2024 WEST VIRGINIA OBSERVATIONAL SEAT BELT SURVEY REPORT

prepared for

West Virginia Governor's Highway Safety Program

GHSP
WEST VIRGINIA GOVERNOR'S HIGHWAY SAFETY PROGRAM

prepared by

Cambridge Systematics, Inc.

CAMBRIDGE SYSTEMATICS

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date

November 2024

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Executive Summary

West Virginia has adopted the long-term goal of zero traffic fatalities, with an interim goal of reducing fatalities by one-half by 2030, using 2006 to 2010 as a five-year average base. According to the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS), from 2018 to 2022 the average percentage of known unrestrained fatalities in the State was 42 percent. To reach the State's target of zero traffic fatalities, increasing seat belt use should be a top priority.

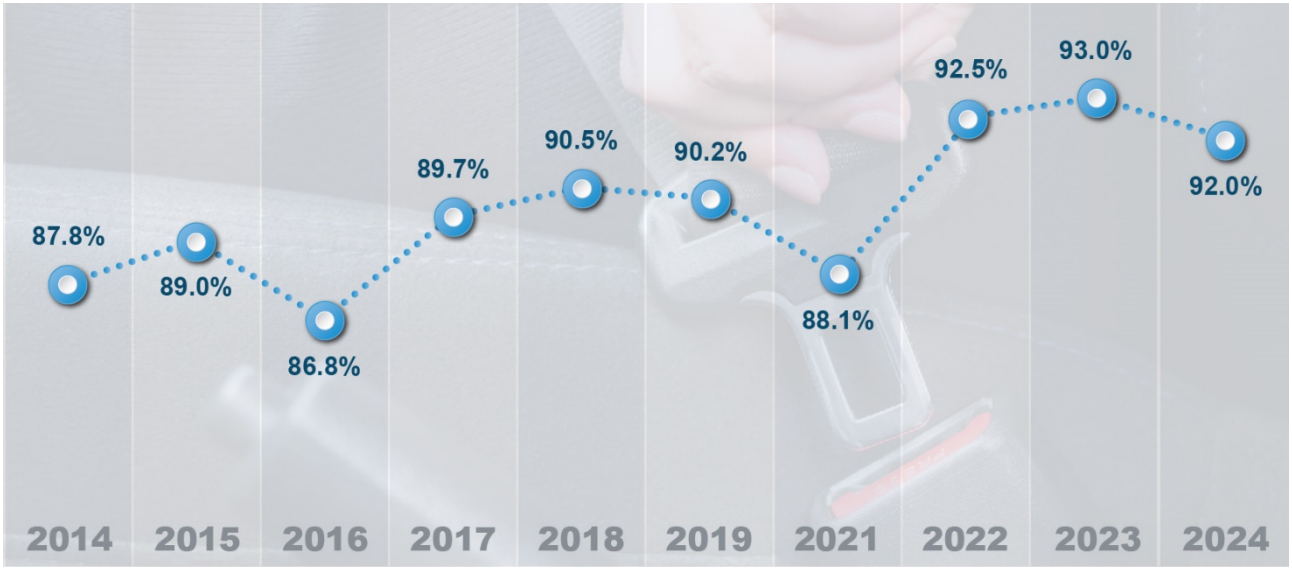
This report outlines the observed seat belt use rate in West Virginia collected between May 28 and June 7th, 2024, during both the weekdays and weekends. This report also documents the seat belt use rate and identifies the primary sources of variation in seat belt use, allowing the Governor's Highway Safety Program (GHSP) and its stakeholders to develop and revise countermeasures to address unrestrained vehicle occupants.

Observers recorded seat belt information on 22,874 drivers and 6,124 onboard front seat passengers for a total of 28,998 observations. Observers were not able to record seat belt use for 98 observations, resulting in a statewide nonresponse unweighted rate of 0.34 percent for the 2024 survey, compared to a nonresponse rate of 0.27 percent for the State's 2023 survey. An observational seat belt survey was not conducted in 2020 due to the COVID-19 pandemic. As such, in the various charts and tables in this report there will be no data to report for 2020.

The 2024 seat belt rate in West Virginia remains strong, exceeding 90 percent, with an observed rate of 91.98 percent, for readability Figure ES.1 rounds rates to the nearest tenths. The rate has a standard error of 0.03 percent (relative standard error = 0.03 percent), well within the standard requirement of 2.5 percent set forth by NHTSA. This represents a slight decrease from the 2023 observed seat belt use rate of 93.0 percent and is very close to the 2022 rate of 92.5 percent. All 14 counties where observations occurred had seat belt use rates between 79.0 percent and 99.3 percent in 2024.

Figure ES.1 West Virginia Observed Seat Belt Use Rates

2014 to 2024



Source: https://cdan.nhtsa.gov/stsi.htm# and 2023 observational seat belt survey.

Section 1 of this report discusses the sampling procedures and methods used to obtain an estimate of the seat belt use rate in West Virginia; it also describes procedures for the selection of counties, stratification of roadways, and observation sites. Section 2 details the results of this effort, beginning with the statewide seat belt use rate and trends over several years, along with a summary of the characteristics of occupants, vehicles, and observation sites. The report concludes with an analysis of selected characteristics of vehicle occupants and observation sites. The information provided by this report will help to identify the conditions under which seat belts are more or less likely to be used, allowing safety stakeholders across the State to improve upon their strategies for addressing unrestrained vehicle occupants.

Acknowledgments

Cambridge Systematics, Inc. (CS) began a partnership with the GHSP in 2018 to aid in the selection of new survey sites. CS was also involved in the development of this report. The 2024 West Virginia Observational Seat Belt Survey Report would not have been possible without the administration and support of the GHSP staff. Specifically, CS would like to thank Jack McNeely, Director and Amy Boggs, Division Manager for their assistance in compiling the survey data, overseeing the observers, and managing the day-to-day operations of the project.

1.0 Methodology

In 2011, NHTSA issued new Uniform Criteria for State Observational Surveys of Seat Belt Use in Federal Register Vol. 76, No. 63 (April 1, 2011, Rules and Regulations, pages 18042–18059). This report represents West Virginia's fulfillment of the NHTSA requirement to submit a study and data collection protocol for an annual State survey to estimate passenger vehicle occupant restraint use. The current methodology is fully compliant with the Uniform Criteria, and was used to implement West Virginia's newly revised 2023 seat belt survey which will remain in effect through 2027.

The present survey design and methodology is identical to the 2018 selection process and is updated to meet NHTSA's updated requirements. The surveyors selected the sample using a multistage, stratified cluster sampling procedure, to reflect the most recent roadway network conditions. West Virginia is divided into 55 counties and 32 of the counties account for 85 percent of all passenger vehicle fatalities between 2016 and 2020. The present survey draws observation sites from an updated selection of 14 counties. Surveyors selected a total of 116 observation sites, resulting in 4 to 12 sites per county during the survey period in May and June. Surveyors used the same methodology approved by NHTSA for the 2023 survey and the methodology is valid through 2027 unless otherwise noted.

The 2024 observation survey design involved a five-step process, which included:

1. The selection of counties based on vehicle occupant fatalities and regions of the State.
2. The stratification of roads based on functional use classes.
3. The selection of specific road segments within each stratum and county.
4. The development of seat belt use estimation procedures and computations.
5. The establishment of data collection and quality procedures consistent with NHTSA requirements.

1.1 County Selection

Surveyors identified a total of 32 counties as having the most passenger vehicle occupant fatalities. These counties accounted for 85 percent of all fatalities during the time period studied. Of the 32 counties, 14 were selected for inclusion in the 2024 observation survey to represent all three regions of the State. The selection procedure involved dividing the State into three geographic regions, then allocating the number of counties by region based on the number of qualified counties in the region, and within each region making probability-proportional-to-size (PPS) selections with the odds of selection proportional to the county's total roadway length. Appendix A shows the selected counties and identified regions of the State on the map.

1.1.1 Roadway Stratification and Definitions

The 2023 survey design identified 116 total observation sites across 14 counties in the State. A large number of observation sites were necessary to meet NHTSA's requirement of having a standard error no greater than 2.5 percent. The surveyors determined the 116 sites by the mix of counties and road type distributions within counties. Consistent with NHTSA guidelines, the 2023 survey excluded rural local roads in non-Metropolitan Statistical Area (MSA) counties. Road strata include Primary Roadways, Secondary Roadways, and Local Roads (excluding rural local roads in non-MSA counties). Each of the 14 counties has

road segments in at least one of the road strata. The survey used six segments in Primary Roadways Strata, four segments in Secondary Roadways Strata, and two segments in Local Roads Strata (excluding rural local roads in non-MSA counties).

1.1.2 Roadway Segment and Site Selection

The surveyors used an approach to identify specific roadway segments that involved a PPS procedure, with lengths of roadways defined as the "size." Segments were randomly drawn from county-stratum populations of road segments, with the probability of drawing any segment proportional to its portion of the total roadway lengths within the county-stratum. Sampling called for selecting twice the number of road segments required, retaining the order of selection, to provide for the necessary sample and an equal number of alternates, or "spare" segments. Surveyors selected and distributed a total of five certainty segments among the 116 primary and alternate segments across the roadway functional strata.

Prior to actual data collection, surveyors selected specific locations for data observations based on visits to the locations, maps, and/or online road-level images. The direction of travel to be observed was randomly selected for each segment and/or site. Sites were selected based on having a clear view of the vehicles and considering observer and direction of travel of vehicles. Efforts also were made to select observation sites where traffic naturally slows to improve accuracy. When specific site locations were unusable or not able to provide a clear view of belt use, observers chose alternate locations within the road segment where they could more effectively observe the same traffic stream. Surveyors documented details and reasons for changing locations; Appendix B provides a complete list of selected primary road segments.

1.1.3 Seat Belt Rate and Standard Error Calculations

Surveyors calculated seat belt use rates using formulas based on the proportion of the State's total roadway length "represented" by the site. Seat belt use rate calculations followed a four-step process. First, estimated rates were calculated for each road type stratum within each county. The general formula for combining observed belt use rates from observation sites on individual segments, for a single county-stratum, is shown in formula (1).

This formula is used when the county-stratum contains certainty segments; the contribution of each segment to the overall county-stratum rate is proportional to the "size" of the segment's contribution to the entire county-stratum traffic (i.e., its roadway length, adjusted by the inverse of the probability of the segment's being selected into the sample).

$$p_{i(j)k} = \frac{\sum_l S_{i(j)k} W_{i(j)k} p_{i(j)k}}{\sum_l S_{i(j)k} W_{i(j)k}} \quad (1)$$

Where $i(j)$ = county i within region j, k = stratum, l= site within stratum and county, $S_{i(j)k}$ = roadway length for segment l in county-stratum $i(j)k$, and $p_{i(j)k}$ = the observed seat belt use rate at site $i(j)k = BS_{i(j)k}/O_{i(j)k}$ where $B_{i(j)k}$ = total number of belted occupants (drivers and outboard front seat passengers) observed at site, $O_{i(j)k}$ = total number of occupants with known belt use observed at site; and $W_{i(j)k}$ = the inverse of the probability of segment l's selection, as described above: (certainty segments) $W_{i(j)k} = 1.00$ or (random segments).

$$W_{i(j)k} = \frac{\sum_{m=1}^{N} S_{i(j)klm}}{n * S_{i(j)k}}$$

Where N = total number of segments in county-stratum $i(j)k$ excluding the certainty segments and n = number of segments to be randomly selected excluding certainty segments. In the case where there were no certainty segments in the county-stratum, formula (1) reduces to the simple formula (1a):

$$p_{i(j)k} = \frac{\sum_{l=1}^{n_{i(j)k}} p_{i(j)k}}{n_{i(j)k}} \quad (1a)$$

Where $i(j)$ = county i within region j, k = stratum, l= site within stratum and county, $n_{i(j)k}$ = number of sites within the stratum-county combination, and $p_{i(j)k}$ = the observed seat belt use rate at site $i(j)kl$ = $BS_{i(j)kl}/O_{i(j)kl}$ where $B_{i(j)kl}$ = total number of belted occupants (drivers and outboard front seat passengers) observed at site, $O_{i(j)kl}$ = total number of occupants with known belt use observed at site.

Second, a county-by-county seat belt use rate, $p_{i(j)k}$, was obtained by combining county-stratum seat belt use rates across strata within counties, weighted by the stratum's relative contribution to total county roadway length:

$$p_{i(j)} = \frac{\sum_k S_{i(j)k} p_{i(j)k}}{\sum_k S_{i(j)k}} \quad (2)$$

Where $S_{i(j)k}$ = roadway length for all roads in stratum k in county $i(j)$, $p_{i(j)k}$ = the observed seat belt use rate for stratum k in county $i(j)$.

In the third step, category-weighted seat belt use rates for each region of counties were obtained by combining and weighting the rates from the sampled counties in each region by their roadway length and probabilities of being selected:

$$p_j = \frac{\sum_i S_{i(j)} W_{i(j)} p_{i(j)}}{\sum_i S_{i(j)} W_{i(j)}} \quad (3)$$

Where $S_{i(j)k}$ = roadway length for all roads k in county i and region j, $W_{i(j)}$ = the inverse of the probability of the county's selection: $W_{i(j)}$ = 1 for certainty counties; and:

$$W_{i(j)} = \frac{\sum_{l=1}^{N_{(j)}} S_{i(j)l}}{n_{i(j)} * S_{i(j)}}$$

Where $N_{(j)}$ = the number of high-fatality counties in region j and $n_{i(j)}$=the number of those counties selected.

Finally, the statewide seat belt use proportion was calculated by combining the category proportions weighted by their proportion of statewide roadway length:

$$p = \frac{\sum_{j=1}^{3} S_j p_j}{\sum_{j=1}^{3} S_j} \quad (4)$$

The result was a combination of the individual site seat belt use rates weighted to reflect each site's importance in total State roadway length.

Standard error of estimate values was estimated through a jackknife approach, based on the general formula:

$$\hat{\sigma}_{\hat{p}} = \left[\frac{1}{n*(n-1)}\sum_{i=1}^{n}(\hat{p}_i - \hat{p})^2\right]^{1/2}$$

Where $\hat{\sigma}_{\hat{p}}$ = standard deviation (standard error) of the estimated statewide seat belt use proportion $\hat{p}$ (equivalent to p in the notation of formulas 1–4), n = the number of sites, i.e., 116, and $\hat{p}_i$ = the estimated statewide seat belt use proportion with site i excluded from the calculation. The relative error rate was calculated, as well as the 95 percent confidence interval, i.e., $\hat{p} \pm 1.96\hat{\sigma}_{\hat{p}}$. These values are reported for the overall statewide seat belt use rate.

1.2 Procedures

Specific data collection procedures were established prior to the initiation of data collection, guided by the updated 2011 Uniform Criteria for State Observational Surveys of Seat Belt Use established by NHTSA.

1.2.1 Observers

The seat belt survey observers were hired under the direction of the GHSP. These observers performed all field data collection. Prior to any data collection, all observers received approximately one day of training by CS staff in 2018 after the current methodology used was approved by NHTSA. The observers received classroom instruction and several hours in the field practicing observation. Before observers conducted the observations in 2024, GHSP provided a refresher training. The staff developed training to adhere to the observation procedures found in the Uniform Criteria for State Observational Surveys of Seat Belt Use (23 Code of Federal Regulations [CFR] § 1340.7). The topics covered in this training were:

- Review of requirements and purpose of the observational seat belt survey.
- Review of observation procedures and survey data to be collected.
- Discussion of survey scenarios.
- Review of survey application.
- Review of survey dates and submission process.

Observation protocols dictate that all survey data must be collected through direct observation, surveys must occur at the selected observation sites, surveys must occur on the day and time indicated, and observations should last exactly one hour for each survey site. If the observation point was on a heavily traveled roadway making it difficult for the observer to note every vehicle, a reference point on the roadway in the appropriate lane should be chosen. That same reference point then would be used for the remainder of the observations.

The safety of the observers was a priority and covered in the training as well. All observers were to wear a reflective vest and stand in a location that would not impede traffic. Observers were advised that if

construction or weather conditions, such as heavy rain or fog, were present that it was permissible, after notifying GHSP, to reschedule or request an alternate site for the same day and time.

To ensure quality control, the staff provided observers with a refresher training to re-familiarize them with the system.

Lastly, per 23 CFR § 1340.7, observer quality control was overseen by GHSP monitors who went into the field and conducted random unannounced visits at no less than five percent of observation sites. These unannounced visits confirmed that observers were conducting observations at the location, day, and time established in the planning and selection phase. For the 2024 survey, the observer staff remained mostly the same as the previous year. The observers were provided with a revised PowerPoint presentation from 2018 to serve as a refresher for adherence to the observation procedures found in the Uniform Criteria for State Observational Surveys of Seat Belt Use (23 CFR § 1340.7).

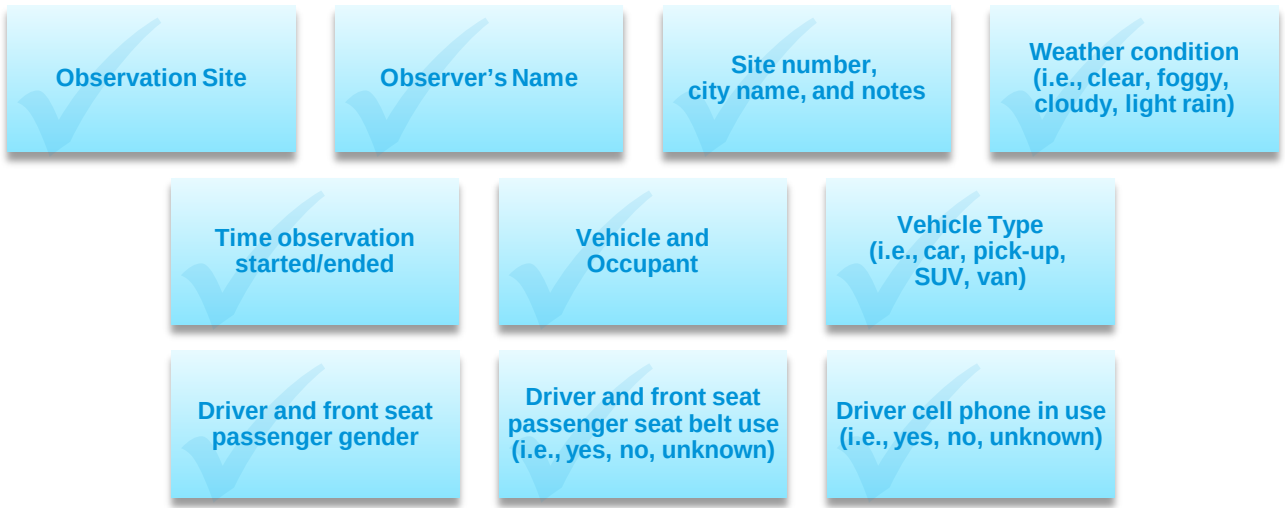
1.2.2 Observation Schedule

Using the survey sites approved by NHTSA in March of 2023, CS worked with the GHSP to establish the observation schedule for 2024. Observations were scheduled between 7:00 a.m. and 6:00 p.m. Exact timing of the observation periods was subject to adjustment so that the resulting number of sites being observed throughout the chosen timeframe were approximately equal. Whenever possible, three to five sites within relative proximity to each other were scheduled for observation on any day. The days of the week assigned were balanced to similar counties to ensure all days of the week have similar clusters. The first site in any cluster to be observed each day was randomly selected, and the additional sites were assigned in an order that provided balance by type of site and time of day while minimizing travel distance and time.

1.2.3 Data Collection Application

To improve not only the timeliness of the observed seat belt use rate results, but also the uniformity and accuracy of the data collected, observers used a survey application (App) on tablet computers. The survey App (see Appendix C) was specifically tailored for West Virginia's observers and did not materially change between its use in the 2018 survey and the 2024 survey. CS worked with the App developer to provide them with all the specific 2023 survey site information. The observers were able to select their survey site from a list; the App provided a map overview of the area to conduct the survey and, if applicable, the survey direction. Information collected on the survey App included information on the specific observation site and vehicle and occupant information (Appendix C).

Figure 1.1 Data Collected from Observational Surveys



2.0 Results

This section presents the results of the analysis on the 28,998 vehicle and occupant observations made in 2024. Surveyors made an extensive effort to summarize the characteristics of occupants, vehicles, and observation sites. The table below provides the seat belt use rate based on the weighted sample of observations. In addition to the overall seat belt use rate, this section presents descriptions of the weighted belt use rate by county, roadway type, gender, vehicle type, cell phone use, and observed belt use of both the driver and front seat passenger. The analysis begins with a description of the sample, including the known and unknown number of occupants, their use of a seat belt, and the nonresponse rate for the survey. This information is followed by a brief analysis of the total sample of both drivers and passengers by county.

Table 2.1 Seat Belt Use Rate

Statistic	Values	Notes
WV Statewide Seat Belt Use Rate	91.98%	
Standard Error	0.03%	<2.50%
Relative Error Rate	0.03%	(0.0003 / 0.9198)
95 Percent Confidence Interval Upper Bound	92.04%	0.9198 + 1.96*0.0003
95 Percent Confidence Interval Lower Bound	91.93%	0.9198 - 1.96*0.0003

The table below provides a description of the number of occupants using and not using a seat belt and the statewide nonresponse rate. Observers were able to ascertain seat belt use for 28,998 occupants, including 22,874 drivers and 6,124 front seat passengers. However, observers were not able to record seat belt use for 98 observations. This resulted in a statewide nonresponse rate (weighted) of 0.39 percent for the 2024 survey, well within the 2.5 percent threshold of acceptability.

Table 2.2 Statewide Seat Belt Use and Nonresponse Rate

Statistic	Values	Notes
Total Occupants with Unknown Seat Belt Status	98	
Total Occupants Observed	28,998	
Sample Nonresponse Rate	0.34%	
Statewide Nonresponse Rate (Weighted)	0.39%	< 2.5%

The table below displays the total number and percentage of observed front seat occupants. As shown, a total of 22,874 drivers and 6,124 outboard front seat passengers were observed. These observations were compiled across 116 observation sites across 14 counties. Three counties had observation counts that exceeded 11 percent of all observations, Cabell (12.7 percent), Lewis (11.9 percent), and Putnam (14.3 percent). These three counties collectively account for over a third of all observations in the state (39.0 percent).

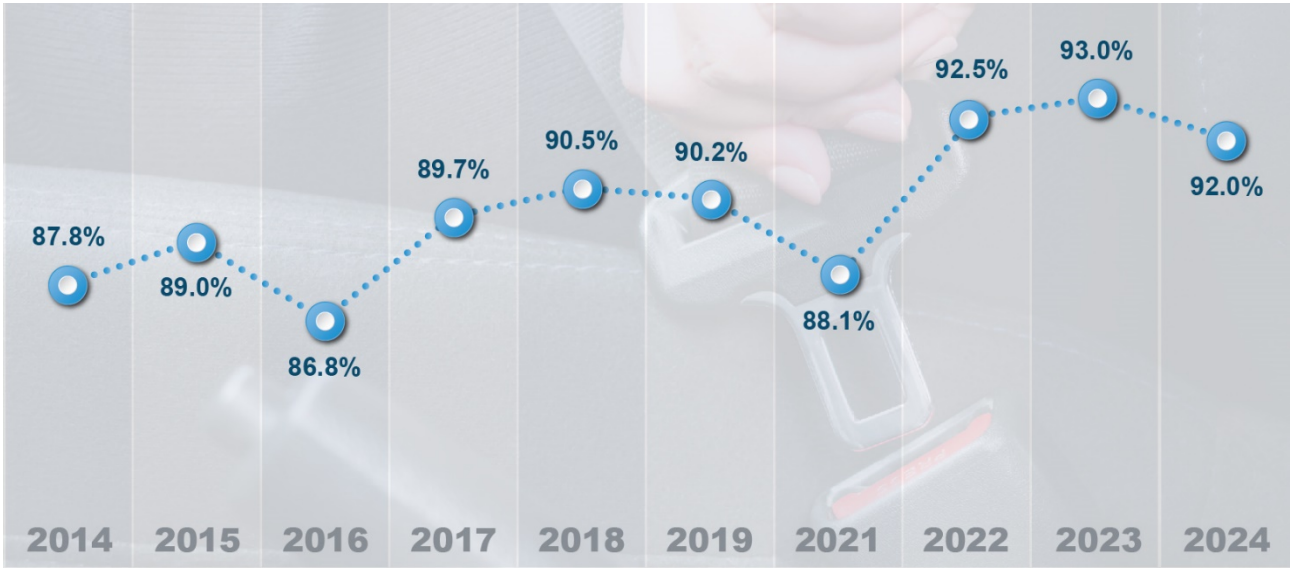
Table 2.3 Observed Rate by County

County	Drivers		Passengers		Total	
	N	%	N	%	N	%
Braxton	1,961	8.6%	564	9.2%	2,525	8.7%
Cabell	3,060	13.4%	635	10.4%	3,695	12.7%
Greenbrier	2,199	9.6%	769	12.6%	2,968	10.2%
Harrison	1,978	8.6%	411	6.7%	2,389	8.2%
Jefferson	1,700	7.4%	529	8.6%	2,229	7.7%
Lewis	2,597	11.4%	860	14.0%	3,457	11.9%
Lincoln	649	2.8%	164	2.7%	813	2.8%
Mason	899	3.9%	264	4.3%	1,163	4.0%
McDowell	212	0.9%	89	1.5%	301	1.0%
Morgan	722	3.2%	122	2.0%	844	2.9%
Putnam	3,494	15.3%	651	10.6%	4,145	14.3%
Raleigh	1,956	8.6%	674	11.0%	2,630	9.1%
Randolph	823	3.6%	142	2.3%	965	3.3%
Upshur	624	2.7%	250	4.1%	874	3.0%
Total	22,874	100.0%	6,124	100.0%	28,998	100.0%

Historically, over time, West Virginia has seen its weighted seat belt use rate climb. In 1992, the usage rate was at 32 percent and climbed to 49.5 percent in 2000. The 91.98 percent seat belt use rate achieved in 2024 represents a slight decline from the 2023 statewide rate of 93 percent. However, it remains strong, consistently above 90 percent. Figure 2.1 shows the linear trend over the last 10 years continues to move upwards, indicating the overall observed seat belt use rate continues to improve despite some historical year-over-year downturns.

Figure 2.1 Observed Seat Belt Use Rates

2014 to 2024



Source: https://cdan.nhtsa.gov/stsi.htm# and 2023 observational seat belt survey.

The percent weighted seat belt use rate for all vehicle occupants by county for 2024 is shown in Figure 2.2. Eight counties had weighted seat belt use rates above 95 percent, including Braxton, Cabell, Greenbrier, Harrison, Lewis, Raleigh, Randolph and Upshur. Putnum County recorded the lowest seat belt use rate at 79.0 percent, slightly higher than in 2023. In both years, the county had a low sample size, representing only 1-1.5 percent of the total observations (a new county that was added to the site selection in 2023). Among the 14 counties where observations were conducted, 11 counties had a seat belt use rate above 90 percent, accounting for approximately 80 percent of the total observations.

Figure 2.2 Weighted Seat Belt Use Rate by County

2024

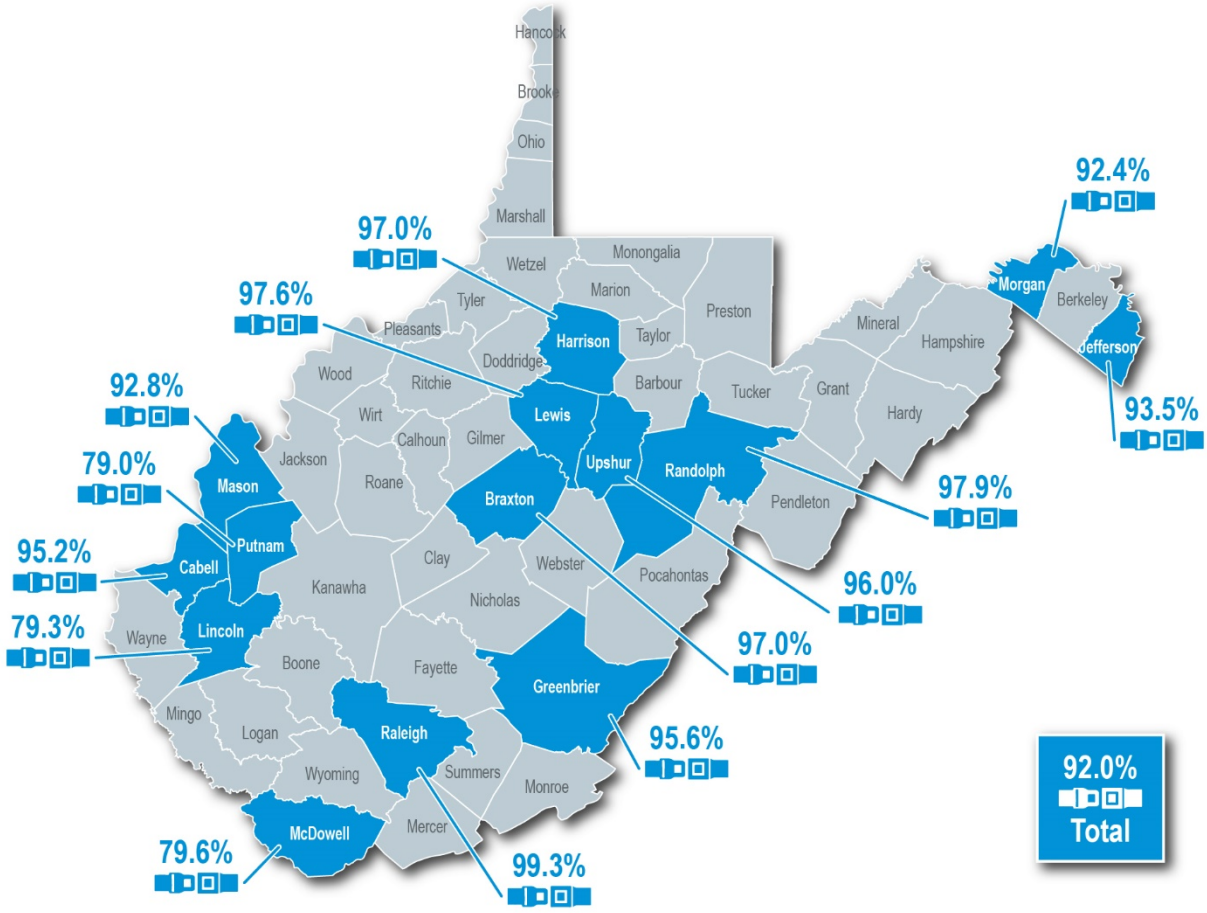


Table 2.4 displays the weighted seat belt use rate by county for 2019 to 2024. However, since new survey sites were selected in 2023, counties of the 2023 selection are shown and only the matching eight counties are included back to 2019. Of these eight counties with historical trends, five counties (Braxton, Greenbrier, Harrison, Lewis, and Raleigh) had a higher observed rate in 2024 than 2019.

Table 2.4 Select County Observed Seat Belt Rates (2018 Selection)
2019–2024

County	2019	2021	2022	2023	2024
Berkeley	99.7%	83.9%	96.3%		
Boone	93.1%	83.5%	85.9%		
Braxton	92.7%	96.9%	97.2%	94.3%	97.0%
Greenbrier	94.9%	95.9%	98.7%	94.9%	95.6%
Harrison	62.2%	85.7%	99.2%	96.8%	97.0%
Jackson	90.1%	90.4%	83.9%		
Lewis	95.8%	92.7%	99.4%	96.6%	97.6%
McDowell	80.5%	73.8%	84.0%	78.8%	79.6%
Mingo	72.1%	85.6%	85.7%		
Monongalia	97.2%	95.5%	96.2%		
Pendleton	98.5%	89.6%	90.9%		
Putnam	90.5%	87.6%	89.0%	92.4%	79.0%
Raleigh	97.1%	89.0%	95.3%	96.1%	99.3%
Randolph	99.7%	88.0%	97.3%	97.4%	97.9%
Total	**90.2%**	**88.1%**	**92.5%**	**93.0%**	**92.0%**

Table 2.5 shows the survey results for the 14 counties selected in 2023. Notably, there was a nearly 35 -point gain in Harrison County from 2019 to 2024. This change falls outside the deviation that would be expected over the 2019 to 2024 period, but generally post-COVID trends were unpredictably dynamic. While only eight counties were consistent between the 2019 and 2024 selection, all but Putnam County saw relatively consistent or increased seatbelt usage, and Putnam's decline is impacted by uniquely low sample size.

Table 2.5 County Weighted Seat Belt Rates (2023 Selection)
2019–2024

County	2019	2021	2022	2023	2024
Braxton	92.7%	96.9%	97.2%	94.3%	97.0%
Cabell				92.1%	95.2%
Greenbrier	94.9%	95.9%	98.7%	94.9%	95.6%
Harrison	62.2%	85.7%	99.2%	96.8%	97.0%
Jefferson				97.4%	93.5%
Lewis	95.8%	92.7%	99.4%	96.6%	97.6%
Lincoln				82.5%	79.3%
Mason				95.9%	92.8%

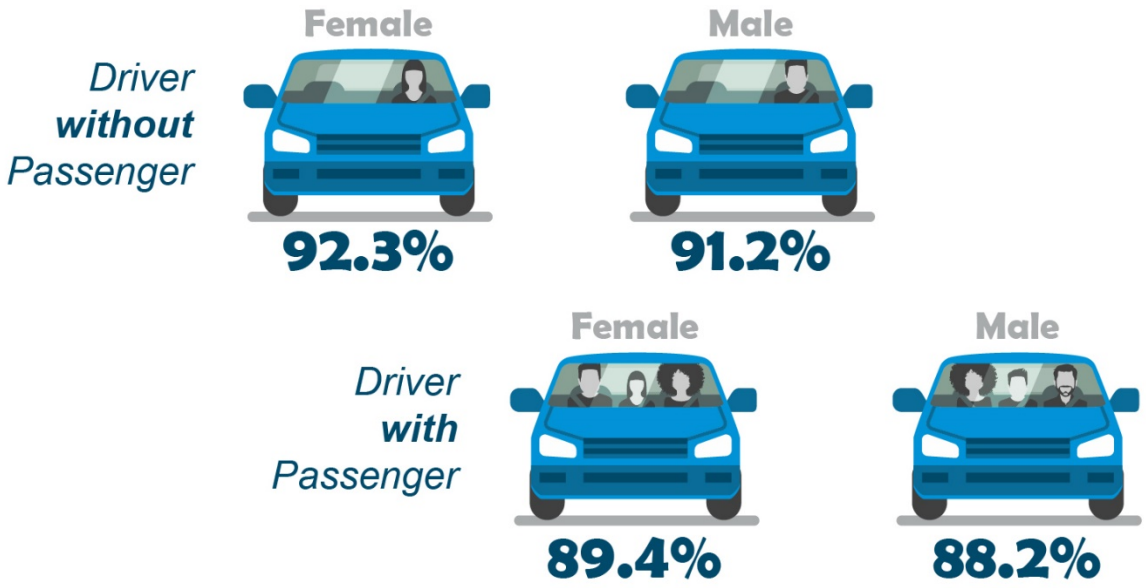
McDowell				78.8%	79.6%
Morgan				93.6%	92.4%
Putnam	90.5%	87.6%	89.0%	92.4%	79.0%
Raleigh	97.1%	89.0%	95.3%	96.1%	99.3%
Randolph	99.7%	88.0%	97.3%	97.4%	97.9%
Upshur				97.2%	96.0%
Total	**90.2%**	**88.1%**	**92.5%**	**93.0%**	**92.0%**

2.1 Characteristics of Belted Drivers and Passengers

This section analyzes various characteristics of drivers and passengers and their relationships with belt use to identify variations in seat belt use by occupant, site characteristics, and vehicle type. It is anticipated this information will help to identify the conditions where seat belts are more or less likely to be used in the State to help develop appropriate countermeasures in education and enforcement.

When segmenting the data by seat belt use rate for drivers with or without a passenger in the front seat, the observations led to some interesting findings. In the 2021 survey, male drivers had an 11.2-point higher seat belt rate with a passenger than driving alone, and female drivers had a 2.8-point higher seat belt rate with a passenger than without. In the 2022 survey, male drivers had a 4.8-point higher seat belt rate with a passenger than driving alone, and female drivers had a 1.9-point higher seat belt rate with a passenger than without. In the 2023 survey, male drivers had a 2.3-point higher seat belt rate with a passenger than driving alone, and female drivers had a 4.0-point higher seat belt rate with a passenger than without. Finally, in the most recent 2024 survey, both female and male drivers with a passenger were less likely to be belted, bucking the long established trend of higher seat belt use rates when driving with a passenger. This may be a one year anomaly, but as additional years' worth of data become available stronger conclusions and correlations may be possible.

Figure 2.3 2024 Weighted Seat Belt Use Rate for Drivers with Passenger Versus Without



Generally speaking, male drivers were less likely to use seat belts compared to female drivers (Table 2.6). This finding is consistent with previous observational surveys in West Virginia over the past several years. Male drivers (90.9 percent) continued to be less likely to be observed wearing a seat belt in comparison to female drivers (93.5 percent). In 2024, the gap between male and female narrowed marginally from 2023 to 2.6 points from approximately 4 points. Similarly, in Table 2.7, male passengers were less likely to use a seat belt (86.6 percent) compared to female passengers (91.2 percent).

Table 2.6 shows the distribution of the driver's seat belt use by gender and county in 2024. Across the 14 counties studied, the belt use rate for males (90.9 percent) was lower than females (93.5 percent). Females had a higher seat belt rate in 12 of the 14 counties. Only in Jefferson and Lincoln Counties did females (95.5 and 76.6 percent, respectively) have a lower seat belt rate than males (95.9 and 82.4 percent, respectively). This disparity is likely not a larger trend, but is slightly larger than the number of counties with this observation in 2023 (1).

Table 2.6 Driver Belt Use Rates by Gender and County

	Drivers		
	Male %	Female %	Total %
Braxton	96.2%	99.4%	96.9%
Cabell	94.4%	97.1%	95.2%
Greenbrier	93.4%	98.9%	95.3%
Harrison	96.0%	98.6%	96.8%
Jefferson	95.9%	95.5%	95.0%
Lewis	97.3%	98.6%	97.7%
Lincoln	82.4%	76.6%	79.5%
Mason	89.3%	98.5%	92.0%

	Drivers		
	Male %	Female %	Total %
McDowell	77.4%	85.6%	80.6%
Morgan	91.5%	94.2%	92.6%
Putnam	72.4%	77.6%	79.5%
Raleigh	99.2%	99.9%	99.3%
Randolph	96.8%	99.7%	97.6%
Upshur	95.9%	96.7%	96.1%
Total	**90.9%**	**93.5%**	**92.2%**

The following table (Table 2.7) displays the results of seat belt use for passengers by gender and county. Similar to the results for drivers, the findings showed correlations between seat belt use of passengers by gender. Across the 14 counties studied, the belt use rate for male passengers (86.6 percent) is much less than females passengers (91.2 percent) based on the algorithm used for all sites in the same county and same road stratum weight. The largest disparity was in Putnam County, where male passengers were recorded using seat belts only 11.4 percent of the time, compared to 55.3 percent for female passengers. While this 44-point gap seems significant, it is likely due to statistical nuances rather than a widespread concern. Male seat belt usage was lower than female usage statewide in the passenger category. Additionally, the methodology assigns higher weight to local roads, where very few passengers were observed in Putnam County, which may have contributed to the disparity.

Table 2.7 Passenger Belt Use Rates by Gender and County

	Passengers		
	Male %	Female %	Total %
Braxton	90.4%	99.9%	97.8%
Cabell	99.0%	95.4%	95.5%
Greenbrier	95.6%	97.0%	96.7%
Harrison	98.8%	98.7%	98.7%
Jefferson	90.1%	92.5%	91.1%
Lewis	97.1%	97.8%	97.0%
Lincoln	76.9%	81.0%	78.9%
Mason	99.3%	95.1%	95.7%
McDowell	83.7%	75.8%	78.9%
Morgan	82.6%	99.9%	93.6%
Putnam	11.4%	55.3%	55.3%
Raleigh	99.9%	99.0%	90.4%
Randolph	100.0%	100.0%	100.0%
Upshur	92.9%	96.4%	95.7%
Total	**86.6%**	**91.2%**	**89.9%**

As with most of the nation, West Virginia saw its lowest seat belt use rate in pickup trucks (86.3 percent), followed by SUVs (92.1 percent), then vans (92.5 percent) and cars (93.7 percent), the three of which tend to be similar in use rate generally. Geographically, the Northern region of the State saw the highest seat belt use rate (96.4 percent), followed by the Eastern Panhandle region (92.9 percent), with the lowest use rate coming from the Southern region of the State (88 percent). These results are similar to those of last year's study (2023). A map of the State's regions can be found in Appendix A. When analyzing roadway functional class, local roadways had the lowest observed seat belt rate at 89.1 percent, followed by secondary roadways at 93.4 percent. Primary roadways had the highest rate, at 96.9 percent, consistent with the 2023 results , except for local roads, which saw a 3 percent decline. This decrease could be attributed to the lower number of observations on local roads.

Table 2.8 Seat Belt Use Rate for Drivers and Passengers by Vehicle Type and Site Characteristics

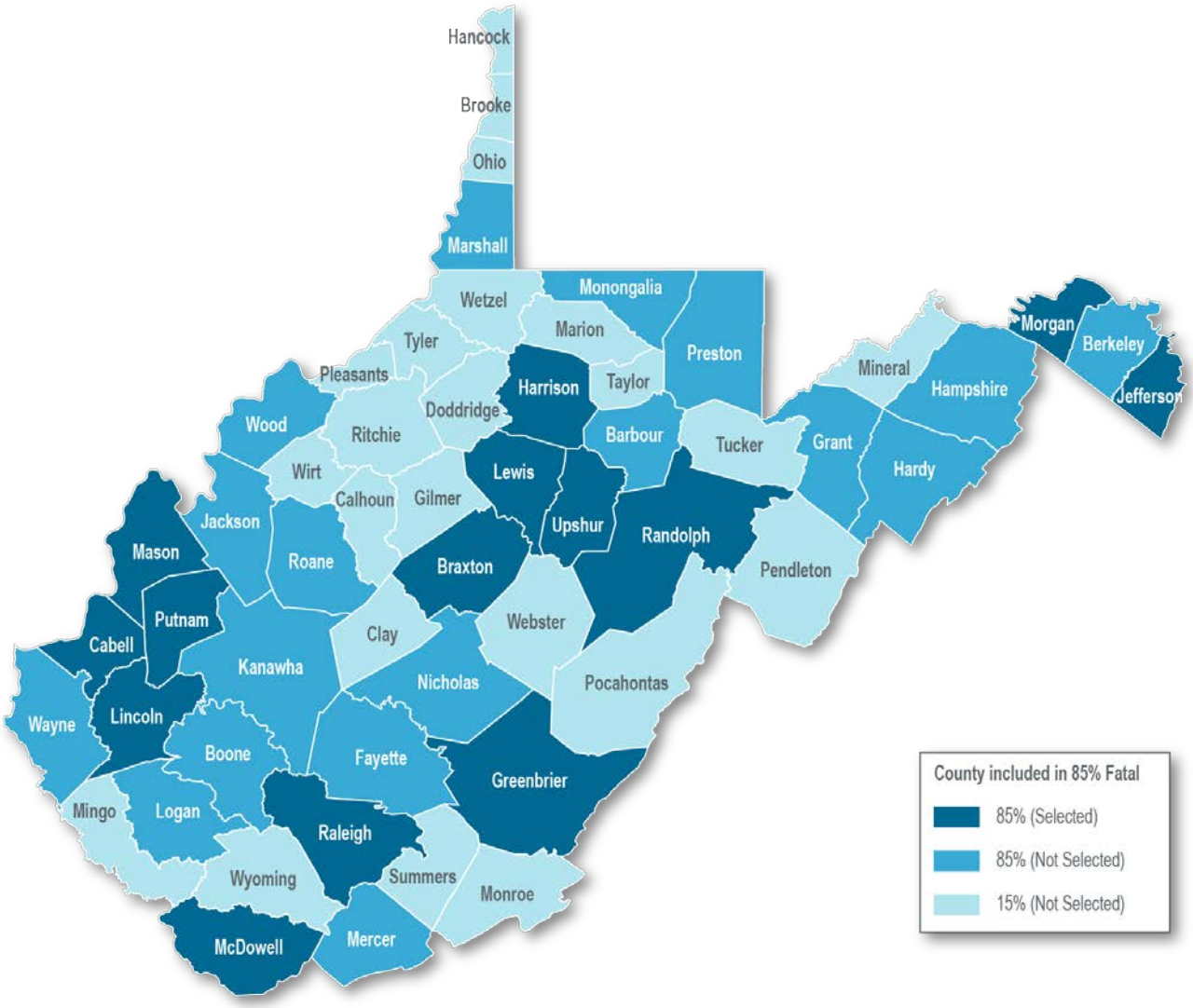
Vehicle Type and Site Characteristics	Driver	Passenger	Total
Vehicle Type			
Car	93.8%	97.2%	93.7%
Pickup Truck	86.5%	87.4%	86.3%
Van	93.7%	87.4%	92.5%
SUV	92.7%	91.6%	92.1%
Region			
Eastern Panhandle	93.8%	92.3%	92.9%
North	96.1%	97.5%	96.4%
South	88.4%	82.7%	88.0%
Functional Class			
Primary	96.6%	98.1%	96.9%
Secondary	93.4%	86.5%	93.4%
Local	90.0%	84.6%	89.1%

Cell phone use while driving is one form of distracted driving. The seat belt observers also were able to capture observed cell phone use during the survey of those drivers using hand-held cell phones. The table below shows the number of observations of driver cell phone use and no cell phone use and breaks it down by gender and whether a seat belt was in use. Males had an observed cell phone use of 2.1 percent, whereas females had a slightly higher observed use of 2.5 percent. Among drivers observed using a cell phone, 60.5% were male, while 39.5% were female. Additionally, 90.8% of drivers using a cell phone were wearing a seat belt, compared to 95.9% of drivers who were not using a cell phone. This could suggest a correlation between belted drivers and being less likely to use a cell phone while driving, which has been observed in previous years.

Table 2.9 Observed Cell Phone Use by Gender and Seat Belt Use

	Cell Phone Use		No Cell Phone Use	
	Number	Percent	Number	Percent
Gender				
Male Driver	310 (2.1% of all males)	60.5%	14,533	65.3%
Female Driver	202 (2.5% of all females)	39.5%	7,730	34.7%
Seat Belt Use				
Use	464	90.8%	21,350	95.9%
No Use	47	9.2%	917	4.1%

Appendix A. Seat Belt Observational Counties and Regions



Appendix B. Seat Belt Observational Survey Site List

Site ID	Site Type	Date Observed	Sample Weight	Number of drivers	Number of front passengers	Number of occupants[1] belted	Number of occupants unbelted	Number of occupants with unknown belt use
1	Original	6/3/2024	195.9564274	201	77	272	6	0
2	Original	6/3/2024	60.89874885	79	20	95	4	0
3	Original	6/2/2024	37.94752263	287	94	373	7	1
4	Original	6/3/2024	34.33292677	275	79	348	6	0
5	Original	6/2/2024	46.79573242	356	99	450	5	0
6	Original	6/2/2024	104.6254887	348	56	393	11	0
7	Original	6/3/2024	83.38969712	20	3	22	1	0
8	Original	6/3/2024	97.01485109	352	116	464	4	0
9	Original	6/2/2024	118.8783971	8	1	9	0	0
10	Original	6/2/2024	400.7510877	35	19	49	5	0
11	Original	6/2/2024	48.71925934	126	21	135	11	1
12	Original	5/31/2024	535.2243165	252	57	284	23	2
13	Original	6/3/2024	10.78064635	305	61	339	24	3
14	Original	6/2/2024	16.43338823	176	68	229	13	2
15	Original	5/31/2024	73.94961085	230	48	261	17	0
16	Original	6/3/2024	22.69966833	247	61	280	26	2
17	Original	5/31/2024	20.95914984	407	55	433	28	1
18	Original	6/3/2024	458.5011944	535	116	605	43	3
19	Original	6/2/2024	43.30379815	474	98	532	40	0
20	Original	5/31/2024	41.1505315	239	35	250	23	1
21	Original	6/3/2024	2393.127703	48	11	56	3	0
22	Original	6/2/2024	5684.699291	21	4	24	1	0
23	Original	6/3/2024	15.02642364	295	57	331	21	0
24	Original	6/3/2024	29.28744827	208	29	227	10	0
25	Original	6/3/2024	53.86705472	230	37	259	8	0
26	Original	6/1/2024	22.83646007	340	176	508	8	0
27	Original	6/1/2024	22.11341068	178	38	211	5	0
28	Original	6/1/2024	39.43405413	372	221	583	10	0
29	Original	6/3/2024	853.6494067	28	7	34	1	0
30	Original	6/1/2024	337.8260025	73	40	106	7	0
31	Original	6/1/2024	906.7408018	364	145	477	32	0
32	Original	6/3/2024	52.57852473	111	19	124	6	0
33	Original	5/28/2024	558.9788664	186	24	204	6	0

Site ID	Site Type	Date Observed	Sample Weight	Number of drivers	Number of front passengers	Number of occupants[1] belted	Number of occupants unbelted	Number of occupants with unknown belt use
34	Original	5/30/2024	30.45702406	195	59	249	4	1
35	Original	5/30/2024	43.4503916	48	7	52	3	0
36	Original	5/30/2024	33.123556	303	71	363	9	2
37	Original	5/28/2024	33.41574168	181	33	205	7	2
38	Original	5/30/2024	18.96670035	218	42	253	7	0
39	Original	5/30/2024	310.9369491	181	38	211	7	1
40	Original	5/28/2024	210.2922716	248	51	296	3	0
41	Original	5/28/2024	465.8961893	153	13	158	8	0
42	Original	5/28/2024	72.60691844	265	73	328	9	1
43	Original	6/2/2024	11.48978261	90	29	118	0	1
44	Original	5/31/2024	10.72853306	77	17	92	0	2
45	Original	5/31/2024	21.88368349	73	12	83	2	0
46	Original	5/31/2024	14.07645263	103	11	112	1	1
47	Original	6/2/2024	14.85136257	80	15	94	1	0
48	Original	6/2/2024	3.488506515	48	13	61	0	0
49	Original	5/31/2024	34.76682081	167	29	192	3	1
50	Original	6/1/2024	363.2157598	252	105	355	2	0
51	Original	6/1/2024	88.229718	119	42	161	0	0
52	Original	6/2/2024	685.8462661	651	234	883	2	0
53	Original	6/1/2024	728.9352297	26	15	37	4	0
54	Original	6/1/2024	3605.572051	14	7	20	1	0
55	Original	5/31/2024	8.184947767	503	171	667	7	0
56	Original	6/1/2024	53.0863417	136	52	181	6	1
57	Original	6/1/2024	37.24591211	86	47	129	3	1
58	Original	6/1/2024	28.35346222	143	29	164	7	1
59	Original	5/31/2024	4.066083095	462	192	645	9	0
60	Original	5/31/2024	6.896019428	743	260	984	19	0
61	Original	5/31/2024	37.87959928	127	17	140	3	1
62	Original	6/1/2024	227.6250028	121	32	146	7	0
63	Original	6/1/2024	260.5972796	70	18	87	1	0
64	Original	5/31/2024	353.9821505	206	42	243	5	0
65	Original	5/29/2024	719.4532903	76	16	88	3	1
66	Original	5/31/2024	229.1065587	198	53	209	39	3
67	Original	5/29/2024	130.2891788	199	37	209	25	2
68	Original	5/29/2024	108.2630155	67	13	73	5	2
69	Original	5/31/2024	330.0919732	11	7	13	5	0

Site ID	Site Type	Date Observed	Sample Weight	Number of drivers	Number of front passengers	Number of occupants[1] belted	Number of occupants unbelted	Number of occupants with unknown belt use
70	Original	5/31/2024	264.6671452	98	38	113	21	2
71	Original	5/30/2024	174.8482841	46	18	36	27	1
72	Original	5/30/2024	320.4090778	41	8	44	4	1
73	Original	5/30/2024	719.5819402	85	41	105	20	1
74	Original	5/30/2024	237.0728389	40	22	53	9	0
75	Original	6/1/2024	109.2376466	38	10	42	6	0
76	Original	6/1/2024	209.5423842	224	56	260	18	2
77	Original	6/1/2024	93.9091008	220	56	266	10	0
78	Original	6/1/2024	3451.559604	417	142	523	35	1
79	Original	6/4/2024	66.8101227	223	38	244	15	2
80	Original	6/3/2024	485.4152616	150	34	171	12	1
81	Original	6/3/2024	25.86542665	100	16	107	9	0
82	Original	6/3/2024	196.3331486	55	10	61	3	1
83	Original	6/4/2024	418.0663179	44	2	40	4	2
84	Original	6/4/2024	616.3109402	150	22	160	11	1
85	Original	5/30/2024	13.41230106	426	78	467	28	9
86	Original	5/30/2024	12.42833201	505	82	537	39	11
87	Original	5/28/2024	18.62641562	320	32	295	46	11
88	Original	5/29/2024	25.64277389	548	160	697	11	0
89	Original	5/29/2024	23.07991276	599	85	676	8	0
90	Original	5/29/2024	58.33467318	608	143	738	13	0
91	Original	5/30/2024	231.5053769	63	12	65	8	2
92	Original	5/29/2024	35.86192863	124	22	142	4	0
93	Original	5/28/2024	53.79682324	103	8	98	10	3
94	Original	5/28/2024	553.0141789	186	27	175	33	5
95	Original	5/30/2024	2885.644783	9	2	6	5	0
96	Original	5/28/2024	1364.37114	3	0	3	0	0
97	Original	6/2/2024	130.5563237	170	103	272	1	0
98	Original	6/2/2024	39.37387119	163	56	218	1	0
99	Original	5/30/2024	60.39972088	127	49	175	1	0
100	Original	6/2/2024	160.3226461	164	104	266	2	0
101	Original	5/30/2024	138.3297619	207	44	246	4	1
102	Original	5/30/2024	122.206824	217	89	303	3	0
103	Original	5/30/2024	206.9952513	183	43	222	4	0
104	Original	6/7/2024	452.5408631	186	30	209	7	0
105	Original	6/7/2024	142.4885108	108	31	137	2	0

Site ID	Site Type	Date Observed	Sample Weight	Number of drivers	Number of front passengers	Number of occupants[1] belted	Number of occupants unbelted	Number of occupants with unknown belt use
106	Original	6/7/2024	126.1758151	234	57	287	4	0
107	Original	6/7/2024	3262.18082	8	2	10	0	0
108	Original	6/2/2024	3833.033079	189	66	252	3	0
109	Original	5/30/2024	57.05588572	136	26	156	6	0
110	Original	5/30/2024	33.91695113	67	10	75	2	0
111	Original	5/30/2024	33.0675239	98	21	119	0	0
112	Original	5/30/2024	327.7963074	522	85	595	12	0
113	Original	6/2/2024	48.42695075	111	44	152	3	0
114	Original	6/2/2024	50.14197877	68	20	81	7	0
115	Original	6/2/2024	344.5322152	157	58	209	5	1
116	Original	6/2/2024	44.56608907	288	128	401	15	0
Total				**22,874**	**6,124**	**27,777**	**1,123**	**98**

[1] Occupants refer to both drivers and passengers.

Appendix C. Observational Survey Collection Form