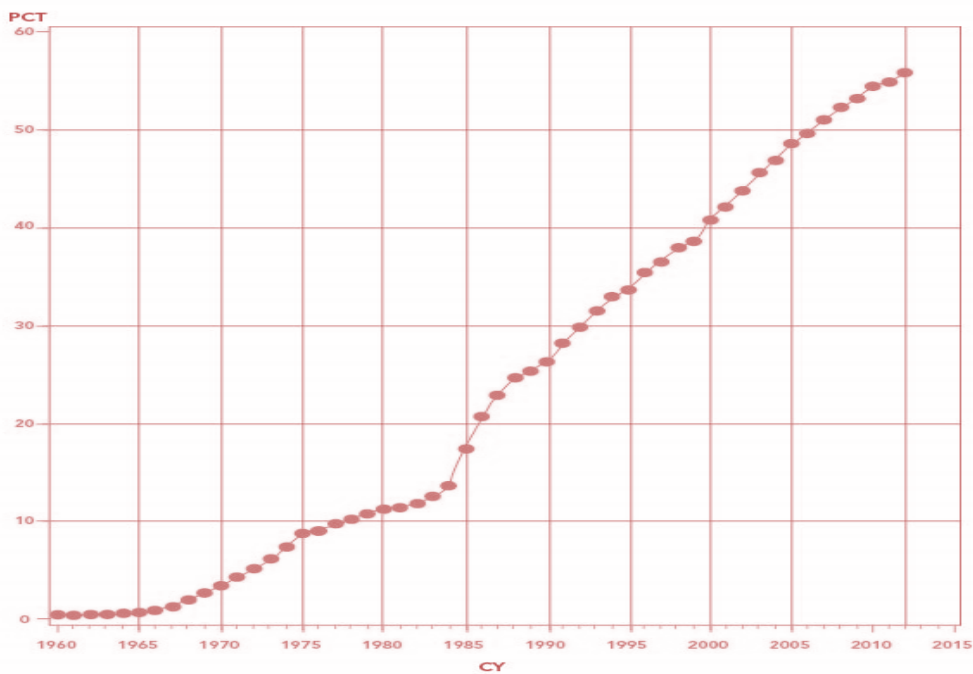
2016 Estimates Report An Additional Spike

According to the National Safety Council, there was another 6% increase in motor vehicle deaths in 2016. Also, as seen above, The Governors Highway Safety Association anticipates 6,000 pedestrian fatalities.

One factor not included in this analysis is improved safety features found in cars and roadways today (e.g., Automatic emergency braking systems, back up cameras, forward collision warning system, lane departure warning system, better road infrastructure etc.). According to a NHTSA study, from 1965-2012 vehicle safety technologies have saved a higher percentage of potential fatalities every year. This trend is very likely to have continued to today. By excluding sophisticated safety features this implies that our model's interpolated expected decline in crashes is a conservative evaluation and further warns that the rise in crashes and fatalities is justified by components beyond additional population on the roads.

TABLE 3

Percent of Potential Fatalities Save by Vehicle Safety Technologies increased every year from 1965-2012. (Source: NHTSA DOT HS 812 069)



CONCLUSION

Rate Rises Beyond Increased Amount of Drivers

The rate of crashes and fatalities should be consistent whether the miles driven increases or decreases. The trending higher rates indicate other factors exist beyond the amount of drivers. The introduction and dependence of smartphones trend is more in aligned with this spike than any other factor. Distracted driving information at crashes remains almost nonexistent so its impossible to pinpoint the exact cause. We can determine that the rate increase is more profound than can be explained by a more populated roadway.

SOURCES OF DATA

Crashes per year—[DOT HS 812 261](#) and [DOT HS 812 318](#)

Fatalities per year—FARS Database and [DOT HS 812 348](#)

Vehicle Miles travelled per year—FARS Database and [DOT HS 812 348](#)

Seat belt usage per year—[DOT HS 812 243](#)

Fatalities due to drunk driving per year—FARS Database and [DOT HS 812 348](#)

Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standards, 1960-2012 [DOT HS 812 069](#)

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