Observational Study of Use of Cell Phone and Texting Among Drivers in California

Comparison of Data from 2011 and 2012

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This methodological report describes survey research and data collection methods used for the second Observational Survey of Cell Phone and Texting Use Among California Drivers study conducted in 2012. This study was conducted by Ewald & Wasserman Research Consultants on behalf of the California Office of Traffic Safety and the Safe Transportation Research and Education Center at the University of California, Berkeley. The goal of the survey was to obtain a statewide statistically representative observational sample of California's cell phone use behaviors, focusing on mobile device use and comparing it with the 2011 survey data. Vehicle drivers were observed at controlled intersections, such as traffic lights and stop signs; a protocol similar to the National Occupancy Protection Use Study methodology published by NHTSA was used. The sample frame included a total of 5,664 vehicle observations from 129 sites. The total percentage of drivers distracted by electronic devices (holding a phone to the ear, manipulating a handheld electronic device while driving, or talking on a handheld device) increased to 6.2% in 2012 from 4.2% in 2011. California's baseline level of cell phone use and driving will be a critical metric over the years as traffic safety stakeholders mobilize to conduct high-visibility enforcement campaigns, explore new policies, expand educational programs, and engineer countermeasures to increase safety on the roads.

This methodological report describes the survey research and data collection methods used by Ewald & Wasserman Research Consultants for the second wave of the Observational Survey of Cell Phone and Texting Use Among California Drivers Study. The study was conducted on behalf of the California Office of Traffic Safety (OTS) and the Safe Transportation Research and Education Center (SafeTREC) at the University of California (UC), Berkeley. The study objective was the second wave of a statewide statistically representative observational study of California drivers' distracted driving behaviors, including cell phone and other electronic device use.

The goal of this project was to observe vehicle drivers at controlled intersections, such as traffic lights and stop signs, and use a data collection protocol similar to the National Occupancy Protection Use Study (NOPUS) methodology published by NHTSA on electronic device use of drivers in its Traffic Safety Facts publications DOT HS 811 372 (*1*) and DOT HS 811 361 (*2*). Also used was the methodological outline of the *Seat Belt Survey Regulation for Section 157 Surveys: 23CRF Part 1340* published by NHTSA (*3*).

The final data set includes a total of 5,664 vehicle observations from 129 sites in the state of California and observer-rated information on driver's age, gender, ethnicity, vehicle type, number of passengers in the vehicle, and presence of children younger than 8 years. Additional observations on driver distractedness include the driver holding a phone to the ear, talking on a Bluetooth or other headset, manipulating a handheld device, or talking on a handheld device.

METHODS

Sample Methodology and Sample Site Selection

Replicating the data collection effort conducted in 2011, the overall sample frame was created with a multistage proportional random site selection based on daily vehicle miles traveled (DVMT) on California roadways, determining DVMT by county as the primary sampling units. The DVMT information was derived from the California Department of Transportation's Highway Performance Monitoring System 2009 California Public Road Data. Tables listing the maintained DVMT by jurisdictions and by county were summarized to create the overall main sample frame for the site selection.

In the first step of sample preparation, all ineligible jurisdictions (not open to the public, with limited access, or no roadways) were removed from the sample frame. All remaining jurisdictions were deemed eligible and included city jurisdictions as well as highways and unincorporated land by county and by the definitions of rural and suburban sites.

After the removal of ineligible jurisdictions, all counties in the state of California accounting for less than 1.0% each of the total DVMT in the state were excluded. In this process, 10 of California's 58 counties were removed, leaving the sample frame with counties and jurisdictions accounting for 99.2% of the total California DVMT. The 10 excluded counties, which accounted for 0.8% of all DVMT in the state of California, were Amador, Calaveras, Plumas, Mono, Del Norte, Modoc, Trinity, Mariposa, Sierra, and Alpine.

The next step involved the first random selection of counties in a proportional randomized design, in which the proportion of inclusion was the DVMT per county. For the eligible 48 counties and jurisdictions, a sample interval was created on the basis of a target of

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17 counties, which served as the random value for the first stage site inclusion. All counties with a DVMT larger than the random value were automatically included in the sample frame because of their size and excluded from the subsequent random selection list. The five counties included by DVMT volume were Los Angeles County, Riverside County, San Bernardino County, San Diego County, and Orange County. They accounted for 53.6% of all DVMT in the state of California.

The remaining 12 sites to be selected were pulled in a proportional randomized design, which increased the probability of inclusion in the sample frame for counties with a higher DVMT volume. The final list of counties selected included Alameda, Butte, El Dorado, Kern, Merced, Placer, San Joaquin, San Mateo, Santa Clara, Solano, Sonoma, Tulare, Los Angeles, Orange, San Bernardino, San Diego, and Riverside.

In the subsequent step of the proportional random selection, the actual sites in each selected county were determined. The secondary sampling unit consisted of either city or town jurisdictions, unincorporated land, or state highway jurisdictions. By using a proportional cell selection method, jurisdictions with higher volumes of DVMT had a higher probability to be included in the sample frame. This procedure resulted in 130 selected sites in the 17 selected counties.

Of the 130 included observation sites, 27 sites were highway sites and 25 were unincorporated land sites. For the highway sites, only controlled exit ramps with either a stop sign or a traffic light were included. For the unincorporated sites, the controlled intersection closest to the geographically determined random site was selected.

After the selection of jurisdictions in each county, each site was pinpointed geographically with various mapping software. For jurisdiction sites with defined boundaries and in cases in which information on boundaries was available for the software, a random site selector was used to select a site within a defined area. For this process, the software created a random number stream based on the *x*- and *y*-axis of the jurisdiction boundaries, which were partitioned into polygons with a standard partitioning algorithm. Polygons were further geospatially partitioned into triangles of varying sizes, and a number stream created two random numbers based on the axis length of the triangle, thus ensuring that the larger the target area, the higher the probability of selection. For geographic sites with limited geospatial information, a similar but manual process was used, which determined the outer boundaries of the jurisdiction and the latitude and longitude of the area and then randomly created a latitude and longitude number set for the target geographic area. The electronic maps used for this purpose were overlaid with a meter grid reference system to produce a grid layer of 1,000 × 1,000 m, and all selected locations were placed in the exact middle of that square kilometer.

The final site selected was confirmed by using Google Earth to ensure that (*a*) an eligible roadway existed and (*b*) it had an intersection or highway exit ramp that was controlled and eligible for data collection. Sites that did not qualify or those that could not be accessed safely by a field observer for a targeted 45-min observation period were reselected by selecting either the opposite side of the intersection or, for highway exit ramps, the exit ramp for traffic from the opposite travel location.

Interview Locations, Times, and Durations

The data collection was conducted between February 20, 2012, and April 11, 2012, by Ewald & Wasserman field observer teams based out of the San Francisco Bay Area and a southern California (Los Angeles and San Diego) area. Data collection times ranged from 7:00 a.m. to 6:30 p.m. and included weekend days and weekdays. The field observers were rigorously trained in the methodology and protocols and assigned batches of location sites where they would conduct the 45-min observation. The field observers were monitored and managed by the E&W project manager throughout the study period.

The team in southern California was responsible for visiting the sites located in San Bernardino, San Diego, Riverside, Orange, and Los Angeles Counties. The Bay Area team in northern California was assigned Alameda, Butte, El Dorado, Kern, Merced, Placer, San Joaquin, San Mateo, Santa Clara, Solano, Sonoma, and Tulare Counties for their data collection routes. The teams were instructed to contact the Project Manager concerning site identification issues, weather, or safety concerns.

Staff Training

Training Procedures and Pretesting of Observation Form

The Ewald & Wasserman field observer teams in northern and southern California were trained in a team meeting format, including a detailed review of data collection procedures and observation protocol, followed by a closely supervised on-site visit and a 45-min round of test observations. Ewald & Wasserman also conducted a round of observation form pilot tests in San Mateo County before the start of the actual data collection. As a result of the pretest, the format of the form was modified to allow for more individual observations. See Figure 1 for the final version of the observation form.

The northern California team was trained during the last week of February 2012. The team and field supervisor visited a selected test site together, practicing all aspects of the data collection, including site positioning, identification of the accurate lane to code, and swift and accurate markings in the coding selections on the observation form.

The southern California team was trained during the last week of February 2012, and the team visited three training sites in the Los Angeles–Long Beach area to practice in a group setting, as well as individually. During the training, the Ewald & Wasserman project manager monitored all staff for accuracy and quality control. All observers were instructed on the coding categories in advance of the data collection.

The field observers were provided with a packet of materials that included observation forms, specific site locations, a validation letter on UC Berkeley SafeTREC and OTS letterhead for respondents inquiring about the purpose of the observations, and guidelines for procedures while in the field.

The field observers were provided with explicit instructions on (*a*) locating and ensuring the accurate assigned location, (*b*) confirming that the position of the observation direction was as specified on the detailed map for that location, and (*c*) implementing an exact procedure for time recording, lane selection, and coding accuracy.

Field Data Collection

After the training, all field observer staff members were assigned a number of sites for traffic observations. The selection of sites for a

ID of Location: ________________ Alternate 1: ______________________ Alternate 2: ________________ Road: 1=HWY Exit Ramp 2=Surface Street 3=Other

Data Collected by: ______________________________ Weather condition: ________________________ Start Time: ________________________________ Notes: _______

Data Collected on: ______________________________ Area Type: 1=Rural 2=Urban 3=Suburban End Time: ________________________________ Notes: _______

	DRIVER/VEHICLE CHARACTERISTICS						DRIVER BEHAVIOR			
Event #	Age A=16-24 B=25-69 C=70 and older	Gender M=Male F=Female	Ethnicity W=White AA=African American A=Asian H=Hispanic O=Other	Vehicle type 1=Passenger car 2=Van or SUV 3=Pickup truck	Passengers Number in car (If 1 - Skip next question)	Kids under age 8 Y=Yes N=No	Holding Phone to Ear with Hand √	Talking on Headset OR Bluetooth √	Manipulating Handheld Device √	Talking on Handheld Device √
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FIGURE 1 Observation form (ID = identification; HWY = highway).

staff member was guided by multiple factors, including the actual site location. A total of six field staff were deployed in California, and the number of observations gathered per site ranged from zero to 165 vehicles. A single observer was positioned at the controlled intersection, whenever safe and possible on the driver's side of the road. After completing the observation at the assigned sites, field observers submitted forms and all additional documentation to the Ewald & Wasserman headquarters in San Francisco for a comprehensive data review and data entry into electronic format. The data from the observation forms were entered electronically by using a data entry program written specifically for this project. This program was designed to eliminate data entry errors and ensure the accuracy of the electronic data.

Time Frames of Data Collection and Comparison with 2011 Data

The observational data were collected between February 20, 2012, and April 11, 2012, by the Ewald & Wasserman field teams.

Data collection times ranged from 7:00 a.m. to 6:06 p.m. and included weekend days and weekdays with a higher emphasis on data collection during morning and evening peak hours as described in the NOPUS methodology. About a third of all observations were completed during morning and evening peak hours, defined to be weekdays from 7:00 to 9:30 a.m. and from 3:30 to 5:00 p.m.

The distribution of data collection time frames by the definitions of peak hour, weekend, and in-between times was noted and compared with the 2011 values. Overall, 29.7% of all observations were made during peak hour, 22.4% were completed on a weekend day, and the remaining 47.9% were collected at all other times. The differences compared with the 2011 observations range between 0.6% and 3.3% per site.

Ewald & Wasserman also gathered information on the actual time frame of the data collected so future analysis of the peak hour definition is possible. However, for the purpose of this study, analysis adhered to the NOPUS methodology definition.

Data Site Definitions and Comparison with 2011 Data

Roadway Type In total, 26.6% of all observations were made at highway exit ramps, including major California routes and freeways, and 72.8% were completed on surface streets. Other categorized streets included one surface street site at an intersection with a shopping mall exit. The difference in percentage compared with the 2011 data collection ranged between 0.2% and 2.3%.

Area Type The observation area type was coded into three categories: rural, urban, and suburban. The rural locations represented 21.0% of the sites observed, 49.6% were coded as urban, with the remaining 29.4% in suburban locations.

Demographic Characteristics of Drivers and Comparison with 2011 Data

Overall, the observed age and ethnicity of drivers are comparable with the 2011 data. For the age of drivers, the majority, or 87.2%, were coded as between 25 and 69 years old, 7.6% were between 16 and 24 years old, and 5.2% were older than 70 years.

Gender The gender of the vehicle driver has shown a substantial shift with a 12.6% increase in female drivers, which is significant compared with that of the previous year (from 41.4% in 2011 to 54.0% in 2012).

Race and Ethnicity For the racial and ethnic coding of drivers, 55.9% were coded White and 26.1% were coded as Hispanic/Latino. About 10.6% of drivers observed were Asian and 4.4% African American. All were comparable with the distribution in 2011.

Number of Passengers The observed number of vehicle passengers ranged from one passenger (only the driver) to six passengers (the driver plus five). The majority of drivers, 71.8%, drove alone, while 21.1% had two passengers (the driver plus one additional passenger) in the car. A total of 7.0% of all vehicles observed had more than two passengers in the vehicle. The number of single drivers increased from 2011 by 3.9% while the number of two-occupant vehicles dropped by 4.7%. That increase in single drivers between 2011 and 2012 is significant.

Child Passengers A total 7.0% of observed vehicles (394 vehicles) had a passenger younger than the age of 8, compared with 5.3% of all vehicles in 2011.

Vehicle Type Vehicles were coded according to type. A total of 51.3% of all vehicles were coded as passenger cars, 32.1% were vans or SUVs, and 16.6% were pickup trucks, very similar to the 2011 data.

RESULTS

Electronic Device Use and DD

The DD variable was created from the observation of three behaviors:

- Holding a phone to the ear,
- Manipulating a handheld electronic device while driving, and
- Talking on a handheld device.

The rationale for creating this category excluding Bluetooth or headset devices is that in 2008, a law was passed prohibiting all drivers from using a handheld wireless telephone while operating a motor vehicle, and in 2009, a law prohibiting texting while operating a motor vehicle went into effect (*4*). Talking on a phone using a headset or Bluetooth device was not included in the DD behavior variable created for this evaluation since the law in California bans handheld use of cell phones; therefore, the three distracted driving behaviors constitute illegal behavior in California.

A positive confirmation of any one of those three behaviors by an observed driver was coded as DD in a separate variable. The data collection on these three driver behaviors included every instance observed and was noted as an exclusive occurrence on the observation form. The DD variable created reflects the number of unique vehicles in which the behavior was observed; the number of unique observations is higher.

TABLE 1 DD Variable Created and Difference Compared with 2011

DD	Frequency 2012	Percentage 2012	Percentage 2011	Difference
Yes	364	6.4	4.2	+2.2
No	5,300	93.6	95.8	–2.2
Total	5,664	100.0	100.0	na

NOTE: na = not applicable. Screening indicates statistically significant results.

Total Percentage of DD

The total percentage of DD observed increased to 6.4% in 2012 from 4.2% in 2011, an overall increase of 2.2% (Table 1). This 2.2 percentage point difference is significant at a 95% confidence level; the confidence interval for the true percentage difference lies between 1.4% and 3.1%. This result means there is a significant increase in the observed rate of DD (as defined by the protocol outlined above).

The frequency of all distracted behaviors, including using a headset or Bluetooth device, is noted in Table 2 and has increased in all instances since 2011. The incidence of observed drivers manipulating a handheld device increased by 1.6% between 2011 and 2012, which is significant.

DD and Gender, Area Type, and Age Group

To evaluate any shifts in gender and DD, the 2012 and 2011 data variables were compared. There is no significant difference between males and females in the rate of distracted driving.

Gender The comparison of gender and DD increased between 2011 and 2012 for both males (2.5%) and females (2.0%). Both increases are statistically significant (Table 3).

Area Type The comparison of DD and area type—defined as rural, urban, or suburban—did not show any significant differences.

TABLE 2 Frequencies of Behaviors and Difference Compared with 2011

Behavior	Frequency 2012	DD (%) 2012	DD (%) 2011	Difference (%)
Holding phone to ear	134	2.4	2.1	+0.3
Talking with headset or Bluetooth[a]	115	2.0	1.5	+0.5
Manipulating handheld device	185	3.3	1.7	+1.6
Talking on handheld device	49	0.9	0.6	+0.3

NOTE: Screening indicates statistically significant results.
[a]Not part of distracted driving variable.

TABLE 3 DD, by Gender, 2011–2012

Gender	DD (%) 2012	DD (%) 2011	Difference (%)
Female	6.3	4.3	+2.0
Male	6.6	4.1	+2.5
Total	6.4	4.2	+2.2

There was no significant difference in area type and distracted driving observed in 2011 either. The comparison of area type and the observation of the driver talking on a headset or Bluetooth device showed a significant difference ($p = .001$). A total of 3.1% of all drivers talking on a headset or Bluetooth device were observed in rural areas and in only 1.4% of drivers in urban areas.

Age Group The comparison of DD by age group from 2011 to 2012 is shown in Table 4. The age group of 16- to 24-year-old drivers had a significantly higher rate of DD compared with older age groups ($p = .000$). A similar difference by age group was found in the 2011, although not significant. There seems to be some indication of an increase in electronic device use while driving for younger drivers in particular, although there is a noted increase for the 25- to 69-year-old drivers as well. Distracted driving by electronic devices by age group was compared for 2011 and 2012. For the 16- to 24-year-old drivers, the incidence of distracted driving by electronic device use rose from 5.3% in 2011 to 11.4% in 2012. This increase of 6.1% is significant at $p = .000$.

The comparison of male and female 16- to 24-year-old drivers and mobile device use did not show any significant differences. Male and female drivers in this age group had a comparable rate of DD (10.4% and 12.3%, respectively).

Table 5 shows the breakdown by age of the different types of DD behaviors and a comparison between 2011 and 2012 data. The use of headset or Bluetooth shows a higher rate of use for younger drivers, although that difference is not significant.

DD, by Time of Observation

The comparison of DD by time of observation does not show any significant differences between the peak hour, weekend, or all other observation times. There is an overall lower incidence of mobile device use by drivers while driving on weekends (6.0%) and a higher incidence during peak hour (7.0%).

TABLE 4 DD, by Age, 2011–2012

Age	DD (%) 2012	DD (%) 2011	Difference (%)
16–24	11.4	5.3	+6.1
25–69	6.2	4.2	+2.0
70 and older	3.4	1.8	+1.6
Total	6.4	4.2	+2.2

NOTE: Screening indicates statistically significant results.

TABLE 5 DD Behaviors, by Age, 2011–2012

	DD (%)	
Age	2012	2011
Holding phone to ear		
16–24	4.7	3.2
25–69	2.2	2.0
70 and older	1.4	0.6
Total	2.4	2.1
Talking with headset or Bluetooth		
16–24	2.3	2.3
25–69	2.1	1.5
70 and older	1.0	0.6
Total	2.0	1.5
Manipulating handheld device		
16–24	6.3	1.9
25–69	3.1	1.7
70 and older	1.0	1.2
Total	3.3	1.7
Talking on handheld device		
16–24	0.5	0.2
25–69	0.9	0.7
70 and older	1.0	0.6
Total	0.9	0.6

Use of Headsets and Bluetooth Devices

Of total peak hour drivers, 2.9% were seen talking on a headset or Bluetooth device. On the weekend, 1.6% of observed drivers talked on a headset or Bluetooth. This difference is significant at $p = .00$.

Countywide and Regional Results on DD

DD Behaviors, by Region

For the purpose of geographic segmentation, three regions were delineated by county into northern California, central California, and southern California. A total of 1,851 observations (32.7%) were completed in the northern California region, 397 (7.0%) in the central California region, and 3,451 (60.3%) in the southern California region. There is no significant difference in the incidence of DD for the three defined regions.

Further comparisons looked at the region variable by the observed distracted driving behaviors “holding phone to ear” and “manipulating handheld device while driving,” with neither showing a significant difference by California region. There is a significant relationship between the region variable and talking on a handheld phone ($p = .00$) and between region and talking on a headset or Bluetooth device ($p = .00$). The central California region (Tulare, Kern, and Merced Counties) had a significantly higher rate of talking on a handheld device as well as using a headset or Bluetooth device while driving.

DD Variable, by County

The comparison of observed DD by county is shown in Table 6. There are noticeable differences between counties in the level of DD, but the number of observations in each county is too small in some cases to be significant. Some more rural counties show a higher rate of DD, but not all of them.

TABLE 6 DD, by County

	DD				
	Yes		No		
County	Number	Percentage	Number	Percentage	Total
Alameda	24	5.0	459	95.0	483
Butte	4	15.4	22	84.6	26
El Dorado	5	6.8	69	93.2	74
Kern	4	3.0	130	97.0	134
Los Angeles	88	6.6	1,249	93.4	1,337
Merced	15	8.4	164	91.6	179
Orange	30	5.0	574	95.0	604
Placer	21	6.1	322	93.9	343
Riverside	5	2.8	176	97.2	181
San Bernardino	30	7.4	374	92.6	404
San Diego	70	7.9	820	92.1	890
San Joaquin	11	10.9	90	89.1	101
San Mateo	19	8.1	216	91.9	235
Santa Clara	20	4.4	439	95.6	459
Solano	11	10.8	91	89.2	102
Sonoma	1	3.6	27	96.4	28
Tulare	6	7.1	78	92.9	84
Total	364	6.4	5,300	93.6	5,664

DD, by Driver and Vehicle Characteristics

There is no significant difference between drivers with or those without children younger than the age of 8 in the car with respect to DD. Drivers with a child younger than age 8 in the car show an even higher frequency (6.9%) of distracted driving compared with that among drivers without a child in the car (6.4%), although the difference is not significant.

There were also no significant differences in the distracted driving variable by vehicle type. There were no significant differences in DD behavior by the number of passengers in the car or by the race and ethnicity variable. There were also no significant differences in the DD variable by road type.

Notes on Limitations

As outlined in the Driver Electronic Device Use Protocol published by NHTSA (DOT HS 811 361), the methodology has two noteworthy limitations. First, the observation protocol observes drivers only during daylight hours. Second, it observes them only at controlled intersections, and not while driving. It is therefore plausible that the actual observed numbers of distracted drivers, as well as the effect on safety, might be either higher or lower than observed.

DISCUSSION OF RESULTS

This is the second year the Observational Study of Cell Phone and Texting Use Among California Drivers has been conducted. Several noteworthy changes have been recorded. First, the incidence of manipulation of a handheld device almost doubled between 2011 and 2012. Manipulation of a handheld device may include texting, e-mailing, navigation, and obtaining directions or information via voice activation. This observation has also coincided with the rapid increase in market share of smartphones in the past year. Some sources estimate that almost half of the total U.S. population will be using mobile phones to access the Internet by 2015 (*5*). A Pew Internet survey found that 46% of adults in the United States owned smartphones in February 2012, as opposed to 35% who owned one as of May 2011 (*6*). With the growing market share of these phones, it is conceivable that increasing numbers of people will be using their features.

As the trend toward increased smartphone ownership increases, so do safety concerns. Given NHTSA's 2009 report that 24,000 (5%) people injured in distracted-driving-related crashes cited cell phones as the distraction and that 16% of fatal crashes in 2009 involved reports of distracted driving, this growth in phone use causes concern (*7*). That drivers were more likely to initiate conversations and visual and manual tasks when stopped than at higher speeds may suggest a level of self-regulation.

Young drivers, between the ages of 16 and 24, were also documented as having a statistically significant increase in handheld manipulation of a mobile device. In 2011, 5.3% of drivers 16 to 24 were observed manipulating handheld devices, while 11.4% were observed doing so in 2012. Although the observation of younger drivers manipulating handheld devices was not significant in 2011, it was in 2012. The Pew study found that of the smartphone adopters, 18- to 35-year-olds had the highest market share of these electronic devices. Seniors, however, had the lowest adoption of smartphones (*6*). It is sobering, then, to look at injury data. Of drivers younger than 20 involved in fatal crashes, 16% were reported to have been distracted while driving. This percentage is higher than any other age group (*7*). People driving alone and people driving in rural areas had significantly higher use than others. It is likely that drivers use mobile devices to pass the time while driving and that the use of smartphones provides company.

IMPLICATIONS

The substantial and dramatic growth in those manipulating handheld devices deserves attention. New research is exploring the effect of mobile device use, especially talking and texting while driving, and its relationship to crashes. In addition, more needs to be understood about distracted behaviors. This study observed use while vehicles were stopped. Funkhouser and Sayer suggest using a mobile device when a vehicle is stopped is a form of self-regulation that may not translate into the same crash risk as using devices while the vehicle is moving (*8*). To understand the extent of this self-regulation, it will be important to know when mobile device use is initiated—whether approaching a stop while the vehicle is moving or once at a stop. Research must continue to explore the effect of handheld versus hands-free mobile device use on behavior and, with the use of voice-activated controls, GPS, and so forth, explore the effect of different types of mobile phone use on driving and safety. In addition, it is important to understand the patterns related to rural versus urban use, male versus female use, and young versus older driver use.

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