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

TRAFFIC SAFETY FACTS
Research Note

NHTSA

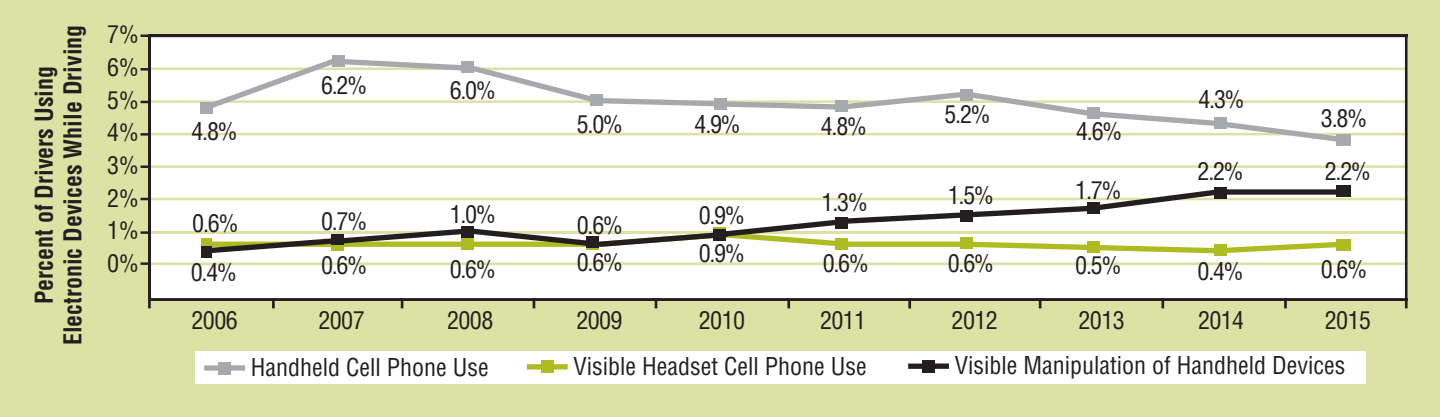
DOT HS 812 326 | Summary of Statistical Findings | September 2016

Driver Electronic Device Use in 2015

Summary

The percentage of passenger vehicle drivers text-messaging or visibly manipulating handheld devices remained constant at 2.2 percent in 2015. Driver handheld cell phone use decreased from 4.3 percent in 2014 to 3.8 percent in 2015 (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 the National Center for Statistics and Analysis of the National Highway Traffic Safety Administration.

Figure 1
Driver Use of Electronic Devices, 2006–2015



Results: Drivers Holding Phones to Their Ears While Driving

The percentage of drivers holding cell phones to their ears while driving decreased from 4.3 percent in 2014 to 3.8 percent in 2015 (Table 1). This rate translates into an estimated 542,000 passenger vehicles driven by people using handheld cell phones at a typical daylight moment in 2015. It also translates into an estimated 6.9 percent of the vehicles whose drivers were using some type of phone (either handheld or hands-free) at a typical daylight moment in 2015. Please refer to the section "Estimating Drivers on the Road and Hands-Free Cell Phone Users" for more details on these two estimates.

The 2015 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, 2006–2015

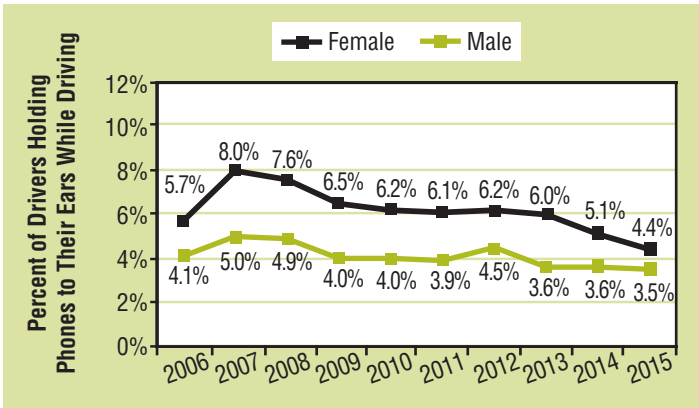
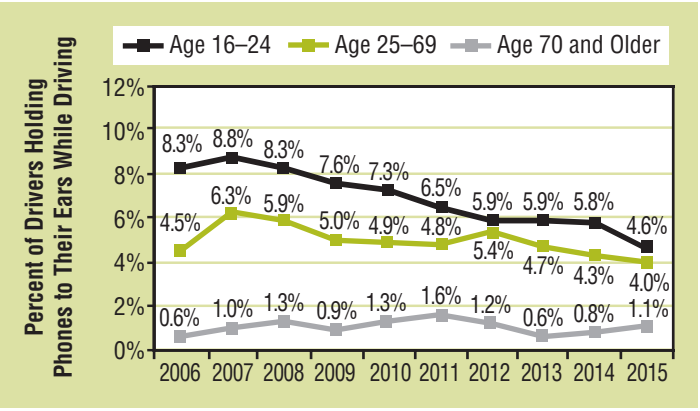


Figure 3
Driver Handheld Cell Phone Use, by Age, 2006–2015



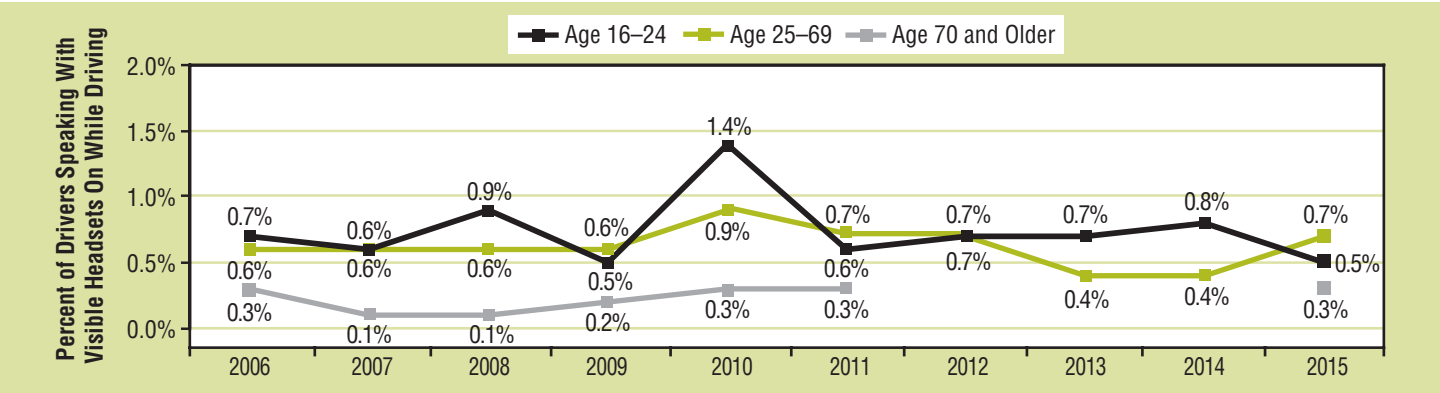
Drivers Speaking With Visible Headsets On While Driving

Table 2 shows the percentages of drivers speaking with visible headsets on while driving in 2014 and 2015, by major characteristics.

The percentage of drivers speaking with visible headsets while driving increased from 0.4 percent in 2014 to 0.6 percent in 2015, as shown in Figure 1 and Table 2. For White drivers, that estimate increased significantly from 0.3 percent in 2014 to 0.5 percent in 2015 as shown in Table 2.

Figure 4 shows that there was no significant change in visible headset use in any age group from 2014 to 2015.

Figure 4
Drivers Speaking With Visible Headsets On, by Age, 2006–2015



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

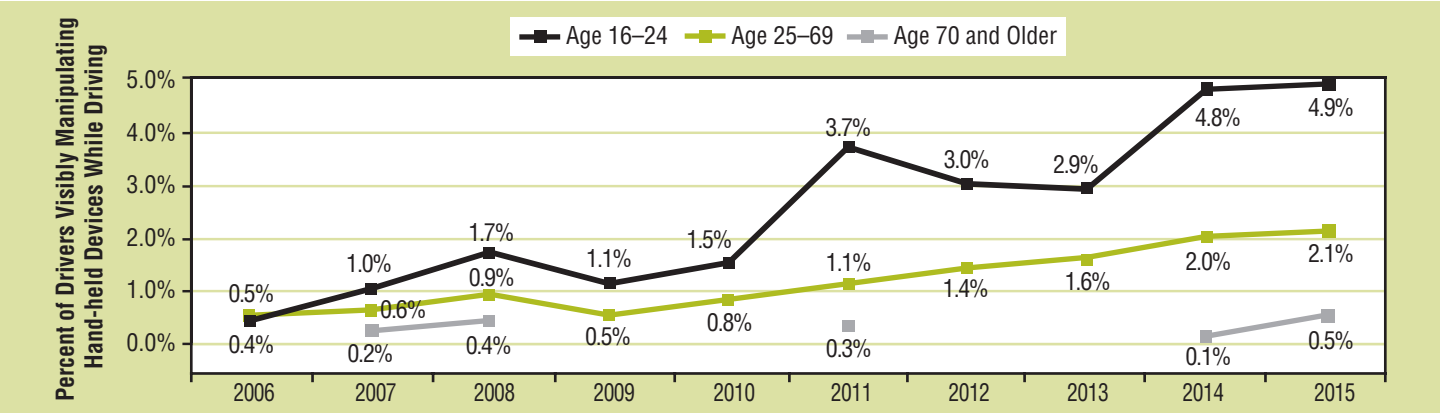
Drivers Visibly Manipulating Handheld Devices While Driving

The percentage of drivers visibly manipulating handheld devices while driving remained constant at 2.2 percent in 2015 (Figure 1 and Table 3). Table 3 presents the percentages of drivers visibly manipulating handheld devices in 2014 and 2015 by major characteristics.

The 2015 NOPUS observed a significant increase in visible manipulation of handheld devices for drivers with passengers all 8 or older and for drivers in rural areas (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, 2006–2015



Note: Data not sufficient to produce reliable estimates in 2007, 2008, 2011, 2014, and 2015 for 70 and older.

Table 1

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

Driver Group[1]	2014		2015		2014–2015 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]	4.3%	(3.7, 4.9)	3.8%	(3.4, 4.3)	-0.4	(-1.2, 0.3)	0.26
Males	3.6%	(3.0, 4.4)	3.5%	(3.1, 3.9)	-0.2	(-0.9, 0.6)	0.67
Females	5.1%	(4.3, 6.1)	4.4%	(3.6, 5.3)	-0.7	(-1.9, 0.5)	0.23
Drivers by Age Group[6]							
16–24	5.8%	(4.9, 7.0)	4.6%	(3.6, 5.7)	-1.3	(-2.7, 0.1)	0.08
25–69	4.3%	(3.6, 5.0)	4.0%	(3.5, 4.6)	-0.3	(-1.1, 0.5)	0.44
70 and Older	0.8%	(0.5, 1.4)	1.1%	(0.7, 1.7)	0.3	(-0.4, 0.9)	0.45
Drivers by Race[6]							
White	4.2%	(3.6, 4.9)	3.9%	(3.4, 4.4)	-0.3	(-1.1, 0.5)	0.41
Black	**7.3%**	**(5.9, 9.0)**	**5.7%**	**(4.6, 7.0)**	**-1.7**	**(-3.3, -0.1)**	**0.04**
Other Races	2.5%	(1.6, 3.7)	2.3%	(1.8, 3.0)	-0.1	(-1.4, 1.1)	0.82
Drivers on							
Expressway Exit Ramps	4.4%	(3.7, 5.1)	3.9%	(3.4, 4.5)	-0.5	(-1.4, 0.4)	0.27
Other Surface Streets	4.2%	(3.5, 5.0)	3.8%	(3.3, 4.4)	-0.4	(-1.2, 0.4)	0.37
Drivers Traveling Through							
Light Precipitation	5.0%	(3.6, 7.0)	3.9%	(3.0, 5.1)	-1.1	(-3.0, 0.8)	0.24
Light Fog	3.5%	(1.3, 9.3)	3.6%	(2.1, 6.3)	0.1	(-4.4, 4.6)	0.95
Clear Weather Conditions	4.2%	(3.6, 4.8)	3.8%	(3.4, 4.4)	-0.3	(-1.1, 0.4)	0.34
Drivers of							
Passenger Cars	4.0%	(3.3, 4.9)	3.4%	(2.9, 4.0)	-0.6	(-1.5, 0.3)	0.19
Vans and SUVs	4.4%	(3.7, 5.3)	4.1%	(3.5, 4.9)	-0.3	(-1.3, 0.8)	0.58
Pickup Trucks	4.7%	(3.7, 5.9)	4.3%	(3.6, 5.1)	-0.4	(-1.8, 1.0)	0.57
Drivers in the							
Northeast	3.6%	(2.7, 4.8)	3.1%	(2.3, 4.2)	-0.5	(-2.0, 0.9)	0.48
Midwest	5.3%	(4.3, 6.4)	4.6%	(3.9, 5.4)	-0.7	(-1.9, 0.5)	0.26
South	5.4%	(4.2, 7.0)	4.8%	(3.9, 5.8)	-0.6	(-1.9, 0.7)	0.35
West	2.7%	(1.6, 4.6)	2.1%	(1.4, 3.1)	-0.6	(-2.2, 0.9)	0.41
Drivers in							
Urban Areas	5.3%	(4.0, 7.0)	4.0%	(2.8, 5.7)	-1.2	(-3.4, 0.9)	0.25
Suburban Areas	3.9%	(3.2, 4.7)	3.7%	(3.0, 4.4)	-0.2	(-1.2, 0.7)	0.63
Rural Areas	4.4%	(3.5, 5.5)	4.2%	(3.4, 5.1)	-0.2	(-1.5, 1.0)	0.71
Drivers Traveling During							
Weekdays	4.8%	(4.1, 5.7)	4.4%	(3.9, 5.0)	-0.4	(-1.3, 0.5)	0.41
Rush Hours	5.2%	(4.3, 6.3)	4.7%	(4.0, 5.5)	-0.5	(-1.7, 0.7)	0.39
Nonrush Hours	4.4%	(3.7, 5.2)	4.2%	(3.6, 4.8)	-0.2	(-1.1, 0.7)	0.64
Weekends	2.8%	(2.1, 3.8)	2.3%	(1.8, 3.0)	-0.5	(-1.4, 0.3)	0.21
Drivers With[6]							
No Passengers	5.3%	(4.6, 6.2)	4.8%	(4.2, 5.4)	-0.5	(-1.5, 0.4)	0.27
At Least One Passenger	2.1%	(1.5, 2.8)	1.8%	(1.4, 2.1)	-0.3	(-1.0, 0.4)	0.36
Drivers With[6]							
No Passengers	5.3%	(4.6, 6.2)	4.8%	(4.2, 5.4)	-0.5	(-1.5, 0.4)	0.27
Passengers All Under Age 8	5.3%	(3.6, 7.7)	4.0%	(2.7, 5.8)	-1.3	(-3.9, 1.4)	0.33
Passengers All 8 and Older	1.6%	(1.1, 2.3)	1.5%	(1.1, 1.9)	-0.1	(-0.7, 0.5)	0.69
Some Passengers Under 8 and Some 8 or Older	3.1%	(1.6, 6.2)	2.2%	(1.4, 3.3)	-0.9	(-3.3, 1.5)	0.43

[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 2015 is different from that used in 2014.

[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 2014 and 2015 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, 2014, 2015

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

Driver Group[1]	2014		2015		2014–2015 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]	0.4%	(0.3, 0.7)	0.6%	(0.4, 0.9)	0.2	(-0.1, 0.4)	0.16
Males	0.4%	(0.2, 0.6)	0.7%	(0.4, 1.1)	0.3	(-0.1, 0.7)	0.14
Females	0.5%	(0.3, 0.9)	0.5%	(0.4, 0.8)	0.0	(-0.3, 0.4)	0.80
Drivers by Age Group[6]							
16–24	0.8%	(0.4, 1.3)	0.5%	(0.3, 0.8)	-0.3	(-0.8, 0.2)	0.27
25–69	0.4%	(0.3, 0.6)	0.7%	(0.5, 1.0)	0.2	(-0.0, 0.5)	0.09
70 and Older	NA	NA	0.3%	(0.1, 0.9)	NA	NA	NA
Drivers by Race[6]							
White	**0.3%**	**(0.2, 0.4)**	**0.5%**	**(0.4, 0.7)**	**0.2**	**(0.0, 0.4)**	**0.02**
Black	1.4%	(0.8, 2.4)	0.6%	(0.3, 1.2)	-0.8	(-1.7, 0.2)	0.10
Other Races	0.7%	(0.4, 1.4)	1.1%	(0.6, 2.1)	0.4	(-0.4, 1.1)	0.33
Drivers on							
Expressway Exit Ramps	0.6%	(0.3, 1.0)	0.9%	(0.5, 1.5)	0.3	(-0.2, 0.8)	0.24
Other Surface Streets	0.3%	(0.2, 0.5)	0.5%	(0.4, 0.6)	0.1	(-0.0, 0.3)	0.14
Drivers Traveling Through							
Light Precipitation	0.5%	(0.2, 1.7)	0.7%	(0.5, 1.0)	0.2	(-0.5, 0.8)	0.58
Light Fog	NA	NA	2.6%	(0.8, 8.3)	NA	NA	NA
Clear Weather Conditions	0.4%	(0.3, 0.6)	0.6%	(0.4, 0.9)	0.1	(-0.1, 0.4)	0.29
Drivers of							
Passenger Cars	0.5%	(0.3, 0.8)	0.7%	(0.5, 1.1)	0.2	(-0.2, 0.6)	0.27
Vans and SUVs	0.4%	(0.3, 0.6)	0.7%	(0.4, 1.0)	0.2	(-0.0, 0.5)	0.09
Pickup Trucks	0.3%	(0.2, 0.5)	0.3%	(0.2, 0.5)	0.0	(-0.1, 0.2)	0.62
Drivers in the							
Northeast	0.5%	(0.2, 1.3)	0.4%	(0.1, 1.6)	-0.1	(-0.7, 0.6)	0.83
Midwest	0.2%	(0.1, 0.6)	0.3%	(0.1, 0.5)	0.1	(-0.2, 0.4)	0.55
South	0.4%	(0.2, 0.7)	0.5%	(0.3, 0.9)	0.2	(-0.2, 0.5)	0.29
West	0.7%	(0.4, 1.2)	1.2%	(0.7, 2.2)	0.6	(-0.2, 1.3)	0.16
Drivers in							
Urban Areas	1.0%	(0.5, 1.7)	0.8%	(0.5, 1.2)	-0.2	(-0.9, 0.5)	0.58
Suburban Areas	0.4%	(0.3, 0.6)	0.7%	(0.5, 1.1)	0.3	(-0.0, 0.7)	0.06
Rural Areas	0.2%	(0.1, 0.5)	0.3%	(0.2, 0.5)	0.1	(-0.2, 0.3)	0.65
Drivers Traveling During							
Weekdays	0.5%	(0.4, 0.8)	0.7%	(0.5, 1.0)	0.2	(-0.1, 0.4)	0.22
Rush Hours	0.4%	(0.2, 0.7)	0.8%	(0.5, 1.2)	0.4	(-0.0, 0.7)	0.07
Nonrush Hours	0.6%	(0.4, 1.0)	0.6%	(0.5, 0.9)	0.0	(-0.3, 0.3)	0.99
Weekends	0.2%	(0.1, 0.4)	0.4%	(0.2, 1.0)	0.2	(-0.2, 0.6)	0.27
Drivers With[6]							
No Passengers	0.6%	(0.4, 0.9)	0.8%	(0.6, 1.2)	0.3	(-0.1, 0.6)	0.14
At Least One Passenger	0.1%	(0.0, 0.3)	0.1%	(0.1, 0.2)	0.0	(-0.1, 0.2)	0.81
Drivers With[6]							
No Passengers	0.6%	(0.4, 0.9)	0.8%	(0.6, 1.2)	0.3	(-0.1, 0.6)	0.14
Passengers All Under Age 8	NA	NA	NA	NA	NA	NA	NA
Passengers All 8 and Older	0.1%	(0.0, 0.2)	0.2%	(0.1, 0.3)	0.1	(-0.0, 0.2)	0.20
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 percent 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 2015 is different from that used in 2014.
[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 2014 and 2015 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, 2014, 2015

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

Driver Group[1]	2014		2015		2014–2015 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]	2.2%	(1.6, 3.0)	2.2%	(1.7, 2.9)	0.0	(-1.0, 1.0)	0.99
Males	1.8%	(1.3, 2.5)	1.8%	(1.3, 2.5)	-0.1	(-0.9, 0.8)	0.91
Females	2.8%	(2.0, 3.8)	2.9%	(2.3, 3.7)	0.1	(-1.1, 1.4)	0.81
Drivers by Age Group[6]							
16–24	4.8%	(3.3, 7.0)	4.9%	(3.8, 6.3)	0.1	(-2.3, 2.4)	0.95
25–69	2.0%	(1.5, 2.7)	2.1%	(1.5, 2.9)	0.1	(-0.9, 1.0)	0.89
70 and Older	0.1%	(0.0, 0.5)	0.5%	(0.2, 1.4)	0.3	(-0.2, 0.9)	0.25
Drivers by Race[6]							
White	1.8%	(1.3, 2.5)	2.0%	(1.5, 2.7)	0.2	(-0.7, 1.0)	0.71
Black	4.2%	(2.7, 6.5)	4.1%	(2.4, 7.1)	-0.1	(-3.1, 2.9)	0.96
Other Races	3.7%	(2.5, 5.5)	2.3%	(1.7, 3.1)	-1.4	(-3.0, 0.2)	0.09
Drivers on							
Expressway Exit Ramps	2.2%	(1.5, 3.1)	2.3%	(1.4, 3.6)	0.1	(-1.2, 1.4)	0.89
Other Surface Streets	2.2%	(1.6, 3.1)	2.2%	(1.8, 2.7)	0.0	(-0.9, 0.9)	0.93
Drivers Traveling Through							
Light Precipitation	1.8%	(1.1, 2.8)	2.3%	(1.4, 3.8)	0.5	(-0.9, 1.9)	0.45
Light Fog	4.4%	(1.4, 13.0)	NA	NA	NA	NA	NA
Clear Weather Conditions	2.3%	(1.7, 3.0)	2.3%	(1.7, 3.0)	0.0	(-1.0, 1.0)	1.00
Drivers of							
Passenger Cars	2.6%	(1.9, 3.4)	2.9%	(2.2, 3.8)	0.3	(-0.9, 1.4)	0.61
Vans and SUVs	2.2%	(1.5, 3.0)	2.0%	(1.4, 2.7)	-0.2	(-1.2, 0.8)	0.68
Pickup Trucks	1.3%	(0.9, 2.1)	1.3%	(0.9, 1.9)	0.0	(-0.9, 0.9)	0.99
Drivers in the							
Northeast	1.7%	(0.9, 3.1)	1.2%	(0.7, 2.0)	-0.5	(-1.7, 0.7)	0.40
Midwest	1.0%	(0.6, 1.7)	2.0%	(0.8, 4.8)	1.1	(-0.8, 3.0)	0.27
South	2.8%	(1.6, 4.6)	2.6%	(1.7, 3.9)	-0.2	(-2.3, 1.9)	0.87
West	3.1%	(2.1, 4.7)	2.6%	(1.9, 3.4)	-0.6	(-2.3, 1.1)	0.47
Drivers in							
Urban Areas	3.9%	(2.6, 5.9)	2.8%	(1.8, 4.3)	-1.1	(-3.4, 1.1)	0.32
Suburban Areas	2.5%	(1.9, 3.3)	2.5%	(1.9, 3.4)	0.1	(-1.0, 1.1)	0.92
Rural Areas	**0.7%**	**(0.5, 1.0)**	**1.1%**	**(1.0, 1.4)**	**0.4**	**(0.0, 0.9)**	**0.03**
Drivers Traveling During							
Weekdays	2.6%	(1.9, 3.6)	2.2%	(1.7, 2.8)	-0.4	(-1.4, 0.6)	0.41
Rush Hours	2.3%	(1.6, 3.4)	2.0%	(1.6, 2.5)	-0.3	(-1.3, 0.8)	0.61
Nonrush Hours	2.9%	(2.0, 4.2)	2.4%	(1.8, 3.1)	-0.6	(-1.6, 0.5)	0.30
Weekends	1.2%	(0.8, 1.8)	2.3%	(1.3, 3.8)	1.1	(-0.4, 2.5)	0.14
Drivers With[6]							
No Passengers	2.9%	(2.2, 4.0)	2.7%	(2.1, 3.4)	-0.3	(-1.4, 0.8)	0.60
At Least One Passenger	0.7%	(0.5, 1.0)	1.3%	(0.8, 2.1)	0.6	(-0.1, 1.3)	0.12
Drivers With[6]							
No Passengers	2.9%	(2.2, 4.0)	2.7%	(2.1, 3.4)	-0.3	(-1.4, 0.8)	0.60
Passengers All Under Age 8	3.1%	(1.8, 5.4)	2.7%	(1.5, 4.6)	-0.4	(-3.0, 2.1)	0.73
Passengers All 8 and Older	**0.5%**	**(0.3, 0.7)**	**1.2%**	**(0.7, 2.0)**	**0.7**	**(0.0, 1.5)**	**0.05**
Some Passengers Under 8 and Some 8 or Older	0.7%	(0.2, 2.5)	0.9%	(0.5, 1.7)	0.2	(-1.0, 1.4)	0.73

[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 percent 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 2015 is different from that used in 2014.
[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 2014 and 2015 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, 2014, 2015

NOPUS Data Collection and Estimation

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 2015 NOPUS data was collected from June 1 to June 27, while the 2014 data was collected from June 2 to June 27.

Statistically significant increases in the use of handheld phones, headset use, and manipulation of handheld devices from 2014 to 2015 are shown, respectively, in Table 1, Table 2, and Table 3 by having a result with a p-value 0.05 or less in the tables' column 8. The statistical confidence intervals used in a given driver group (e.g., drivers in the Midwest) are provided in columns 3, 5, and 7 of the tables.

The NOPUS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation procedures. The sample sites for the 2015 NOPUS were entirely from the 2015 NOPUS sample redesign. Please refer to the section of the 2015 NOPUS Redesign. Table 4 shows the observed sample sizes of the 2015 NOPUS. A total of 45,916 vehicles were observed at the 1,566 data collection sites. Due to ineligibility, construction, danger in the area, or road closure, the observations could not be completed at some of the sampled observation sites.

Table 4
Sites and Vehicles Observed in the 2015 NOPUS

Number of	2014	2015	Percentage Change
Sites Observed	1,379	1,566	+13.6%
Vehicles Observed	35,992	45,916	+27.6%

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.

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NOPUS Categories and Definitions

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, the 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, tablet, 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., iPad) to view travel directions, check e-mails or calendar appointments, or surf the Internet, manual dialing, playing handheld games, and holding phones in front of their faces to converse or check messages via speakerphone or use voice-activated dialing. Manipulation of the 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 the 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 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 would 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), and 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 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 to be 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

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 from 2010 to 2015, 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 2015.

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

2015 VMT: The data source for the 2015 VMT used here is the Traffic Volume Trends reports by the Federal Highway Administration. The December 2015 version of the *Traffic Volume Trends* (available at www.fhwa.dot.gov/policyinformation/travel_monitoring/15dectvt/15dectvt.pdf) shows that the year-to-date VMT (preliminary number for all vehicles) in 2015 is 3,147,848 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 2015 at a given daylight moment = 2009 Driver # × (2015 VMT / 2009 VMT) = 13,399,139 × (3,147,848 / 2,956,762) = 14,265,082. Given the handheld cell phone use rate for 2015 is 3.8 percent, the numbers of drivers of privately owned vehicles on the road at a typical daylight moment who were holding cell phones to their ears in 2015: 14,265,082 × .038 ≅ 542,073 (approximately 542,000 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 3.8 percent estimate of drivers using handheld cell phones in 2015 from NOPUS shows an estimated 3.11 percent of drivers using hands-free cell phones. Thus, a total of 6.91 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 2015. Please note that MVOSS cell phone use pattern (handheld versus 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 2016)

Many States restrict cell phone use by drivers. As of March 2016, no State completely banned 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 drivers (Table 6). In 41 States, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands texting laws are primary enforcement, and the other States have secondary enforce-

ment of texting for drivers. Of the 4 States without all-driver texting bans, 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		

†Laws in effect as of March 2016

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

†Laws in effect as of March 2016
Note: States with* have secondary enforcement of texting for drivers.

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

The 2015 NOPUS Redesign

The NOPUS sample was redesigned in 2015 and implemented to conduct the 2015 survey. NHTSA initiated the redesign to make the NOPUS more efficient, accurate, and representative. Also, beginning with the 2015 NOPUS, the reporting precision has been increased to be consistent with generally recommended Federal practices for reporting survey estimates. In addition, the new design incorporates scalability and flexibility in its design to accommodate changing resources. A sample of 57 primary sampling units (PSUs) was selected from a frame of 1,588 PSUs. The redesigned NOPUS sample was selected using a stratified two-stage design. The first stage of selection was the county, referred to as the PSU within the design framework. The PSUs were targeted for selection based on their measure of size (MOS). The second stage of selection or secondary sampling unit (SSU), within the selected PSUs, is the road segment. At the road segment level, the NOPUS data collectors are then positioned so that they can efficiently observe seat belt use, motorcycle helmet use, and driver electronic device use.

Frame Formation: The NOPUS sample frame of PSUs excluded Puerto Rico and other U.S. Territories due to data collection cost constraints. All other counties in the United States were included in the sampling frame with the exception of 37 counties and three areas in Alaska; these locations were excluded on the basis of low traffic volume measured in terms of vehicle miles traveled (VMT) or because they were geographically isolated. The sample frame of SSUs excluded segments along unnamed roads, culs-de-sac, private roads, and a variety of other road types that have traditionally had very low traffic volume measured by VMT.

The PSUs consist of individual counties or groups of counties that were formed to minimize the distance that data collectors might have to travel within a particular PSU, while maintaining road segments that reflected a minimum number of annual vehicle miles traveled for each PSU. All PSUs for the sample frame are contained within their States; a PSU cannot be in more than one State if it is comprised of multiple counties. The measure of size is the 2012 VMT obtained from the Federal Highway Administration.

Stratification: One PSU was sampled with certainty because of its large VMT, and the remaining PSUs were first grouped into eight major strata based on the four U.S. Census-designated regions (Northeast, Mideast, South, and West) and the two urbanicity classes (urban and rural). Within each major stratum, the PSUs were ordered by their predicted seat belt use rates, from lowest to highest. Then the PSUs were further stratified through cut points of the predicted seat belt use rate, resulting in strata with approximately equal total MOS. The restraint use rates were predicted by a linear regression model that used primary seat belt law enforcement, the county-level ratio of fatal crashes to VMT, and other county-level demographic data.

Sample Selection: A sample of 57 PSUs was selected using a sequential Poisson method (Ohlsson, 1998) with probability approximately proportional to the MOS (VMT). The new NOPUS sample was selected to maximize PSU overlap with the old sample, thus maintaining comparability of the estimates from the current and previous samples. A SSU sample of road segments within each PSU is selected based upon the types of roads and urban/rural status with specified sampling rates.

The sample size of the PSUs and SSUs were determined to minimize the overall variance (increasing the efficiency) of restraint use and the costs necessary to conduct the NOPUS. As described before, the stratification employed in the redesign clusters the sampling units so that the PSUs within each stratum are very similar in terms of their predicted seat belt use rates, resulting in increased efficiency (smaller variance) at the PSU-level than that generated from previous NOPUS sample. To minimize variance within the PSUs, NHTSA used updated cost and road segment information to revise the road segment stratum sampling rates in order to achieve more efficiency from the survey.

Changes and Improvements: Using estimated seat belt use rates to form PSU strata provides a stratification that allows flexibility if resources for the survey change. It is straightforward to collapse strata (reducing the number of PSUs in the sample) with this method by combining adjacent strata or to increase PSU sample sizes by sampling additional PSUs per stratum.

Data collection protocols remain largely the same in the redesigned NOPUS; however, NHTSA has made some minor adjustments to streamline data collection. In order to provide an estimate based on all vehicles affected by seat belt laws in relevant jurisdictions, data collectors observe and record seat belt use for all passenger vehicles observed at the data collection sites. In previous NOPUS surveys, government, emergency, and commercially marked vehicles were excluded from observation.

NOPUS is based on a probability sample, and this survey continues to use standard survey sampling methods for constructing sampling weights for estimating national seat belt use rates, and to use replication methods to calculate standard errors of these estimates.

Prior to 2015, NHTSA's NOPUS publications reported integer percentage values for seat belt use point estimates. Along with updating the survey design, NHTSA has revised its NOPUS reporting format to be consistent with statistical best practices across the Federal Government. The new reporting format presents percentage point estimates with one decimal place. Along with this change, 95-percent confidence intervals and p-values accompany the point estimates.

References

Ohlsson, E. (1998). Sequential Poisson sampling. *Journal of Official Statistics*, 14, 149-162.

For More Information

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

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

Suggested APA format citation:

Pickrell, T. M., Li, R., & KC, S. (2016, September). *Driver electronic device use in 2015* (Traffic Safety Facts Research Note. Report No. DOT HS 812 326). Washington, DC: National Highway Traffic Safety Administration.

U.S. Department of Transportation

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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