U.S. Department of Transportation
National Highway Traffic Safety Administration

TRAFFIC SAFETY FACTS
Research Note

NHTSA

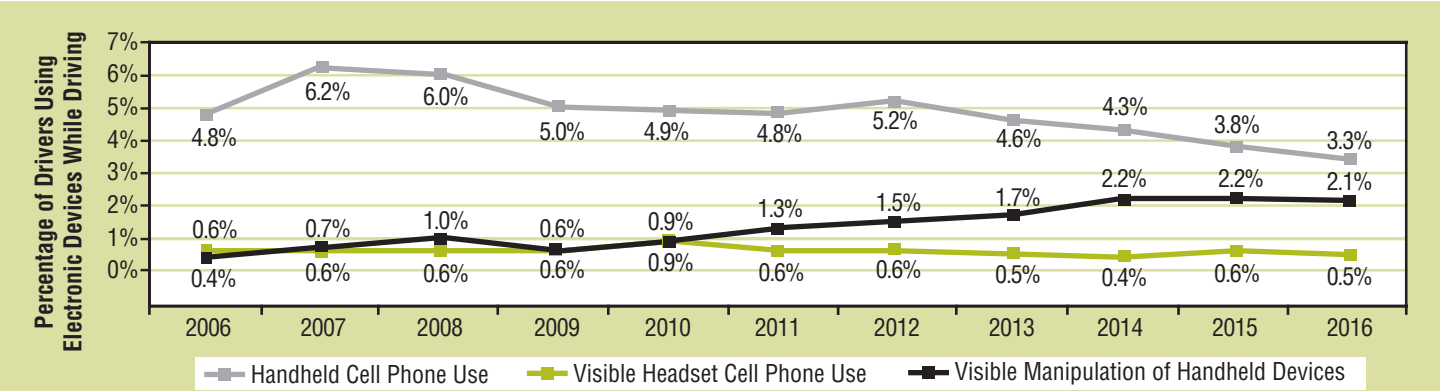
DOT HS 812 426 | Summary of Statistical Findings | June 2017

Driver Electronic Device Use in 2016

Summary

The percentage of passenger vehicle driver handheld cell phone use decreased from 3.8 percent in 2015 to 3.3 percent in 2016; this was a statistically significant decrease. Drivers' visible manipulation of handheld devices decreased from 2.2 percent in 2015 to 2.1 percent in 2016 (Figure 1); this was not a statistically significant decrease. These results are from the National Occupant Protection Use Survey (NOPUS), which provides the only nationwide probability-based observed data on driver electronic device use in the United States. The NOPUS is conducted annually by National Center for Statistics and Analysis of the National Highway Traffic Safety Administration (NHTSA).

Figure 1
Driver Use of Electronic Devices, 2006–2016



Results: Drivers Holding Phones to Their Ears While Driving

The percentage of drivers holding cell phones to their ears while driving decreased from 3.8 percent in 2015 to 3.3 percent in 2016 (Table 1). This rate translates into an estimated 481,000 passenger vehicles driven by people using handheld cell phones at a typical daylight moment in 2016. It also translates into an estimated 6.0 percent of the vehicles whose drivers were using some type of phone (either handheld or hands-free) at a typical daylight moment in 2016. Please refer to the section "Estimating Drivers on the Road and Hands-Free Cell Phone Users" for more details on these two estimates.

The 2016 NOPUS found that handheld cell phone use continued to be higher among female drivers than male drivers (Figure 2). It also found that handheld cell phone use continued to be highest among 16- to 24-year-old drivers, and lowest among drivers 70 and older (Figure 3).

Figure 2
Driver Handheld Cell Phone Use by Gender, 2006–2016

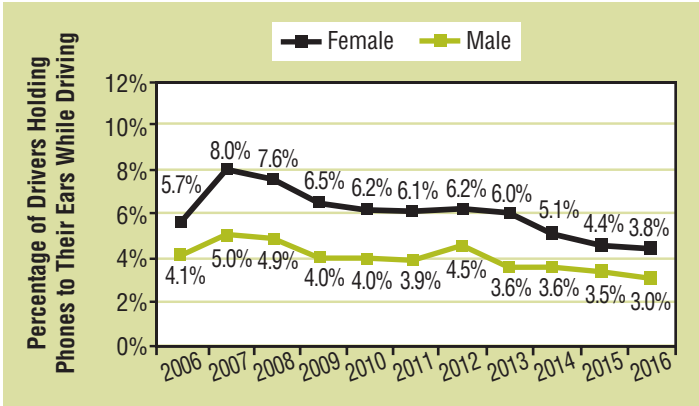
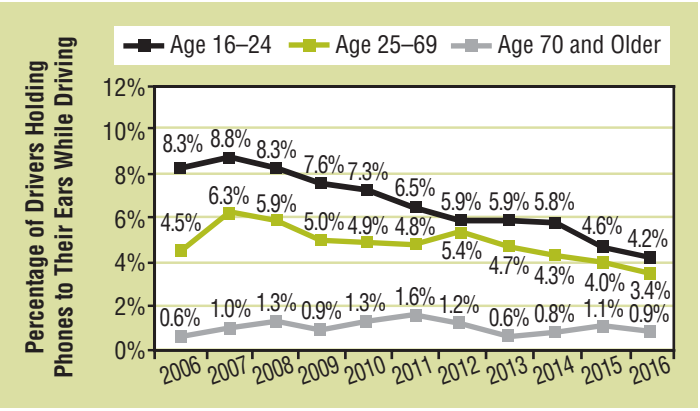


Figure 3
Driver Handheld Cell Phone Use by Age, 2006–2016

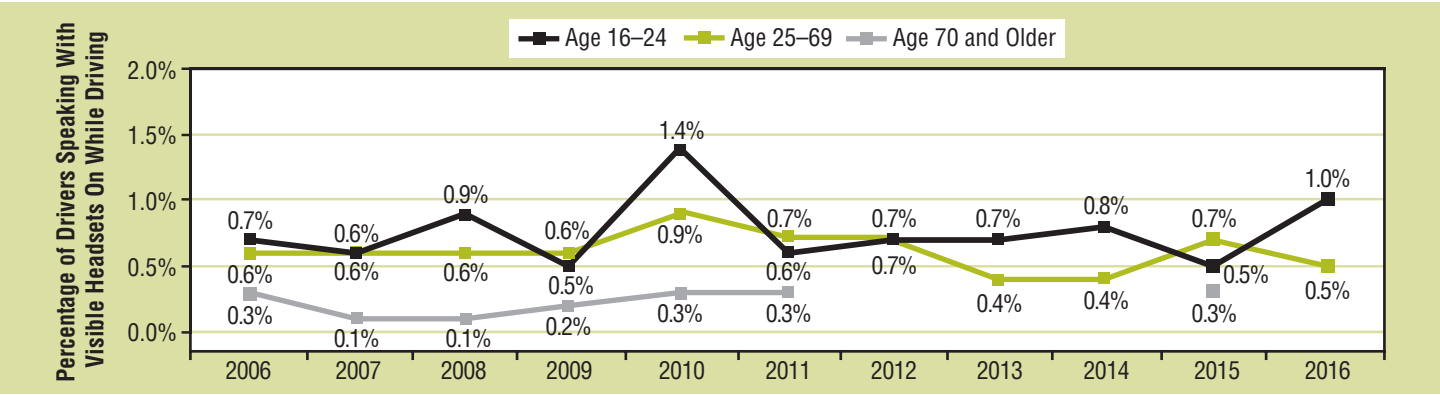


Drivers Speaking With Visible Headsets On While Driving

Table 2 shows the percentages of drivers speaking with visible headsets on while driving in 2015 and 2016, by major characteristics.

The percentage of drivers speaking with visible headsets on while driving decreased from 0.6 percent in 2015 to 0.5 percent in 2016, as shown in Figure 1 and Table 2. For drivers who appeared to be 16 to 24 years old, that estimate increased significantly from 0.5 percent in 2015 to 1.0 percent in 2016, as shown in Table 2 and Figure 4 below.

Figure 4
Drivers Speaking With Visible Headsets On by Age, 2006–2016



Note: Data was not sufficient to produce reliable estimates in 2012, 2013, 2014, and 2016 for age 70 and older.

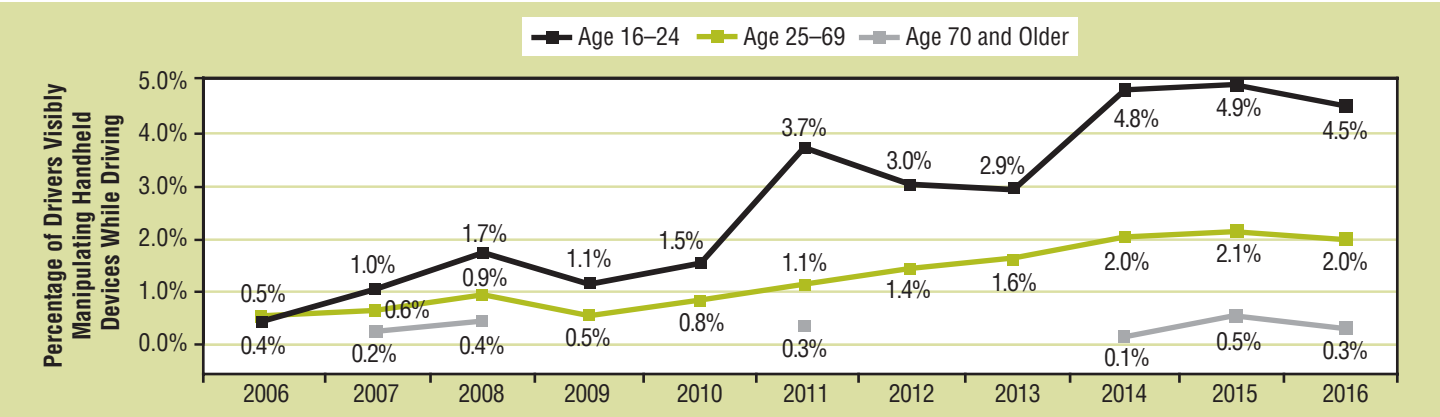
Drivers Visibly Manipulating Handheld Devices While Driving

The percentage of drivers visibly manipulating handheld devices while driving decreased from 2.2 percent in 2015 to 2.1 percent in 2016 (Figure 1 and Table 3). Table 3 presents the percentages of drivers visibly manipulating handheld devices in 2015 and 2016, by major characteristics.

Driver manipulation of handheld electronic devices saw no significant changes from 2015 to 2016 (Table 3).

Additionally, Figure 5 shows that since 2007, young drivers 16 to 24 years old have been observed manipulating electronic devices at higher rates than older drivers.

Figure 5
Drivers Visibly Manipulating Handheld Devices by Age, 2006–2016



Note: Except in 2007, 2008, 2011, 2014, and 2015, data was not sufficient to produce a reliable estimate for age 70 and older.

Table 1

The Percentage of Drivers Holding Phones to Their Ears While Driving, by Major Characteristics

Driver Group[1]	2015		2016		2015–2016 Change		
	% of Drivers Holding Phones to Ears[2]	95% Confidence Interval[3]	% of Drivers Holding Phones to Ears[2]	95% Confidence Interval[3]	Change in Percentage	95% Confidence Interval[4]	P-Value[5]
All Drivers[6]	**3.8%**	**(3.4, 4.3)**	**3.3%**	**(2.9, 3.8)**	**-0.5**	**(-1.0, -0.1)**	**0.03**
Males	**3.5%**	**(3.1, 3.9)**	**3.0%**	**(2.5, 3.4)**	**-0.5**	**(-1.0, -0.0)**	**0.04**
Females	4.4%	(3.6, 5.3)	3.8%	(3.3, 4.5)	-0.5	(-1.3, 0.3)	0.18
Drivers by Age Group[6]							
16–24	4.6%	(3.6, 5.7)	4.2%	(3.3, 5.4)	-0.4	(-1.6, 0.9)	0.56
25–69	**4.0%**	**(3.5, 4.6)**	**3.4%**	**(3.0, 3.9)**	**-0.6**	**(-1.1, -0.0)**	**0.04**
70 and Older	1.1%	(0.7, 1.7)	0.9%	(0.5, 1.6)	-0.1	(-0.9, 0.7)	0.75
Drivers by Race[6]							
White	**3.9%**	**(3.4, 4.4)**	**3.3%**	**(2.9, 3.8)**	**-0.6**	**(-1.0, -0.1)**	**0.02**
Black	5.7%	(4.6, 7.0)	4.6%	(3.5, 6.0)	-1.1	(-2.2, 0.1)	0.06
Other Races	2.3%	(1.8, 3.0)	2.4%	(1.7, 3.3)	0.0	(-0.9, 1.0)	0.97
Drivers on							
Expressway Exit Ramps	3.9%	(3.4, 4.5)	3.3%	(2.7, 4.1)	-0.5	(-1.3, 0.2)	0.17
Other Surface Streets	**3.8%**	**(3.3, 4.4)**	**3.3%**	**(2.8, 3.9)**	**-0.5**	**(-1.0, -0.0)**	**0.04**
Drivers Traveling Through							
Light Precipitation	3.9%	(3.0, 5.1)	3.4%	(2.7, 4.2)	-0.5	(-1.8, 0.9)	0.47
Light Fog	3.6%	(2.1, 6.3)	2.5%	(1.2, 5.1)	-1.2	(-3.7, 1.3)	0.34
Clear Weather Conditions	3.8%	(3.4, 4.4)	3.3%	(2.9, 3.8)	-0.5	(-1.1, 0.0)	0.05
Drivers of							
Passenger Cars	3.4%	(2.9, 4.0)	3.1%	(2.5, 3.8)	-0.3	(-1.0, 0.4)	0.40
Vans and SUVs	**4.1%**	**(3.5, 4.9)**	**3.3%**	**(2.9, 3.8)**	**-0.8**	**(-1.7, -0.0)**	**0.04**
Pickup Trucks	4.3%	(3.6, 5.1)	3.8%	(3.2, 4.6)	-0.4	(-1.5, 0.6)	0.38
Drivers in the							
Northeast	**3.1%**	**(2.3, 4.2)**	**1.9%**	(1.3, 2.9)	-1.2	**(-2.3, -0.1)**	**0.03**
Midwest	4.6%	(3.9, 5.4)	4.2%	(3.4, 5.1)	-0.4	(-1.3, 0.5)	0.36
South	**4.8%**	**(3.9, 5.8)**	**3.9%**	**(3.1, 5.0)**	**-0.9**	**(-1.6, -0.1)**	**0.03**
West	2.1%	(1.4, 3.1)	2.4%	(1.6, 3.7)	0.3	(-0.6, 1.2)	0.45
Drivers in							
Urban Areas	3.7%	(3.2, 4.3)	3.3%	(2.9, 3.9)	-0.4	(-1.0, 0.3)	0.25
Rural Areas	**4.1%**	**(3.4, 5.0)**	**3.2%**	**(2.6, 4.1)**	**-0.9**	**(-1.5, -0.3)**	**0.00**
Drivers Traveling During							
Weekdays	**4.4%**	**(3.9, 5.0)**	**3.8%**	**(3.3, 4.3)**	**-0.7**	**(-1.3, -0.1)**	**0.03**
Rush Hours	**4.7%**	**(4.0, 5.5)**	**3.8%**	**(3.2, 4.4)**	**-0.9**	**(-1.7, -0.1)**	**0.03**
Non-Rush Hours	4.2%	(3.6, 4.8)	3.7%	(3.2, 4.3)	-0.5	(-1.1, 0.2)	0.16
Weekends	2.3%	(1.8, 3.0)	2.0%	(1.6, 2.6)	-0.3	(-1.0, 0.5)	0.46
Drivers With[6]							
No Passengers	4.8%	(4.2, 5.4)	4.2%	(3.7, 4.8)	-0.6	(-1.3, 0.1)	0.10
At Least One Passenger	**1.8%**	**(1.4, 2.1)**	**1.2%**	**(1.0, 1.6)**	**-0.5**	**(-0.9, -0.1)**	**0.02**
Drivers With[6]							
No Passengers	4.8%	(4.2, 5.4)	4.2%	(3.7, 4.8)	-0.6	(-1.3, 0.1)	0.10
Passengers All Under Age 8	4.0%	(2.7, 5.8)	3.8%	(2.5, 5.9)	-0.1	(-2.5, 2.2)	0.90
Passengers All 8 and Older	**1.5%**	**(1.1, 1.9)**	**0.9%**	**(0.7, 1.2)**	**-0.5**	**(-0.9, -0.1)**	**0.01**
Some Passengers Under 8, and Some 8 or Older	2.2%	(1.4, 3.3)	1.5%	(0.7, 3.2)	-0.7	(-2.3, 0.9)	0.39

[1] Drivers of passenger vehicles with no commercial or government markings stopped at a stop sign or stoplight between the hours of 7 a.m. and 6 p.m.

[2] The percentage of drivers holding a phone to their ears, based on the subjective assessments of roadside observers.

[3] The Wilson Confidence Interval is used in the estimated percentages in the driver group (e.g., drivers in urban areas), which is in the form: $\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\}/(2(n_{EFF} + t^2))$, where p is the estimated percentage of drivers holding phones to ears, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.

[4] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/2)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom used in 2016 is different from that used in 2015.

[5] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the 2015 and 2016 estimates for the group in question, indicated with bold type.

[6] Age, gender, and racial classifications are based on the subjective assessments of roadside observers.

Data Source: NOPUS, NHTSA's National Center for Statistics and Analysis, 2015, 2016

Table 2
Percentage of Drivers Speaking With Visible Headsets on While Driving, by Major Characteristics

Driver Group[1]	2015		2016		2015–2016 Change		
	% of Drivers Speaking with Headsets[2]	95% Confidence Interval[3]	% of Drivers Speaking with Headsets[2]	95% Confidence Interval[3]	Change in Percentage	95% Confidence Interval[4]	P-Value[5]
All Drivers[6]	0.6%	(0.4, 0.9)	0.5%	(0.4, 0.7)	-0.1	(-0.4, 0.2)	0.54
Males	0.7%	(0.4, 1.1)	0.6%	(0.4, 0.8)	-0.1	(-0.5, 0.3)	0.59
Females	0.5%	(0.4, 0.8)	0.5%	(0.3, 0.7)	-0.1	(-0.4, 0.2)	0.62
Drivers by Age Group[6]							
16–24	**0.5%**	**(0.3, 0.8)**	**1.0%**	**(0.6, 1.5)**	**0.5**	**(0.1, 1.0)**	**0.03**
25–69	0.7%	(0.5, 1.0)	0.5%	(0.4, 0.7)	-0.1	(-0.5, 0.2)	0.33
70 and Older	0.3%	(0.1, 0.9)	NA	NA	NA	NA	NA
Drivers by Race[6]							
White	0.5%	(0.4, 0.7)	0.4%	(0.3, 0.6)	-0.1	(-0.4, 0.1)	0.33
Black	0.6%	(0.3, 1.2)	1.1%	(0.6, 1.8)	0.4	(-0.3, 1.1)	0.21
Other Races	1.1%	(0.6, 2.1)	0.9%	(0.5, 1.5)	-0.2	(-1.2, 0.7)	0.62
Drivers on							
Expressway Exit Ramps	0.9%	(0.5, 1.5)	0.5%	(0.4, 0.8)	-0.3	(-0.9, 0.2)	0.20
Other Surface Streets	0.5%	(0.4, 0.6)	0.5%	(0.4, 0.7)	0.1	(-0.2, 0.3)	0.60
Drivers Traveling Through							
Light Precipitation	0.7%	(0.5, 1.0)	0.7%	(0.3, 1.8)	0.0	(-0.6, 0.6)	0.93
Light Fog	2.6%	(0.8, 8.3)	1.4%	(0.5, 3.6)	-1.2	(-4.9, 2.5)	0.51
Clear Weather Conditions	0.6%	(0.4, 0.9)	0.5%	(0.4, 0.7)	-0.1	(-0.4, 0.3)	0.73
Drivers of							
Passenger Cars	0.7%	(0.5, 1.1)	0.5%	(0.4, 0.7)	-0.2	(-0.5, 0.2)	0.31
Vans and SUVs	0.7%	(0.4, 1.0)	0.6%	(0.4, 0.9)	0.0	(-0.4, 0.4)	0.85
Pickup Trucks	0.3%	(0.2, 0.5)	0.3%	(0.2, 0.5)	0.0	(-0.3, 0.2)	0.79
Drivers in the							
Northeast	0.4%	(0.1, 1.6)	0.6%	(0.4, 0.9)	0.2	(-0.5, 0.8)	0.58
Midwest	0.3%	(0.1, 0.5)	0.2%	(0.1, 0.4)	0.0	(-0.2, 0.2)	0.68
South	0.5%	(0.3, 0.9)	0.6%	(0.4, 0.8)	0.0	(-0.2, 0.3)	0.79
West	1.2%	(0.7, 2.2)	0.7%	(0.3, 1.5)	-0.5	(-1.6, 0.6)	0.34
Drivers in							
Urban Areas	0.7%	(0.4, 1.1)	0.6%	(0.4, 0.9)	-0.1	(-0.5, 0.3)	0.71
Rural Areas	0.5%	(0.2, 1.1)	0.3%	(0.2, 0.5)	-0.1	(-0.6, 0.3)	0.53
Drivers Traveling During							
Weekdays	0.7%	(0.5, 1.0)	0.6%	(0.4, 0.8)	-0.1	(-0.5, 0.2)	0.38
Rush Hours	0.8%	(0.5, 1.2)	0.6%	(0.4, 1.0)	-0.1	(-0.6, 0.3)	0.53
Non Rush Hours	0.6%	(0.5, 0.9)	0.5%	(0.3, 0.8)	-0.2	(-0.5, 0.2)	0.36
Weekends	0.4%	(0.2, 1.0)	0.4%	(0.2, 0.7)	0.0	(-0.4, 0.5)	0.91
Drivers With[6]							
No Passengers	0.8%	(0.6, 1.2)	0.7%	(0.5, 1.0)	-0.2	(-0.6, 0.3)	0.42
At Least One Passenger	0.1%	(0.1, 0.2)	0.2%	(0.1, 0.4)	0.1	(-0.1, 0.2)	0.35
Drivers With[6]							
No Passengers	0.8%	(0.6, 1.2)	0.7%	(0.5, 1.0)	-0.2	(-0.6, 0.3)	0.42
Passengers All Under Age 8	NA	NA	0.1%	(0.1, 0.4)	NA	NA	NA
Passengers All 8 and Older	0.2%	(0.1, 0.3)	0.2%	(0.1, 0.4)	0.1	(-0.1, 0.2)	0.45
Some Passengers Under 8, and Some 8 or Older	NA	NA	NA	NA	NA	NA	NA

[1] Drivers of passenger vehicles with no commercial or government markings stopped at a stop sign or stoplight between the hours of 7 a.m. and 6 p.m.
[2] The percentage of drivers speaking with visible headsets while driving, based on the subjective assessments of roadside observers.
[3] The Wilson Confidence Interval is used in the estimated percentages in the driver group (e.g., drivers in urban areas), which is in the form: $\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\} / (2(n_{EFF} + t^2))$, where p is the estimated percentage of speaking with visible headsets while driving, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.
[4] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/2)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom used in 2016 is different from that used in 2015.
[5] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the 2015 and 2016 estimates for the group in question, indicated with bold type.
[6] Age, gender, and racial classifications are based on the subjective assessments of roadside observers.
NA: Data was not sufficient to produce a reliable estimate.

Data Source: NOPUS, NHTSA's National Center for Statistics and Analysis, 2015, 2016

Table 3
Percentage of Drivers Visibly Manipulating Handheld Devices While Driving, by Major Characteristics

Driver Group[1]	2015		2016		2015–2016 Change		
	% of Drivers Manipulating Hand-Held Devices[2]	95% Confidence Interval[3]	% of Drivers Manipulating Hand-Held Devices[2]	95% Confidence Interval[3]	Change in Percentage	95% Confidence Interval[4]	P-Value[5]
All Drivers[6]	2.2%	(1.7, 2.9)	2.1%	(1.7, 2.6)	-0.1	(-0.8, 0.5)	0.70
Males	1.8%	(1.3, 2.5)	1.7%	(1.3, 2.1)	-0.1	(-0.8, 0.5)	0.73
Females	2.9%	(2.3, 3.7)	2.8%	(2.2, 3.4)	-0.1	(-0.9, 0.6)	0.72
Drivers by Age Group[6]							
16–24	4.9%	(3.8, 6.3)	4.5%	(3.5, 5.8)	-0.4	(-1.9, 1.1)	0.60
25–69	2.1%	(1.5, 2.9)	2.0%	(1.6, 2.5)	-0.1	(-0.8, 0.6)	0.82
70 and Older	0.5%	(0.2, 1.4)	0.3%	(0.1, 0.7)	-0.2	(-0.8, 0.4)	0.45
Drivers by Race[6]							
White	2.0%	(1.5, 2.7)	1.9%	(1.6, 2.3)	0.0	(-0.6, 0.6)	0.91
Black	4.1%	(2.4, 7.1)	3.0%	(2.0, 4.6)	-1.1	(-3.4, 1.2)	0.34
Other Races	2.3%	(1.7, 3.1)	2.4%	(1.7, 3.2)	0.1	(-0.8, 1.0)	0.85
Drivers on							
Expressway Exit Ramps	2.3%	(1.4, 3.6)	2.0%	(1.4, 2.7)	-0.3	(-1.3, 0.7)	0.53
Other Surface Streets	2.2%	(1.8, 2.7)	2.2%	(1.9, 2.6)	0.0	(-0.6, 0.6)	0.99
Drivers Traveling Through							
Light Precipitation	2.3%	(1.4, 3.8)	2.8%	(2.0, 3.9)	0.5	(-0.8, 1.8)	0.45
Light Fog	NA	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	2.3%	(1.7, 3.0)	2.1%	(1.7, 2.5)	-0.2	(-0.9, 0.5)	0.58
Drivers of							
Passenger Cars	2.9%	(2.2, 3.8)	2.4%	(1.9, 3.0)	-0.5	(-1.3, 0.4)	0.26
Vans and SUVs	2.0%	(1.4, 2.7)	2.1%	(1.7, 2.6)	0.2	(-0.5, 0.9)	0.62
Pickup Trucks	1.3%	(0.9, 1.9)	1.4%	(1.0, 1.9)	0.0	(-0.7, 0.8)	0.94
Drivers in the							
Northeast	1.2%	(0.7, 2.0)	1.1%	(0.6, 2.1)	-0.1	(-0.5, 0.3)	0.60
Midwest	2.0%	(0.8, 4.8)	2.1%	(1.5, 3.0)	0.1	(-1.5, 1.7)	0.90
South	2.6%	(1.7, 3.9)	2.6%	(1.9, 3.6)	0.0	(-1.3, 1.3)	0.99
West	2.6%	(1.9, 3.4)	2.0%	(1.5, 2.6)	-0.5	(-1.5, 0.4)	0.27
Drivers in							
Urban Areas	2.6%	(1.9, 3.6)	2.4%	(2.0, 3.0)	-0.2	(-1.0, 0.7)	0.65
Rural Areas	1.3%	(1.0, 1.6)	1.3%	(0.9, 1.9)	0.1	(-0.4, 0.5)	0.82
Drivers Traveling During							
Weekdays	2.2%	(1.7, 2.8)	2.3%	(1.8, 2.8)	0.0	(-0.6, 0.6)	0.89
Rush Hours	2.0%	(1.6, 2.5)	2.3%	(1.7, 3.0)	0.3	(-0.4, 0.9)	0.39
Non-Rush Hours	2.4%	(1.8, 3.1)	2.2%	(1.8, 2.7)	-0.2	(-1.0, 0.7)	0.69
Weekends	2.3%	(1.3, 3.8)	1.7%	(1.3, 2.2)	-0.6	(-1.8, 0.6)	0.32
Drivers With[6]							
No Passengers	2.7%	(2.1, 3.4)	2.6%	(2.2, 3.2)	0.0	(-0.7, 0.7)	0.99
At Least One Passenger	1.3%	(0.8, 2.1)	0.9%	(0.6, 1.2)	-0.4	(-1.1, 0.2)	0.20
Drivers With[6]							
No Passengers	2.7%	(2.1, 3.4)	2.6%	(2.2, 3.2)	0.0	(-0.7, 0.7)	0.99
Passengers All Under Age 8	2.7%	(1.5, 4.6)	1.9%	(1.0, 3.6)	-0.7	(-2.6, 1.2)	0.43
Passengers All 8 and Older	1.2%	(0.7, 2.0)	0.8%	(0.6, 1.1)	-0.4	(-1.1, 0.3)	0.26
Some Passengers Under 8, and Some 8 or Older	0.9%	(0.5, 1.7)	0.6%	(0.3, 1.2)	-0.4	(-1.2, 0.4)	0.34

[1] Drivers of passenger vehicles with no commercial or government markings stopped at a stop sign or stoplight between the hours of 7 a.m. and 6 p.m.
[2] The percentage of drivers visibly manipulating handheld devices while driving, based on the subjective assessments of roadside observers.
[3] The Wilson Confidence Interval is used in the estimated percentages in the driver group (e.g., drivers in urban areas), which is in the form: $\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\} / (2(n_{EFF} + t^2))$, where p is the estimated percentage of drivers visibly manipulating handheld devices, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.
[4] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/2)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom used in 2016 is different from that used in 2015.
[5] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the 2015 and 2016 estimates for the group in question, indicated with bold type.
[6] Age, gender, and racial classifications are based on the subjective assessments of roadside observers.
NA: Data was not sufficient to produce a reliable estimate.

Data Source: NOPUS, NHTSA's National Center for Statistics and Analysis, 2015, 2016

NOPUS Data Collection and Estimation

The NOPUS is the only nationwide probability-based observational survey of driver electronic device use in the United States. The survey observes usage as it actually occurs at randomly selected roadway sites, and thus provides the best tracking of the extent to which people in the United States use cell phones and other electronic devices while driving.

The survey data is collected by trained data collectors at probabilistically sampled intersections controlled by stop signs or stoplights, where data collectors observe (from the roadside) drivers and other occupants of passenger vehicles having no commercial or government markings. Data is collected between 7 a.m. and 6 p.m. Only stopped vehicles are observed to allow time to collect the variety of information required by the survey, including subjective assessments of occupants' age and race. Observers collect data on the driver, right-front passenger, and up to two passengers in the second row of seats. Observers do not interview occupants, so that NOPUS can capture the untainted behavior of occupants. The 2016 NOPUS data was collected between June 6 and June 25, while the 2015 data was collected between June 1 and June 27.

Statistically significant increases in the use of handheld phones, headset use, and manipulation of handheld devices between 2015 and 2016 are shown, respectively, in Tables 1, 2, and 3 by having a result with a p-value of 0.05 or less in the tables' far-right column.

The NOPUS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation procedures. The sample sites for the 2016 NOPUS were entirely from the 2015 NOPUS sample redesign. Table 4 shows the observed sample sizes of the 2016 NOPUS. A total of 48,177 vehicles were observed at the 1,600 data collection sites. Due to ineligibility, construction, danger in the area, or road closure, observations could not be completed at some of the sampled observation sites.

Table 4
Sites and Vehicles Observed in the 2016 NOPUS

Number of	2015	2016	Percentage Change
Sites Observed	1,566	1,600	2.2%
Vehicles Observed	45,916	48,177	4.9%

Data collection, estimation, and variance estimation for NOPUS are conducted by Westat, Inc., under the direction of NHTSA's National Center for Statistics and Analysis under Federal contract number DTNH22-13-D-00284.

NOPUS Categories and Definitions

The NOPUS observes three types of driver electronic device use while driving: "holding phones to their ears," "speaking with visible headsets on," and "visibly manipulating handheld devices."

Drivers are counted as "holding phones to their ears" if they are holding to their ears what appear to the data collectors to be phones. This would include behaviors such as drivers engaging in conversation, listening to messages, or conducting voice-activated dialing while holding phones to their ears. However, a data collector may not have knowledge of various types of wireless phones. Thus, the device that has been identified as a "phone" may only reflect his/her conception of what constitutes a "phone." Also, corded car phones and satellite phones may or may not have been identified as "phones."

Drivers are counted as "speaking with visible headsets on" if they appear to be speaking and wearing a headset with a microphone. This would include behaviors such as talking, engaging in conversation, or conducting voice-activated dialing via a wireless earpiece on the driver's right ear, or via an ear bud connected by wire to a cell phone. Talking via a visible Bluetooth headset (usually on the driver's right ear) would also be included in this category. However, it would not include drivers using headsets that do not involve cell phones (e.g., iPods), since these headsets do not involve microphones. Note that the wireless earpieces that are obscured by hair or clothing, or are on the driver's left ear, would not be included because they would not be visible to the roadside observer. In addition, some wireless ear buds would not be included, as they are too small to be observed from the roadside. The drivers with headsets who are not speaking at the time of observation are not included because they might have recently completed a call or be waiting for an expected call. Each driver in the survey is observed for about 10 seconds before the data collector decides whether or not the driver is speaking. Also, note that the drivers counted as speaking through a visible headset might have been talking to a passenger or using voice-activated computer software rather than using a phone.

Drivers are counted as "visibly manipulating handheld devices" if they appear to be manipulating some type of electronic device such as a cell phone, a smart phone, a tablet, a video game, or some other device. This would include behaviors such as text messaging, using a Web-capable smart phone (e.g., an iPhone) or a tablet (e.g., an iPad) to view travel directions, check e-mails or calendar appointments, surf the Internet, manual dialing, playing handheld games, and holding phones in front of their faces to converse or check messages via speakerphone or to use voice-activated dialing. Manipulation of non-handheld devices (adjusting volume on stereos, pressing buttons on a dashboard GPS unit, etc.) is not included in this category. Also, note that a driver characterized by the survey as "manipulating handheld device" may or may not have been speaking.

There are means by which drivers can use cell phones that would neither be recorded as "holding phones to their ears" nor as "speaking with visible headsets on" or as "visibly manipulating handheld devices" in the NOPUS. These would include: (1) a driver using a cell phone headset but is not speaking during the approximately 10-second period when he/she is being observed, and (2) a driver using technologies that cannot be observed from the roadside. The unobservable technologies could include: a wireless earpiece obscured by

hair or clothing or on the left ear, a driver conversing via a speakerphone with the phone on the passenger seat or in a cell phone holder on the vehicle dashboard, a driver using a phone that is built into the vehicle (e.g., OnStar), or a driver using the cell phone hands-free via a Bluetooth car kit or via a Bluetooth system that is built into the vehicle (e.g., SYNC). It is possible that at some point in the future, NOPUS may be able to capture such behaviors by directing a device that can detect cell phones in-use in the passing vehicles.

The racial categories "Black," "White," and "Members of Other Races" appearing in the tables reflect subjective characterizations by roadside observers regarding the race of the occupants. Likewise, observers record the age group (8-15; 16-24; 25-69; and 70 or older) that best fits their visual assessment of each observed occupant.

"Expressway Exit Ramps" are defined as the access roads from roadways with limited access, while "Other Surface Streets" comprise all other roadways.

"Weekday Rush Hours" are defined as being from 7 a.m. to 9:30 a.m. and from 3:30 p.m. to 5 p.m. on weekdays, while "Weekday Non-Rush Hours" comprise all other weekday hours (9:30 a.m. to 3:30 p.m. and 5 p.m. to 6 p.m.).

Since NOPUS is not a census and is based on a probability sample, it is impossible to produce State-by-State driver electronic device use results. However, NOPUS produces regional estimates of the use rates based on the following categories:

- **Northeast:** ME, VT, NH, MA, RI, CT, NY, PA, NJ
- **Midwest:** MI, OH, IN, IL, WI, MN, IA, MO, KS, NE, SD, ND
- **South:** WV, MD, DE, VA, KY, TN, NC, SC, GA, FL, AL, MS, AR, LA, OK, TX, DC
- **West:** AK, WA, OR, CA, NV, ID, UT, AZ, NM, CO, WY, MT, HI

Please note that since 2015, an objective area type classification has been used to place the subjective area type based on trained data collectors' best judgement. Each NOPUS site is assigned an objective area type characterization based on the Census Bureau definitions of urbanized areas and urban clusters (see www.census.gov/geo/reference/ua/urban-rural-2010.html). It is defined as:

- **Urban:** A site which intersects an urbanized area or urban cluster (i.e., an area of at least 2,500 people);
- **Rural:** All other sites.

Estimating Drivers on Road and Hands-Free Cell Phone Users

NHTSA used the 2009 National Household Travel Survey (NHTS) data to derive the total number of vehicles (drivers) on the road at a typical daylight moment in the United States in 2009. Since the NHTS was not conducted during 2010–2016, the following estimate based on the published 2009 NHTS estimate was used to derive the total number of drivers on the road at a typical daylight moment in 2016.

The published 2009 estimate: 13,399,139 drivers are on the road at a given daylight moment.

2016 VMT: The data source for the 2016 Vehicle Miles Traveled (VMT) used here is the Traffic Volume Trends reports by the Federal Highway Administration. The December 2016 version of the "Traffic Volume Trends" (available at https://www.fhwa.dot.gov/policyinformation/travel_monitoring/16dectvt/page2.cfm) shows that the year to date VMT (preliminary number, for all vehicles) in 2016 is 3,217,956 million miles, as compared to 2,956,762 million miles in 2009. NHTSA's calculations assume that this all-vehicle VMT is an acceptable estimate for passenger vehicle VMT, especially when using a ratio estimate. Therefore, the number of drivers in 2016 at a given daylight moment = 2009 Driver # × (2016 VMT / 2009 VMT) = 13,399,139 × (3,217,956 / 2,956,762) = 14,582,790. Given the handheld cell phone use rate for 2016 is 3.3 percent, the numbers of drivers of privately owned vehicles on the road at a typical daylight moment who were holding cell phones to their ear in 2016: 14,582,790 × .033 ≅ 481,232 (approximately 481,000 noted in the beginning of this research note). NHTSA's 2007 Motor Vehicle Occupant Safety Survey (MVOSS) estimated that, for drivers using cell phones while driving, 55 percent tended to use handheld cell phones and 45 percent tended to use hands-free phones. Applying the proportion 0.8182 (= 45 / 55) of these percentages to the 3.3 percent estimate of drivers using handheld cell phones in 2016 from NOPUS shows an estimated 2.7 percent of drivers using hands-free cell phones. Thus, a total of 6.0 percent of drivers are estimated to be using either a handheld or a hands-free cell phone while driving at a typical daylight moment in the United States in 2016. Please note that MVOSS cell phone use pattern (handheld vs. hands-free) reflects general times (daytime and nighttime), whereas the NOPUS estimates reflect daytime use only.

State Laws on Driver Electronic Device Use (Enacted As of March 2017)

Many States restrict cell phone use by drivers. As of March 2017, no State completely bans all forms of cell phone use by drivers. However, Table 5 shows that a ban on driving while talking on a handheld cell phone was in place in 14 States (California, Connecticut, Delaware, Hawaii, Illinois, Maryland, Nevada, New Hampshire, New Jersey, New York, Oregon, Vermont, Washington, and West Virginia), the District of Columbia, Puerto Rico, Guam, and the Virgin Islands (available at www.ghsa.org/html/stateinfo/laws/cellphone_laws.html). All of these laws are primary enforcement—an officer may cite a driver for using a handheld cell phone without any other traffic offense taking place.

Forty-six States, the District of Columbia, Puerto Rico, Guam, and the Virgin Islands ban text messaging for all driv-

ers (Table 6). In 41 States, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands, texting laws are primary enforcement. The other States have secondary enforcement of texting for drivers. Of the four States without an all driver texting ban, two prohibit text messaging by novice drivers, and one restricts school bus drivers from texting.

Table 5
States and U.S. Territories With Laws† Banning Handheld Cell Phone Use While Driving

California	Connecticut	Delaware	Hawaii	Illinois
Maryland	Nevada	New Hampshire	New Jersey	New York
Oregon	Vermont	Washington	West Virginia	District of Columbia
Puerto Rico	Guam	Virgin Islands		

†States and the District of Columbia with laws in effect as of March 2017

Table 6
States and U.S. Territories With Laws† Banning Text-Messaging While Driving

Alabama	Alaska	Arkansas	California	Colorado
Connecticut	Delaware	Florida*	Georgia	Hawaii
Idaho	Illinois	Indiana	Iowa*	Kansas
Kentucky	Louisiana	Maine	Maryland	Massachusetts
Michigan	Minnesota	Mississippi	Nebraska*	Nevada
New Hampshire	New Jersey	New Mexico	New York	North Carolina
North Dakota	Ohio*	Oklahoma	Oregon	Pennsylvania
Rhode Island	South Carolina	South Dakota*	Tennessee	Utah
Vermont	Virginia	Washington	West Virginia	Wisconsin
Wyoming	District of Columbia	Puerto Rico	Guam	Virgin Islands

†States and the District of Columbia with laws in effect as of March 2017
Note: States with* have secondary enforcement of texting for drivers.

Arkansas also bans the use of handheld cell phones while driving in a school zone or in a highway construction zone. This law is secondarily enforced. Texas has banned the use of handheld cell phones and texting in school zones.

References

Santos, A., McGuckin, N., Nakamoto, H. Y., Gray, D., & Liss, S. (2011, June). Summary of travel trends: 2009 National Household Travel Survey (Report No. FHWA-PL-ll-022). Washington, DC: Federal Highway Administration. Available at http://nhts.ornl.gov/2009/pub/stt.pdf.

For More Information

This Research Note was written by Timothy M. Pickrell, and Hongying (Ruby) Li, both mathematical statisticians in the Mathematical Analysis Division, National Center for Statistics and Analysis, NHTSA. For questions regarding the information presented in this document, please contact timothy.pickrell@dot.gov.

Additional data and information on the survey design and analysis procedures will be available in upcoming publications and will be posted at www.nhtsa.gov/NCSA.

For more information on NHTSA's policy on distracted driving, please visit www.nhtsa.gov or www.distraction.gov.

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National Highway Traffic Safety Administration

This research note and other general information on highway traffic safety may be accessed by Internet users at: www-nrd.nhtsa.dot.gov/CATS/index.aspx