Traffic Safety Facts
Research Note

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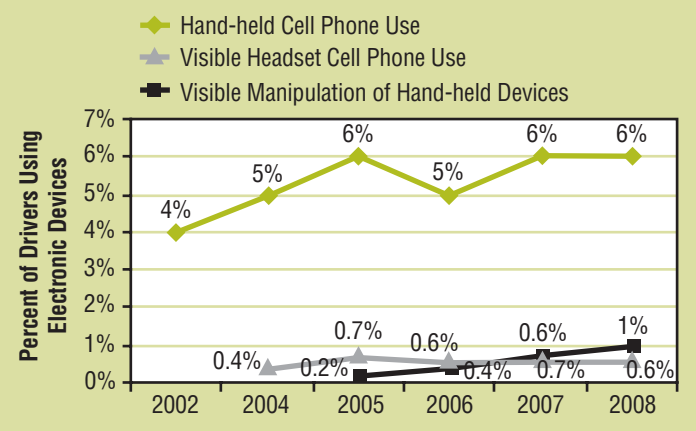
Driver Electronic Device Use in 2008

The percentage of drivers visibly manipulating hand-held devices has reached 1 percent while the hand-held cell phone use by drivers stood at 6 percent in 2008. This result is 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 (NCSA) of the National Highway Traffic Safety Administration.

The 2008 hand-held cell phone use rate translates into 812,000 vehicles being driven by someone using a hand-held cell phone at any given daylight moment.[1] It also translates into an estimated 11 percent of the vehicles whose drivers were using some type of phone (hand-held or hands-free) in the typical daylight moment. The 2008 survey also found the following:

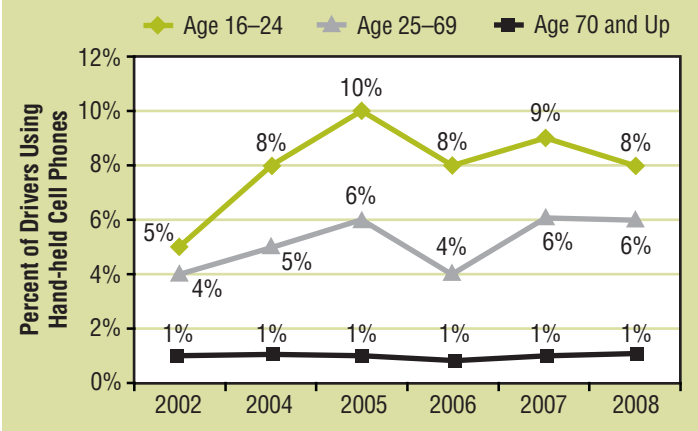
- Hand-held cell phone use continued to be higher among 16- to 24-year-olds and lower among drivers age 70 and older.

Figure 1
Driver Use of Electronic Devices



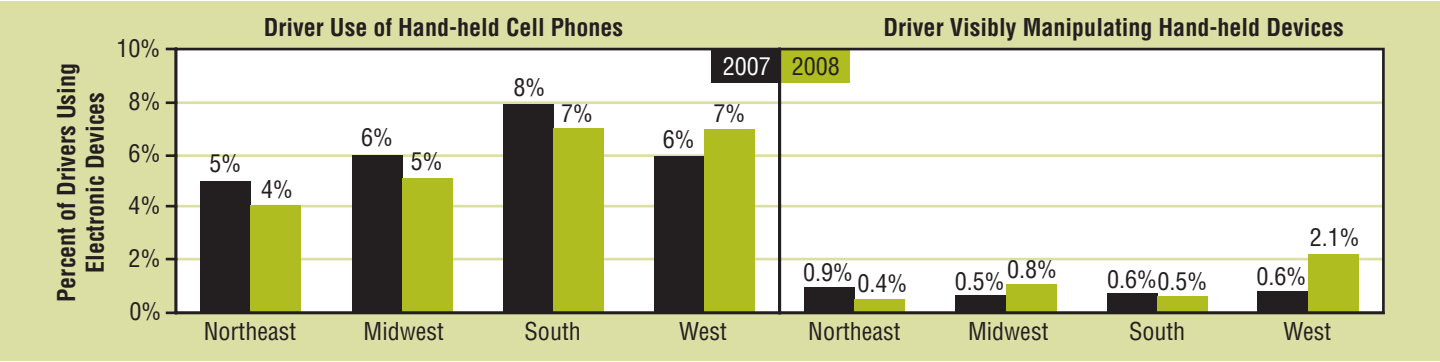
Data Source: NOPUS, NHTSA's National Center for Statistics and Analysis, 2002–2008

Figure 2
Driver Hand-Held Cell Phone Use by Age



Data Source: NOPUS, NHTSA's National Center for Statistics and Analysis, 2002–2008

Figure3
Driver Use of Electronic Devices by Region



Data Source: NOPUS, NHTSA's National Center for Statistics and Analysis, 2002–2008

[1] For more details about this calculation, please refer to the Survey Methodology section of this report.

Table 1
The Percent of Drivers Holding Phones to Their Ears, by Major Characteristics

Driver Group[1]	2007		2008		2007-2008 Change	
	% of Drivers Holding Phone to Ear[2]	Confidence That Use Is High or Low in Group[3]	% of Drivers Holding Phone to Ear[2]	Confidence That Use Is High or Low in Group[3]	Difference in Percentage Points	Confidence in a Change in % of Drivers Holding Phone to Ear[4]
All Drivers	6%		6%		0	38%
Males	5%	**100%**	5%	**100%**	0	23%
Females	8%	**100%**	8%	**100%**	0	36%
Drivers Who Appear to Be						
Age 16-24	9%	**100%**	8%	**100%**	-1	46%
Age 25-69	6%	79%	6%	74%	0	49%
Age 70 and Older	1%	**100%**	1%	**100%**	0	52%
Drivers Who Appear to Be						
White	6%	86%	6%	**98%**	0	48%
Black	8%	**99%**	8%	**99%**	0	2%
Members of Other Races	6%	86%	6%	54%	0	38%
Drivers on						
Expressway Exit Ramps	7%	**99%**	6%	**93%**	-1	62%
Other Surface Streets	6%	**99%**	6%	**93%**	0	18%
Drivers Traveling Through						
Light Precipitation	5%	**92%**	6%	60%	1	37%
Fog	5%	83%	4%	89%	-1	13%
Clear Weather Conditions	6%	**95%**	6%	64%	0	49%
Drivers of						
Passenger Cars	6%	**100%**	6%	**99%**	0	21%
Vans and SUVs	7%	**100%**	7%	**100%**	0	70%
Pickup Trucks	6%	89%	6%	52%	0	21%
Drivers in the						
Northeast	4%	**100%**	4%	**97%**	0	26%
Midwest	6%	76%	5%	**99%**	-1	82%
South	8%	**100%**	7%	87%	-1	60%
West	6%	68%	7%	**96%**	1	**94%**
Drivers in						
Urban Areas	6%	53%	7%	**91%**	1	33%
Suburban Areas	7%	**99%**	7%	**98%**	0	23%
Rural Areas	5%	**100%**	4%	**100%**	-1	63%
Drivers Traveling During						
Weekdays	7%	**100%**	7%	**100%**	0	28%
Rush Hours	8%	**100%**	8%	**100%**	0	12%
Nonrush Hours	6%	**100%**	6%	**100%**	0	36%
Weekends	4%	**100%**	4%	**100%**	0	44%
Drivers With[5]						
No Passengers	8%	**100%**	8%	**100%**	0	17%
At Least One Passenger	2%	**100%**	2%	**100%**	0	30%
Drivers With[5]						
No Passengers	8%	**100%**	8%	**100%**	0	17%
Passengers All Under Age 8	7%	76%	6%	55%	-1	36%
Passengers All Age 8 and Older	2%	**100%**	2%	**100%**	0	34%
Some Passengers Under Age 8 and Some Age 8 or Older	2%	**100%**	2%	**100%**	0	1%

[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 who appeared to be holding a phone to their ears. Age, gender, and racial classifications are based on the subjective assessments of roadside observers.
[3] The level of statistical confidence that use in the driver group (e.g., drivers who appear to be White) is higher or lower than use in the corresponding complementary driver group (e.g., combined drivers who appear to be Black or members of other races). Confidence levels that meet or exceed 90 percent are formatted in boldface type. Confidence levels are rounded to the nearest percentage point, and so levels reported as "100 percent" confidence are between 99.5 percent and 100.0 percent.
[4] The degree of statistical confidence that the 2008 use rate is different from the 2007 rate. Confidence levels that meet or exceed 90 percent are formatted in boldface type.
[5] Among passengers observed in the right-front seat and the 2nd row of seats (but NOPUS only counts up to two passengers in the 2nd row and none in the 3rd row and beyond).

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

Table 2
The Percent of Drivers Speaking With Visible Headsets On, by Major Characteristics

Driver Group[1]	2007		2008		2007-2008 Change	
	% of Drivers Speaking with Headsets[2]	Confidence That Use Is High or Low in Group[3]	% of Drivers Speaking with Headsets[2]	Confidence That Use Is High or Low in Group[3]	Difference in Percentage Point Tenths	Confidence in a Change in % of Drivers Speaking With Headsets[4]
All Drivers	0.6%		0.6%		0.0	16%
Males	0.6%	**98%**	0.6%	80%	0.0	6%
Females	0.5%	**98%**	0.5%	80%	0.0	31%
Drivers Who Appear to Be						
Age 16-24	0.6%	52%	0.9%	**91%**	0.3	54%
Age 25-69	0.6%	**93%**	0.6%	68%	0.0	7%
Age 70 and Older	0.1%	**100%**	0.1%	**100%**	0.0	2%
Drivers Who Appear to Be						
White	0.6%	59%	0.4%	**99%**	-0.2	61%
Black	0.9%	**98%**	0.8%	86%	-0.1	17%
Members of Other Races	0.3%	**99%**	1.4%	**97%**	1.1	**97%**
Drivers on						
Expressway Exit Ramps	0.7%	85%	1.0%	**99%**	0.3	65%
Other Surface Streets	0.5%	85%	0.4%	**99%**	-0.1	60%
Drivers Traveling Through						
Light Precipitation	0.5%	66%	0.3%	**93%**	-0.2	59%
Fog	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	0.6%	79%	0.6%	**94%**	0.0	18%
Drivers of						
Passenger Cars	0.6%	79%	0.6%	78%	0.0	15%
Vans and SUVs	0.6%	60%	0.6%	51%	0.0	7%
Pickup Trucks	0.4%	**90%**	0.4%	**91%**	0.0	13%
Drivers in the						
Northeast	0.7%	70%	0.5%	65%	-0.2	50%
Midwest	0.3%	**98%**	0.3%	**98%**	0.0	32%
South	0.7%	69%	0.3%	**97%**	-0.4	**99%**
West	0.5%	60%	1.3%	**97%**	0.8	88%
Drivers in						
Urban Areas	0.4%	86%	1.1%	**99%**	0.7	**96%**
Suburban Areas		87%	0.6%	62%	0.0	30%
Rural Areas	0.5%	76%	0.3%	**98%**	-0.2	82%
Drivers Traveling During						
Weekdays	0.7%	**100%**	0.6%	84%	-0.1	21%
Rush Hours	0.9%	**95%**	0.9%	**99%**	0.0	5%
Nonrush Hours	0.5%	**95%**	0.4%	**99%**	-0.1	40%
Weekends	0.2%	**100%**	0.5%	84%	0.3	83%
Drivers With[5]						
No Passengers	0.8%	**100%**	0.8%	**100%**	0.0	15%
At Least One Passenger	0.1%	**100%**	0.2%	**100%**	0.1	47%
Drivers With[5]						
No Passengers	0.8%	**100%**	0.8%	**100%**	0.0	15%
Passengers All Under Age 8	0.2%	**100%**	0.6%	58%	0.4	**93%**
Passengers All Age 8 and Older	0.1%	**100%**	0.1%	**100%**	0.0	5%
Some Passengers Under Age 8 and Some Age 8 or Older	NA	NA	0.3%	**98%**	NA	NA

Table 3
The Percent of Drivers Visibly Manipulating Hand-Held Devices, by Major Characteristics

Driver Group[1]	2007		2008		2007-2008 Change	
	% of Drivers Manipulating Hand-Held Devices[2]	Confidence That Use Is High or Low in Group[3]	% of Drivers Manipulating Hand-Held Devices[2]	Confidence That Use Is High or Low in Group[3]	Difference in Percentage Point Tenths	Confidence in a Change in % of Drivers Manipulating Hand-Held Devices[4]
All Drivers	0.7%		1.0%		0.3	76%
Males	0.5%	**99%**	0.8%	**100%**	0.3	85%
Females	0.9%	**99%**	1.2%	**100%**	0.3	67%
Drivers Who Appear to Be						
Age 16-24	1.0%	**99%**	1.7%	**100%**	0.7	84%
Age 25-69	0.6%	69%	0.9%	**99%**	0.3	65%
Age 70 and Older	0.2%	**99%**	0.4%	**100%**	0.2	69%
Drivers Who Appear to Be						
White	0.7%	80%	1.0%	57%	0.3	65%
Black	0.6%	64%	0.8%	**91%**	0.2	47%
Members of Other Races	0.4%	84%	1.2%	87%	0.8	**99%**
Drivers on						
Expressway Exit Ramps	0.7%	67%	0.8%	**96%**	0.1	21%
Other Surface Streets	0.6%	67%	1.1%	**96%**	0.5	86%
Drivers Traveling Through						
Light Precipitation	1.9%	**93%**	0.8%	62%	-1.1	66%
Fog	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	0.5%	**92%**	1.0%	66%	0.5	**94%**
Drivers of						
Passenger Cars	0.8%	**96%**	1.0%	74%	0.2	60%
Vans and SUVs	0.7%	52%	1.1%	**94%**	0.4	79%
Pickup Trucks	0.3%	**98%**	0.6%	**99%**	0.3	82%
Drivers in the						
Northeast	0.9%	73%	0.4%	**99%**	-0.5	62%
Midwest	0.5%	73%	0.8%	68%	0.3	39%
South	0.6%	58%	0.5%	**98%**	-0.1	26%
West	0.6%	56%	2.1%	**99%**	1.5	**95%**
Drivers in						
Urban Areas	0.6%	63%	1.5%	87%	0.9	86%
Suburban Areas	0.9%	**96%**	1.1%	87%	0.2	53%
Rural Areas	0.3%	**99%**	0.3%	**100%**	0.0	36%
Drivers Traveling During						
Weekdays	0.8%	**97%**	1.1%	**100%**	0.3	77%
Rush Hours	0.7%	70%	1.2%	57%	0.5	75%
Nonrush Hours	0.8%	70%	1.1%	57%	0.3	68%
Weekends	0.4%	**97%**	0.6%	**100%**	0.2	63%
Drivers With[5]						
No Passengers	0.8%	**99%**	1.3%	**100%**	0.5	77%
At Least One Passenger	0.3%	**99%**	0.4%	**100%**	0.1	76%
Drivers With[5]						
No Passengers	0.8%	**99%**	1.3%	**100%**	0.5	77%
Passengers All Under Age 8	0.6%	61%	1.5%	**100%**	0.9	**99%**
Passengers All Age 8 and Older	0.2%	**100%**	0.3%	**100%**	0.1	59%
Some Passengers Under Age 8 and Some Age 8 or Older	0.3%	**92%**	0.3%	**100%**	0.0	19%

[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 who appeared to be wearing a headset with a microphone and speaking. Age, gender, and racial classifications are based on the subjective assessments of roadside observers.
[3] The level of statistical confidence that use in the driver group (e.g., drivers who appear to be White) is higher or lower than use in the corresponding complementary driver group (e.g., combined drivers who appear to be Black or members of other races). Confidence levels that meet or exceed 90 percent are formatted in boldface type. Confidence levels are rounded to the nearest percentage point, and so levels reported as "100 percent" confidence are between 99.5 percent and 100.0 percent.
[4] The degree of statistical confidence that the 2008 use rate is different from the 2007 rate. Confidence levels that meet or exceed 90 percent are formatted in boldface type.
[5] Among passengers observed in the right-front seat and the 2nd row of seats (but NOPUS only counts up to two passengers in the 2nd row and none in the 3rd row and beyond).

NA: Data not sufficient to produce a reliable estimate. Data Source: NOPUS, NHTSA's National Center for Statistics and Analysis

- Hand-held cell phone use by drivers in the Western United States has increased from 6 percent in 2007 to 7 percent in 2008.
- The use of visible headsets while driving was still less than 1 percent.
- The percentage of drivers visibly manipulating hand-held devices in the West significantly increased from 0.6 percent in 2007 to 2.1 percent in 2008.

Survey Methodology

Sites and Vehicles Observed

Numbers of	2007	2008	Percentage Change
Sites Observed	1,534	1,504	-2%
Vehicles Observed	58,216	55,199	-5%

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 observers at probabilistically sampled intersections controlled by stop signs or stoplights, where the vehicle occupants are observed from the roadside. Data is collected between the hours of 7 a.m. and 6 p.m. Only stopped vehicles are observed to allow time to collect a 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 the NOPUS can capture the untainted behavior of occupants. The 2008 NOPUS data was collected between June 2 and June 22, while the 2007 data was collected between June 4 and June 25, 2007.

Because the NOPUS sites were chosen through probabilistic means, we can analyze the statistical significance of its results. Statistically significant increases in the use of hand-held phones (respectively, headset use or manipulation of hand-held devices) between 2007 and 2008 are identified in the table of "the percent of drivers holding phones to their ears" on Page 2 (respectively, "the percent of drivers speaking with visible headsets on" on Page 3 or "the percent of drivers visibly manipulating hand-held devices" on Page 4) by having a result that is 90 percent or greater in column 7. Statistical confidence levels that hand-held use, headset use, or the manipulation of hand-held devices in a given driver group, e.g., drivers in the Northeast, is higher or lower than in the complementary driver group, e.g., combined drivers in the Midwest, in the South and in the West, are provided in columns 3 and 5. Such comparisons are made within categories delineated by changes in row shading in the tables. The exception to this is the grouping "Drivers Traveling During…," in which weekdays are compared to weekends, and weekday rush hour to weekday non-rush hour.

As we will discuss in much more detail later in the definition section, some cell phone use, such as hands-free cell phone use via a Bluetooth car kit or drivers using wireless earpieces obscured by hair or clothing or on their left ears, could not be observed from the roadside and thus would not be captured by NOPUS.

NHTSA's 2007 Motor Vehicle Occupant Safety Survey (MVOSS) estimated that, for drivers using cell phones while driving, 55 percent tended to use hand-held cell phones and 45 percent tended to use hands-free phones. Applying the proportion 0.8182 (= 45/55) of these percentages to the 6 percent estimate of drivers using hand-held cell phones in 2008 from NOPUS shows an estimated 5 percent of drivers using hands-free cell phones. Thus, 11 percent of drivers are estimated to be using either a hand-held or hands-free cell phone while driving in a typical daylight moment in the United States in 2008.

The estimate of the number of drivers using hand-held phones was calculated based on the methodology explained in our report "Cell Phone Use on the Roads in 2002", but with some modifications. Unlike the estimates for previous years which used either an exponential or linear growth model for estimating the number of drivers on the road in a typical moment, we use the ratio estimator (VMTs[2] versus drivers on road) which better reflects the reality that drivers on road in the United States has been declining in the past two years. The 2002 report is available at the Web site http://www-nrd.nhtsa.dot.gov/Pubs/809580.PDF.

The NOPUS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation and variance estimation procedures. The 2008 NOPUS continued the transition to the newly designed sample of observation sites, which was implemented in 2006. The 2008 results reflect the partial

[2] The final estimate of the vehicle miles traveled (VMT) for 2008 has not been released by the Federal Highway Administration (FHWA) of the U.S. Department of Transportation. The 2008 VMTs used in our calculations are derived from FHWA's "December 2008 Traffic Volume Trends" (http://www.fhwa.dot.gov/ohim/tvtw/08dectvt/index.cfm).

incorporation of a set of observation sites from the new design (about 60%) and a set of the observation sites from the old design (about 40%). Data from 2005 and prior years was obtained from the old observation sites only.

Data collection, estimation, and variance estimation for the NOPUS are conducted by Westat, Inc., under the direction of the National Center for Statistics and Analysis in NHTSA under Federal contract number DTNH22-07-D-00057.

Definitions

The estimates of the number of vehicles or drivers on the road during the typical daylight moment were formed from data collected at stop signs and stoplights. The estimates effectively assume that the number of vehicles and occupants on a road do not depend on whether the road has a stop sign, stop light, or neither. To the extent that driver cell phone use at stop signs and stop lights is different than elsewhere, the NOPUS estimate of the number of drivers holding phones to their ears during the typical daylight moment might overestimate or underestimate the true quantity.

Drivers were counted as "holding phones to their ears" if they were holding to their ears what appeared to the observer to be a phone. This would include such behaviors as drivers engaged in conversation, listening to messages, or conducting voice-activated dialing while holding a phone to their ears. Note that PDAs such as Blackberrys would count as phones.

Drivers were counted as "speaking with visible headsets on" if they appeared to be speaking and wearing a headset with a microphone. This would include such behaviors as talking 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. It would not include drivers using headsets that do not involve cell phones (such as iPods) since these headsets do not involve microphones. Note that 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 earbuds would not be included as they are too small to be observed from the roadside. Drivers with headsets who were not speaking at the time of observation were not included because they might not have, e.g., recently completed a call or be waiting for an expected call. We estimate that each driver in the survey was observed for about 10 seconds before the data collector decided whether or not the driver was speaking. Note also that drivers counted as speaking with a visible headset on might have been talking to a passenger or using voice-activated computer software rather than using a phone.

Drivers were counted as "visibly manipulating hand-held devices" if they appeared to be manipulating some type of electronic device, whether a cell phone, PDA, video game, or other device. This would include such behaviors as: manual dialing; text messaging; using a Web-capable cell phone or a PDA (such as a Blackberry) to view travel directions, check e-mails or calendar appointments, or surf the Internet; playing hand-held games; and holding phones in front of their face to converse or check messages via speakerphone or use voice-activated dialing. Manipulation of non-hand-held devices (adjusting volume on stereos, pressing buttons on a dashboard GPS unit, etc.) was not included. Also note that a driver characterized by the survey as "manipulating hand-held devices" might or might not have been speaking.

We note that 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" nor as "visibly manipulating hand-held devices" in the NOPUS. These would include but not limited to: (1) a driver using a cell phone headset who is not speaking during the approximately 10 seconds the driver is observed, and (2) a driver using technologies that cannot be observed from the roadside. Such technologies would include: a driver using 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 (such as 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 (such as 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 at 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 recorded the age group (8 to 15 years; 16 to 24 years; 25 to 69 years; and 70 years or older) that best fit 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.

States With Laws Banning Hand-Held Cell Phone Use While Driving[1]

California	Connecticut	New Jersey	New York
Utah	Washington	District of Columbia	

[1]States with laws in effect as of June 30, 2008. Also includes DC.

Driver cell phone use is largely unrestricted by State laws. No States ban use outright. Currently, jurisdiction-wide bans on driving while talking on a hand-held cell phone are in place in 6 States (California, Connecticut, New Jersey, New York, Utah[3], and Washington) and the District of Columbia. Twenty-one States and the District of Columbia have special cell phone driving laws for novice drivers. A few States ban use in certain situations, such as when operating a school bus or public transit vehicle. In addition, some major cities have hand-held bans or otherwise restrict use.

Using a headset while driving is even less restricted by traffic laws. No States or major cities ban such use outright. As with driver hand-held cell phone use, a small number of States restrict the manner of use, e.g., by requiring sound to travel unimpaired to at least one of the driver's ears, or ban certain types of use in certain situations, such as by banning cell phone use (whether hand-held or hands-free) when operating a school bus or public transit vehicle.

Text messaging is banned for all drivers in 13 States (Alaska, Arkansas, California, Colorado, Connecticut, Louisiana, Maryland, Minnesota, New Jersey, Tennessee, Utah, Virginia, and Washington) and the District of Columbia.

NHTSA's policy on using cell phones while driving is conveyed in the following statements from www.nhtsa.gov: "The primary responsibility of the driver is to operate a motor vehicle safely. The task of driving requires full attention and focus. Cell phone use can distract drivers from this task, risking harm to themselves and others. Therefore, the safest course of action is to refrain from using a cell phone while driving." More information on the agency's policy can be found on this Web site.

For More Information

This research note was written by Timothy M. Pickrell, a mathematical statistician in the Mathematical Analysis Division, National Center for Statistics and Analysis, NHTSA, and by Tony Jianqiang Ye, a contractor employed by URC Enterprises, Inc., working with 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 to be posted at the Web site http://www-nrd.nhtsa.dot.gov/CMSWeb/index.aspx in 2009.

[3] Utah calls the offense careless driving.

U.S. Department of Transportation
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