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Abstract
This report presents results from the 2019 National Occupant Protection Use Survey (NOPUS) Controlled Intersection Study, the only nationwide probability-based occupant restraint use survey. NHTSA's National Center for Statistics and Analysis conducts this survey annually. The 2019 NOPUS found that seat belt use among male occupants increased significantly from 87.7 percent in 2018 to 89.1 percent in 2019; however, seat belt use continued to be lower for males (89.1%) than females (92.7%). Seat belt use in rear seats (77.5%) continued to be lower than that in front seats (90.7%). Restraint use for children from birth to 7 years old in 2019 was 91.3 percent, not statistically different from 90.4 percent in 2018.

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Definitions

The percentages provided in this report are interpreted as the percentages of occupants during an average daylight moment.

Vehicle occupants observed in the NOPUS survey are counted as "belted" if they appear to have a shoulder belt across the front of the body. NOPUS does not observe the use of lap belts because these restraints cannot be reliably observed from the roadside.

The survey classifies a child as follows.

- Restrained in a rear-facing car seat if the child appears to be on a seat on top of the vehicle seat, facing the rear of the vehicle, with harness straps across the front of the child.
- Restrained in a forward-facing car seat if the child appears to be on a seat on top of the vehicle seat, facing the front of the vehicle, with harness straps across the front of the child.
- Restrained in a high-backed booster seat if the child appears to be on a seat on top of the vehicle seat with a shoulder belt across the front of the child.
- Restrained in a seat belt or backless booster seat if there is a shoulder belt across the front of the child but the observers cannot see if the child is in a seat on top of the vehicle seat.
- Restrained if the child is restrained by any of the above.
- The remaining children are classified as unrestrained. Note that in the survey there is no mention of being "unrestrained" in, for example, a forward-facing car seat. NOPUS does not observe the use of lap belts, and does not distinguish between seat belts and backless booster seats, because these assessments cannot be reliable if observed from the roadside.

The racial categories "Black," "White," and "Members of other races" in NOPUS reflect subjective characterizations by roadside observers regarding the race of vehicle occupants. Likewise, observers record age groups (8 to 15 years old, 16 to 24 years old, 25 to 69 years old, and 70 and older) that best fit their visual assessment of each observed occupant.

"Expressways" are defined as roadways with limited access, while "surface streets" are all other roadways.

A roadway is defined to have "fast traffic" during the observation period if the average speed of passenger vehicles passing the observers exceeds 50 mph, with "medium-speed traffic" defined as 31 to 50 mph, and "slow traffic" defined as 30 mph or slower.

A roadway is defined to have "heavy traffic" during the observation period if the average number of vehicles on the roadway is greater than 5 per lane per mile, with "moderately dense traffic" defined as greater than 1 but less than or equal to 5 vehicles per lane per mile, and "light traffic" as less than or equal to 1 vehicle per lane per mile. Please note that this traffic density breakdown was revised in the 2011 NOPUS to better capture the traffic patterns.

The NOPUS sample design does not allow for State-by-State restraint use estimates; however, NOPUS produces estimates by region, defined as follows.

Northeast: Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont

Midwest: Iowa, Kansas, Illinois, Indiana, Michigan, Minnesota, Missouri, North Dakota, Nebraska, Ohio, South Dakota, Wisconsin

South: Alabama, Arkansas, the District of Columbia, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia

West: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming

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Executive Summary

NOPUS, the National Occupant Protection Use Survey, is the only nationwide probability-based survey of seat belt use (for occupants 8 and older in both front and rear seats), motorcycle helmet use, child restraint use (for children under 8 years old), and driver electronic device use in the United States. NHTSA's National Center for Statistics and Analysis conducts this survey annually. Two sub-surveys – the Moving Traffic Survey and the Controlled Intersection Study – comprise the NOPUS.

In the Controlled Intersection Study, occupants of passenger vehicles are observed from the roadside at intersections controlled by stop signs or stoplights. Only stopped vehicles are observed to allow ample time to collect a variety of information required by the survey. NOPUS derives its estimates of seat belt use in rear seats, child restraint use, driver electronic device use, and demographic characteristics of vehicle occupants from the Controlled Intersection Study. Details about the NOPUS sample design are in Section 5 of this report.

This report presents results of occupant restraint use from the 2019 NOPUS Controlled Intersection Study. NHTSA will publish the driver electronic device use results in a separate research note. The following are the major findings from the 2019 NOPUS Controlled Intersection Study.

Front Seats Belt Use (Among Occupants 8 and Older):

- Overall front seat belt use in 2019 was 90.7 percent, not statistically different at the 0.05 level from 89.6 percent in 2018.
- Seat belt use among male occupants increased significantly from 87.7 percent in 2018 to 89.1 percent in 2019; however, seat belt use continued to be lower for males (89.1%) than females (92.7%).
- Seat belt use among 25- to 69-year-olds increased significantly from 89.5 percent in 2018 to 91.0 percent in 2019. Seat belt use continued to be lower among 16- to 24-year-olds (87.6%) than other age groups.
- Seat belt use continued to be lower among Black occupants (86.4%) than White occupants (90.7%) and members of other races (94.1%).

Rear Seats Belt Use (Among Occupants 8 and Older):

- Seat belt use continued to be lower in rear seats (77.5%) than in front seats (90.7%).
- Seat belt use in rear seats continued to be higher in States with seat belt laws for all seating positions (84.0%) than in States with front-seat-only belt laws (68.0%).

Child Restraint Use (For Children From Birth to 7 Years Old):

- Restraint use for children from birth to 7 years old in 2019 was 91.3 percent, not statistically different from 90.4 percent in 2018.
- Rear seat placement among children driven by drivers between the ages of 16 and 24 years old increased significantly from 95.3 percent in 2018 to 99.0 percent in 2019.
- Restraint use for children driven by belted drivers (92.9%) continued to be significantly higher than for those driven by unbelted drivers (68.0%).

1. Introduction

NOPUS is the only nationwide probability-based survey of seat belt use (for occupants 8 and older in both front and rear seats), motorcycle helmet use, child restraint use (for children under 8 years old), and driver electronic device use in the United States. NCSA conducts the NOPUS annually. Two sub-surveys, the Moving Traffic Survey and the Controlled Intersection Study, comprise the NOPUS.

In the Moving Traffic Survey, front-seat occupant shoulder belt use data and motorcyclist helmet use data are collected either at the roadside or by data collectors in vehicles (on expressways). NOPUS estimates of front-seat belt use and motorcycle helmet use are from the Moving Traffic Survey. The collective front-seat belt use estimate (also known as NHTSA's national seat belt estimate) is described in Seat Belt Use in 2019 - Overall Results.

In contrast, the NOPUS Controlled Intersection Study data is collected at intersections controlled by stop signs or stoplights, where vehicle occupants are observed from the roadside. Since the vehicles are stationary, data collectors have enough time to record occupants' characteristics such as race, age, gender, and seat belt use. NOPUS derives its estimates of rear-seat belt use, child restraint use, driver electronic device use, and demographic characteristics of the vehicle occupants from the Controlled Intersection Study.

Only motorcycles and passenger vehicles (passenger cars, pickup trucks, SUVs, and vans) are observed in the NOPUS. The population of interest includes all 50 States, the District of Columbia, with the sample observation sites consisting of Federal, State, and county highways, residential streets, and rural roads. Data is collected only during daylight hours when light is adequate to observe seat belt use through the vehicle windshield.

The 2019 NOPUS data collection was conducted from 7 a.m. to 6 p.m. during the period from June 2 to June 17, 2019. The 2019 NOPUS survey data is based on the results of 71,519 occupants observed in 52,268 vehicles at 1,615 data collection sites. Of those observed occupants, 2,921 were children under 8. More details on the NOPUS sampling, data collection and estimation are discussed in Section 5: NOPUS Methodology.

Please note that the terms "significant" and "statistically significant" are used interchangeably throughout this report. "Significant" always means "statistically significant," and the statistical significance level is alpha=0.05. In tables below, the data with p-values that are less than 0.05 are formatted in boldface type.

The percentages provided in this report are interpreted as the percentage of occupants during an average daylight moment.

2. Demographic Results in Front Seats

The national seat belt use estimate in 2019 was 90.7 percent; not a significant change from 89.6 percent in 2018 (NCSA, 2019). This section presents a demographic breakdown of the occupants who used seat belts in 2019. Table 1 presents passenger vehicle occupant seat belt use in front seats by demographic and other characteristics in 2018 and 2019. NOPUS demographics are highlighted below.

Age

Seat belt use among 25- to 69-year-olds in front seats increased from 89.5 percent in 2018 to 91.0 percent in 2019. Figure 1 and Table 1 show a comparison of the seat belt use rates from 2018 and 2019 across these age groups.

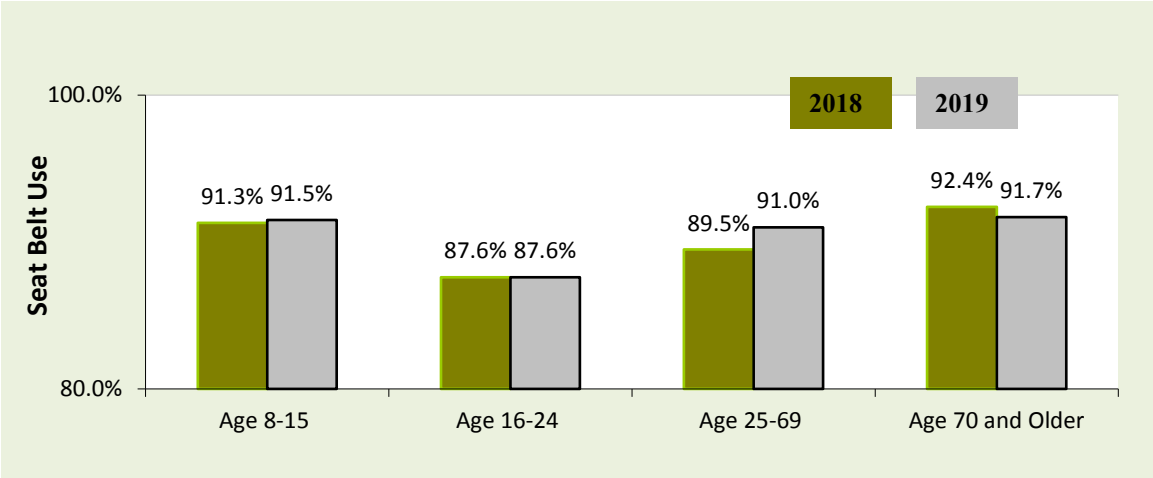

Figure 1: Seat Belt Use by Age for Occupants 8 and Older in 2018 and 2019

Figure 2 displays the trends of seat belt use for the four age groups over a 10-year period (2010-2019). Seat belt use among 16- to 24-year-olds has been consistently lower than other age groups.

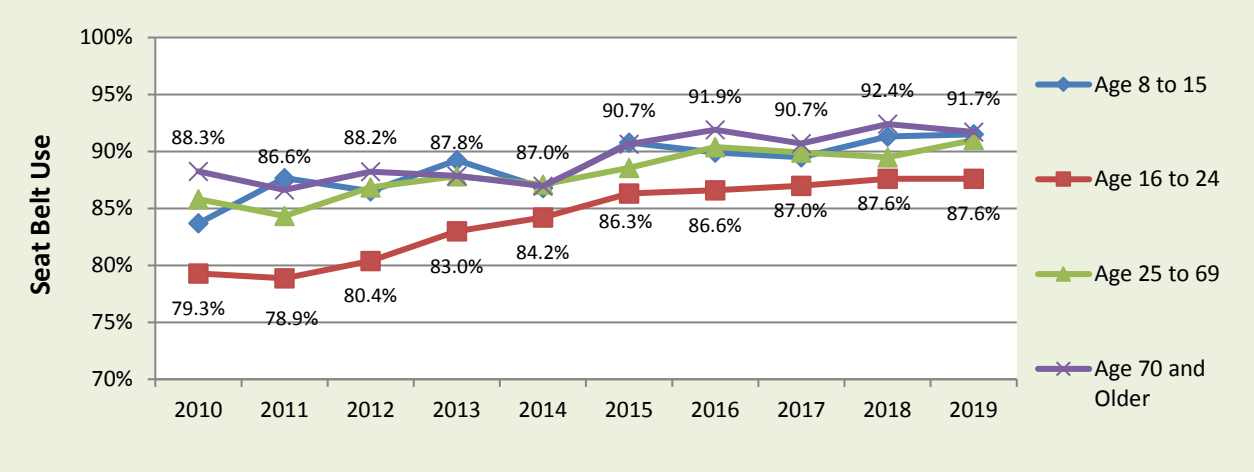

Figure 2: Seat Belt Use by Age for Occupants 8 and Older, 2010-2019

Gender

Figure 3 shows the trends of seat belt use for male and female occupants over a period of 10 years (2010 to 2019). In 2019 seat belt use continued to be lower for males (89.1%) than females (92.7%). Seat belt use among male occupants in front seats increased significantly from 87.7 percent in 2018 to 89.1 percent in 2019.

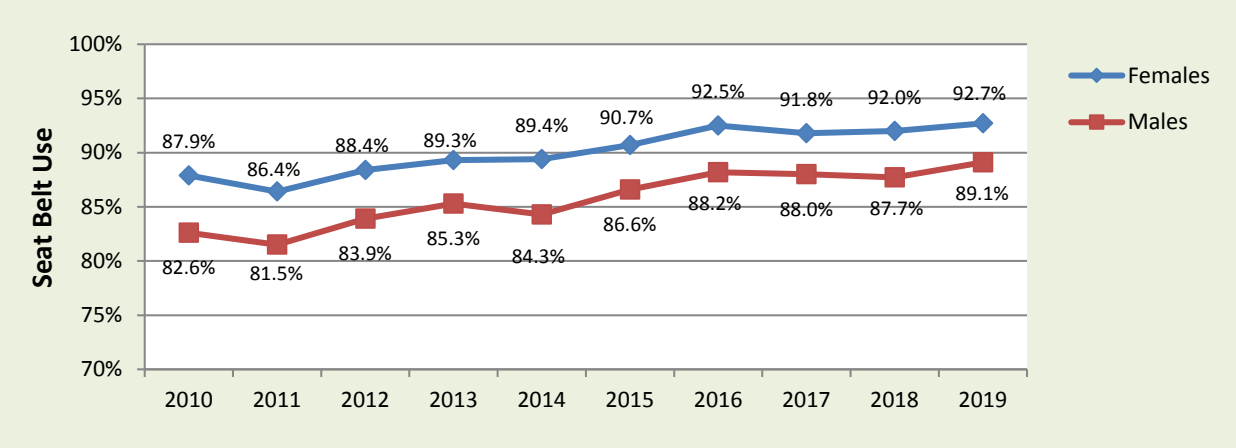

Figure 3: Seat Belt Use by Gender for Occupants 8 and Older, 2010-2019

Race

In NOPUS, observed vehicle occupant race categories are Black, White, and members of other races. This characterization is based on the visual assessment of the data collectors who observe vehicle occupants from roadsides.

Figure 4 shows the trends of seat belt use among the three race categories over a period of 10 years (2010 to 2019). In 2019 seat belt use continued to be lower among Black occupants than White occupants and members of other races. Furthermore, seat belt use for members of other races continued to be higher than the other two race categories. There were no significant changes in seat belt use from 2018 to 2019 for any of the occupant race categories.

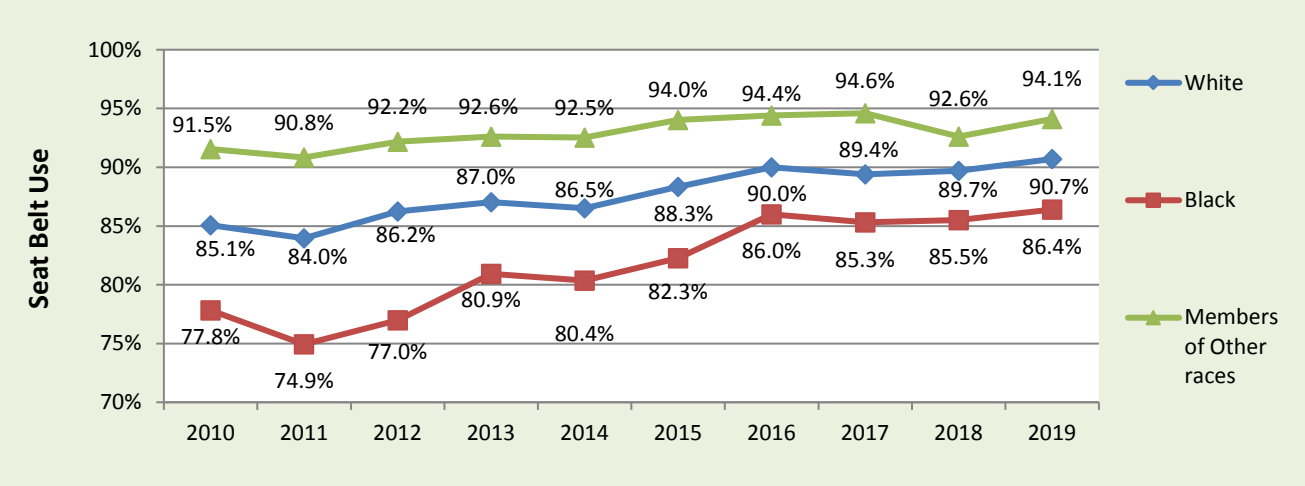

Figure 4: Seat Belt Use by Race for Occupants 8 and Older, 2010-2019

Presence of Passengers and Seat Belt Use

Figure 5 shows that seat belt use continued to be lower for a driver driving alone (90.3%) than for a driver driving with at least one passenger in the vehicle (92.4%). Among drivers who drove alone, seat belt use increased significantly from 88.9 percent in 2018 to 90.3 percent in 2019.

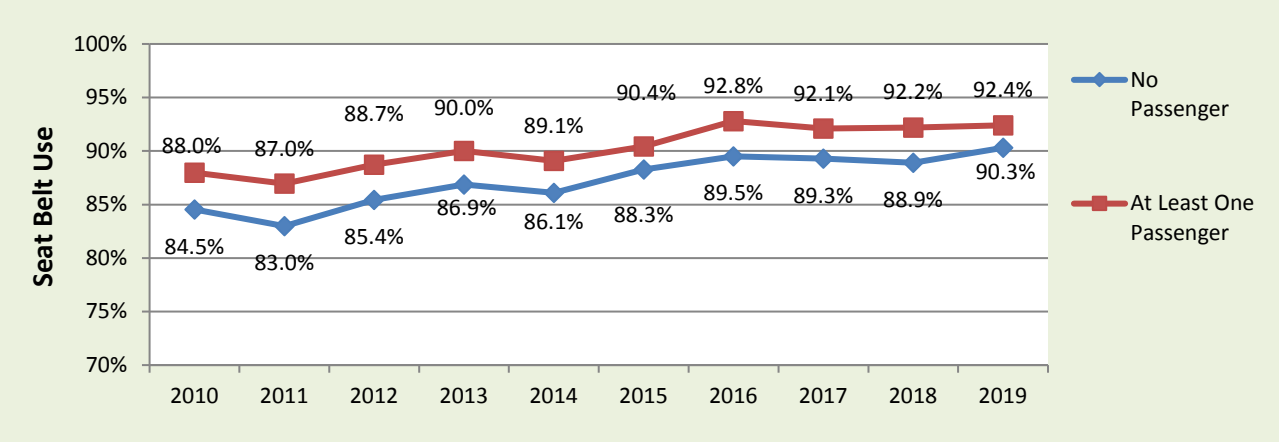

Figure 5: Passenger Effect on Seat Belt Use for Occupants 8 and Older, 2010-2019

Table 1: Passenger Vehicle Occupant Seat Belt Use in Front Seats by Demographic and Other Characteristics

Occupant Group[1]	2018		2019		2018 - 2019 Change		
	Belt Use[2]	95% Confidence Interval[3]	Belt Use[2]	95% Confidence Interval[3]	Change in Percent-age[4]	95% Confidence Interval[5]	P-value[6]
All Occupants	89.6%	(88.0, 91.1)	90.7%	(89.2, 92.0)	1.1	(-0.2, 2.3)	0.09
Males[7]	**87.7%**	**(85.7, 89.5)**	**89.1%**	**(87.4, 90.6)**	**1.4**	**(0.1, 2.7)**	**0.04**
Females[6]	92.0%	(90.7, 93.1)	92.7%	(91.3, 93.8)	0.7	(-0.7, 2.0)	0.31
Occupants by Age Group[6]							
8 to 15	91.3%	(88.8, 93.3)	91.5%	(87.8, 94.1)	0.2	(-3.1, 3.4)	0.92
16 to 24	87.6%	(85.0, 89.8)	87.6%	(84.6, 90.1)	0.0	(-3.3, 3.3)	> 0.99
25 to 69	**89.5%**	**(87.9, 91.0)**	**91.0%**	**(89.5, 92.3)**	**1.4**	**(0.2, 2.6)**	**0.03**
70 and Older	92.4%	(90.5, 94.0)	91.7%	(89.6, 93.3)	-0.8	(-2.9, 1.4)	0.46
Occupants by Race[6]							
White	89.7%	(88.1, 91.2)	90.7%	(89.1, 92.2)	1.0	(-0.4, 2.4)	0.14
Black	85.5%	(80.0, 89.7)	86.4%	(81.6, 90.1)	0.9	(-2.4, 4.2)	0.59
Members of Other Races	92.6%	(91.2, 93.8)	94.1%	(92.6, 95.4)	1.5	(-0.4, 3.4)	0.11
Drivers With							
No Passengers	**88.9%**	**(87.1, 90.5)**	**90.3%**	**(88.8, 91.6)**	**1.4**	**(0.1, 2.7)**	**0.04**
At Least One Passenger	92.2%	(90.5, 93.6)	92.4%	(90.7, 93.9)	0.2	(-1.3, 1.7)	0.77
Drivers With							
No Passengers	**88.9%**	**(87.1, 90.5)**	**90.3%**	**(88.8, 91.6)**	**1.4**	**(0.1, 2.7)**	**0.04**
Passengers All Under 8	91.2%	(88.8, 93.2)	91.9%	(87.4, 94.8)	0.6	(-3.2, 4.5)	0.73
Passengers All 8 and Older	92.2%	(90.4, 93.6)	92.3%	(90.6, 93.7)	0.1	(-1.5, 1.6)	0.92
Some Passengers Under 8 and Some 8 or Older	93.7%	(91.1, 95.5)	95.4%	(94.0, 96.5)	1.8	(-0.3, 3.9)	0.09
Drivers 16-24 With							
No Passengers	86.9%	(83.6, 89.7)	87.4%	(84.6, 89.7)	0.5	(-3.0, 3.9)	0.79
Passengers All 16-24	90.1%	(85.6, 93.4)	86.9%	(81.6, 90.9)	-3.2	(-10.1, 3.8)	0.36

[1] Drivers and right-front passengers of passenger vehicles.
[2] Use of shoulder belts observed from 7 a.m. to 6 p.m
[3] The Wilson confidence interval is used in the estimated percentages in the occupant group (e.g., occupants who are male), which is in the form: $\{(2n\_EFF\ p+t\hat{}2\ ) \pm t\sqrt{((t\hat{}2+4n\_EFF\ pq)\ )}\}/(2(n\_EFF+t\hat{}2\ ))$, where p is the estimated percentage of Belt Use, $(n\_EFF=n)/D\_EFF$ is the effective sample size (where n is the sample size and D_EFF is the design effect), $t=t\_((1-\alpha/2)\ )\ (df)$, is a multiplier from the t-distribution with df degrees of freedom, and q=1-p. For percentages, these endpoints are multiplied by 100.
[4] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.
[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p\pm t\_((1-\alpha/2)\ )\ (df)\ \sqrt{(v(p))}$, where p is the estimated change in percentage point, v(p) is its estimated variance, and $t\_((1-\alpha/2)\ )\ (df)$ is a multiplier from the t-distribution with df degrees of freedom.
[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; indicated with bold type
[7] The age, gender, and racial classifications are based on the subjective assessments of roadside observers.

Occupant Group[1]	2018		2019		2018 - 2019 Change		
	Belt Use[2]	95% Confidence Interval[3]	Belt Use[2]	95% Confidence Interval[3]	Change in Percent-age[4]	95% Confidence Interval[5]	P-value[6]
At Least One Passenger Not 16-24	88.3%	(81.0, 93.0)	88.5%	(82.1, 92.8)	0.2	(-7.0, 7.5)	0.95
Occupants 16-24 When							
All Occupants Are 16-24	87.6%	(84.7, 90.1)	86.8%	(83.5, 89.6)	-0.8	(-4.6, 3.0)	0.67
At Least One Occu-pant Is Not 16-24	87.7%	(84.3, 90.4)	89.5%	(85.8, 92.2)	1.8	(-2.6, 6.1)	0.41

Source: NOPUS, 2018, 2019.

3. Seat Belt Use in Rear Seats

According to Federal Motor Vehicle Safety Standard (FMVSS) 208, Occupant Crash Protection, except for convertibles and open-body vehicles, all outboard designated seating positions shall be equipped with integral lap and shoulder belts at every forward facing, outboard designated seating position. Using the 2019 vehicle registration data from the National Vehicle Population Profile (R. L. Polk & Co., n.a.), NHTSA estimated that 96.2 percent of passenger vehicles on the road have shoulder belts in the rear outboard seating positions. Of the 3.8 percent of vehicles that have only lap belts in the rear outboard seats, all observed rear-seat vehicle occupants are counted by NOPUS as *unbelted (not restrained with a shoulder belt)*, even if they are using lap belts. Consequently, NOPUS rear-seat shoulder belt use estimates reflect both the degree to which vehicle occupants use restraints and the availability of shoulder belts in these seating positions. Please note that NOPUS only observes up to two passengers in the second row of seats and none in the third row and beyond.

Table 3 presents results of seat belt use in rear seats of passenger vehicles in 2018 and 2019 as well as the changes between the 2 years. Some major results are highlighted below.

Seat Belt Use in Rear Seats Versus in Front Seats

Figure 6 displays the front and rear seat belt use trends from 2010 to 2019. As in previous years, seat belt use in 2019 was lower in rear seats (77.5%) than in front seats (90.7%).

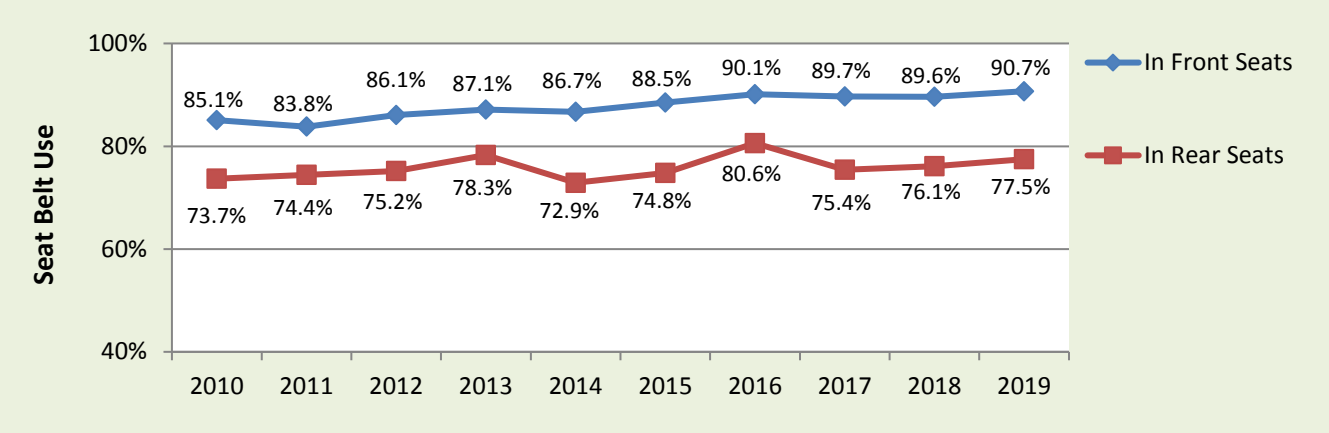

Figure 6: Seat Belt Use by Seating Position for Occupants 8 and Older, 2010-2019

State Laws and Rear-Seat Belt Use

At the time the 2019 NOPUS survey was conducted, 29 States and the District of Columbia required all vehicle occupants 18 and older to use seat belts when riding in rear seats (Highway Loss Data Institute, 2020). Alabama passed a law in 2019 requiring seat belts to be used in all seating positions, however, that law did not go into effect until September 2019, after the NOPUS data has already been collected (Gore, 2019). Please note that rear-seat belt use laws are secondary in Idaho, Kansas, Maryland, Massachusetts, Montana, Nevada, New Jersey, North Carolina, Vermont, and Wyoming. Secondary seat belt laws state that a law enforcement officer may issue a ticket for not wearing a seat belt only when there is another citable traffic infraction. New Hampshire is the only State that does not have mandatory seat belt laws for adults 18 and older.

Table 2 is a list of States requiring seat belts be used in all seating positions.

Table 2: States With Laws Requiring Seat Belts Be Used in All Seating Positions

Alaska	California	Delaware
District of Columbia	Hawaii	Idaho
Illinois	Indiana	Kansas
Kentucky	Louisiana	Maine
Maryland	Massachusetts	Minnesota
Mississippi	Montana	Nevada
New Jersey	New Mexico	North Carolina
Oregon	Rhode Island	South Carolina
Texas	Utah	Vermont
Washington	Wisconsin	Wyoming

States with laws in effect as of June 2019, requiring people 18 and older to use seat belts in all seating positions. Also includes the District of Columbia. Source: Highway Loss Data Institute, 2020

Figure 7 shows the trends of rear-seat belt use among passengers in the States with or without laws requiring belt use in all seating positions over the period 2010-2019. As in previous years, seat belt use in rear seats in 2019 was higher in the States with laws requiring belt use in all seating positions (84.0%) than in the States requiring belt use only in front seats (68.0%).

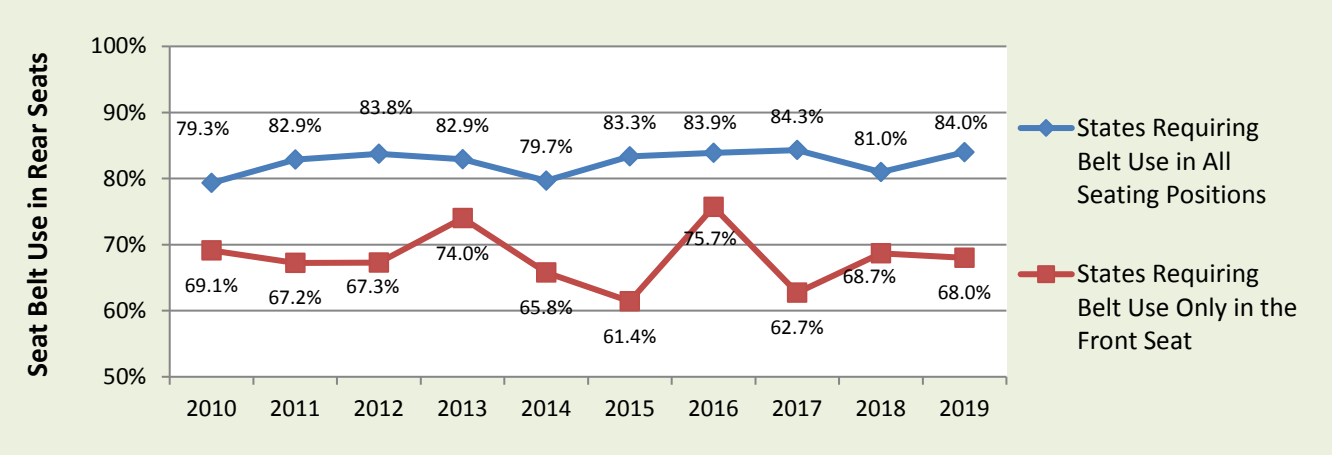

Figure 7: Seat Belt Use in Rear Seats by State Law Type for Occupants 8 and Older, 2010-2019

Similar to female occupants in front seats, seat belt use among female passengers in rear seats (78.9%) was higher than the seat belt use among male passengers in rear seats (76.2%). Seat belt use continued to be lower among Black occupants than White occupants and members of other races in both front and rear seats. None of the year-to-year changes in seat belt use in rear seats were statistically significant.

Table 3: Seat Belt Use in Rear Seats of Passenger Vehicles, by Major Characteristics

Passenger Group[1]	2018		2019		2018 – 2019 Change		
	Belt Use[2]	95% Confidence Interval[3]	Belt Use[2]	95% Confidence Interval[3]	Change in Percentage[4]	95% Confidence Interval[5]	P-value[6]
All Passengers	76.1%	(69.2, 81.8)	77.5%	(71.2, 82.8)	1.4	(-3.5, 6.3)	0.56
Males[7]	75.2%	(69.4, 80.2)	76.2%	(70.7, 80.9)	1.0	(-5.2, 7.1)	0.75
Females[6]	77.0%	(68.0, 84.0)	78.9%	(70.1, 85.7)	2.0	(-3.2, 7.1)	0.44
Passengers by Age Group[6]							
8 to 15	85.6%	(81.8, 88.7)	83.9%	(78.6, 88.1)	-1.7	(-7.9, 4.6)	0.58
16 to 24	71.5%	(61.0, 80.1)	75.1%	(67.8, 81.2)	3.6	(-7.8, 14.9)	0.53
25 to 69	68.1%	(58.4, 76.5)	71.1%	(59.2, 80.7)	3.0	(-4.4, 10.5)	0.41
70 and Older	85.6%	(76.2, 91.6)	85.0%	(69.4, 93.4)	-0.5	(-11.8, 10.7)	0.92
Passengers by Race[6]							
White	79.9%	(74.7, 84.2)	81.2%	(77.8, 84.2)	1.3	(-3.7, 6.4)	0.59
Black	63.7%	(48.3, 76.7)	65.0%	(51.4, 76.4)	1.3	(-10.0, 12.5)	0.82
Members of Other Races	72.5%	(59.5, 82.5)	73.5%	(58.2, 84.6)	1.0	(-12.1, 14.1)	0.88
Passengers in States With Laws Requiring Belts Be Used							
In All Seating Positions	81.0%	(75.0, 85.7)	84.0%	(78.9, 88.1)	3.1	(-1.5, 7.7)	0.18
In Front Seats Only	68.7%	(52.0, 81.7)	68.0%	(54.8, 78.8)	-0.8	(-11.9, 10.3)	0.89

Source: NOPUS, 2018, 2019.

[1] Up to two passengers observed in the second row of seats in passenger vehicles.
[2] Use of shoulder belts observed from 7 a.m. to 6 p.m.
[3] The Wilson confidence interval is used in the estimated percentages in the occupant group (e.g., occupants who are male), which is in the form: $\{(2n\_EFF\ p+t^2) \pm t\sqrt{((t^2+4n\_EFF\ pq))}\}/(2(n\_EFF+t^2))$, where p is the estimated percentage of Belt Use, $(n\_EFF=n/D\_EFF$ is the effective sample size (where n is the sample size and D_EFF is the design effect), $t=t\_((1-\alpha/2))$ (df), is a multiplier from the t-distribution with df degrees of freedom, and q=1-p. For percentages, these endpoints are multiplied by 100.
[4] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.
[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t\_((1-\alpha/2))$ (df) $\sqrt{(v(p))}$, where p is the estimated change in percentage point, v(p) is its estimated variance, and $t\_((1-\alpha/2))$ (df) is a multiplier from the t-distribution with df degrees of freedom.
[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question, indicated with bold type.
[7] The age, gender, and racial classifications are based on the subjective assessments of roadside observers.

4. Child Restraint Use

In 2019 NOPUS continued to collect roadside observational data on child restraint use for all children under 8 years old. Detailed results of child restraint use are presented in Tables 5, 6, and 7. Table 5 presents the results of child restraint use in passenger motor vehicles by major characteristics in 2018 and 2019 as well as the changes between the two years. Table 6 presents results on child rear placement by major characteristics in 2018 and 2019 as well as the changes between the two years. Table 7 divides the child occupants into three age groups and reports restraint use by some other characteristics among these groups. Some of the major results of child restraint use are discussed below.

Child Restraint Use Among All Children Under 8

Restraint use for children under 8 in 2019 is 91.3 percent, up from 90.4 percent in 2018. Figure 8 shows the child restraint use trend since 2010.

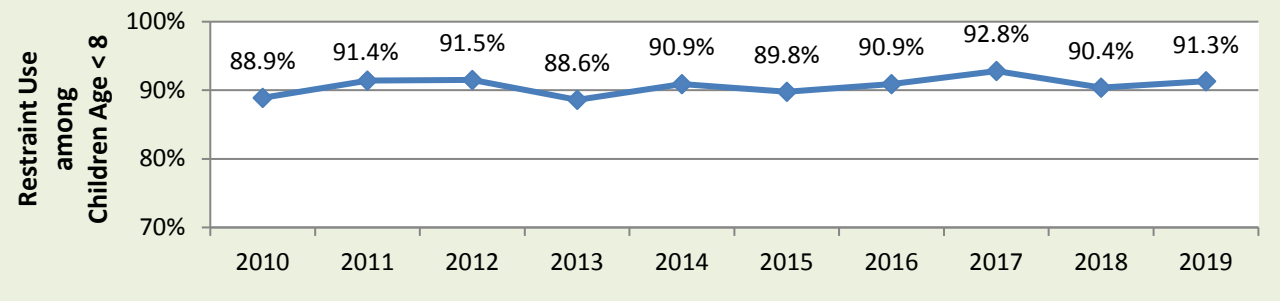

Figure 8: Child Restraint Use Among Children Under 8, 2010-2019

Child Rear Seat Placement

Figure 9 shows the trends (for each age group) of rear seat placement of children under 8 from 2010 to 2019. The 2019 NOPUS found that 94.5 percent of children under 8 rode in rear seats of vehicles. In the infant group (from birth to 12 months), 99.5 percent rode in rear seats. Nearly all (99.2%) of children 1 to 3 years old and 90.1 percent of 4- to 7-year-olds were in rear seats in 2019. Rear seat placement among children driven by drivers 16 to 24 years old increased significantly from 95.3 percent in 2018 to 99.0 percent in 2019. Note that the child restraint use in rear seats increased to 92.2 percent in 2019 from 91.3 percent in 2018 (Table 5).

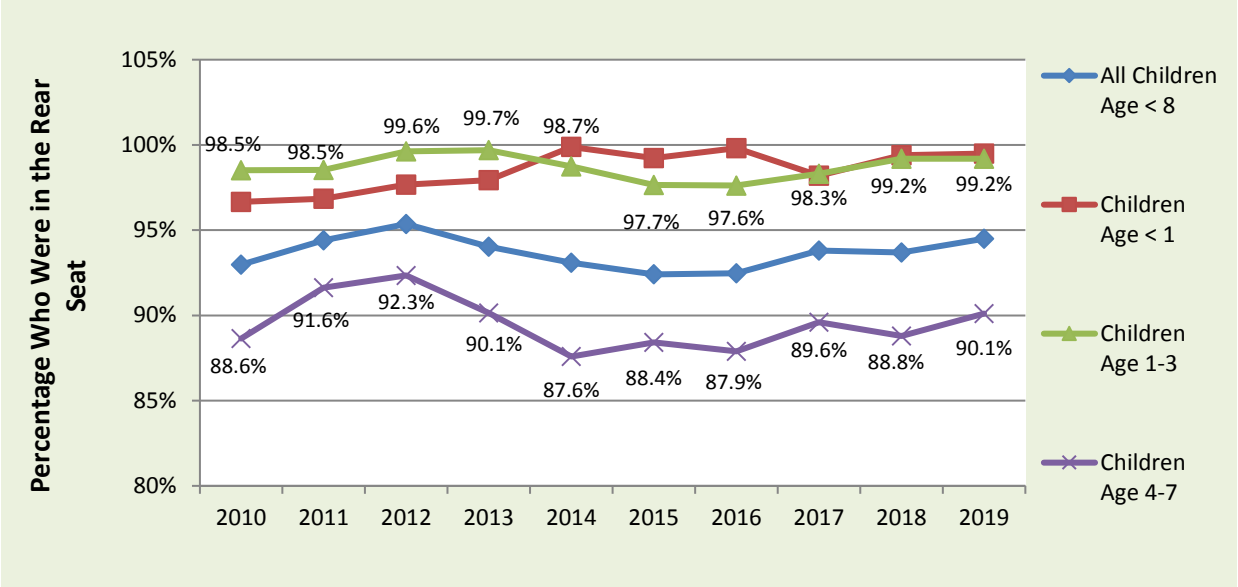

Figure 9: Child Rear Seat Placement, 2010-2019

At the time the 2019 survey was conducted, 10 States required children 5 and younger who weighed less than 80 pounds and were less than 54 inches tall, to ride in the rear seats of vehicles. Table 4 lists the States with child rear placement laws.

Table 4: States With Laws Requiring Children 5 and Younger to Be in Rear Seats*

California	Georgia	Maine
Nebraska	New Jersey	Rhode Island
South Carolina	Tennessee	Washington
Wyoming		

* Among children less than 80 pounds and less than 54" tall. States with laws in effect as of June 27, 2019. In no other States did such laws take effect during the period June 27, 2018, to June 27, 2019. In Delaware, children 11 and younger and 65 inches or less must be in rear seats if passenger air bags are active. Source: Highway Loss Data Institute, 2020

Child Restraint Use by Region

There were no significant changes in child restraint use from 2018 to 2019 in any of the regions, as shown in Figure 10. Among all regions, the biggest change occurred in the Northeast. Child restraint use decreased from 90.3 percent in 2018 to 86.1 percent in 2019.

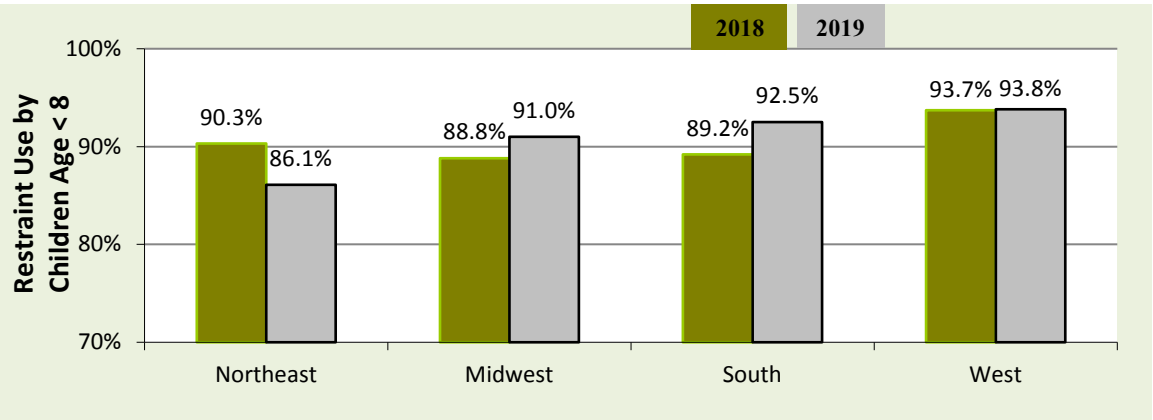

Figure 10: Child Restraint Use by Region in 2018 and 2019

Except for a few years, child restraint use in the west region has consistently exceeded that in the other regions as shown in Figure 11.

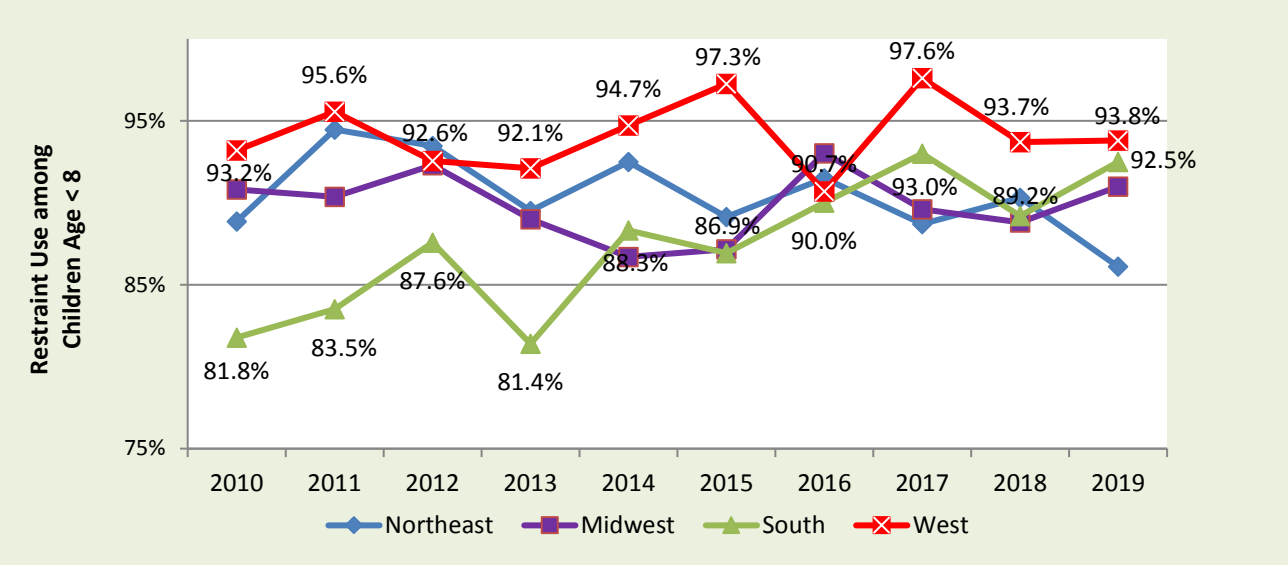

Figure 11: Child Restraint Use by Region, 2010-2019

Child Restraint Use by Time of Week

There were no significant changes in child restraint use from 2018 to 2019 for any of the time of week categories. Nevertheless, the largest change occurred in the weekday non-rush hours category where the child restraint use increased from 86.9 percent in 2018 to 90.0 percent in 2019 (Figure 12).

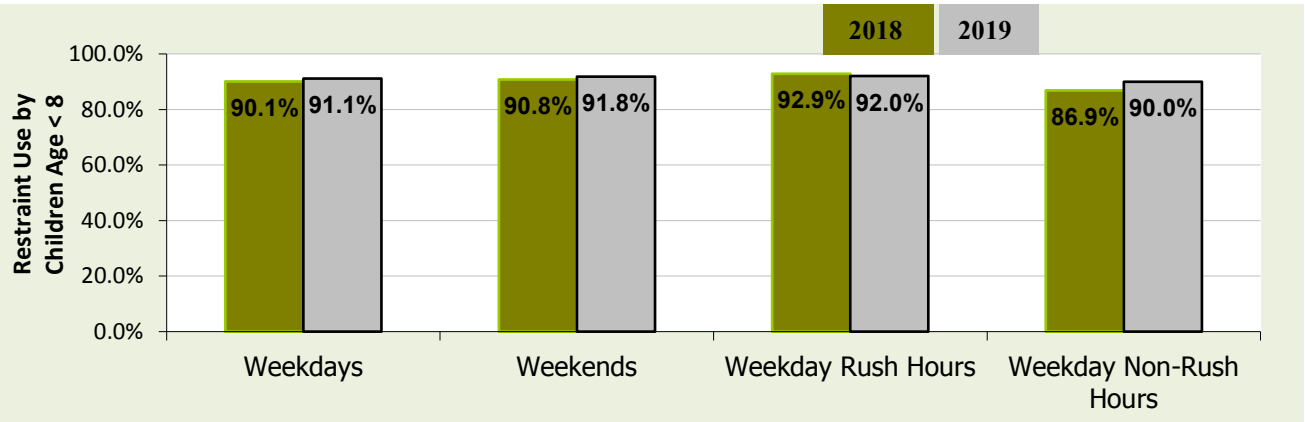

Figure 12: Child Restraint Use by Time of Week in 2018 and 2019

Child Restraint Use by Vehicle Type

As shown in Figure 13, restraint use for children traveling in passenger cars increased from 85.2 percent in 2018 to 88.4 percent in 2019; this was not a statistically significant increase.

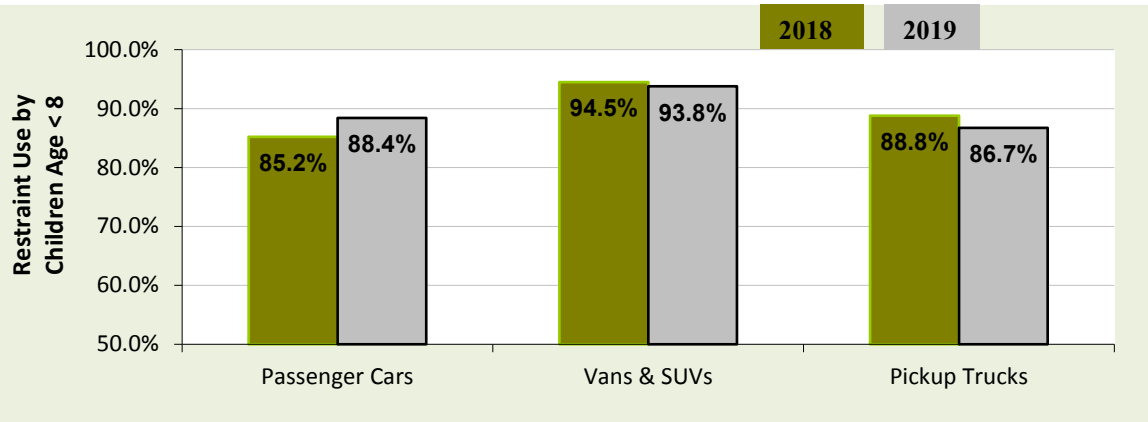

Figure 13: Child Restraint Use by Vehicle Type in 2018 and 2019

Child Restraint Use by Driver Type and Belt Use Status

As shown in Figure 14, restraint use for children driven by belted drivers continued to be significantly higher than for those driven by unbelted drivers.

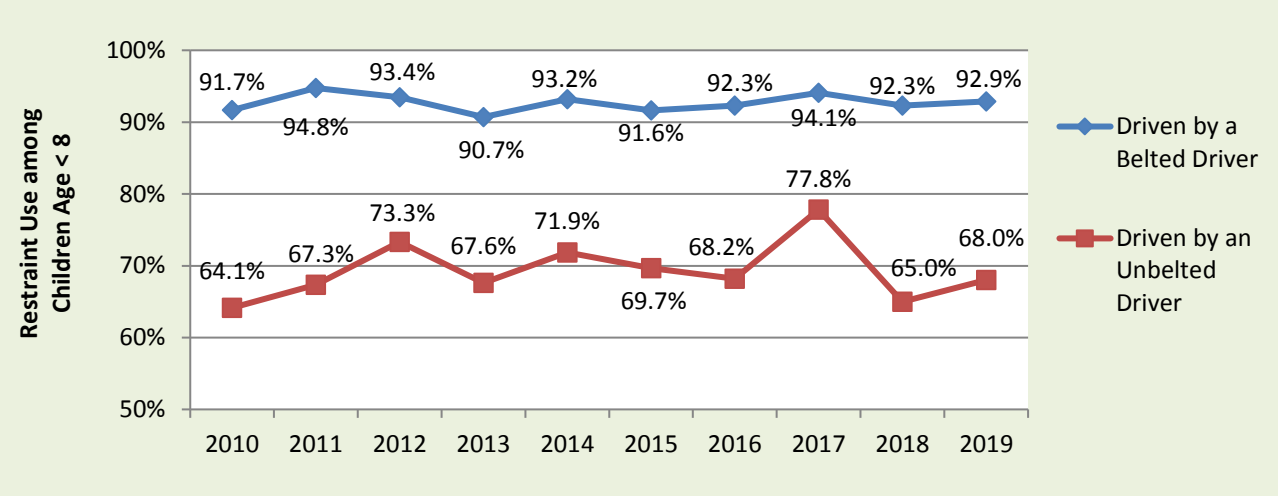

Figure 14: Child Restraint Use by Driver Belt Status, 2010-2019

Table 5: Child Restraint Use in Passenger Motor Vehicles, by Major Characteristics

Child Passenger Group[1]	2018		2019		2018-2019 Change		
	Restraint Use[2]	95% Confidence Interval[3]	Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[4]	Confidence in a Change in Use[5]	P-value[6]
All Child Passengers (From Birth to 7 Years)	90.4%	(87.6, 92.6)	91.3%	(88.8, 93.3)	1.0	(-1.7, 3.6)	0.45
Children Driven by							
a Belted Driver	92.3%	(89.4, 94.4)	92.9%	(90.8, 94.6)	0.7	(-1.7, 3.1)	0.57
an Unbelted Driver	65.0%	(54.6, 74.2)	68.0%	(56.2, 77.9)	3.0	(-14.5, 20.6)	0.72
a Male Driver	88.7%	(85.6, 91.2)	90.5%	(87.4, 93.0)	1.8	(-2.3, 5.9)	0.37
a Female Driver	91.6%	(88.1, 94.2)	91.8%	(89.0, 94.0)	0.2	(-2.9, 3.4)	0.88
a Driver 16 to 24	91.3%	(88.3, 93.6)	90.9%	(82.1, 95.6)	-0.4	(-7.9, 7.2)	0.92
a Driver 25 to 69	90.3%	(87.2, 92.6)	91.4%	(88.6, 93.6)	1.1	(-1.7, 4.0)	0.42
a Driver 70 and Older	91.3%	(79.0, 96.7)	89.9%	(67.8, 97.4)	-1.5	(-18.9, 16.0)	0.87
a White Driver	92.8%	(89.9, 94.9)	93.2%	(90.6, 95.1)	0.4	(-2.2, 3.0)	0.75
a Black Driver	77.8%	(68.4, 85.0)	82.3%	(75.5, 87.5)	4.5	(-4.1, 13.0)	0.30
a Driver Who is a Member of Other Races	89.4%	(84.1, 93.0)	89.2%	(84.2, 92.8)	-0.1	(-6.2, 6.0)	0.96
Children in							
Front Seats	75.5%	(57.9, 87.4)	77.1%	(62.1, 87.4)	1.6	(-17.0, 20.2)	0.86
Rear Seats	91.3%	(89.1, 93.1)	92.2%	(90.0, 93.9)	0.8	(-1.5, 3.1)	0.48
Child Passengers on							
Expressways	93.3%	(90.6, 95.3)	92.9%	(90.2, 94.8)	-0.5	(-4.1, 3.1)	0.79
Surface Streets	88.1%	(83.5, 91.5)	90.3%	(86.8, 92.9)	2.2	(-1.3, 5.6)	0.21
Child Passengers Traveling in							
Fast Traffic	92.1%	(89.8, 93.9)	93.2%	(90.9, 95.0)	1.1	(-1.8, 4.1)	0.44
Medium-Speed Traffic	88.4%	(82.1, 92.7)	90.9%	(86.5, 94.0)	2.4	(-3.5, 8.4)	0.40
Slow Traffic	89.5%	(81.5, 94.3)	88.2%	(82.7, 92.1)	-1.4	(-6.5, 3.8)	0.59
Child Passengers in							
Passenger Cars	85.2%	(80.5, 88.9)	88.4%	(84.0, 91.8)	3.3	(-0.7, 7.2)	0.10
Vans and SUVs	94.5%	(92.3, 96.1)	93.8%	(90.8, 95.9)	-0.7	(-3.7, 2.4)	0.67
Pickup Trucks	88.8%	(81.7, 93.4)	86.7%	(78.3, 92.2)	-2.1	(-11.9, 7.7)	0.66

[1] Passengers under age 8 observed from 7 a.m. to 6 p.m. in the right-front seat or the second row of seats in passenger vehicles that are stopped at a stop sign or stoplight. Age, gender, and racial classifications are based on the subjective assessments of roadside observers.

[2] Use of child car seats (forward- or rear-facing), booster seats, and seat belts.

[3] The Wilson confidence interval is used in the estimated percentages in the occupant group (e.g., occupants who are male), which is in the form: $\{(2n\_EFF\ p+t^2) \pm t\sqrt{((t^2+4n\_EFF\ pq))}\}/(2(n\_EFF+t^2))$, where p is the estimated percentage of Belt Use, $(n\_EFF=n)/D\_EFF$ is the effective sample size (where n is the sample size and D_EFF is the design effect), $t=t\_((1-\alpha/2))\ (df)$, is a multiplier from the t-distribution with df degrees of freedom, and q=1-p. For percentages, these endpoints are multiplied by 100.

[4] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.

[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t\_((1-\alpha/2))\ (df)\ \sqrt{(v(p))}$, where p is the estimated change in percentage point, v(p) is its estimated variance, and $t\_((1-\alpha/2))\ (df)$ is a multiplier from the t-distribution with df degrees of freedom.

[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question, indicated with bold type.

Child Passenger Group[1]	2018		2019		2018-2019 Change		
	Restraint Use[2]	95% Confidence Interval[3]	Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[4]	Confidence in a Change in Use[5]	P-value[6]
Child Passengers in the							
Northeast	90.3%	(76.7, 96.3)	86.1%	(79.6, 90.8)	-4.2	(-12.3, 3.9)	0.30
Midwest	88.8%	(81.5, 93.4)	91.0%	(85.6, 94.5)	2.3	(-2.7, 7.2)	0.36
South	89.2%	(85.0, 92.3)	92.5%	(88.8, 95.1)	3.3	(-1.1, 7.8)	0.14
West	93.7%	(91.3, 95.5)	93.8%	(91.1, 95.6)	0.1	(-2.5, 2.7)	0.95
Child Passengers in							
Urban Areas	90.4%	(87.0, 93.0)	91.1%	(88.4, 93.2)	0.6	(-2.5, 3.8)	0.68
Rural Areas	90.1%	(87.3, 92.4)	92.0%	(87.3, 95.0)	1.9	(-2.5, 6.2)	0.39
Child Passengers Traveling During							
Weekdays	90.1%	(87.0, 92.5)	91.1%	(87.7, 93.6)	1.0	(-1.6, 3.6)	0.43
Rush Hours	92.9%	(89.8, 95.1)	92.0%	(88.4, 94.6)	-0.9	(-4.4, 2.6)	0.61
Non-Rush Hours	86.9%	(80.7, 91.3)	90.0%	(84.2, 93.8)	3.1	(-0.9, 7.1)	0.13
Weekends	90.8%	(85.9, 94.1)	91.8%	(87.0, 94.9)	1.0	(-5.4, 7.4)	0.76

Source: NOPUS, 2018, 2019.

Table 6: The Percentage of Children Who Rode in Rear Seats, by Major Characteristics

Child Passenger Group[1]	2018		2019		2018-2019 Change		
	Percentage Who Were in Rear Seat[2]	95% Confidence Interval[3]	Percentage Who Were in Rear Seat[2]	95% Confidence Interval[3]	Change in Percentage Points[4]	Confidence in a Change in Use[5]	P-value[6]
All Child Passengers (From Birth to 7 Years)	93.7%	(92.0, 95.1)	94.5%	(92.3, 96.1)	0.8	(-1.3, 2.9)	0.45
0 (Infants)	99.4%	(98.0, 99.8)	99.5%	(98.5, 99.8)	0.1	(-1.0, 1.1)	0.92
1-3	99.2%	(98.4, 99.6)	99.2%	(98.0, 99.7)	0.0	(-1.0, 1.0)	0.95
4-7	88.8%	(85.7, 91.4)	90.1%	(86.5, 92.8)	1.2	(-2.5, 5.0)	0.51
Child Passengers in States With[6] Law Requiring Children From Birth of 5 Years Be in Rear Seats	96.1%	(94.0, 97.5)	94.1%	(89.8, 96.6)	-2.1	(-6.0, 1.9)	0.29
No Such Law	93.0%	(90.2, 95.0)	94.6%	(92.3, 96.3)	1.6	(-1.0, 4.3)	0.21
Children Driven by							
a Belted Driver	94.1%	(92.3, 95.5)	94.6%	(92.3, 96.2)	0.5	(-1.6, 2.7)	0.61
an Unbelted Driver	89.4%	(81.9, 94.0)	93.4%	(87.1, 96.7)	4.0	(-3.8, 11.8)	0.30
a Male Driver	94.6%	(92.7, 96.0)	95.2%	(92.1, 97.1)	0.6	(-2.2, 3.5)	0.66
a Female Driver	93.1%	(90.7, 94.9)	94.1%	(91.5, 95.9)	1.0	(-1.8, 3.7)	0.48
a Driver 16 to 24	**95.3%**	**(93.0, 96.9)**	**99.0%**	**(97.0, 99.6)**	**3.6**	**(1.5, 5.8)**	**< 0.01**
a Driver 25 to 69	93.6%	(91.8, 95.1)	93.9%	(91.5, 95.7)	0.3	(-2.1, 2.7)	0.80
a Driver 70 and Older	93.1%	(85.2, 96.9)	97.6%	(92.9, 99.2)	4.5	(-2.1, 11.0)	0.18
a White Driver	93.0%	(90.5, 94.9)	94.4%	(91.9, 96.1)	1.3	(-1.2, 3.9)	0.29
a Black Driver	94.3%	(90.1, 96.7)	95.6%	(90.8, 97.9)	1.3	(-3.9, 6.5)	0.61
a Driver Who is a Member of Other Races	96.4%	(93.9, 97.9)	94.5%	(89.9, 97.1)	-1.9	(-5.8, 1.9)	0.32
Child Passengers on							
Expressways	96.2%	(93.2, 97.9)	97.3%	(95.0, 98.6)	1.1	(-0.9, 3.2)	0.27
Surface Streets	91.9%	(89.4, 93.8)	92.6%	(89.8, 94.6)	0.7	(-2.4, 3.8)	0.64
Child Passengers Traveling in							
Fast Traffic	95.3%	(92.4, 97.1)	96.1%	(93.3, 97.8)	0.9	(-2.1, 3.8)	0.55
Medium-Speed Traffic	93.0%	(88.1, 96.0)	93.7%	(90.9, 95.6)	0.7	(-4.0, 5.4)	0.77
Slow Traffic	92.0%	(88.9, 94.3)	92.4%	(89.3, 94.7)	0.4	(-3.2, 3.9)	0.83
Child Passengers in							
Passenger Cars	93.8%	(90.4, 96.1)	94.4%	(90.7, 96.7)	0.6	(-3.3, 4.4)	0.76
Vans and SUVs	94.6%	(92.7, 96.0)	95.8%	(93.9, 97.1)	1.2	(-1.0, 3.4)	0.28
Pickup Trucks	87.6%	(81.3, 91.9)	84.2%	(74.9, 90.6)	-3.3	(-12.3, 5.6)	0.45

[1] Passengers under 8 observed from 7 a.m. to 6 p.m. in the right-front seat or the second row of seats in passenger vehicles that are stopped at a stop sign or stoplight. Age, gender, and racial classifications are based on the subjective assessments of roadside observers.

[2] The percentage of the child passenger group who were in the second row of seats at the time of observation.

[3] The Wilson confidence interval is used in the estimated percentages in the occupant group (e.g., occupants who are male), which is in the form: $\{(2n\_EFF\ p+t^2) \pm t\sqrt{((t^2+4n\_EFF\ pq))}\}/(2(n\_EFF+t^2))$, where p is the estimated percentage of Belt Use, $(n\_EFF=n)/D\_EFF$ is the effective sample size (where n is the sample size and D_EFF is the design effect), $t=t\_((1-\alpha/2))\ (df)$, is a multiplier from the t-distribution with df degrees of freedom, and q=1-p. For percentages, these endpoints are multiplied by 100.

[4] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.

[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t\_((1-\alpha/2))\ (df)\ \sqrt{(v(p))}$, where p is the estimated change in percentage point, v(p) is its estimated variance, and $t\_((1-\alpha/2))\ (df)$ is a multiplier from the t-distribution with df degrees of freedom.

[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question, indicated with bold type.

Child Passenger Group[1]	2018		2019		2018-2019 Change		
	Percentage Who Were in Rear Seat[2]	95% Confidence Interval[3]	Percentage Who Were in Rear Seat[2]	95% Confidence Interval[3]	Change in Percentage Points[4]	Confidence in a Change in Use[5]	P-value[6]
Child Passengers in the							
Northeast	96.8%	(94.8, 98.1)	97.6%	(95.9, 98.6)	0.8	(-1.7, 3.2)	0.53
Midwest	92.1%	(85.4, 95.9)	93.3%	(89.4, 95.9)	1.3	(-4.6, 7.2)	0.66
South	91.1%	(87.6, 93.6)	93.9%	(89.5, 96.6)	2.9	(-1.2, 7.0)	0.16
West	97.2%	(95.8, 98.1)	94.3%	(87.1, 97.6)	-2.9	(-7.6, 1.9)	0.23
Child Passengers in							
Urban Areas	94.2%	(92.1, 95.8)	95.3%	(93.3, 96.7)	1.1	(-1.1, 3.2)	0.32
Rural Areas	92.3%	(88.2, 95.1)	92.6%	(88.1, 95.5)	0.3	(-4.5, 5.1)	0.91
Child Passengers Traveling During							
Weekdays	93.5%	(91.3, 95.2)	94.2%	(91.9, 95.8)	0.7	(-2.0, 3.4)	0.62
Rush Hours	93.6%	(91.2, 95.4)	94.9%	(91.7, 96.9)	1.3	(-1.8, 4.4)	0.38
Non-Rush Hours	93.4%	(89.0, 96.1)	93.3%	(90.8, 95.1)	-0.1	(-4.3, 4.1)	0.95
Weekends	94.1%	(91.2, 96.1)	95.2%	(91.9, 97.2)	1.0	(-2.2, 4.3)	0.51
Child Passengers in a							
Rear-Facing Car Seat	99.6%	(98.3, 99.9)	99.6%	(98.5, 99.9)	0.0	(-0.8, 0.8)	0.96
Forward-Facing Car Seat	98.5%	(96.6, 99.4)	99.1%	(97.2, 99.7)	0.6	(-1.1, 2.3)	0.50
High-Backed Booster Seat	99.3%	(96.0, 99.9)	99.4%	(96.5, 99.9)	0.2	(-1.7, 2.1)	0.87
Seat belt or Backless Booster Seat	89.1%	(85.8, 91.8)	89.2%	(84.5, 92.6)	0.0	(-4.5, 4.5)	0.99
No Restraint Observed	84.1%	(72.4, 91.5)	85.5%	(76.8, 91.4)	1.4	(-11.4, 14.2)	0.82

Source: NOPUS, 2018, 2019.

Table 7: Child Restraint Use in Passenger Motor Vehicles, by Age and Other Characteristics

Child Passenger Group[1]	2018		2019		2018-2019 Change		
	Restraint Use[2]	95% Confidence Interval[3]	Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[4]	Confidence in a Change in Use[5]	P-value[6]
Infants (From Birth to 12 Months)							
Infants Driven by							
a Belted Driver	99.5%	(98.3, 99.9)	98.5%	(94.3, 99.6)	-1.0	(-3.4, 1.4)	0.39
an Unbelted Driver	100.0%	(100.0, 100.0)	100.0%	(100.0, 100.0)	0.0	(0.0, 0.0)	1.00
a Male Driver	99.3%	(95.8, 99.9)	99.7%	(98.2, 100.0)	0.4	(-1.2, 1.9)	0.63
a Female Driver	99.7%	(98.8, 99.9)	98.0%	(91.8, 99.5)	-1.7	(-5.1, 1.7)	0.32
Infants in							
Passenger Cars	99.3%	(95.8, 99.9)	96.4%	(86.2, 99.1)	-2.9	(-8.7, 2.8)	0.31
Vans and SUVs	99.8%	(98.7, 100.0)	99.8%	(98.9, 100.0)	0.0	(-0.6, 0.6)	0.90
Pickup Trucks	NA	NA	NA	NA	NA	NA	NA
Infants in the							
Northeast	99.4%	(97.1, 99.9)	100.0%	(100.0, 100.0)	0.6	(-0.5, 1.6)	0.28
Midwest	100.0%	(100.0, 100.0)	100.0%	(100.0, 100.0)	0.0	(0.0, 0.0)	1.00
South	99.1%	(95.5, 99.8)	97.1%	(89.0, 99.3)	-1.9	(-6.8, 2.9)	0.42
West	100.0%	(100.0, 100.0)	99.4%	(96.0, 99.9)	-0.6	(-2.0, 0.7)	0.35
Infants in							
Urban Areas	99.6%	(98.1, 99.9)	98.2%	(92.6, 99.6)	-1.4	(-4.5, 1.7)	0.37
Rural Areas	99.5%	(97.5, 99.9)	99.6%	(97.7, 99.9)	0.1	(-1.1, 1.4)	0.84
Children 1 to 3							
Children 1-3 Driven by							
a Belted Driver	95.9%	(93.1, 97.7)	96.3%	(92.8, 98.1)	0.4	(-2.3, 3.1)	0.78
an Unbelted Driver	76.3%	(62.7, 86.0)	72.5%	(53.1, 86.0)	-3.8	(-27.7, 20.1)	0.75
a Male Driver	92.3%	(88.7, 94.8)	94.8%	(89.1, 97.6)	2.5	(-2.7, 7.8)	0.33
a Female Driver	96.5%	(93.1, 98.3)	95.1%	(90.2, 97.6)	-1.4	(-5.4, 2.6)	0.48
Children 1-3 in							
Passenger Cars	92.1%	(87.0, 95.3)	92.2%	(83.1, 96.6)	0.1	(-8.1, 8.3)	0.98
Vans and SUVs	97.0%	(94.5, 98.4)	97.1%	(93.7, 98.7)	0.1	(-2.5, 2.8)	0.92
Pickup Trucks	93.8%	(82.6, 98.0)	92.9%	(77.9, 98.0)	-0.9	(-12.8, 11.0)	0.88
Children 1-3 in the							
Northeast	90.2%	(76.8, 96.3)	93.1%	(81.7, 97.6)	2.8	(-1.2, 6.9)	0.16
Midwest	95.0%	(90.9, 97.3)	95.0%	(80.6, 98.8)	-0.1	(-10.4, 10.3)	0.99
South	94.7%	(90.2, 97.2)	94.8%	(87.1, 98.0)	0.1	(-5.7, 5.9)	0.97
West	97.4%	(92.1, 99.2)	97.5%	(96.4, 98.2)	0.0	(-3.6, 3.7)	0.98

[1] Passengers under 8 observed from 7 a.m. to 6 p.m. in the right-front seat or the second row of seats in passenger vehicles that are stopped at a stop sign or stoplight. Age, gender, and racial classifications are based on the subjective assessments of roadside observers.

[2] Use of child car seats (forward- or rear-facing), booster seats, and seat belts.

[3] The Wilson confidence interval is used in the estimated percentages in the occupant group (e.g., occupants who are male), which is in the form: $\{(2n\_EFF\ p+t^2) \pm t\sqrt{((t^2+4n\_EFF\ pq))}\}/(2(n\_EFF+t^2))$, where p is the estimated percentage of Belt Use, $(n\_EFF=n/D\_EFF$ is the effective sample size (where n is the sample size and D_EFF is the design effect), $t=t_{((1-\alpha/2))}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and q=1-p. For percentages, these endpoints are multiplied by 100.

[4] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table

[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{((1-\alpha/2))}(df)\sqrt{(v(p))}$, where p is the estimated change in percentage point, v(p) is its estimated variance, and $t_{((1-\alpha/2))}(df)$ is a multiplier from the t-distribution with df degrees of freedom.

[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question, indicated with bold type.

Child Passenger Group[1]	2018		2019		2018-2019 Change		
	Restraint Use[2]	95% Confidence Interval[3]	Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[4]	Confidence in a Change in Use[5]	P-value[6]
Children 1-3 in							
Urban Areas	95.0%	(91.7, 97.0)	96.2%	(92.7, 98.1)	1.2	(-1.8, 4.3)	0.41
Rural Areas	93.4%	(87.6, 96.6)	92.1%	(82.9, 96.6)	-1.3	(-8.7, 6.1)	0.72
Children 4 to 7							
Children 4-7 Driven by							
a Belted Driver	87.9%	(83.3, 91.4)	89.1%	(85.9, 91.6)	1.1	(-3.4, 5.7)	0.61
an Unbelted Driver	48.7%	(34.7, 62.9)	56.6%	(43.9, 68.5)	7.9	(-15.1, 31.0)	0.49
a Male Driver	84.0%	(78.4, 88.4)	86.1%	(81.6, 89.6)	2.1	(-5.1, 9.2)	0.56
a Female Driver	86.0%	(80.3, 90.2)	87.4%	(82.6, 91.0)	1.4	(-4.9, 7.7)	0.65
Children 4-7 in							
Passenger Cars	77.0%	(68.6, 83.6)	83.8%	(77.7, 88.6)	6.9	(-0.9, 14.6)	0.08
Vans and SUVs	91.2%	(87.5, 93.9)	89.7%	(85.1, 93.0)	-1.5	(-6.8, 3.9)	0.58
Pickup Trucks	85.0%	(74.7, 91.6)	80.2%	(69.0, 88.1)	-4.8	(-19.0, 9.4)	0.49
Children 4-7 in the							
Northeast	86.1%	(67.2, 94.9)	77.1%	(67.1, 84.8)	-9.0	(-23.2, 5.3)	0.21
Midwest	82.1%	(67.3, 91.1)	86.2%	(78.0, 91.6)	4.0	(-9.8, 17.9)	0.55
South	83.9%	(77.4, 88.8)	89.2%	(83.9, 93.0)	5.3	(-2.5, 13.1)	0.18
West	89.4%	(85.4, 92.4)	90.6%	(87.0, 93.3)	1.2	(-1.4, 3.9)	0.35
Children 4-7 in							
Urban Areas	84.8%	(78.8, 89.3)	85.7%	(81.8, 89.0)	1.0	(-4.8, 6.8)	0.73
Rural Areas	86.0%	(81.8, 89.3)	89.6%	(83.5, 93.6)	3.6	(-3.3, 10.6)	0.29

NA: Data was not sufficient to produce a reliable estimate.
Source: NOPUS, 2018, 2019.

5. NOPUS Methodology

The NOPUS sample was redesigned in 2015 and that design has since been used to conduct the survey. This section discusses the sample design, data collection, and estimation used in the 2019 NOPUS Controlled Intersection Study. Data collection, estimation, and variance estimation for NOPUS are conducted by Westat, Inc., under the direction of the NCSA under Federal contract number 693JJ918D000001.

Sample Design

The NOPUS uses a complex multistage probability sample, statistical data editing, imputation for unknown values, and complex estimation procedures. The sample sites for the 2019 NOPUS were entirely from the 2015 NOPUS sample redesign.

The redesigned NOPUS sample was selected using a stratified two-stage design. The first stage of selection was the individual county or set of adjacent counties, referred to as the primary sampling unit (PSU) within the design framework. The PSUs were targeted for selection based on their measure of size (MOS). A sample of 57 primary sampling units (PSUs) were selected from a frame of 1,588 PSUs.

The second stage of selection or secondary sampling unit (SSU), within the selected PSUs, is the road segment. At the road segment level, the NOPUS data collectors are then positioned so that they can efficiently observe seat belt use, motorcycle helmet use, and driver electronic device use.

The NOPUS sample frame of PSUs excluded Puerto Rico and the U.S. Territories. All other counties in the United States were included in the sampling frame with the exception of 37 counties and three areas in Alaska; these locations were excluded on the basis of low traffic volume measured in terms of vehicle miles traveled (VMT) or because they were geographically isolated. The sample frame of SSUs excluded segments along unnamed roads, cul-de-sacs, private roads, and a variety of other road types that have traditionally had very low traffic volume measured by VMT.

One PSU was sampled with certainty because of its large VMT, and the remaining PSUs were then grouped into the eight major strata based on the four Census region (Northeast, Midwest, South, and West) and two urbanicity classes (Urban and Rural).

A sample of 57 PSUs was selected using a Sequential Poisson method with probability approximately proportional to the VMT as the MOS (Ohlsson, 1998). The new NOPUS sample was selected to maximize PSU overlap with the old sample, thus maintaining comparability of the estimates from the current and previous samples. A SSU sample of road segments within each PSU is selected based upon the types of roads and urban/rural status with specified sampling rates.

Table 8 shows the observed sample sizes of the 2019 NOPUS Controlled Intersection Study. A total of 71,519 occupants were observed in 52,268 vehicles at 1,615 data collection sites. Of these observed occupants, 2,921 were children under 8. Please note that due to ineligibility, construction, danger in the area, or road closure, observations could not be completed at some of the sampled observation sites.

Table 8: Sites, Vehicles, and Occupants in the 2019 NOPUS Controlled Intersection Study

Numbers of	2018	2019	Percentage Change
Sites Observed	1,612	1,615	0.19%
Vehicles Observed	51,414	52,268	1.66%
Total Occupants	70,919	71,519	0.85%
Occupants 8 and Older	67,817	68,598	1.15%
In Front Seat	64,432	65,489	1.64%
In Rear Seat	3,385	3,109	-8.15%
Occupants Under 8	3,102	2,921	-5.83%
Children Under 1	464	413	-10.99%
Children 1 to 3	1,003	993	-1.00%
Children 4 to 7	1,635	1,515	-7.34%

Data Collection

The 2019 NOPUS data collection was conducted during the period from June 2 to June 17, 2019.

Data collection protocols remain largely the same in the redesigned NOPUS from 2015; however, NHTSA made adjustments such as including government, emergency, and commercial vehicles, and those carrying hazardous materials. Such vehicles are subject to seat belt laws in relevant jurisdictions and should be observed.

In the NOPUS Controlled Intersection Study, trained data collectors observe restraint use of drivers and other occupants of passenger vehicles (passenger cars, pickup trucks, SUVs, and vans) that have stopped at a stop sign or stoplight during daylight hours from 7 a.m. to 6 p.m. Observations are made both on the surface streets and at the ends of the expressway exit ramps (where there are controlled intersections). Only stopped vehicles are observed based on the time required to collect the variety of information required by the survey, including subjective assessments of the vehicle occupant age and race. Observers collect data on the driver, right-front passenger, and up to two passengers in the second row of seats. Observers do not interview vehicle occupants, allowing NOPUS to capture the uninfluenced behavior of the occupants.

The NOPUS Controlled Intersection Study is conducted annually following the NOPUS Moving Traffic Survey and is usually scheduled for all surface streets and limited access highway ramps, where NOPUS data from previous years indicates that a controlled intersection exists. If the data collectors arrive at an assigned surface street site and the site is not controlled, they are instructed to search for an alternate data collection site further along the same road segment. After the data collectors have located a controlled intersection, they position themselves at the traffic signal or stop sign, facing the oncoming traffic from the side of the road. The data collectors walk in the direction of the oncoming traffic, away from the intersection to make their observations. When the traffic light turns green or they finish observing all vehicles, the data collectors return to the intersection to wait for the next traffic light cycle or next vehicle. They observe vehicles in the lane closest to their observational position, even if the closest lane is an exclusive turn lane (which is often the case at the controlled intersections.) When possible and if visibility allows,

the data collectors also observe the other lanes of traffic. The data collectors are instructed to record the first behavior of the driver in which they observe.

Estimation

NOPUS estimates the proportion of occupants restrained in restraint type (R) among the occupants having characteristic (C) using the formula,

$$\text{Restraint Use}_{\text{CR}} = \frac{\sum_{i,j,k} w_{ijk} F_{ijk} CR_{ijk}}{\sum_{i,j,k} w_{ijk} F_{ijk} C_{ijk}},$$

where w_{ijk} and F_{ijk}, respectively, denote the base weight and the product of various weight adjustment factors at the site k in the stratum j of the PSU i. CR_{ijk} stands for the number of observed occupants having characteristic C and restrained in restraint type R and C_{ijk} denotes the number of observed occupants having characteristic C at the site k in the stratum j of the PSU i. For example, the seat belt use by vehicle type is estimated using the above formula, where CR_{ijk} is the number of observed belted occupants in certain type of vehicles (such as passenger cars, vans & SUVs, or pickup trucks) and C_{ijk} is the number of ALL (belted and unbelted) occupants observed in that type of vehicles at the site k in the stratum j of the PSU i.

Prior to 2015 NHTSA's NOPUS publications reported integer percentage values for seat belt use point estimates. Along with updating the survey design, NHTSA has revised its NOPUS reporting format to be consistent with statistical best practices across the Federal Government. The new reporting format presents percentage point estimates with one decimal place. Along with this change, 95 percent confidence intervals and p-values accompany the point estimates.

In certain instances, NHTSA does not provide estimates. These are typically restraint use estimates whose numerator is based on fewer than five persons observed, or whose denominator is based on fewer than 30 people observed. These are reported as "NA" in publications. Any related estimate (i.e., change in use and confidence estimates) is not reported as well. The same criteria are used in reporting estimates from the NSUBS.

6. References

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