OBSERVATIONAL STUDY OF DISTRACTED DRIVING DUE TO ELECTRONIC DEVICE USE AMONG CALIFORNIA DRIVERS FOR 2018

SUMMARY REPORT

PROVIDED TO THE CALIFORNIA OFFICE OF TRAFFIC SAFETY
OCTOBER 2018
WILLIAM H. BOMMER, PHD
PROJECT DIRECTOR
FRESNO, CALIFORNIA

I. EXECUTIVE SUMMARY

The 2018 distracted driving survey made some modifications to previously used approaches due to changes in electronic technology, and to make observations more accurate. Three specific electronically-based distracted driving behaviors were measured in this survey. More specifically, speaking on a hand-held device, manipulating a hand-held device, and speaking on a phone via Bluetooth or a headset were recorded. This was a change from 2017 when speaking on a hand-held device and holding a phone to the ear were observed separately.

The 2018 survey was conducted at the same locations as those that were used in 2017. An observational survey was conducted at 204 locations across 17 California counties. These locations are a statistically valid sampling of California roads based on the requirements described in Section 157 Surveys: 23CRF Part 1340. Observations were conducted for 50 minutes by trained observers who generally had previous law enforcement experience.

Distracted driving due to electronic devices rose in in 2018. More specifically, a rate of 4.52% was found which was up from 3.58% in 2017 (7.6% in 2016, 5.4% in 2015, and 3.8% in 2014). Further analysis of the 2018 findings indicated that use was higher on local roads (4.92% on local roads versus 3.24% on secondary roads and 2.37% on highways). Further, pickup trucks had higher usage rates than did other vehicle types (5.39% for pickups and 4.32% for other vehicles). Additional overall findings indicated that usage was higher when passengers were not present (5.55% when no passenger was present versus only 0.69% when passengers were in the vehicle) and much lower when children were present (1.92%) than when no children were present (4.55%).

When it comes to enforcement and public awareness campaigns, the findings of this survey are that focusing on drivers of pickups, drivers on local roads, and drivers who are without a passenger would be the most effective way of bringing down usage rates.

As an additional analysis, Bluetooth/headset usage was estimated using a NHTSA-approved method. When this calculation was included, the overall percentage of distracted driving due to electronic device use was 6.86%, which was virtually unchanged from the comparable number in 2017 (i.e., 6.80%).

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II. INTRODUCTION

This report explains the methods and the results associated with the "Observational Survey of Distracted Driving among California Drivers Study" conducted by California State University, Fresno for the California Office of Traffic Safety (OTS).

This report describes CSU Fresno's observational data collection procedures and compares these findings to the previous six years of data collected for OTS. The goal of these surveys has been to collect observational data of a statistically valid, representative sample of drivers' distracted driving behaviors, including cell phone and other electronic device use.

The overall study design included the observation of drivers where traffic was controlled. Usually, this means that the observations occur at traffic lights, stop signs, or in other places where traffic is moving at relatively low speeds. Observing traffic at low speeds is necessary to make accurate observations and to ensure the safety of the observers. The data collection approach was designed to maximize comparability with previous observational surveys. These previous surveys used a data collection protocol similar to the National Occupancy Protection Use Study (NOPUS) methodology published by the National Highway Transportation Safety Administration (NHTSA) on electronic device use by drivers in their Traffic Safety Facts publications, DOT HS 811 372 and DOT HS 811 361. The data collection plan also incorporated sections of the methodological outline of the Seat Belt Survey Regulation for Section 157 Surveys: 23CRF Part 1340, published by NHTSA. As a result, the current observational data were collected using the same basic procedures.

III. METHOD

A. Sample Methodology and Sample Site Selection

The sites for the Distracted Driving survey were the same as those selected for the annual restraint usage survey, which the National Highway Safety Administration (NHTSA) requires of all states and territories. The counties and sites for the 2017 California restraint use survey were new in 2017 due to a required resampling which ensures that the sites are representative of California's current road inventory (i.e., in this case the TIGER road database). Consistent with the restraint use survey, the current survey had 204 road sites located in 17 California counties, with each county having 12 sites. Data from each site were weighted by the likelihood of the county selection, the road site's selection, the number of lanes observed, and the number of vehicles observed during the observation period.

B. Observation Locations, Times, and Duration

Field observations were conducted between August 2, 2018 and September 1, 2018, within a period that was consistent with previous collection efforts. More specifically, all data collection occurred between the hours of 7:30 am and 6:00 pm during non-rainy days and included all seven days of the week. This was the same time frame as previous years of data collection. Surveyors visited all 204 road sites. All staff were rigorously trained in the methods and procedures and assigned defined location sites where they would conduct the 50-minute observation. All surveyors had previous law enforcement experience, and the vast majority of surveyors were recently retired California Highway Patrol officers.

C. Observational Study Outcomes

All 204 sites across the 17 counties were included in the current study. This procedure yielded 30,388 observations. This was a much higher number of observations than have been collected in any previous survey. This increased sample size serves to provide smaller standard errors for the findings and increase the statistical confidence of the conclusions reached.

Using the data collected, we were able to assess an overall "distracted driving" rate as well as individual usage rates for the specific types of electronic distractions observed.

IV. RESULTS

A. Results on Distracted Driving Due to Electronic Device Use

Overall electronic device use and distracted driving due to electronic devices variable

The variable "distracted driving due to electronic devices (DD)" was created based on two behaviors observed by field staff and included:

1. manipulating a hand-held electronic device while driving, and
2. talking on a hand-held device.

It should be pointed out that previous surveys used a third category of distracted driving which was labeled "phone to ear". For the 2018 survey, this behavior was combined with the talking on a hand-held device because holding a phone to the ear certainly suggests that a person is talking on a hand-held device. Previous surveys used two separate categories to try to distinguish when a person was using a hand-held speakerphone versus using a phone physically pressed to the ear. This distinction, however, caused confusion and was difficult to distinguish from other forms of electronic distraction. As a result, we used a single category of "talking on a hand-held device" to include cases of people holding a phone to their ear or holding the phone and talking on a speakerphone.

The calculated percentage of driver behavior and electronic device use across the 204 observed road sites is shown in Table 1. Talking on a phone using a headset or Bluetooth device was NOT included in the variable created for the purpose of this evaluation. Any observed instance of the two behaviors was coded as "distracted driving due to electronic device use" in a separate variable (labelled DD). The data collection on these 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 of distracted behavior is higher.

For a further analysis, we used estimates provided by the 2014-2016 distracted driving surveys to calculate a correction factor for an estimate of headset/Bluetooth usage. These numbers are not in the main body of the report, as they are estimates, but have been provided in Appendix A to allow for a direct comparison of this year's results with other historically relevant findings.

Table 1. Distracted Driving Due to Electronic Devices

	2018	2017	2016	2015	2014	2013	2012
Total Usage	4.52%	3.58%	7.6%	5.4%	3.8%	4.6%	6.4%
Manipulating Handheld	2.74%	1.51%	4.5%	3.3%	2.2%	2.5%	3.3%
Talking on Handheld	1.79%	1.33%	0.9%	1.0%	0.7%	0.7%	0.9%
Sample Size	**30,388**	**19,387**	**5,341**	**5,349**	**5,693**	**6,099**	**5,664**

In addition to calculating an overall usage rate and examining the rates of specific types of electronic distractions, the observational survey is also designed to separate these usage figures by a set of other factors. These other factors included:

- Road type where the distracted driving was observed
- Vehicle type in which the behavior occurred
- Whether a passenger was present in the vehicle
- Whether a young child was a passenger in the vehicle
- The county in which the distracted driving was observed

The results of these analyses are presented in the subsequent tables.

Table 2. Distracted Driving Due to Electronic Devices by Road Type in 2018

	Combined	Highways	Secondary	Local
Total Usage	4.52%	2.37%	3.24%	4.92%
Manipulating Handheld	2.74%	1.01%	0.83%	2.91%
Talking on Handheld	1.79%	1.37%	0.68%	2.01%
Sample Size	**30,388**	**9,243**	**14,908**	**6,237**

Table 3. Distracted Driving Due to Electronic Devices by Vehicle Type in 2018

	Combined	Car, Van, or SUV	Pickups
Total Usage	4.52%	4.32%	5.39%
Manipulating Handheld	2.74%	3.17%	0.95%
Talking on Handheld	1.79%	1.15%	4.45%
Sample Size	**30,388**	**24,751**	**5,637**

Table 4. Distracted Driving Due to Electronic Devices by Passenger Presence

	Combined	Passenger is Present	No Passenger Present
Total Usage	4.52%	0.69%	5.55%
Manipulating Handheld	2.74%	0.03%	3.33%
Talking on Handheld	1.79%	0.36%	2.14%
Sample Size	**30,388**	**7,954**	**22,434**

Table 5. Distracted Driving Due to Electronic Devices by Whether a Child Under Age 8 is Present

	Combined	Child is Present	No Child Present
Total Usage	4.52%	1.92%	4.55%
Manipulating Handheld	2.74%	0.23%	2.76%
Talking on Handheld	1.79%	1.69%	1.79%
Sample Size	**30,388**	**220**	**30,168**

Table 6. Distracted Driving Due to Electronic Devices by County

	Sample Size	Combined Total usage	Manipulating Handheld	Talking on Handheld
Total Usage	**30,388**	**4.52%**	**2.74%**	**1.79%**
San Joaquin	1,527	5.98%	3.15%	2.87%
Kern	937	5.87%	0.81%	5.12%
Riverside	2,082	5.72%	3.85%	1.86%
Contra Costa	2,259	5.71%	3.26%	2.46%
San Diego	1,987	5.35%	4.93%	0.42%
Orange	1,400	4.65%	2.54%	2.11%
Monterey	1,318	3.92%	2.87%	1.05%
Los Angeles	1,849	3.69%	3.10%	0.59%
Solano	1,811	3.34%	2.71%	0.63%
Ventura	2,088	3.06%	1.17%	1.90%
Alameda	3,171	2.73%	1.89%	0.83%
Sonoma	1,017	2.72%	2.13%	0.66%
San Bernardino	2,140	2.07%	0.59%	1.48%
San Luis Obispo	1,284	1.67%	1.02%	0.65%
San Mateo	2,550	1.64%	0.11%	1.52%
Santa Barbara	1,044	0.85%	0.35%	0.50%
Sacramento	1,924	0.74%	0.40%	0.35%

V. INTERPRETATION OF RESULTS

A. Overall usage rates compared to previous years

As reported in Table 1, the rate of distracted driving showed an increase between 2017 and 2018.

Overall, the distracted driving due to electronic devices was 4.52% in 2018 versus 3.58% in 2017. With the 2018 results collected, the 2017 results appear to be somewhat of an anomaly compared to recent years, whereas the 2018 results are generally in line with historic numbers. It is important to note that this value indicates that *at any one time*, the number of people distracted due to using an electronic device was 4.52%, but the number of people engaging in this behavior across their time on a given trip is likely *much higher*. In other words, a person may have been on a phone or sending a text five minutes before they were observed and these cases are not included in the distracted driving figures. In this way, distracted driving is significantly different from seat belt usage (i.e., another relevant safety-related behavior), which tends to be more stable across the time in a vehicle.

Of the types of behaviors observed most often, manipulating a hand-held device was the most common. This is generally "texting while driving", although it could certainly be email checking, GPS usage, or other activities being carried out on a hand-held instrument (usually a phone). The other category of behavior involves actually speaking on a telephone. Talking on a hand-held (e.g., using the speakerphone while the phone is in the driver's hand or holding the phone to the ear) directly involves talking to others while driving.

B. Distracted Driving by Road Type

The results of the 2018 survey (presented in Table 2) found that local roads were the most frequent sites of distracted driving behaviors. This result is consistent with the results from 2017. This result is particularly problematic as local roads also tend to be the most dangerous when it comes to fatalities and injuries on a per mile basis.

Electronic device usage is likely highest on local roads due to the prevalence of "short trips" and "errands". On longer trips (which are more likely to involve highway travel), the driver has a longer time across which to communicate with others and to use an electronic device. As a percentage of the time in the vehicle, however, this usage would be significantly lower. On shorter trips, the driver may only be in the vehicle for a few minutes and the nature of short trips makes them more likely places for electronic use to occur (i.e., coordinating the pick-up of individuals, meeting others, etc.).

C. Distracted Driving by Vehicle Type

The results included in Table 3 showed that distracted driving due to electronic devices was highest in pickup trucks. This finding is notable when taken in combination with the seatbelt use surveys that consistently find lower usage among occupants of pick up drivers. The combination of findings suggest that future information campaigns and enforcement, which focuses on pickups, may be more productive in terms of improving safer driving practices.

D. Distracted Driving by Whether a Passenger is Present

Table 4 includes data showing that across all types of electronic devices, being alone in a vehicle greatly increased the likelihood of engaging in electronics use. In fact, being alone was associated with an overall electronic usage rate that was more than 8 times the rate shown by people who had a passenger in the vehicle and over 11 times the rate of manipulating a hand-held device.

The reasons for this would seem straightforward. When a passenger is present, the driver will be less likely to call another person as he or she already has a person in the vehicle with whom to communicate. Further, it is likely that in many cases, the passenger can place the call (or send the text) for the driver. On the downside, however, it is likely that the presence of the passenger also adds to the overall level of distraction of the driver due to conversations with the passenger and the tendency for drivers to look at their passengers while driving.

E. Distracted Driving by Whether a Child Under 8 Years of Age is Present

Table 5 presents data that specifically compares distracted driving due to electronic devices in cases where a young child is present versus when a young child is not present. Manipulating a hand-held device was much less likely when a child was present. Thus, it appears that more parents are heeding the advice regarding "texting", while talking on a phone may be perceived to be "more acceptable" or "less dangerous".

F. Distracted Driving by County

Table 6 shows the full results of the observational survey broken down by County. Overall, no strong geographic trends emerged from the data indicating that use did not systematically vary by north or south or by inland or coastal counties. The three Counties, which showed the most distracted driving due to electronic usage, were San Joaquin, Kern, and Riverside. The three counties with the least electronic usage were Sacramento, Santa Barbara, and San Mateo. Over the last two years, San Joaquin was one of the highest use counties, and San Mateo was one of the lowest use counties in both years.

APPENDIX A

Distracted Driving in California: Results Overview and Additional Analysis

Overall electronic device use and distracted driving due to electronic devices variable

The variable "distracted driving due to electronic devices (DD)" was created based on three behaviors observed by field staff and included:
1. talking on a hand-held device (either by holding the phone to the ear or holding it close to the mouth), and
2. manipulating a hand-held electronic device while driving

The third variable observed was NOT included in the DD behaviors:
3. Talking on a phone using a headset or Bluetooth device

Talking with headset/Bluetooth is likely to be underestimated via direct observation since it is very difficult to observe. This usage, however, can be estimated by using data from the California Traffic Safety Survey. This has been done by estimating the ratio between drivers who self-report talking with a hands-free device and drivers who self-report talking with a hand-held device. Using an average of these survey findings across the period of 2014-2016 provided us with a correction factor of 1.3. As a result, our observational findings of "talking on a hand-held device" was multiplied by 1.3 to provide an estimate for the actual headset/Bluetooth usage. These total values are reported in Table A1.

Table A1. Cellphone and Electronic Device Use Rates

	2018	2017	2016	2015	2014
Total Cellphone Use Rates	6.86%	6.80%	12.8%	9.2%	6.6%
Manipulating Handheld	2.74%	1.51%	4.5%	3.3%	2.2%
Talking on Handheld	1.79%	2.37%	3.5%	2.7%	1.8%
*Talking with headset/Bluetooth	2.33%	2.92%	4.8%	3.3.%	2.5%
Sample Size	**30,388**	**19,387**	**5,341**	**5,349**	**5,693**