State of Vermont

Distracted Driving Observation Results

2022 FINAL REPORT


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I. INTRODUCTION

According to National Highway Traffic Safety Administration (NHTSA) estimates, distracted driving caused an estimated 3,142 deaths in 2020 (accounting for 8.1% of all motor vehicle crash deaths that year). The number of "distracted affected" deaths were up by less than 1 percent from the 3,119 deaths in 2019, but up by 9.9 percent compared to the 2,858 deaths in 2018 (NCSA, 2022). In 2020 there were an estimated 324,652 injuries involving a distracted driving (NCSA, 2022).

Enforcement strategies have been effective at reducing incidences of distracted driving. A 2010 enforcement project in CT and NY aimed at enforcing a new handheld cell phone use law (and "texting" when observed) resulted in declines in observed handheld use and phone manipulation (Chaudhary et al., 2014). A similar project in larger locations in CA and DE also resulted in decreases in observed distracted driving in both locations (Chaudhary et al., 2015). Retting et al., (2017) report that enforcing "texting" bans alone was more difficult, albeit possible, with strong enough laws. Following enforcement efforts aimed at texting behaviors in CT and MA, observations failed to show a change in the rates of drivers manipulating their phones from baseline to post-enforcement.

Enforcement efforts require laws to be in place banning the behavior. As of August 2022, there are 24 States and the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands that prohibit drivers of all ages from using handheld cell phones while driving. All these laws allow for primary enforcement, which grants law enforcement the ability to stop motorists solely for cell phone use while driving. All states except Montana and Missouri ban text messaging for drivers of all ages. Missouri bans texting for drivers under 21 and Montana has no ban at all. Earlier research showed that handheld bans reduced instances of drivers' use of a handheld phone, but those earlier law changes occurred when cell phone use was not as ubiquitous as it is now (McCartt et al., 2014). The impact of texting bans has little evidence to show effectiveness at reducing texting behavior (McCartt et al., 2014).

Vermont's texting and driving law went into effect in 2010, while a hand-held ban was added in 2014. Preusser Research Group, Inc. conducted Vermont's inaugural round of distracted driving observations during select dates in October 2021, and then again in April 2022.

II. ROADSIDE OBSERVATIONS

A. Site Selection Methodology

PRG used many of the site selection elements of Vermont's annual seat belt survey when selecting road segments for the distracted driving survey. PRG started with the sites already included in the statewide survey and further refined selection specifically for the needs of the distracted driving survey. We observed distracted driving at 56 of the statewide seatbelt sites. Our experience suggests that some sites have fewer cars (and thus low observation numbers) and given the relative rarity of distracted driving behavior compared to unbelted behavior, these low observation sites fail to add any statistical value to the survey. Sites known to have low observation numbers, such as local roadway sites (accounting for 12 of the 89 sites in the seat belt survey) and others, were thus excluded from the distracted driving survey. These sites were removed in a manner that maintains the integrity of the survey in terms of its statewide representation. That is, the survey still covers all county-groups and functional class strata (except for local roadways) within those groups. Removal of these seat belt sites freed up room in the schedule allowing us to add new distracted driving sites in both school and construction zones. The school zone sites will be repeated for future surveys. The work zone sites will be reselected each year with the help of AOT. Work zones that are still active for subsequent surveys will be maintained to allow for better comparison.

PRG selected and mapped 85 sites into functional clusters suitable for roadside observational schedules. Fifty-six (56) were from the statewide survey that will be consistent from year to year and used (perhaps with the school-zone sites) to produce the statewide estimate. Another 12 sites are from school zones. School zone sites are distributed as well as possible across different school types (high school, middle school, elementary school) throughout the state. The final 12 sites are work zones. We tried to distribute the work zones across the state but were only able to choose from work zones published on Vermont's VTrans website.[1] As stated earlier, work zone sites selected for the 2021 survey will be observed in subsequent surveys if still active, but if a zone is closed, we will select a new site—some sites were reselected for the 2022 survey.

B. Observation Protocol Methodology

Appendix A shows detailed observer instructions (all observers participated in both in-depth classroom training and roadside field training). Driver use of handheld cell phones while driving was observed for 60 minutes at each of the 85 sites. All data were recorded on paper data collection forms (see **Appendix B**). Three types of cell phone use behaviors were recorded: handheld, hands-free, or manipulation. ***Handheld*** was selected when a cell phone was observed being held in the driver's hand while he/she was talking (either held up to ear or using speaker phone). ***Hands free*** was coded when a driver was observed alone in a vehicle but appeared to be talking to themselves (in-vehicle technology or Bluetooth device use is assumed in this scenario). ***Manipulation*** was coded when a driver was observed texting, typing, or otherwise manipulating

[1] https://vtrans.vermont.gov/on-the-road

the keyboard or screen of a cell phone. Manipulation could include texting, dialing, checking e-mail, using a mobile GPS application or other activities. No attempt was made to distinguish between these activities. A ***"probable"*** interpretation was added to the Manipulation coding.

Please note, the three main use categories mentioned above are *not* mutually exclusive. For example, drivers could be observed manipulating while also talking. Observers also coded type of vehicle (car, pickup truck, sport utility, van), driver's sex and estimated age category (<25, 25-59, >59).

Vehicles were randomly selected using a reference point. A stationary point is chosen by the observer far enough down the road where the vehicle, but not the driver's behavior, can be seen traveling toward the site location. As the selected vehicle approaches, the observer looks into the vehicle and begins to record data. Once all data for a vehicle is recorded, the observer looks back up to the predetermined reference point to select the next vehicle to be observed. This method ensures that the next vehicle to be observed is randomly selected from the traffic stream without any predetermined knowledge of driver cell phone use. Only passenger vehicles were observed (excluding police, fire, and ambulance). Only vehicles traveling in the nearest lane were coded as device use that is below the steering wheel cannot be seen as vehicles get further away from the observer due to the change in visual angle. Only one vehicle is observed/recorded at a time.

III. RESULTS

Experienced observers collected distracted driving data on nearly 20,000 vehicles (N=19,986) across 85 sites throughout the State of Vermont. Data were collected in 12 of Vermont's 14 counties as well as Work Zone and School Zone sites.

Data were collected during the month of October 2021 (N=11,089) and April 2022 (N=8,897). For each vehicle selected, the observers noted Vehicle Type (car, pick up, SUV, or Van), Driver Age (<25, 25-59, 60+, or unsure), Driver Sex (male, female, unsure), and whether the driver was engaged in a distracted driving behavior.

Three types of distracted driving behaviors related to cell phone use were coded: Talking on a Handheld cell phone (HH), Talking using a Handsfree device (HF), and Manipulation. One unique feature of these observations was the inclusion of "probable" manipulation as a coded behavior. Probable manipulation was coded when the phone itself could not be seen but the driver's behavior indicated that texting was taking place (e.g., repeated, quick, furtive glances to one's lap). For the purpose of data analysis, Manipulation is represented in two separate categories: Manipulation Observed (MO) where the phone in hand was clearly observed, and Manipulation including Probable (MiP) which combines the observed and probable manipulations.

A general distracted variable was also created - "Any Observed" distraction (AO) which was coded when a driver was either talking on a handheld cell phone (HH), talking using a handsfree device (HF), or observed manipulating a phone (MO). Lastly, the most inclusive variable "Any including Probable" (AiP) was coded when a driver was observed talking on a handheld cell phone (HH), or handsfree device (HF), or observed manipulating a phone (MO) or *probably* manipulating a phone (MiP).

The tables below will present three categories of behavior: 1) Talking on a cell phone while driving (HH, HF), 2) Manipulating a cell phone (MO, MiP), and 3) Any distraction (AO, AiP). Overall rates of distracted behaviors are presented in Table 1. The distracted behaviors will be compared across site type, county, driver sex, driver age, vehicle type, and time of day.

Binary logistic regressions were computed to determine change in distracted behavior between the two waves of observations (October 2021 and April 2022). The overall rates of talking while using a handsfree device dropped significantly from October 2021 to April 2021 (HF, χ^2 (1) = 11.62, p<.01, 95% CI [0.47, 0.82]), as did manipulating a phone (MO, χ^2 (1) = 7.34, p<.01, 95% CI [0.71, 0.95]), manipulation including probable (MiP, χ^2 (1) = 6.58, p<.05, 95% CI [0.78, 0.97]), any distraction (AO, χ^2 (1) = 19.49, p<.0001, 95% CI [0.68, 0.86]), and any distraction including probable (AiP, χ^2 (1) = 15.81, p<.0001, 95% CI [0.75, 0.91]). Essentially every behavior category, except talking on a handheld phone, showed a significant decrease between October 2021 and April 2022.

Table 1. Overall Rates of Observed Distracted Behaviors (% distracted)

Behavior*	October 2021	April 2022
Handheld (HHU) (%)	1.5%	1.6%
(N)	(169)	(141)
Handsfree (HFU) (%)	1.4%	0.9%
(N)	(154)	(77)
Manipulation Observed (MO) %	4.5%	3.8%
(N)	(502)	(334)
Manipulation incl. Probable (MiP) %	7.7%	6.7%
(N)	(853)	(600)
Any Distraction Observed (AO) %	7.2%	5.6%
(N)	(773)	(485)
Any incl. Probably (AiP) %	10.1%	8.4%
(N)	(1,119)	(751)

*Note that an individual driver can be coded as performing more than one distracted behavior.

A. Distracted Driving Rates by Site Types: Work Zone, School Zone, Other

Distracted driving rates were compared across *School Zone* sites, *Work Zone* sites, and *Other* sites (i.e., all other county sites combined). Binary logistic regressions were conducted for differences over time (i.e., from October 2021 to April 2022) for School Zone sites and Other sites. Since the Work Zone sites were not all the same across the two waves of observations, these rates are reported in the tables, but work sites were not included in the Wave by Site comparisons. Binary logistic regressions were conducted for each of the behavior category, looking at the interaction of Wave (Oct. 2021. Apr. 2022) by Site (School Zone, Other). A significant interaction would indicate that the change over time in one site type is different than the change in the other type of site.

Table 2 shows the rates for talking on a cell phone while driving (both HH and HF). The *Wave x Site* interaction was not significant for either behavior (HH, χ^2 (1) = 0.46, *NS*; HF, χ^2 (1) = 0.41, *NS*), neither were the effects of Wave nor Site. Thus, when broken down by Site Type, the rates of HH and HF did not change across time or across sites. Table 2 shows that the number of drivers observed talking while driving was quite small.

Table 2. Talking on a Cell Phone While Driving by Site Type and Wave (% distracted)

Behavior	Site	October 2021	April 2022
Handheld (HH)	Other % (N)	1.6% (121)	1.5% (97)
	School % (N)	1.7% (25)	2.0% (26)
	Work % (N)	1.1% (23)	1.4% (18)
Handsfree (HF)	Other % (N)	1.4% (107)	0.9% (57)
	School % (N)	1.2% (17)	0.5% (7)
	Work % (N)	1.4% (30)	1.0% (13)

The rates for *manipulating a cell phone while driving* were higher than those for *talking on a cell phone while driving*, but still relatively low and observed in less than 5 percent of drivers. Rates of observed manipulation did not show a significant Site X Wave interaction (MO, χ^2 (1) = 1.64, *NS*) nor a significant effect of Wave. Site type did show a significant main effect (MO, χ^2 (1) = 4.69, p<.05, 95% CI [1.03, 1.82]), suggesting that the overall rates of MO were higher in *School Zones* than in *Other* sites.

When *probable* manipulation was added to the *observed* manipulation, rates increased to close to 8 percent of drivers. Rates of *manipulation including probable* did not change across time or across sites. The Wave x Site interaction was not significant (MiP, χ^2 (1) = 0.30, *NS*, neither were the main effects of Wave nor Site.

Table 3. Phone Manipulation by Site Type and Wave (% distracted)

Behavior	Site	October 2021	April 2022
Manipulation Observed (MO)	Other % (N)	4.4% (330)	3.6% (231)
	School % (N)	4.6% (67)	4.9% (63)
	Work % (N)	4.9% (105)	3.2% (40)
Manipulation incl. Probable (MiP)	Other % (N)	7.7% (577)	6.9% (436)
	School % (N)	7.6% (109)	7.3% (94)
	Work % (N)	7.8% (167)	5.6% (70)

Table 4 shows the observed rates for *any distraction* (AO) and *any including probable* (AiP). Overall, approximately 7 percent of drivers were observed using their cell phone (talking

or manipulating) while driving (i.e., *any* distraction). Rates of any distraction did not show a significant Site X Wave interaction (AO, χ^2 (1) = 2.48, *NS*) nor a significant effect of Wave. Site type did show a significant main effect (AO, χ^2 (1) = 4.48, $p<.05$, 95% CI [1.02, 1.66]), suggesting that the overall rates of AO were higher in *School Zones* than in *Other* sites.

Rates of *any including probable* distraction were around 10 percent, with no significant Wave x Site interaction (AiP, χ^2 (1) = 0.75, *NS*) and no difference in rates across Site Type or Wave.

Table 4. Any Distraction by Site Type and Wave (% distracted)

Behavior	Site	October 2021	April 2022
Any Distraction (AO)	Other % (N)	7.2% (525)	5.4% (334)
	School % (N)	7.2% (101)	6.9% (87)
	Work % (N)	7.1% (147)	5.2% (64)
Any incl. Probable (AiP)	Other % (N)	10.2% (769)	8.5% (539)
	School % (N)	9.9% (143)	9.2% (118)
	Work % (N)	9.7% (207)	7.5% (94)

B. Distracted Driving Rates by County

Distracted driving rates were compared between counties (excluding work and school zone sites). Handheld rates on average were lowest in Lamoille and Chittenden Counties (<1%) and highest Orange County (4%). Handsfree use rates averaged less than 1 percent in 5 counties (Franklin, Lamoille, Orleans, Windham and Windsor) and were highest in Bennington and Orange Counties (1.7%). Table 3 shows the HH and HF use rates for the surveyed counties. Given the small number of positive observations in some counties, statistical analyses were not conducted for county-based phone use rates.

Table 3. Talking on a Cell Phone While Driving by County and Wave (% Yes)

County	Handheld Use		Handsfree Use		Total Observed	
	Oct. 2021	Apr. 2022	Oct. 2021	Apr. 2022	Oct. 2021	Apr. 2022
Addison	1.7%	2.2%	1.0%	1.8%	(N=302)	(N=227)
Bennington	1.2%	1.9%	2.0%	1.4%	(N=406)	(N=414)
Caledonia	2.8%	2.1%	1.8%	1.2%	(N=388)	(N=332)
Chittenden	0.8%	1.1%	2.2%	0.8%	(N=1,652)	(N=1,540)
Franklin	1.7%	1.7%	0.7%	0.6%	(N=1,226)	(N=1,030)
Lamoille	0.0%	1.3%	1.1%	0.0%	(N=94)	(N=77)
Orange	4.0%	4.8%	2.3%	1.0%	(N=175)	(N=104)
Orleans	2.1%	0.7%	0.5%	0.0%	(N=195)	(N=136)
Rutland	2.1%	1.4%	1.2%	1.2%	(N=982)	(N=852)
Washington	1.5%	1.6%	1.7%	0.9%	(N=1,009)	(N=796)
Windham	2.6%	1.7%	0.9%	1.0%	(N=428)	(N=292)
Windsor	1.1%	0.9%	0.8%	0.6%	(N=653)	(N=542)

The usage rates for *phone manipulation (observed)* ranged from an average of 1.4 percent in Orleans County to 6.4 percent in Orange County. When *probable phone manipulation* was included, average rates ranged from 4.1 percent in Orleans to 11.0 percent in Orange County. Table 4 shows the MO and MiP use rates for the surveyed counties.

Table 4. Cell Phone Manipulation While Driving, by County and Wave (% Yes)

County	Manipulation Obs.		Manipulation incl. Prob		Total Observed	
	Oct. 2021	Apr. 2022	Oct. 2021	Apr. 2022	Oct. 2021	Apr. 2022
Addison	5.6%	2.2%	8.9%	7.0%	(N=302)	(N=227)
Bennington	5.4%	3.6%	8.9%	6.3%	(N=406)	(N=414)
Caledonia	5.7%	1.8%	12.4%	7.2%	(N=388)	(N=332)
Chittenden	4.0%	3.0%	7.6%	6.9%	(N=1,652)	(N=1,540)
Franklin	3.8%	5.9%	6.1%	7.9%	(N=1,226)	(N=1,030)
Lamoille	3.2%	2.6%	5.3%	5.2%	(N=94)	(N=77)
Orange	6.9%	5.8%	11.4%	10.6%	(N=175)	(N=104)
Orleans	0.5%	2.2%	3.1%	5.1%	(N=195)	(N=136)
Rutland	6.1%	3.6%	7.8%	6.1%	(N=982)	(N=852)
Washington	2.8%	2.8%	7.2%	7.2%	(N=1,009)	(N=796)
Windham	4.9%	4.1%	8.6%	7.2%	(N=428)	(N=292)
Windsor	4.9%	3.9%	7.2%	5.4%	(N=653)	(N=542)

The average rates for *any observed* distraction ranged from 3.1 percent in Orleans County to 11.7 percent in Orange County. The overall rates of *any including probable* distraction ranged from 5.8 percent in Orleans County to 15.8 percent in Orange County. Table 5 shows the AO and AiP rates for each surveyed county.

Table 5. Any Distraction While Driving, by Wave and County (% Yes)

County	Any Distraction		Any incl. Probable		Total Observed	
	Oct. 2021	Apr. 2022	Oct. 2021	Apr. 2022	Oct. 2021	Apr. 2022
Addison	8.6%	5.1%	11.6%	9.7%	(N=302)	(N=227)
Bennington	7.6%	5.7%	10.6%	8.2%	(N=406)	(N=414)
Caledonia	10.8%	4.1%	16.8%	9.3%	(N=388)	(N=332)
Chittenden	6.9%	4.7%	10.3%	8.4%	(N=1,652)	(N=1,540)
Franklin	6.0%	7.4%	8.2%	9.3%	(N=1,226)	(N=1,030)
Lamoille	4.3%	4.0%	6.4%	6.5%	(N=94)	(N=77)
Orange	13.2%	10.1%	17.1%	14.4%	(N=175)	(N=104)
Orleans	3.2%	3.0%	5.6%	5.9%	(N=195)	(N=136)
Rutland	8.9%	5.7%	10.4%	8.0%	(N=982)	(N=852)
Washington	6.0%	5.0%	10.2%	9.2%	(N=1,009)	(N=796)
Windham	7.7%	5.7%	11.0%	8.6%	(N=428)	(N=292)
Windsor	6.4%	4.5%	8.6%	5.9%	(N=653)	(N=542)

C. Distracted Driving Rates by Sex of Driver

A little more than half (57.0%) of the drivers observed were male, 42.9 percent were female, and sex could not be determined in less than 1 percent (0.1%) of drivers (N=17). Binary logistic regression analyses were conducted to explore distracted driving rates across waves and across sex (drivers of unknown sex were excluded from these analyses). A significant Sex x Wave interaction would indicate that the change from October 2021 to April 2022 is different across men and women.

The rates of *talking on a handheld cell phone* while driving were low (1.5% for men, 1.7% for women) and showed no significant Sex x Wave interaction (HH, χ^2 (1) = 0.25, *NS*), as well as no difference between sexes (HH Sex, χ^2 (1) = 1.20, *NS*) or between waves (HH Wave, χ^2 (1) = 0.48, *NS)*. Rates of handsfree use did not show a significant interaction of Sex x Wave (HF, χ^2 (1) = 0.06, *NS)* but there was a significant drop in HF from October 2021 to April 2022 (HFU Wave, χ^2 (1) = 6.91, $p < .01$, 95% CI [0.43, 0.88] and use rates were significantly higher in women than in men (HFU Sex, χ^2 (1) = 5.58, $p < .05$, 95% CI [1.10, 2.72]). See Table 6 for details.

Table 6. Talking on a Cell Phone While Driving, by Sex and Wave (% distracted)

Behavior	Sex	October 2021	April 2022
Handheld (HHU)	**Men %**	1.5%	1.5%
	(N)	(93)	(73)
	Women %	1.6%	1.8%
	(N)	(73)	(68)
Handsfree (HFU)	**Men %**	1.0%	0.7%
	(N)	(67)	(33)
	Women %	1.8%	1.1%
	(N)	(86)	(44)

Table 7 shows the usage rates for *manipulating a cell phone while driving.* Rates did not show a significant interaction of Sex x Wave (MO, χ^2 (1) = 0.08, *NS)* but there was a significant change in MO from October 2021 to April 2022 (MO Wave, χ^2 (1) = 4.63, p< .05, 95% CI [0.66, 0.98] and use rates were significantly higher in women than in men (MO Sex, χ^2 (1) = 6.70, p< .05, 95% CI [1.07, 1.66]).

Table 7. Cell Phone Manipulation While Driving, by Sex and Wave (% distracted)

Behavior	Sex	October 2021	April 2022
Manipulation Observed (MO)	**Men % (N)**	3.9% (250)	3.3% (165)
	Women % (N)	5.4% (251)	4.4% (169)
Manipulation incl. Probable (MiP)	**Men % (N)**	7.4% (471)	6.1% (306)
	Women % (N)	8.1% (380)	7.6% (294)

When *probable* manipulation was added to the *observed* manipulation, rates increased further. There was no significant Wave x Sex interaction (MiP, χ^2 (1) = 1.27, *NS*), nor was there a change from October 2021 to April 2022 (MiP Wave, χ^2 (1) = 0.88, *NS*). The rates of MiP were significantly higher among women than men (MiP Sex, χ^2 (1) = 7.36, p<.01, 95% CI [1.07, 1.49]).

Although there was no significant Sex x Wave interaction for *any distraction* (Table 8) (AO, χ^2 (1) = 0.01, *NS*), there was a significant decrease in rates between October 2021 to April 2022 (AO Wave, χ^2 (1) = 9.89, p< .01, 95% CI [0.65, 0.91]). Rates were significantly higher among women than men (AO Sex, χ^2 (1) = 11.19, p< .01. 95% CI [1.14, 1.64]).

Rates of *any including probable* distraction showed similar results: the Wave x Sex interaction was not significant (AiP, χ^2 (1) = 0.96, *NS*), but both main effects were. There was a significant decrease in usage from October 2021 to April 2022 (AiP Wave, χ^2 (1) = 3.97, p< .05, 95% CI [0.75, 0.99]) and rates were significantly higher among women than men (AiP Sex, χ^2 (1) = 11.35, p< .01, 95% CI [1.11, 1.50]).

Table 8. Any Distraction While Driving, by Sex and Wave (% distracted)

Behavior	Sex	October 2021	April 2022
Any Distraction Observed (MO)	Men % (N)	6.2% (385)	4.9% (238)
	Women % (N)	8.4% (383)	6.6% (247)
Any incl. Probable (MiP)	Men % (N)	9.4% (603)	7.6% (379)
	Women % (N)	10.9% (510)	9.6% (372)

D. Distracted Driving Rates by Driver Age

More than half (62.2%) of the drivers observed were estimated to be between the ages of 25 and 59, 22.8 percent were estimated to be 60 and over, 14.9 percent were estimated to be under the age of 25, and age could not be estimated in less than 1 percent (0.1%) of drivers (N=13). Given the small number of positive observations in some age groups, the Wave x Age interactions were not computed. Instead, each age group was analyzed separately to look at the difference from October 2021 to April 2022, using chi-square analyses.

Average handheld rates were lowest in the oldest age group (<1%) and highest in the youngest group (2.2%). Handsfree use rates averaged to less than 1 percent in in the 60+ age group and were highest in the <25 age group (1.5%). Table 9 shows the HH and HF use rates for the three age groups. The largest difference from October 2021 to April 2022 was seen in the 25-59 age group for HF, a significant drop of 0.7 percentage points (HFU 25-59, χ^2 (1) = 13.5, p< .0001). No other changes were significant.

Table 9. Talking on a Cell Phone While Driving, by Age and Wave (% distracted)

Behavior	Age	October 2021	April 2022
Handheld (HHU)	<25 % (N)	2.3% (35)	2.0% (30)
	25-59 % (N)	1.7% (114)	1.9% (104)
	60+ % (N)	0.7% (19)	0.4% (7)
Handsfree (HFU)	<25 % (N)	1.6% (24)	1.4% (20)
	25-59 % (N)	1.7% (120)	1.0% (54)
	60+ % (N)	0.4% (10)	0.2% (3)

Phone manipulation rates are shown in Table 10. The average rate of *observed* manipulation was highest in the youngest group (7.7%) and lowest in the oldest group (1.2%). Both the 25-59 and 60+ age groups showed a significant decrease in MO from October 2021 to April 2022. There was a 0.9 percentage point drop in 25–59-year-olds (MO 25-59 χ^2 (1) = 9.25, p< .01) and a 0.6 percentage point decrease in the 60+ year-olds (MO 60+, χ^2 (1) = 6.06, p< .05).

When *probable* manipulation was added to the *observed* manipulation, average rates ranged from 2.7 percent in the oldest group to 13.0 percent in the youngest group. The largest difference from October 2021 to April 2022 was in the 25-59 age group, a drop of 1.4 percentage point. Chi-square analyses indicated that this difference was significant (MiP 25-59, χ^2 (1) = 6.95, p< .01). No other difference was significant.

Table 10. Manipulating a Cell Phone While Driving, by Age and Wave (% distracted)

Behavior	Age	October 2021	April 2022
Manipulation Observed (MO)	<25 % (N)	8.3% (126)	7.0% (103)
	25-59 % (N)	4.8% (332)	3.9% (215)
	60+ % (N)	1.5% (40)	0.9% (16)
Manipulation incl. Probable (MiP)	<25 % (N)	13.2% (200)	12.8% (188)
	25-59 % (N)	8.1% (559)	6.7% (373)
	60+ % (N)	3.3% (90)	2.1% (39)

Rates of *any observed distraction* are shown in Table 11 and ranged from an average of 1.8 percent in the 60+ group to 11.0 percent in the under 25 group. The difference from October 2021 to April 2022 was significant in all three age groups: a 3 percentage point drop for under 25 (AO <25, AO, χ^2 (1) = 5.13, p< .05), a 1.9 percentage point decrease for 25-59 year-olds (AO 25-59, χ^2 (1) = 16.95, p< .0001), and a 1 percentage point decrease for the 60+ (AO 60+, χ^2 (1) = 5.37, p< .05).

Average rates of *any distraction including probable* were highest in the youngest drivers (15.7%) and lowest in the oldest drivers (3.3%). The 25-59 and 60+ age groups showed a significant decrease over time (-2.3 and -1.6 percentage points, respectively) (AiP 25-59, χ^2 (1) = 17.35, p< .0001; AiP 60+, χ^2 (1) = 7.85, p< .01).

Table 11. Any Distraction While Driving, by Age and Wave (% distracted)

Behavior	Age	October 2021	April 2022
Any Distraction Observed (AO)	<25 % (N)	12.5% (175)	9.5% (132)
	25-59 % (N)	8.0% (533)	6.1% (329)
	60+ % (N)	2.3% (60)	1.3% (24)
Any incl. Probable (MiP)	<25 % (N)	16.5% (249)	14.8% (217)
	25-59 % (N)	11.0% (755)	8.7% (487)
	60+ % (N)	4.1% (110)	2.5% (47)

E. Distracted Driving Rates by Vehicle Type

Close to half (44.8%) of vehicle observers were passenger cars, 30.1 percent were SUVs, 20.7 percent were pick-up trucks, and 4.4 percent were vans. Vehicle type was unknown for less than 1 percent (0.01%) of drivers (N=3). Given the small number of positive observations for some vehicle types, the Wave by Vehicle interactions were not computed. Instead, each age group was analyzed separately to look at the difference from October 2021 to April 2022, using chi-square analyses.

The average rates of *talking on a handheld cell phone* were highest among pick-up truck drivers (2.2%) and lowest among drivers of cars (1.3%). Drivers of vans were the only one to show significant difference (an increase of 1.7 percentage points) across time (HH Vans, χ^2 (1) = 3.86, $p < .05$). Given the small number of positive observations (see Table 12), these results should be interpreted with caution.

Average rates of *hands-free* use were highest in passenger cars (1.4%) and lowest in drivers of pick-up trucks (0.7%). There only significant difference over time was in cars (-0.5 percentage points) (HF Cars, χ^2 (1) = 5.24, $p < .05$).

Table 12. Talking on a Cell Phone While Driving, by Vehicle and Wave (% distracted)

Behavior	Vehicle	October 2021	April 2022
Handheld Use (HH)	Car % (N)	1.2% (62)	1.3% (51)
	Pickup % (N)	2.3% (52)	2.0% (37)
	SUV % (N)	1.5% (49)	1.6% (44)
	Van % (N)	1.1% (6)	2.8% (9)
Handsfree Use (HF)	Car % (N)	1.6% (83)	1.1% (42)
	Pickup % (N)	0.9% (21)	0.4% (8)
	SUV % (N)	1.3% (41)	0.9% (26)
	Van % (N)	1.6% (9)	0.3% (1)

Average rates of *observed* manipulation were highest in vans (5.2%) and lowest in pick-up trucks (3.8%) (see Table 13). Only cars showed a significant difference (-0.9 percentage points) from October 2021 to April 2022 (MO Cars, χ^2 (1) = 4.86, $p < .05$). When *probable* manipulation was added to the *observed* manipulation, average rates ranged from 6.4 percent in drivers of pickup trucks to 7.9 percent in drivers of cars. The difference between October 2021 and April 2022 was only significant in pickup trucks (MiP Pickups, χ^2 (1) = 4.02, $p < .05$), which showed a 1.5 percentage point decrease.

Table 13. Manipulating a Cell Phone While Driving, by Vehicle and Wave (% distracted)

Behavior	Vehicle	October 2021	April 2022
Manipulation Observed (MO)	Car % (N)	4.5% (226)	3.6% (139)
	Pickup % (N)	4.3% (97)	3.2% (60)
	SUV % (N)	4.6% (149)	4.3% (119)
	Van % (N)	5.3% (30)	5.1% (16)
Manipulation incl. Probable (MiP)	Car % (N)	8.4% (422)	7.4% (289)
	Pickup % (N)	7.1% (162)	5.6% (105)
	SUV % (N)	7.0% (224)	6.6% (184)
	Van % (N)	8.0% (45)	7.0% (22)

Average rates of *any observed* distraction ranged from 6.0 percent in drivers of pickup trucks to 8.0 percent in drivers of vans. The difference from October 2021 to April 2022 was significant for cars (-1.8 percentage points, AO Cars, χ^2 (1) =11.11, p> .01) and pickup trucks (-2.4 percentage points, AO Pickups, χ^2 (1) =9.70, p< .01). Average rates of any distraction *including probable* were highest in van drivers (10.1%) and lowest in pickup drivers (8.5%). The difference over time was significant for cars (-1.7 percentage points; AiP Cars, χ^2 (1) = 7.1, p< .01) and pickup trucks (-2.7 percentage points; AiP Pickups, χ^2 (1) = 9.75, p< .01). Table 14 shows the usage rates for *any distraction* across vehicle types.

Table 14. Any Distraction While Driving, by Vehicle and Wave (% distracted)

Behavior	Vehicle	October 2021	April 2022
Any Distraction Observed (AO)	Car % (N)	7.3% (352)	5.5% (206)
	Pickup % (N)	7.2% (158)	4.8% (88)
	SUV % (N)	6.9% (218)	6.1% (167)
	Van % (N)	8.2% (45)	7.7% (24)
Any incl. Probable (AiP)	Car % (N)	10.8% (545)	9.1% (356)
	Pickup % (N)	9.8% (223)	7.1% (133)
	SUV % (N)	9.1% (291)	8.3% (232)
	Van % (N)	10.6% (60)	9.5% (30)

F. Distracted Driving Rates by Time of Day

Observations took place during daytime hours. Three time periods were defined for the purposes of analyses: morning observations (start time between 7:00am and 10:25am), midday (start time between 10:25am and 2:15pm) and late afternoon (start time between 2:20pm and 5:05pm). Distribution of observations was evenly divided across time period with approximately one-third of observations occurring in each time category (33.1% in the morning, 33.7% in midday, and 33.2% in late afternoon). Note that since each observation periods lasted 60 minutes, there is some overlap between the three time periods, for instance a "midday" start time of 2:00pm would end at 3:00pm, during the "late afternoon" category. Given the potential overlap between time periods, each period was analyzed separately and not compared to each other. Hence, chi-square analyses were computed to look at the difference from October 2021 to April 2022 for each of the morning, midday, and afternoon periods.

The average rates of *talking on a handheld cell phone* ranged from 1.4 percent in midday hours to 1.8 percent in late afternoon times. The difference from October 2021 to April 2022 was not significant for any of the three time periods, ranging from a drop of 0.3 (morning) to an increase of 0.4 percentage points (afternoon). Table 15 shows the rates for both handheld and handsfree usage by time of day. The average rates of handsfree phone use also hovered around 1 percent. Only the midday period showed a significant change (a drop of 1.0 percentage point) from October 2021 to April 2022 (HF Midday, $\chi^2(1) = 12.30$, $p < .0001$).

Table 15. Talking on a Cell Phone While Driving, by Time and Wave (% distracted)

Behavior	Time of Day	October 2021	April 2022
Handheld Use (HH)	Morning % (N)	1.6% (57)	1.3% (39)
	Midday % (N)	1.4% (56)	1.4% (39)
	Afternoon % (N)	1.6% (56)	2.0% (63)
Handsfree Use (HF)	Morning % (N)	1.4% (51)	0.9% (28)
	Midday % (N)	1.7% (68)	0.7% (19)
	Afternoon % (N)	1.0% (35)	0.9% (30)

Average rates of *observed* manipulation were highest in the morning (4.4%) and lowest in midday hours (4.0%). Only morning showed a significant difference between waves, with a 1.1 percentage point drop from October 2021 to April 2022 (MO Morning, χ^2 (1) = 4.70, p< .05). When *probable* manipulation was added to the *observed* manipulation, average rates ranged from 6.6 percent in late afternoon to 7.8 percent in the morning. The difference between waves was only significant for the morning period (a 1.4 percentage point decrease, MiP Morning, χ^2 (1) = 4.40, p< .05). Table 16 shows the usage rates for *manipulation* across time of day.

Table 16. Manipulating a Cell Phone While Driving, by Time and Wave (% distracted)

Behavior	Time of Day	October 2021	April 2022
Manipulation Observed (MO)	Morning % (N)	4.9% (175)	3.8% (114)
	Midday % (N)	4.4% (176)	3.6% (98)
	Afternoon % (N)	4.4% (151)	3.8% (122)
Manipulation incl. Probable (MiP)	Morning % (N)	8.5% (306)	7.1% (215)
	Midday % (N)	7.5% (301)	7.2% (195)
	Afternoon % (N)	7.1% (246)	6.0% (190)

Average rates of any *observed* distraction hovered around 6 percent throughout the day and are shown in Table 17. The difference between October 2021 and April 2022 was significant for the morning period (a 2.2 percentage point decrease, AO Morning, χ^2 (1) =12.61, p< .0001) and the midday period (a 1.6 percentage point decrease, AO Midday, χ^2 (1) =7.23, p< .01). Average rates of any distraction *including probable* were highest in the morning (9.7%) and lowest in late afternoon (8.6%). The difference between waves was only significant for the morning period (a 2.4 percentage point decrease, AiP Morning, χ^2 (1) =10.35, p< .01).

Table 17. Any Distraction While Driving, by Time and Wave (% distracted)

Behavior	Time of Day	October 2021	April 2022
Any Distraction Observed (AO)	Morning % (N)	7.6% (263)	5.4% (157)
	Midday % (N)	7.2% (283)	5.6% (145)
	Afternoon % (N)	6.7% (227)	5.9% (183)
Any incl. Probable (AiP)	Morning % (N)	10.9% (392)	8.5% (258)
	Midday % (N)	10.1% (408)	8.9% (242)
	Afternoon % (N)	9.2% (319)	7.9% (251)

IV. DISCUSSION

Results in this report were derived from roadside data collected during the first and second waves of scientific distracted driving observations in the state. The overall distracted driving rate (i.e., *any* distraction) in the State of Vermont was 7.2 percent in October 2021 and dropped significantly to 5.6 percent in April 2022, across all observed counties and categories for any type of cell phone use (talking or manipulating). Rate of *any including probable* distraction was 10.1 percent in October and dropped significantly to 8.4 percent six month later. The usage rate for manipulating a cell phone while driving was higher than that for talking on a phone while driving. Distracted driving rates tended to be higher in school zones than in other sites (mostly where phone manipulation is concerned), but differences were small. Distracted driving rates fluctuated somewhat between counties, with the small numbers given way to some volatility in the data.

With the exception of handheld rates (where no difference was found), women had higher rates of distracted driving than men. Both men and women showed a decrease in distracted driving behavior between October 2021 and April 2022. Older drivers consistently had the lowest distracted driving rates. Rates of distracted driving decreased from October to April for

the 25-59 age group in every . behavior category except handheld (where the rates were very low)

Looking at vehicle type, drivers of cars showed significant decreases over time for all behaviors except handheld. Pickup truck drivers also showed significant decreases in the more inclusive categories (i.e. MiP, AO, and AiP). The rates by time of day fluctuated, with morning observations showing significant decreases in most categories of behavior. Few changes over time were observed for midday observations (drop in HF and MiP), and afternoon observations showed no significant change between October 2021 and April 2022.

Overall though, there were some consistent decreases between the two waves of observations, especially where phone manipulation was concerned. These results are positive and very encouraging. Even in the most inclusive categories of distracted behaviors, Vermont fares quite well, with less than 10 percent of drivers showing *any* distraction (including probable, which stood at 8.4% in April 2022).

APPENDIX A: Observer Instructions/Protocol

VT: DISTRACTED DRIVING/PHONE OBSERVATIONS - PROTOCOL

For each site, choose one direction of traffic to observe and indicate this info on the form (the direction chosen for the Pre will determine which direction will be observed in the future).

Include a quick sketch of where you stood & observed on the back of an observation form for each site. Note any helpful landmarks or parking suggestions for future reference.

DD Observation Instructions

- Each observation period will last for one hour (60 minutes).
- Fill out the top of each observation form completely. Staple multiple pages.
- Observe <u>all</u> vehicles except emergency vehicles (police, fire, ambulance), mid-size, box, or heavy trucks (defined as six or more tires), and/or buses.
- Choose a spot on the designated roadway and observe traffic in the lane <u>*closest to you*</u> (i.e., observe the traffic coming toward you, not cars on the opposite side of the road—ONE LANE ONLY FOR THE FULL 60 MINUTES).
- At designated **work zone** sites, pick an observation spot immediately after the zone (to accurately determine whether distraction was happening within zone). For designated **school zone** sites, pick your spot just prior to the beginning of the zone OR immediately after (for similar reasons). Do not stand only school property or immediately at entrances to avoid parental/staff concerns.
- Vehicles must be moving. Do not observe or record driver cell phone/texting use in stopped vehicles. (or at least do not observe them for longer than you would if they are moving) ---only observe cars selected via RP below.
- Select an RP, "reference point", far enough down the road so you can't see the driver cell phone use. Use the RP to randomly select the vehicles you will observe. Record the first vehicle that crosses the RP. Record one vehicle at a time. Return your eyes to the RP and record the next vehicle that crosses. The goal is not to record every vehicle that passes, but to collect data on a consistently random selection of drivers in that particular area during a specific timeframe.
- Do not observe turn lanes. If your observation area has one, move further down the street to a spot before the turn lane begins.
- <u>For each vehicle selected from the reference point, record the following information</u>: type of vehicle (car, pickup truck, sport utility, van,), driver's age category (<25, 25-59, >60), gender, and type of use, if applicable. **REMEMBER: Record info on all *selected* vehicles, regardless of device presence.**
- Record type of phone use using the appropriate columns below (if no use, only record 1st 3 columns):

  - **Handheld Use** (X in Fourth Column): Handheld phone conversation to ear or near the ear (i.e., not in front of face).
  - **Hands Free Use** (X in Fifth Column): If you see someone alone in the car talking to themselves, mark it "Hands Free", whether or not they have an in-ear device, or the Bluetooth is built into the dashboard, or the phone is mounted in a holder or even loose

on lap or seat. Just the presence of a Bluetooth earpiece does NOT = Use. Driver must be observed talking. NOT SINGING

- **Manipulating** (X – ***or P*** – in Sixth Column): Phone in hand but not near ear, whether actively texting or not. Manipulating will be recorded either as **X** (where certain) or **P** (where "probable"). ***Normally,*** "if we don't see it, it's not happening". However, in this instance, if you "really feel in your gut" that the driver is manipulating his/her phone, but you can't see the physical device to confirm, code as **P**.
- **Handheld + Manipulating**: Talking w/ phone in hand, but not held near ear (aka Speakerphone) should have ***two*** columns marked: Handheld ***and*** Manipulating (both with **X)**.
- **Manipulating *while* Hands Free:** *Rare*: Driver with phone in hand, not held near ear, but like speakerphone or texting use – ***and*** talking with a visible Bluetooth or Wired Earpiece. In this case, both Hands Free and Manipulating columns should be marked with an X.

- Do not wear a Safety Vest while observing for distracted driving. We do not want drivers to quickly change their behavior before we can observe and record them. (Putting on a seatbelt takes more time than taking your hand off your phone.) Please discuss this with us if you are uncomfortable with this.
- Try to observe from a slightly elevated location on the side of the road if possible. Observing through the passenger window will give you a better angle to see "lower" texting/manipulating. Even a curb can help.
- Do not observe in a steady rainfall, snow, sleet, or heavy fog. If it begins to rain (or snow or sleet) steadily during an observation, stop collecting data and wait 15 minutes for the precipitation to subside. If it stops, resume observations and extend the observation period to make up for the missed time. If the bad weather continues, notify Robert that the site will need to be made up and proceed to your next scheduled observation. Do not start your next site earlier than scheduled. If observations are interrupted due to inclement weather, complete the sheet you are using, noting the end time. If you resume observations, begin a new sheet, with a new start time.
- Keep one copy of the Law Enforcement Letter with you while observing. Leave the spare letter in your car. Often police will keep your letter. Have ID on you. Be respectful and move if asked. Check the time before and after police interaction so you can stay the few extra minutes needed to complete a full 60 min of observations. Wait for police vehicles to move away from site before resuming obs.
- Use common sense: Observe from a safe distance. Dress for the weather. Bring a hat and comfortable footwear. Hydrate. Use sunblock & bug repellent if needed.
- If a site is seriously compromised due to construction, a crash, emergency vehicles etc. or is unsafe, call PRG for further instructions. Your site will either be rescheduled, or an alternate site may be selected on the spot.

APPENDIX B: Distracted Driving Observation Form

VT Distracted Driving Observation Data Form

SITE ID NUMBER: _____ **OBSERVER:_____**

CITY: _____ LOCATION: _____
(Street) (Cross Street or another landmark)

DATE: _____ - _____ - _____ **DAY OF WEEK: _____** **DIR_____**

WEATHER CONDITION (Circle):
1 Clear / Sunny **4 Fog**
2 Light Rain **5 Clear but Wet**
3 Cloudy

START TIME: _____ (Observation period exactly 1hr)

	Vehicle Type C = Car T= Pick Up S = SUV V = Van	**Age** 1 = < 25 2= 25-59 3= > 60 4= Unsure	**Sex** M=Male F=Female U=Unsure	**Handheld Use**	**Hands Free Use**	**Manipulating (YES=X, PROBABLY=P)**		**Vehicle Type** C = Car T= Pick Up S = SUV V = Van	**Age** 1 = < 25 2= 25-59 3= > 60 4= Unsure	**Sex** M=Male F=Female U=Unsure	**Handheld Use**	**Hands Free Use**	**Manipulating (YES=X, PROBABLY=P)**
1							26						
2							27						
3							28						
4							29						
5							30						
6							31						
7							32						
8							33						
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24							49						
25							50						