SEAT BELT USE IN NORTH DAKOTA

JUNE 2020

Thank you to North Dakota Tourism and Gerald Blank for the use
of the North Dakota picture on the cover.

THIS REPORT WAS PREPARED IN COOPERATION WITH THE

North Dakota Department of Transportation

Safety Division

and

U.S. Department of Transportation

National Highway Traffic Safety Administration

Upper Great Plains Transportation Institute

North Dakota State University, Dept. 2880

P.O. Box 6050

Fargo, North Dakota 58108-6050

Kimberly Vachal[1], Laurel Benson[2], and Jaclyn Andersen[3]

[1]Associate Professor, [2]Consulting Project Specialist, [3]Research Project Specialist

Disclaimer

This research was supported by the North Dakota Department of Transportation and the National Highway Traffic Safety Administration. The contents presented in this report are the sole responsibility of the Upper Great Plains Transportation Institute and the authors.

NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, ndsu.eoaa@ndsu.edu.

EXECUTIVE SUMMARY

North Dakota's seat belt use study provides statistically reliable data from which generalizations, comparative analyses, and recommendations can be developed based on a field survey of driver and right front-seat passenger seat belt use. This National Occupant Protection Use Survey (NOPUS) is based on national standards for survey design and field observation protocol. It provides the North Dakota Department of Transportation (NDDOT) with a systematic evaluation of seat belt use rates within the state. The National Highway Traffic Safety Administration (NHTSA) funds NOPUS through NDDOT's Safety Division.

During the week of June 1-7, 2020, trained observers visited each site in their assigned counties to collect seat belt use for drivers and right front-seat passengers in vehicles with gross vehicle weights up to 10,000 lbs. Data were collected for 17,836 drivers and 4,283 right front-seat passengers for a total of 22,119 vehicle occupants. The observations were conducted at 320 sites across 16 counties. Based on the sampling methodology weighting procedures, the final estimate for the statewide seat belt use was 83.7%.

A summary of major findings from the 2020 survey regarding seat belt use in North Dakota follows:

- **County.** Weighted rates of seat belt use by county showed McKenzie with the highest use at 93.8%, and Burke County with the lowest use at 62.7%. Ward County was also observed to have low use of less than 70% in 2020. Applying three-year averages for trend comparison showed several counties with improvements in rates in the 2018-2020 time period over the previous 2014-2016 average. Trends were not available in five counties that were new to the survey with the 2017 county reselection. The change in the county composition was due to the NHTSA-mandated reselection process that is required in five-year intervals.

- **Vehicle Occupant.** Driver seat belt use was 79.7% while passenger use was 88.3% statewide. At the county level, McKenzie reflected the highest rate of drivers belted at 93.6%. Driver restraint use in Burke, Stutsman, and Ward counties was observed to be less than 70%. McKenzie County also reflected the highest passenger belt use at 99%. In addition, Barnes, Cass, Griggs, Morton, Richland, Stark, and Traill counties had rates of passenger belt use greater than 90%. The lowest rate for passengers was found in Williams County at 69.1%.

- **Region.** Overall rates of seat belt use were higher in the east region at 85.2%, compared with 78.2% in the west region. This regional disparity is noted throughout the 2015–2020 period. Rates in the east ranged from a low of 82.2% in 2017 to a high of 85.7% in 2016, while rates in the west were lower, ranging from a low of 74.7% in 2017 to a high of 79.0% in 2015. Regional disparity was also evident for drivers. In 2020, drivers in the east registered use of 83.4%, compared with their counterparts in the west at 76.7%. Passenger rates continued to reflect regional disparity, with 92.1% usage in the east and 84.7% usage in the west.

- **Vehicle Type.** The results of the 2020 statewide survey indicated occupants of cars, SUVs, and vans demonstrated relatively high restraint use with 81.7%, 87.2%, and 88%, respectively. Truck occupants, on the other hand, were belted at a lower rate of 76.1%, which reflects little change from last year. The sample size of this demographic (44.1%) combined with the lower usage continues to negatively influence the overall North Dakota rate. Male occupants in trucks were belted at 73.9% in 2020, compared with 86.9% for females, and had the lowest five-year average at 72%.

- **Gender.** In 2020, female occupants continued to show higher rates of seat belt use overall (88.2%) than male occupants (77.2%). When considering rates at the county level, females registered use greater than 80% in 13 of the 16 counties. Male rates reached that same level in only seven counties. The gender rates by counties varied from 4 to 27 percentage points. Higher rates hold for females in every county whether they are drivers or passengers.

- **Gender and Vehicle Type.** Females had higher rates of seat belt use than males in every vehicle type. The highest rate for males was found in vans, 85.2%, and the lowest in trucks, 73.9%. By comparison, female rates ranged from a high of 91.7% in vans to a low of 85.7% in cars.

- **Road Type.** Secondary roads held the largest share of occupants in the sample (52.1%), followed by primary roads (38.5%). Local roads had the smallest share (9.4%) mainly due to their selection only in counties designated as metropolitan statistical areas (MSA) per NHTSA protocol. Seat belt use in 2020 was highest on primary roads (90.4%), followed by local roads (80.6%), and secondary roads (74.8%). A comparison of results defined by MSA versus non-MSA county designation showed variations among road types as well. MSA-classified counties show higher rates of use by vehicle occupants: 95.1% on primary roads, 86.1% on secondary roads, and 80.6% on local roads. However, the majority of the sample is from non-MSA counties, with rates of 90% on primary roads and 74.5% on secondary roads. Regional differences in shares and use rates by road type were also noticed.

Table of Contents

EXECUTIVE SUMMARY iii
INTRODUCTION 1
SEAT BELT SURVEY RESULTS 2
Statewide Results 2
Sample Size by Year 2
County Results 4
Results for Vehicle Occupants by Position 6
Results by North Dakota Regions 8
Results by Vehicle Type 11
Results by Occupant Gender and Position 14
Results by Gender and Vehicle Type 18
Results by Road Type 20
FIELD SURVEY PROTOCOL 24
Standard Error and Confidence Intervals 24
Nonresponse Rate 25
Protocols 25
Quality Assurance 26
CONCLUSION 27

List of Figures

Figure 1: Statewide Seat Belt Use, Weighted 3
Figure 2: Seat Belt Use by County, 2020, Weighted 4
Figure 3: Seatbelt Use By County, Three-Year Averages, Weighted 5
Figure 4: Percent Belted by Occupant Position and County, Unweighted, 2020 6
Figure 5: Percent Belted by Position, Annual, Unweighted 7
Figure 6: North Dakota County Stratification 8
Figure 7: Percent Belted by Region, Unweighted 9
Figure 8: Seat Belt Use by Region, Three-Year Averages, Unweighted 9
Figure 9: Percent Belted by Region and Occupant Position, Annual, Unweighted 10
Figure 10: Percent Belted by Vehicle Type, Annual, Unweighted 12
Figure 11: Seat Belt Use by Vehicle Type, Three-Year Averages, Unweighted 12
Figure 12: Percent Belted by Gender, Annual, Unweighted 14
Figure 13: Seat Belt Use by Gender & Position, Three-Year Averages, Unweighted 16
Figure 14: Percent Belted by Gender and Position, Annual, Unweighted 16
Figure 15: Percent Belted by Gender and Vehicle Type, 2020, Unweighted 18
Figure 16: Seat Belt Use by Gender and Vehicle Type, Three-Year Averages, Unweighted 19
Figure 17: Percent of 320 Survey Sites by Road Type, 2012 and 2017 21
Figure 18: Percent Belted by Road Type, Annual, Unweighted 21
Figure 19: Seat Belt Use by Roadway Type, Three-Year Averages, Unweighted 22
Figure 20: Percent Belted by Road Type & Metropolitan Statistical Areas, 2020, Unweighted 23

List of Tables

Table 1: Survey Sample by Occupant Position 2
Table 2: Ratio of Drivers to Passengers, 2015-2020 2
Table 3: Sample Size By Region 8
Table 4: Sample by Vehicle Type 11
Table 5: Percent Belted by County and Vehicle Type, 2020, Unweighted 13
Table 6: Sample by Gender 14
Table 7: Percent Belted by Gender & County, 2020 15
Table 8: Sample by Gender and Position 15
Table 9: Percent Belted by Gender and Position by County, 2020, Unweighted 17
Table 10: Sample by Vehicle Type and Gender 18
Table 11: Annual Percent Belted by Gender and Vehicle Type, Unweighted 19
Table 12: Sample by Road Type 20
Table 13: Annual Percent Belted by Region & Road Type, Unweighted 22
Table 14: Seat Belt Use by Region and MSA Designations 23
Table 15: Summary of the Seat Belt Use Survey 24
Table 16: Confidence Interval 24

INTRODUCTION

The Upper Great Plains Transportation Institute (UGPTI), a research, education, and outreach center at North Dakota State University (NDSU) in Fargo, ND, was contracted by the North Dakota Department of Transportation (NDDOT) to conduct a field survey of seat belt use in 2020. The study replicates the sampling methodology previously approved by the NHTSA and NDDOT for the 2012 survey. That methodology was a redesign of an earlier method to yield a more statistically robust estimate of seat belt use on all roadways in North Dakota. In 2017, survey researchers implemented an NHTSA-mandated review of state crash-related fatalities that resulted in modifications to county inclusion and selection, and a complete reselection of observation sites. This reselection is certified for five years. Requirements for conducting statewide seat belt surveys are published in the Federal Register, Vol. 76 No. 63, April 1, 2011, Rules and Regulations, pp. 18042 – 18059.

The objective of this study was to estimate the statewide rate of seat belt use of drivers and right front-seat passengers in North Dakota.

Additional analyses estimated seat belt use rates in the following categories:

- Occupant position (driver, passenger)
- Gender (male, female)
- Type of vehicle (car, van, sport utility vehicle, truck)
- Region of state (east, west)
- Roadway type (primary, secondary, local)
- Population density/economic activity (MSA, non-MSA)

A description of the tasks involved in conducting the statewide seat belt survey is provided in this report. It includes general information about the methods and protocols. Survey sample design methods were employed to ensure the results were representative of the behavior statewide. One exception to this was that local roads were only sampled in MSA counties per NHTSA protocol.

SEAT BELT SURVEY RESULTS

Statewide Results

Sample Size by Year

Table 1: Survey Sample by Occupant Position

Occupants Observed	2016	% of Sample	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample
Drivers	21,023	78.4%	19,784	80.4%	19,383	79.5%	19,397	80.7%	17,836	80.6%
Passengers	5,802	21.6%	4,822	19.6%	5,007	20.5%	4,645	19.3%	4,283	19.4%
Total	26,825	100.0%	24,606	100.0%	24,390	100.0%	24,042	100.0%	22,119	100.0%

Table 1 shows the size of annual seat belt surveys from 2016-2020 by occupant position. There were 22,119 occupants in 2020, consisting of 17,836 drivers which represented 80.6% of the sample, and 4,283 passengers which represented 19.4% of the sample. These figures include only vehicle occupants where protection status could be determined.

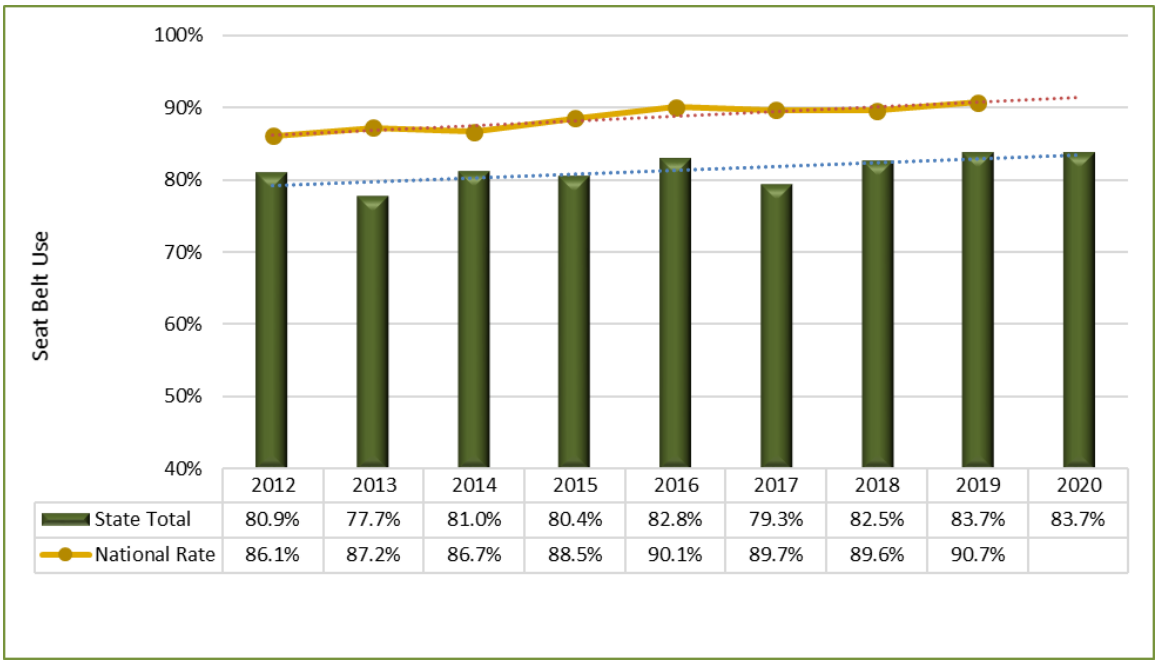
Total sample size can vary from year to year depending on site locations and traffic flow. The overall sample size has remained relatively consistent, however, this year's sample size has decreased by about 2,000 occupants. This decrease might be related to the disruption of day-to-day routines caused by Covid-19. Further, the reduction seen from earlier iterations of the survey may be attributed to the five-year reselection of sites mandated by NHTSA in 2017. Occupant shares are comparable to previous surveys. It is not uncommon to have several individual sites capture only a limited number of vehicles. However, these sites are important to the aggregate measurement of statewide and county seat belt use, so they are captured each year.

The driver-to-passenger ratio can influence overall use rates. In 2020, the ratio was 4.2 drivers for every occupant, meaning drivers represent 80.6% of the sample. Table 2 shows only minor variations in this ratio since 2016. Driver share of the sample deviated roughly 2 percentage points or less over the time period shown.

Table 2: Ratio of Drivers to Passengers, 2015-2020

Ratio	2016	2017	2018	2019	2020
Drivers:Passengers	3.6:1	4.1:1	3.9:1	4.8:1	4.2:1
Drivers as % of Sample	78.4%	80.4%	79.5%	80.7%	80.6%

Overall unweighted results of the 2018 statewide survey indicated 80.8% of vehicle occupants were observed wearing seat belts on North Dakota roads. Because the survey employs a two-stage stratified random sampling scheme, a more appropriate estimate of seat belt use is found by weighting the unadjusted rate. Using those formulas, the overall weighted rate of seat belt use in North Dakota was 83.7% for 2020. Figure 1 shows annual seat belt use since implementation of the amended methodology in 2012. In addition, the graph includes national use as reported by NHTSA with the most recent data showing a rate of 90.7% in 2019. Nationally, NOPUS survey data confirm that vehicle occupants in states with primary enforcement of seat belt laws demonstrate higher restraint use than states with secondary laws. Accordingly, North Dakota aligns more closely with NHTSA's 2019 published rate of 86.2% for states without primary seat belt laws.[1]



	2012	2013	2014	2015	2016	2017	2018	2019	2020
State Total	80.9%	77.7%	81.0%	80.4%	82.8%	79.3%	82.5%	83.7%	83.7%
National Rate	86.1%	87.2%	86.7%	88.5%	90.1%	89.7%	89.6%	90.7%	

Figure 1: Statewide Seat Belt Use, Weighted

*2017 rate marks NHTSA-mandated resampling of counties and sites

[1] National Highway Traffic Safety Administration. Traffic Safety Facts Research Note. January 2019. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812662

County Results

The 2020 weighted seat belt rates by county are shown in Figure 2. Restraint use ranged from a high of 94.0% in McKenzie County to a low of 60.3% in Burke County. Higher seat belt use is generally noticed in counties that follow interstate corridors, and this was supported again in the 2020 data. There is a greater concentration of counties with higher rates where interstates form a share of the road system. There may also be a regional influence depressing rates in Williams County, which is in western North Dakota, with relatively high truck[2] traffic shares and no interstate roadways. Additional detail on these issues is provided later in sections of the report addressing region, vehicle type, and roadway variation in seat belt use rates.

Rates vary from year to year at the county level. The changes can represent sampling differences and are not likely to be statistically significant, especially for counties where there are fewer total observations. However, even the rates for counties with more observations may exhibit noticeable change from one year to the next.

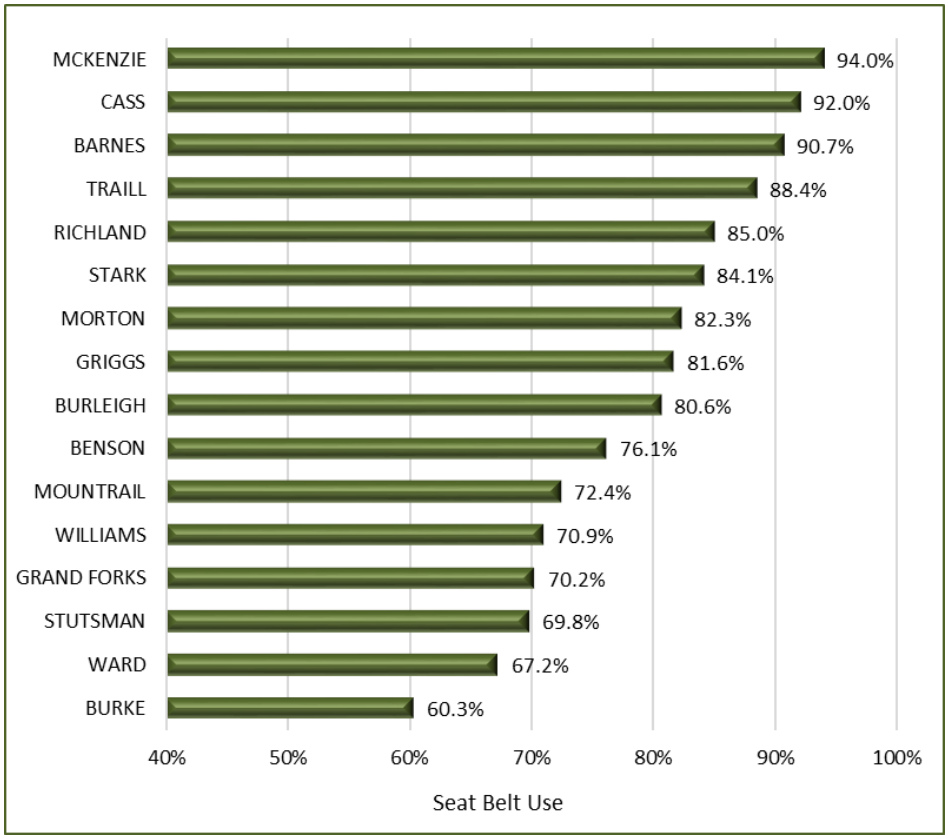


Figure 2: Seat Belt Use by County, 2020, Weighted

[2] Truck definition is trucks with a gross vehicle weight of less than 10,000 lbs. These include pickups, wrecker tow vehicles, flatbed 3- or 4-ton trucks, and utility service trucks; excludes semi or large box trucks, and large emergency vehicles.

To smooth the annual variability, three-year averages are graphed in Figure 3 to provide a representation of county rates. This analysis does not offer the earlier three-year averages for comparison on five counties that were first-year additions to the survey in 2017 because of the reselection process. Rather, occupant use collected during the latter three surveys is averaged for Benson, Burke, Griggs, Mountrail, and Williams counties.

The three-year averages used for trend comparison show variations in seat belt use in several counties. In the most recent three-year time frame, Barnes County leads in belt use at 93.3%. Cass, McKenzie, Morton, Mountrail, Richland, and Traill counties all register rates above 80%.

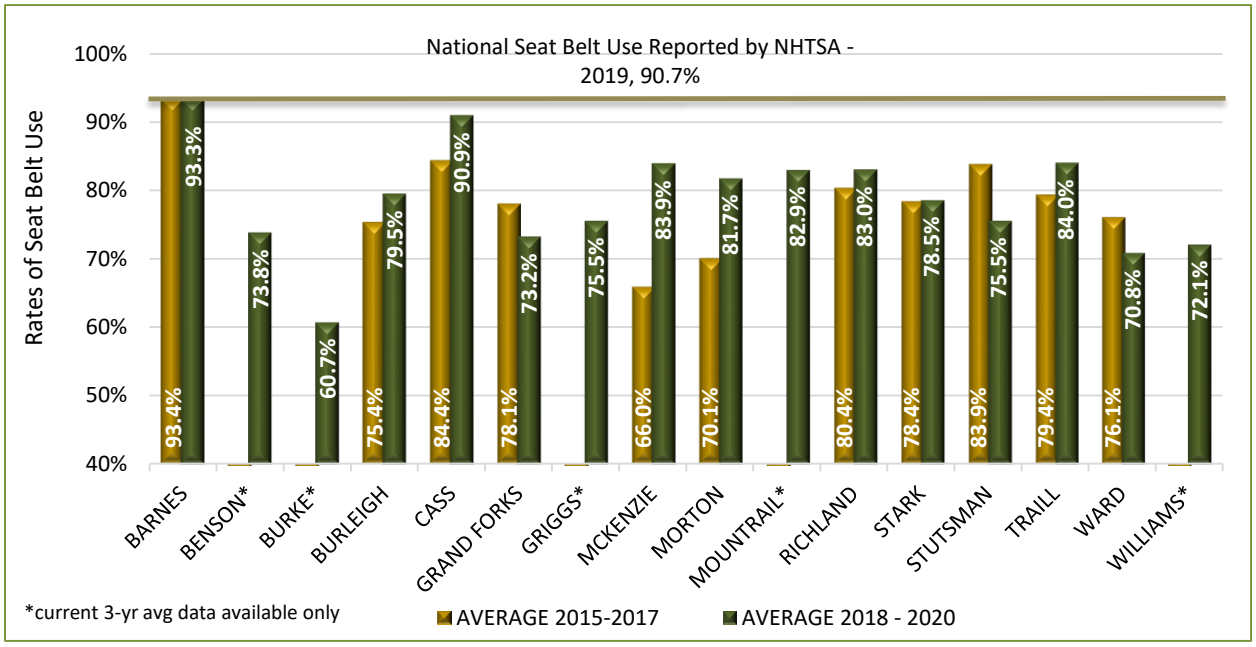


Figure 3: Seat belt Use by County, Three-Year Averages, Weighted

The preceding statewide data are based on the weighted county sampling frame. However, the following sections of this report describe strata frequencies that are unadjusted because of survey design.

Results for Vehicle Occupants by Position

Figure 4 illustrates seat belt use by occupant position in 2020. At the county level, driver use ranged from a low in Burke County of 55.7% to a high of 93.6% in McKenzie County. The spread in passenger use was 69.1% to 99.0% in Williams and Barnes counties, respectively. Annual surveys confirm that, as a rule, passengers buckle up at higher rates than drivers. The 2020 survey showed just two counties, Grand Forks and Williams, with lower restraint use among passengers than drivers.

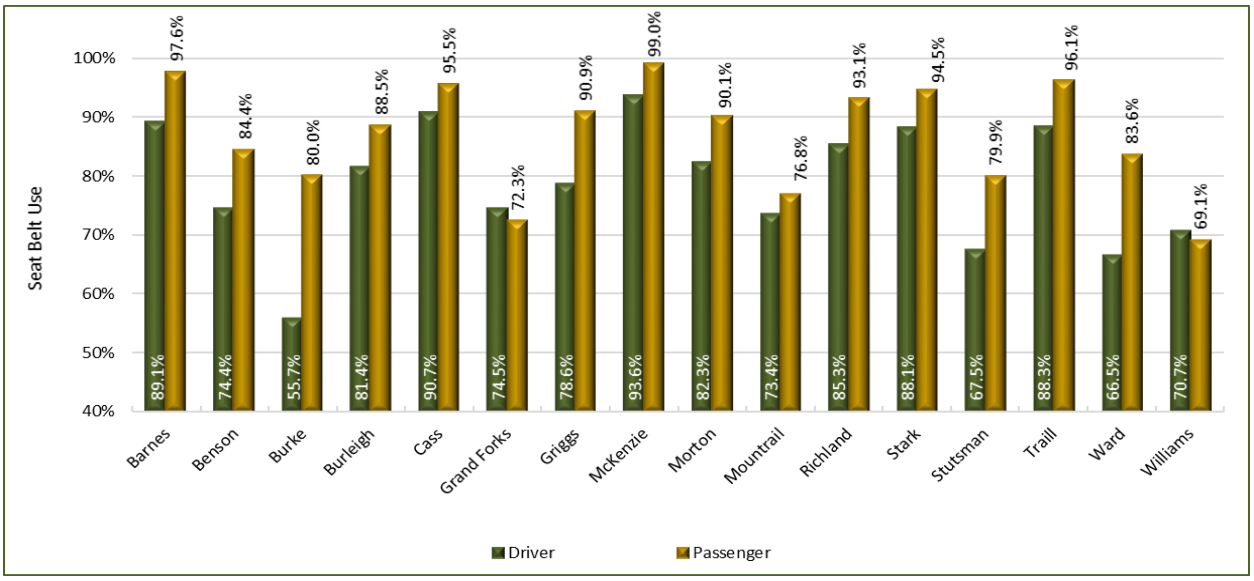
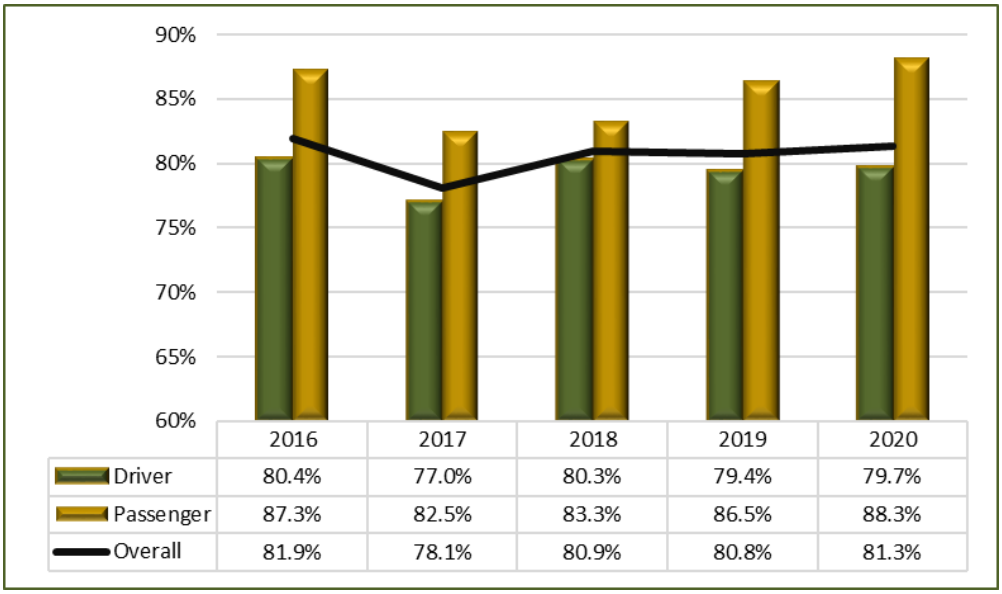


Figure 4: Percent Belted by Occupant Position and County, Unweighted, 2020

Considering the state as a whole, the unweighted estimates of seat belt use in 2020 were 79.7% for drivers and 88.3% for passengers, with an overall estimate of the seat belt use rate of 81.3% for drivers and passengers combined (Figure 5). These rates compare with 79.4%, 86.5%, and 80.8%, respectively in 2019.

Considerable effort has been made to address seat belt use in North Dakota. Experiences from other states suggest that some impetus to cause a major shift will be necessary to achieve significant increases in seat belt use. One possibility would be enactment of a primary seat belt law, which NHTSA suggests would increase seat belt use rates by 10% to 15%. Other possible interventions include heightened education and enforcement across the state.

Some factors that may be useful in administering programs to increase seat belt use in North Dakota are found in the remainder of this report. Differences in seat belt use among regions of the state, gender, vehicle type, and roadway type are explored for additional insight.



	2016	2017	2018	2019	2020
Driver	80.4%	77.0%	80.3%	79.4%	79.7%
Passenger	87.3%	82.5%	83.3%	86.5%	88.3%
Overall	81.9%	78.1%	80.9%	80.8%	81.3%

Figure 5: Percent Belted by Position, Annual, Unweighted

Results by North Dakota Regions

The survey sampling methodology groups the state into an east/west regional division (Figure 6). Both east and west regions contain three "certainty" counties and five additional counties selected from the remaining counties in each region.[3]

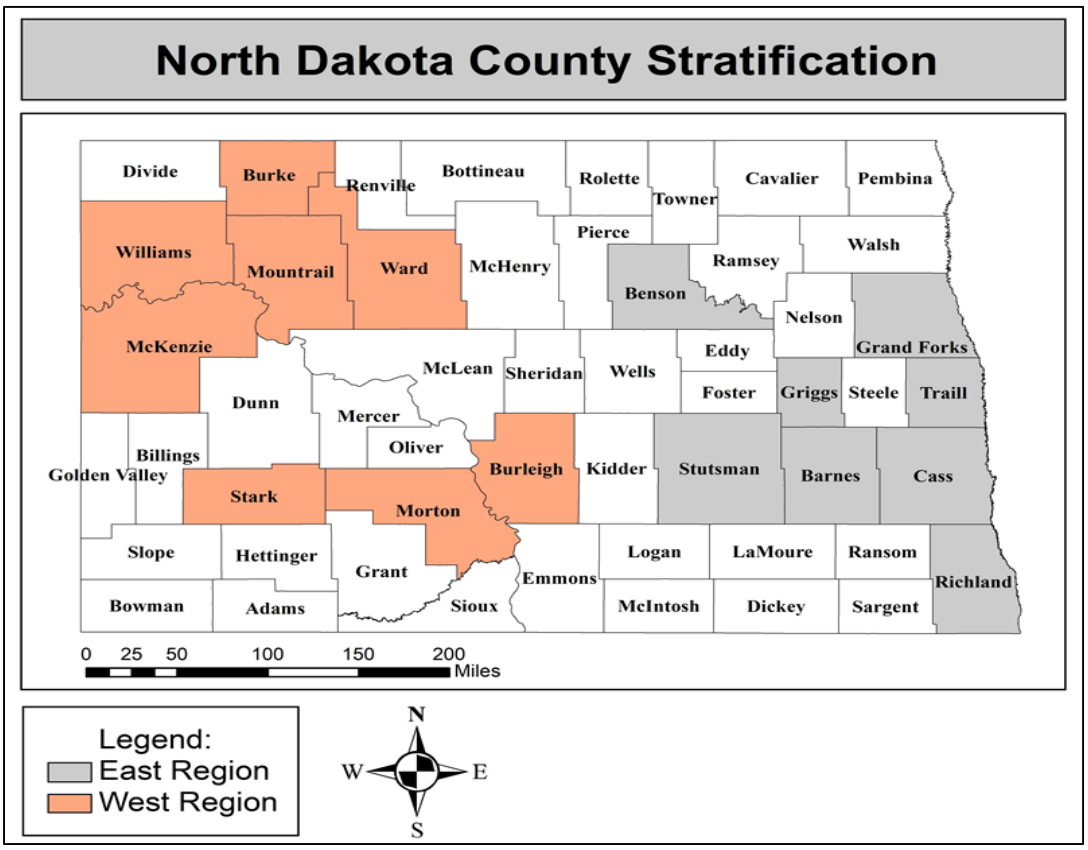


Figure 6: North Dakota County Stratification

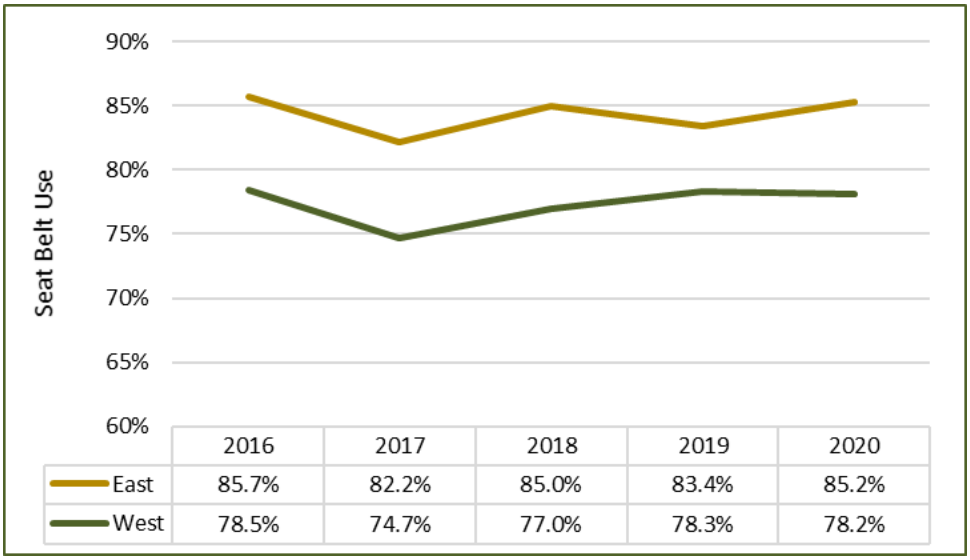
Year-to-year variations in sample size may be associated with revised sites and/or changes in travel levels and patterns. Table 3 shows a proportionate sample distribution between regions throughout the five-year period. Seat belt data collected from western North Dakota totaled 12,202 occupants, compared with 9,917 from the eastern half of the state. This represented 55.2% and 44.8% of the sample, respectively.

Table 3: Sample Size By Region

Region	2016	% of Sample	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample
East	12,713	47.4%	11,180	45.4%	12,041	49.4%	11,620	48.3%	9,917	44.8%
West	14,112	52.6%	13,426	54.6%	12,349	50.6%	12,422	51.7%	12,202	55.2%
Total	26,825	100.0%	24,606	100.0%	24,390	100.0%	24,042	100.0%	22,119	100.0%

[3]For details on methodology, certainty counties and the selection processes, contact NDDOT Safety Division.

Seat belt use is routinely higher in the east than the west, as shown in Figure 7. The rate difference between regions this year closely resembles differences seen in prior years. The comparison of seat belt use in Figure 8 shows an average rate in the east of 84.1% from 2015-2017 and 84.5% from 2018-2020. Seat belt use in the west was lower, but similar between the two periods, 77.4% from 2014-2016 and 77.8% from 2018-2020.



	2016	2017	2018	2019	2020
East	85.7%	82.2%	85.0%	83.4%	85.2%
West	78.5%	74.7%	77.0%	78.3%	78.2%

Figure 7: Percent Belted by Region, Unweighted

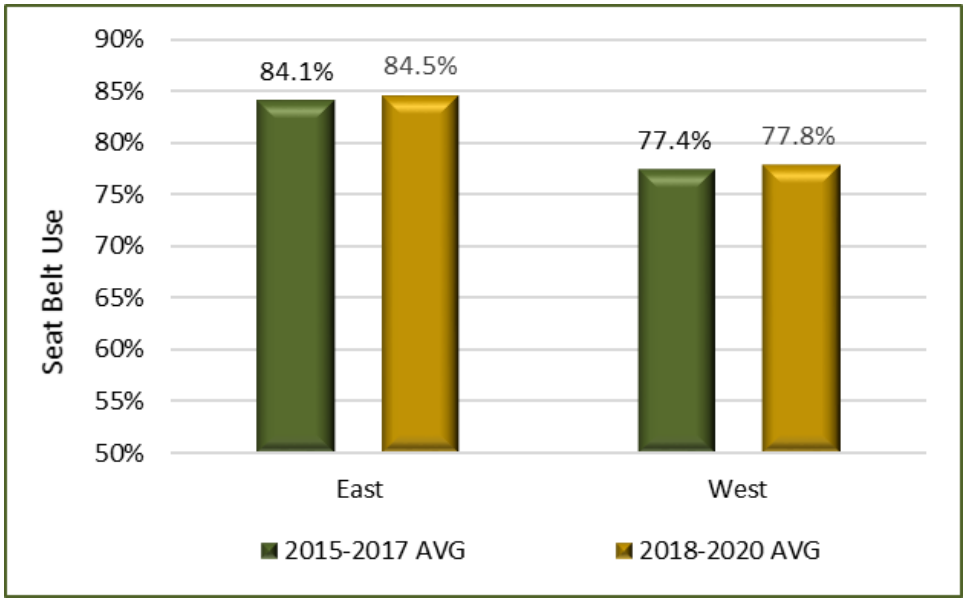


Figure 8: Seat Belt Use by Region, Three-Year Averages, Unweighted

A further breakdown of driver and passenger use by region is seen in Figure 9. Minor up and down fluctuations in belt use by both occupant positions from the east region are seen during the five-year

span shown in the graph. Currently, the rate for drivers in the east is 83.3% and for passengers is 89.2%. Driver rates in the west region are basically unchanged from 2019 to 2020, but continue to represent the lowest usage of the four occupant groups, at 76.8%. A noticeable rise in passenger usage to a five-year high of 85.9% was observed in 2019 in this region, with a slight decrease to 82.7% in 2020.

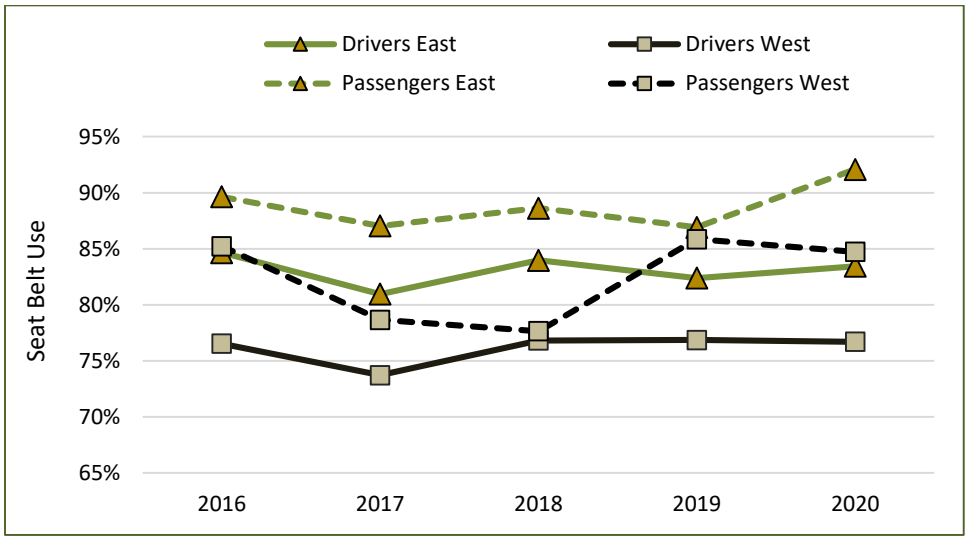


Figure 9: Percent Belted by Region and Occupant Position, Annual, Unweighted

Seat belt use by truck occupants in the west region undoubtedly influences the lower rates. Large truck volume of greater than 50% was observed in Burke, Griggs, McKenzie, Mountrail, and Williams counties. Truck share was as high as 74.7% in McKenzie County. Overall, these counties account for 50.3% (n=4,911) of the statewide share of occupants in this vehicle type. The disproportionate influence is examined further in the next section.

Results by Vehicle Type

Table 4 shows the fleet distribution annually since 2016. During that time, the number of cars surveyed has continued to decrease from the 26.8% share in 2016 to 18.6% in 2020. Van representation has also declined slightly over this same period, and currently represents 5.8% of the sample. The share of SUVs (31.4%) has increased a few points from last year's five-year low of 27.5% share. Trucks make up 44.1% of the occupant share in 2020, and historically hold the largest share of vehicle type.

Table 4: Sample by Vehicle Type

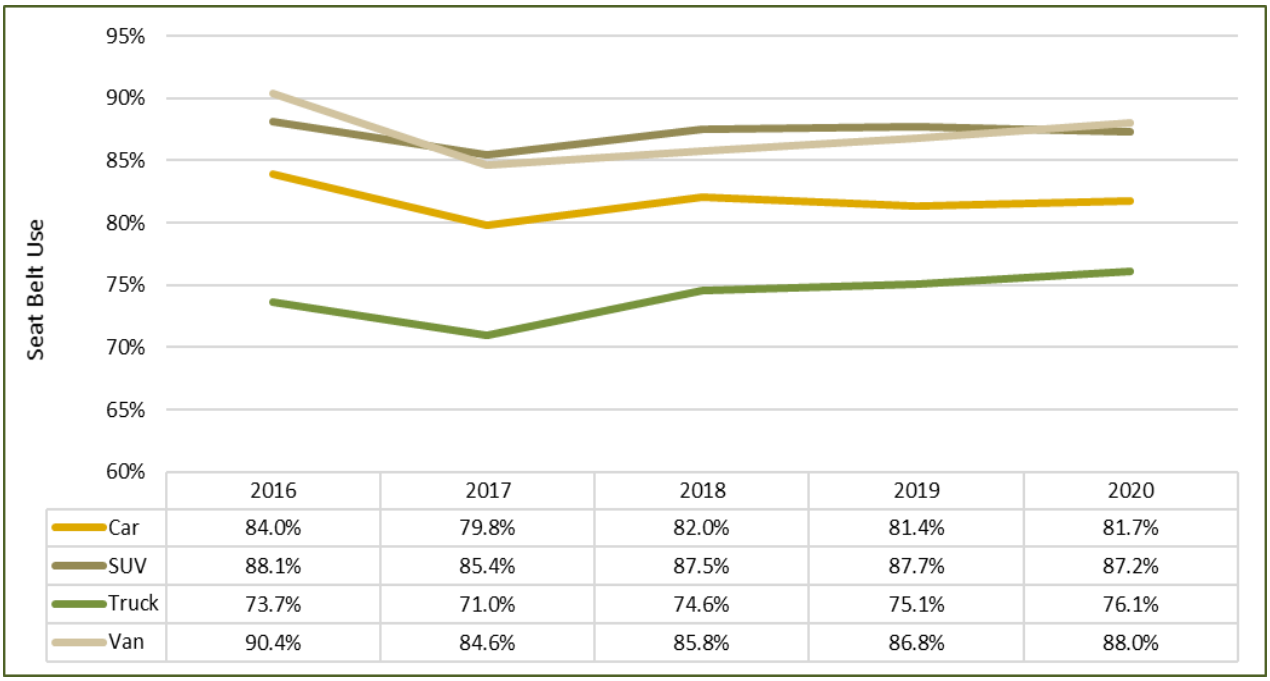
Vehicles Observe	2016	% of Sample	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample
Car	7,192	26.8%	5,646	22.9%	5,364	22.0%	5,620	23.4%	4,122	18.6%
SUV	7,702	28.7%	7,013	28.5%	7,479	30.7%	6,616	27.5%	6,955	31.4%
Truck	9,811	36.6%	10,213	41.5%	9,857	40.4%	10,255	42.7%	9,754	44.1%
Van	2,120	7.9%	1,734	7.0%	1,690	6.9%	1,551	6.5%	1,288	5.8%
Total	26,825	100.0%	24,606	100.0%	24,390	100.0%	24,042	100.0%	22,119	100.0%

Beginning with the 2012 statewide seat belt survey, North Dakota incorporated the expanded uniform criteria vehicle eligibility to define a fleet that included all passenger vehicles with a gross vehicle weight up to 10,000 pounds. This change necessitated the inclusion of various small trucks, e.g., flatbed, utility service, small box trucks, etc. Trucks with commercial use indicated by logos on doors or truck body are within the survey scope.

Regionally, trucks represented 49.5% of vehicles in the west, and 37.45% in the east. The larger share of vehicles in the western region (55.2%), along with the higher volume of trucks, may influence the statewide seat belt rate. The increase in truck share noticed since 2017 may be correlated with geography and the addition to this survey of Burke, Mountrail and Williams counties, all located in the Bakken oil region, and each with a truck share representing more than half of their total vehicle counts. This disproportionate number of trucks in the sample may be shaped by North Dakota's oil development. The nature of the travel environments, with fewer urban lane miles in the west, also likely impacts fleet composition.

At the county level, this disproportionate share of trucks in the west region was most noticeable in McKenzie County, which recorded 74.7% of this vehicle type as a share of the county total. This was followed by Williams County at 67%, Mountrail at 59.1%, and Burke at 55.0%. In the east region, Benson, Grand Forks, Griggs, and Stutsman counties registered the largest shares of trucks, ranging between 40% and 50%.

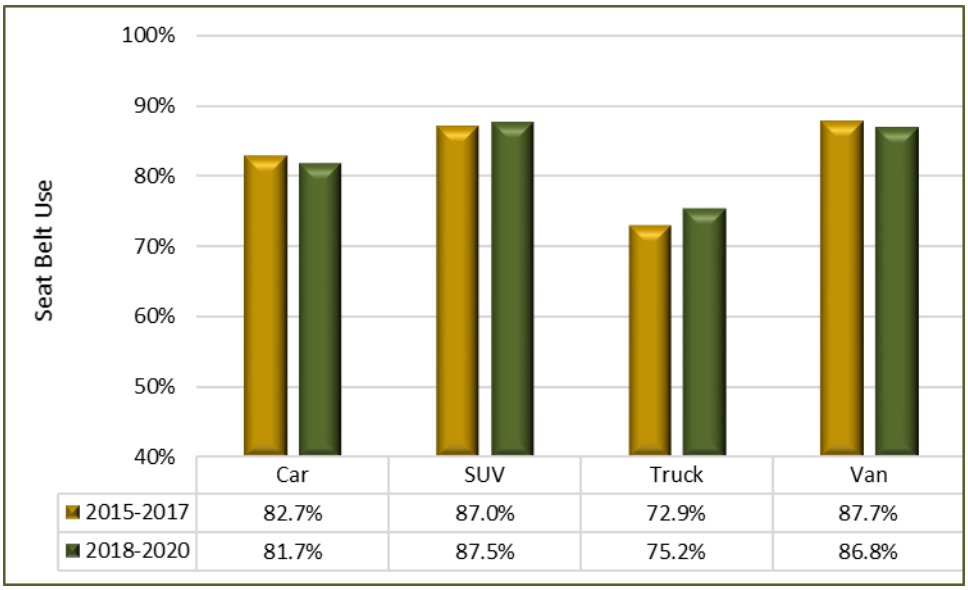
Annual results for overall seat belt use by vehicle type are shown in Figure 10. SUV and van occupants continue to demonstrate the highest usage rates at 87.2% and 88.0%, respectively, followed by car and truck occupants at 81.7% and 76.1%, respectively. Truck occupants continue to have noticeably lower rates than occupants in other vehicle types.



	2016	2017	2018	2019	2020
Car	84.0%	79.8%	82.0%	81.4%	81.7%
SUV	88.1%	85.4%	87.5%	87.7%	87.2%
Truck	73.7%	71.0%	74.6%	75.1%	76.1%
Van	90.4%	84.6%	85.8%	86.8%	88.0%

Figure 10: Percent Belted by Vehicle Type, Annual, Unweighted

The three-year averages used to measure belt use for occupants of each vehicle type show marginal differences between the 3-year periods (Figure 11). Individual county rates by each vehicle type are found in Table 5.



	Car	SUV	Truck	Van
2015-2017	82.7%	87.0%	72.9%	87.7%
2018-2020	81.7%	87.5%	75.2%	86.8%

Figure 11: Seat Belt Use by Vehicle Type, Three-Year Averages, Unweighted

The 2020 results are consistent with long-term trends for seat belt use in North Dakota and other states that do not have primary seat belt laws, are largely rural in nature, and have a high proportion of trucks. While seat belt use by occupants in trucks has increased in recent years, Table 5 shows this demographic

with rates of less than 70% in six of the sixteen observed counties. This lower use, coupled with the proportion of trucks in the sample, can reduce both county rates and the overall state rate.

Table 5: Percent Belted by County and Vehicle Type, 2020, Unweighted

2020							
Car		SUV		Truck		Van	
Barnes	90.4%	Barnes	95.1%	Barnes	87.2%	Barnes	96.5%
Benson	73.9%	Benson	87.8%	Benson	67.3%	Benson	86.4%
Burke	72.3%	Burke	73.4%	Burke	50.3%	Burke	88.9%
Burleigh	74.3%	Burleigh	92.4%	Burleigh	75.1%	Burleigh	84.0%
Cass	89.6%	Cass	94.2%	Cass	90.1%	Cass	88.1%
Grand	71.4%	Grand	86.7%	Grand	64.1%	Grand	90.0%
Griggs	82.4%	Griggs	85.2%	Griggs	75.6%	Griggs	93.3%
McKenzie	93.5%	McKenzie	96.0%	McKenzie	93.6%	McKenzie	100.0%
Morton	78.7%	Morton	91.6%	Morton	77.7%	Morton	88.2%
Mountrail	76.9%	Mountrail	79.0%	Mountrail	70.8%	Mountrail	88.6%
Richland	86.6%	Richland	92.5%	Richland	80.7%	Richland	91.2%
Stark	94.7%	Stark	95.0%	Stark	82.6%	Stark	96.5%
Stutsman	68.1%	Stutsman	72.6%	Stutsman	68.4%	Stutsman	84.2%
Traill	91.5%	Traill	94.9%	Traill	84.0%	Traill	91.9%
Ward	68.8%	Ward	73.7%	Ward	65.1%	Ward	67.8%
Williams	71.1%	Williams	78.8%	Williams	67.0%	Williams	88.2%

Results by Occupant Gender and Position

Minimal year-to-year variation in sample composition is observed for occupant gender and summarized in Table 6. Overall, males represented 61.9% and females 37.3% of the sample in 2020. In a small percentage of observations, 0.8%, occupant gender could not be determined, but occupant protection was still recorded. These cases are included in all of the analyses except where gender is one of the variables of interest. Removing these observations for these parts of the analyses has no effect on the overall numbers, but is mentioned here for comprehensive reporting.

Table 6: Sample by Gender

Gender	2016	% of Sample	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample
Female	10,559	39.4%	8,817	35.8%	9,049	37.1%	8,800	36.6%	8,242	37.3%
Male	16,035	59.8%	15,624	63.5%	15,099	61.9%	14,921	62.1%	13,695	61.9%
Unknown	231	0.9%	165	0.7%	242	1.0%	321	1.3%	182	0.8%
Total	26,825	100.0%	24,606	100.0%	24,390	100.0%	24,042	100.0%	22,119	100.0%

Survey results for seat belt use by gender continued a pattern of higher rates of use by female occupants. Females demonstrated 87.7% usage in 2020, and have consistently registered in the upper 80% range throughout the last five years (Figure 12). By comparison, male restraint use has regularly been less than 80%. Males were observed to be using seat belts at a rate of 77.2% in 2020.

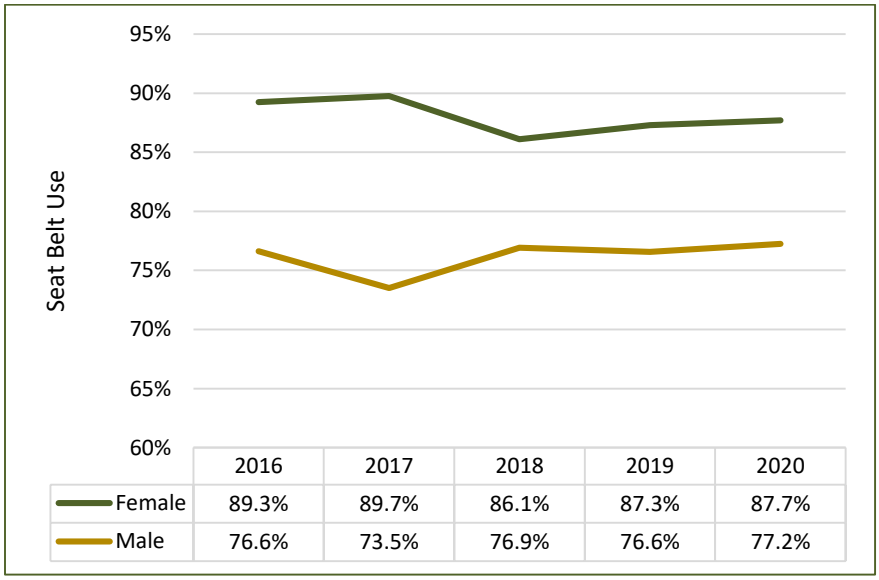


Figure 12: Percent Belted by Gender, Annual, Unweighted

Table 7 shows restraint use by county and gender. Female occupants were observed to have rates above 85% in 10 of 16 counties. In comparison, five counties showed male rates at that same level. However, male seat belt use in several counties was much lower. Burke, Grand Forks, Stutsman, Ward, and Williams all showed males were buckled less than 70% of the time.

Table 7: Percent Belted by Gender & County, 2020

2020			
FEMALE OCCUPANTS		**MALE OCCUPANTS**	
Barnes	95.9%	Barnes	87.5%
Benson	87.4%	Benson	70.6%
Burke	78.6%	Burke	51.8%
Burleigh	88.8%	Burleigh	77.1%
Cass	94.6%	Cass	89.3%
Grand Forks	81.9%	Grand Forks	69.6%
Griggs	89.0%	Griggs	75.2%
McKenzie	97.9%	McKenzie	93.1%
Morton	90.2%	Morton	80.3%
Mountrail	80.8%	Mountrail	71.0%
Richland	92.4%	Richland	82.8%
Stark	96.1%	Stark	85.4%
Stutsman	74.5%	Stutsman	67.6%
Traill	95.0%	Traill	86.7%
Ward	77.7%	Ward	63.3%
Williams	81.9%	Williams	66.8%

The sample by gender and occupant position also remains stable from year to year. Although the sample size is smaller since the reselection process in 2017, the gender distribution of drivers and passengers is proportionate to prior years. As described in Table 8, drivers were more than twice as likely to be male than female (12,124 compared with 5,647). In contrast, there were roughly 20% fewer male passengers than female (1,571 compared with 2,595).

Survey results corroborate higher rates of seat belt use by females regardless of occupant position (Figure 13). Female passengers used restraints at a rate of 93.3 %, the highest usage of gender and occupant positions. This was followed by female drivers at 85.8%. Male rates were considerably lower at 80.1% for passengers and 77.2% for drivers. Male passengers' seat belt use has surpassed male driver seat belt use for the second consecutive year, and therefore resulting in male drivers holding the lowest usage rate. Figure 14 shows a comparison of three-year averages.

Table 8: Sample by Gender and Position

Occupants Observed	2016	% of Sample	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample
Drivers:										
Male	14,119	52.6%	13,702	55.7%	13,268	54.4%	13,188	54.9%	12,124	54.8%
Female	6,770	25.2%	5,966	24.2%	5,943	24.4%	6,001	25.0%	5,647	25.5%
Passengers:										
Male	1,916	7.1%	1,922	7.8%	1,831	7.5%	1,733	7.2%	1,571	7.1%
Female	3,789	14.1%	2,851	11.6%	3,106	12.7%	2,799	11.6%	2,595	11.7%
Unknown:	231	0.9%	165	0.7%	242	1.0%	321	1.3%	182	0.8%
Total	26,825	100.0%	24,606	100.0%	24,390	100.0%	24,042	100.0%	22,119	100.0%

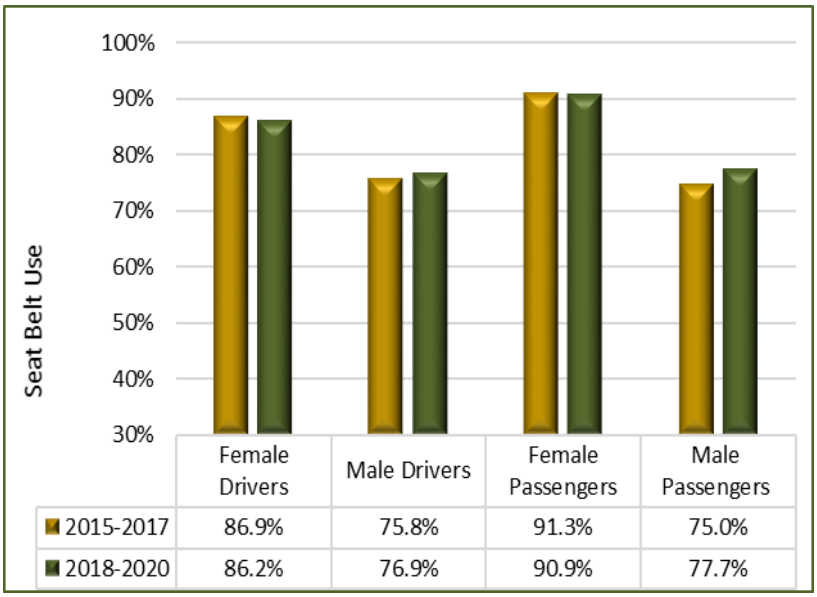


Figure 13: Seat Belt Use by Gender & Position, Three-Year Averages, Unweighted

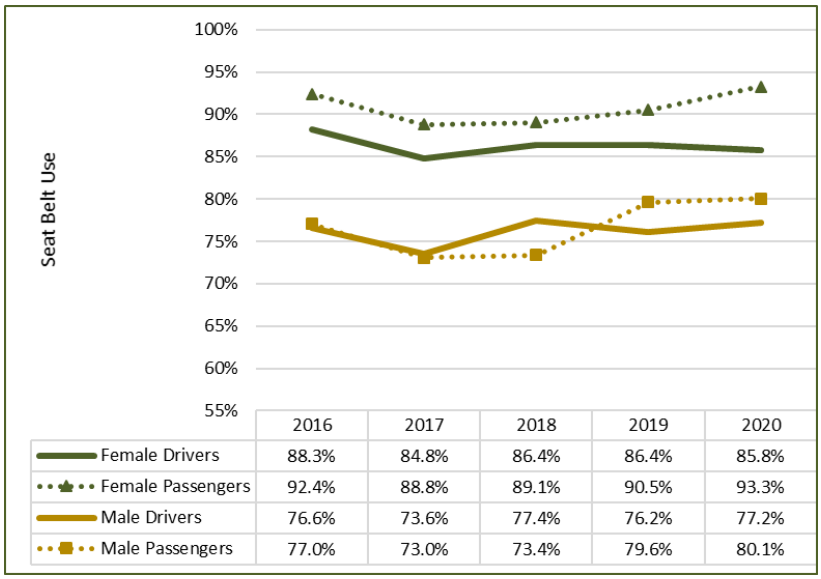


Figure 14: Percent Belted by Gender and Position, Annual, Unweighted

There are wide-ranging seat belt use rates in individual counties in all occupant positions (Table 9). At the county level, female drivers' rates were generally high with only four counties below 80%. Male drivers were found to have low rates of use in Burke (50.3%), Stutsman (66.3%), Ward (62.3%) and Williams (68.3%). As noted previously in this report, female and male passenger rates are higher overall. Grand Forks, Burke, and Williams County male passengers had low rates, 42.3%, 61.5%, and 56.8% respectively.

Table 9: Percent Belted by Gender and Position by County, 2020, Unweighted

2020							
FEMALE DRIVERS		FEMALE PASSENGERS		MALE DRIVERS		MALE PASSENGERS	
Barnes	94.7%	Barnes	97.5%	Barnes	86.5%	Barnes	97.6%
Benson	87.6%	Benson	86.8%	Benson	70.0%	Benson	81.3%
Burke	70.3%	Burke	92.3%	Burke	50.3%	Burke	61.5%
Burleigh	88.4%	Burleigh	90.6%	Burleigh	76.4%	Burleigh	84.3%
Cass	93.4%	Cass	97.4%	Cass	89.3%	Cass	90.0%
Grand For	78.9%	Grand Forks	92.1%	Grand For	72.2%	Grand	42.3%
Griggs	86.5%	Griggs	100.0%	Griggs	74.6%	Griggs	81.0%
McKenzie	97.3%	McKenzie	100.0%	McKenzie	92.8%	McKenzie	97.8%
Morton	88.4%	Morton	92.7%	Morton	79.3%	Morton	85.5%
Mountrail	80.2%	Mountrail	81.8%	Mountrail	71.1%	Mountrail	70.7%
Richland	90.5%	Richland	95.9%	Richland	82.5%	Richland	85.9%
Stark	95.4%	Stark	97.4%	Stark	84.7%	Stark	89.5%
Stutsman	69.6%	Stutsman	81.8%	Stutsman	66.6%	Stutsman	75.3%
Traill	93.5%	Traill	97.9%	Traill	85.7%	Traill	92.9%
Ward	73.8%	Ward	92.3%	Ward	62.3%	Ward	72.3%
Williams	80.2%	Williams	86.3%	Williams	68.3%	Williams	56.8%

Results by Gender and Vehicle Type

Examining the survey sample size without respect to the driver/passenger demographic shows the ratio of male to female occupants is about 1.7 to 1 in 2020 (Table 10). When considering vehicle type, males show lower representation in SUVs, but higher shares of the overall sample in all other vehicle types. A large gender imbalance continues to be noticed in the truck category, where males were 83% of the overall occupant share of this vehicle type.

Table 10: Sample by Vehicle Type and Gender

Occupants Observed	2016	% of Sample	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample
Male										
Car	3,531	13.2%	2,997	12.2%	2,843	11.7%	2,856	11.9%	2,131	9.6%
SUV	3,359	12.5%	2,937	11.9%	3,089	12.7%	2,576	10.7%	2,756	12.5%
Truck	8,049	30.0%	8,699	35.4%	8,248	33.8%	8,671	36.1%	8,087	36.6%
Van	1,096	4.1%	991	4.0%	919	3.8%	818	3.4%	721	3.3%
Female										
Car	3,568	13.3%	2,590	10.5%	2,438	10.0%	2,666	11.1%	1,950	8.8%
SUV	4,261	15.9%	4,017	16.3%	4,316	17.7%	3,926	16.3%	4,135	18.7%
Truck	1,725	6.4%	1,483	6.0%	1,551	6.4%	1,500	6.2%	1,604	7.3%
Van	1,005	3.7%	727	3.0%	744	3.1%	708	2.9%	553	2.5%
Unknown:	231	0.9%	165	0.7%	242	1.0%	321	1.3%	182	0.8%
Total	26,825	100.0%	24,606	100.0%	24,390	100.0%	24,042	100.0%	22,119	100.0%

Differences in seat belt use by gender varied across the vehicle types (Figure 15). In the 2020 survey, male occupants were belted from a low of 73.9% in trucks to a high of 85.2% in vans. Females were belted at rates above 80% in all vehicle types, ranging from a low of 85.7% in cars to a high of 91.7% in vans.

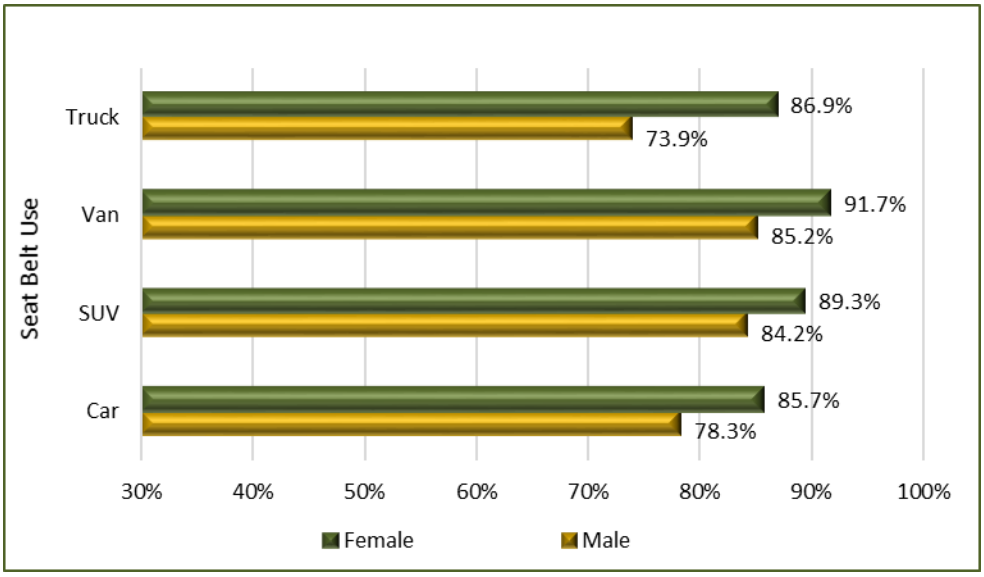


Figure 15: Percent Belted by Gender and Vehicle Type, 2020, Unweighted

Although the size of the disparity between gender seat belt use shifts from year to year, male use is lower than female use in every vehicle type in every year by as much as 15.0 percentage points in trucks in 2016 to as little as 3.8 percentage points in SUVs in 2018 (Table 11). Throughout the five-year period, female rates are consistently high, with usage at least 83.0%. By contrast, annual rates for male seat belt use are much lower, with the rates ranging between 68.9% and 86.6% throughout the same time frame. Both genders are observed to have the lowest five-year mean usage in trucks, and this is also where the gender difference is most noticeable.

Table 11: Annual Percent Belted by Gender and Vehicle Type, Unweighted

Male	2015	2016	2017	2018	2019	2020
Car	80.7%	79.1%	76.5%	78.8%	77.3%	78.3%
SUV	83.7%	84.4%	81.7%	85.2%	84.4%	84.2%
Van	84.4%	86.6%	80.4%	80.3%	82.8%	85.2%
Truck	71.8%	71.0%	68.9%	72.8%	73.4%	73.9%
Female	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Car	88.4%	88.7%	83.5%	85.4%	85.4%	85.7%
SUV	90.5%	91.0%	88.2%	89.0%	89.6%	89.3%
Van	92.7%	94.5%	90.1%	92.2%	91.4%	91.7%
Truck	86.0%	86.0%	83.0%	83.2%	85.0%	86.9%

Minor reductions in seat belt use by females across vehicle types are found in comparing 2015-2017 with 2018-2020 averages (Figure 16). Male occupants show similar reductions in seat belt use in cars and vans. However, rates held steady for males in SUVs and trucks between the two periods.

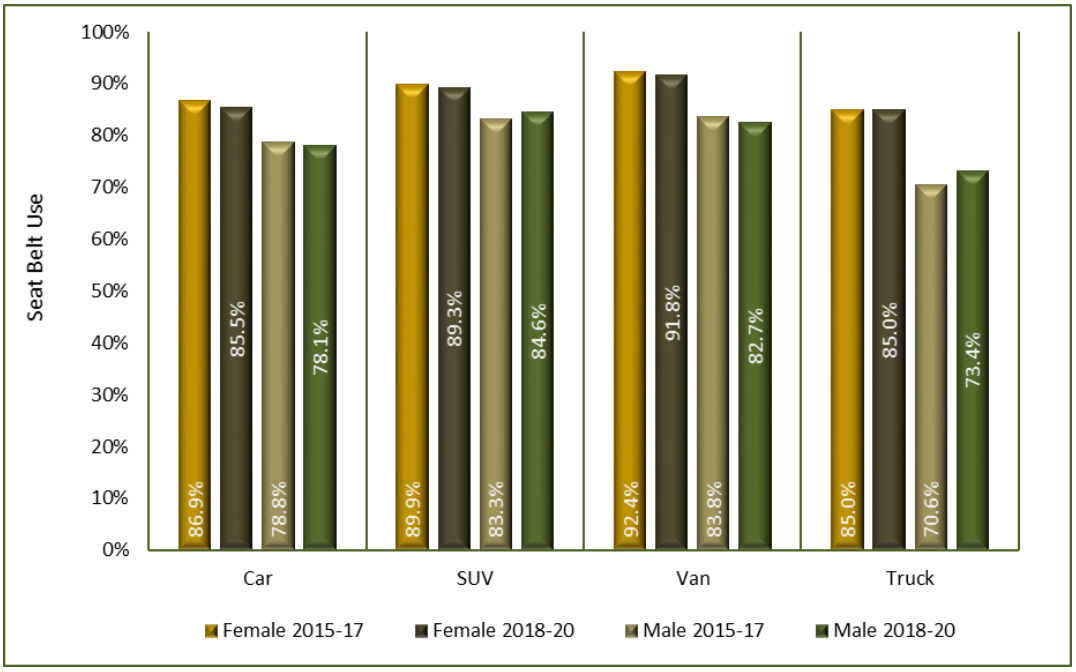


Figure 16: Seat Belt Use by Gender and Vehicle Type, Three-Year Averages, Unweighted

Results by Road Type

Roadways are classified into three road types and broadly described as follows:

- Primary road: divided, limited-access, e.g., interstates
- Secondary road: main arteries usually in the U.S./state/county highway system
- Local neighborhood road/rural road/city street: paved, non-arterial streets

There were 9,917 observations collected from the east region and 12,202 from the west during the 2020 survey. Primary, secondary, and local roadways accounted for 38.5%, 52.1%, and 9.4% of the vehicle occupants, respectively. Sample distribution by road type and region is diverse as shown in Table 12. Through 2016, more observations were collected from primary and local road sites in the east, and fewer observations from sites located on secondary roads. The NHTSA-mandated reselection of sites for the 2017 survey heightened the regional disparity in road classification sample sizes. There was a sizeable decrease in the local road sample in the east, as well as the primary road sample in the west, over previous years. Sample variations are associated with revisions in the number of sites drawn in each road type between 2012 and 2017, as well as contrasting traffic volume at new site locations.

Table 12: Sample by Road Type

Occupants Observed	2016	% of Sample	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample
East										
Primary	6,884	25.7%	7,290	29.6%	7,680	31.5%	7,430	30.9%	6,029	27.3%
Secondary	3,735	13.9%	3,001	12.2%	3,223	13.2%	3,085	12.8%	2,949	13.3%
Local	2,094	7.8%	889	3.6%	1,138	4.7%	1,105	4.6%	939	4.2%
Total East	12,713	47.4%	11,180	45.4%	12,041	49.4%	11,620	48.3%	9,917	44.8%
West										
Primary	4,571	17.0%	2,597	10.6%	2,515	10.3%	1,737	7.2%	2,476	11.2%
Secondary	8,119	30.3%	9,727	39.5%	8,664	35.5%	9,539	39.7%	8,576	38.8%
Local	1,422	5.3%	1,102	4.5%	1,170	4.8%	1,146	4.8%	1,150	5.2%
Total West	14,112	52.6%	13,426	54.6%	12,349	50.6%	12,422	51.7%	12,202	55.2%
Total	26,825	100.0%	24,606	100.0%	24,390	100.0%	24,042	100.0%	22,119	100.0%

Contextual information is provided in Figure 17 which identifies the proportion of sites by road type established with the amended methodology in 2012 followed by the reselection in 2017. These sample disparities, along with diverse habits of restraint use, factor into the regional differences in rates. Although the weighted results do include adjustments for changes to road site characteristics, the unweighted results may be influenced by the site mix and underlying characteristics such as higher use rates on interstate corridors.

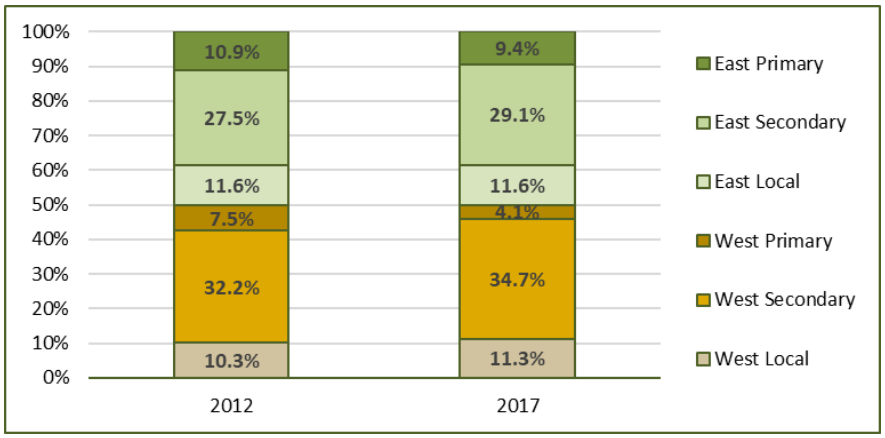


Figure 17: Percent of 320 Survey Sites by Road Type, 2012 and 2017

Figure 18 shows vehicle occupants traveling primary roadways were belted at a higher rate (90.4%) than occupants on secondary and local roads. These occupants routinely used seat belts at rates from 85.7% to 90.4% within the five-year time frame. Belt use by occupants on local roads since 2016 has held steady between 78.2% and 82.2%. Occupants in vehicles on secondary roads have had the lowest seat belt use rates of the three road classifications, currently 74.8%, since 2016. After dipping in 2017, both secondary and local road types saw an upward trend until 2019. However, current rates have ended the uptick.

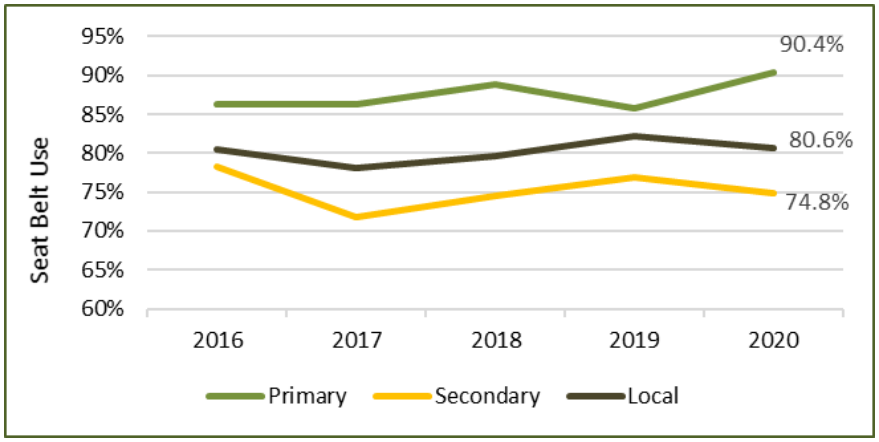


Figure 18: Percent Belted by Road Type, Annual, Unweighted

Annual rates stratified by region and road type over a five-year period are identified in Table 13. Restraint use on primary roads in the east region ranges from 86.2% to 91.0%, while corresponding roads in the west region range from 79.0% to 92.2%. Use on secondary roads fluctuates between 72.6% and 77.5% in the east, and 71.5% and 78.5% in the west. Occupants traveling local roads were belted at rates ranging from 80.4% to 76.3% to 79.0% the east and west regions, respectively. With the occasional exception, rates of use are higher in the east on every road type.

Table 13: Annual Percent Belted by Region & Road Type, Unweighted

EAST	2013	2014	2015	2016	2017	2018	2019	2020
Primary	87.2%	88.1%	90.4%	91.0%	86.3%	89.5%	86.2%	89.7%
Secondary	71.1%	74.1%	75.6%	77.5%	72.6%	74.8%	75.7%	77.0%
Local	75.6%	80.7%	80.8%	83.1%	80.4%	83.1%	86.0%	82.6%
WEST	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Primary	92.7%	85.1%	88.1%	79.0%	86.0%	86.4%	83.6%	92.2%
Secondary	65.0%	72.7%	76.5%	78.5%	71.5%	74.3%	77.3%	74.0%
Local	69.6%	72.5%	67.8%	76.5%	76.3%	76.3%	78.6%	79.0%
TOTAL	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Primary	89.2%	87.0%	89.5%	86.2%	86.2%	88.8%	85.7%	90.4%
Secondary	66.9%	73.1%	76.2%	78.2%	71.7%	74.5%	76.9%	74.8%
Local	73.3%	77.7%	75.6%	80.4%	78.2%	79.7%	82.2%	80.6%

When balancing the year-to-year variability of rates in each road type (Figure 19), little difference is seen between the time periods on most road types in the two regions. However, a greater increase in restraint use on local roads in the west region in 2018-2020 is noted. Regionally the east and west averages are uniform on secondary roads in both periods.

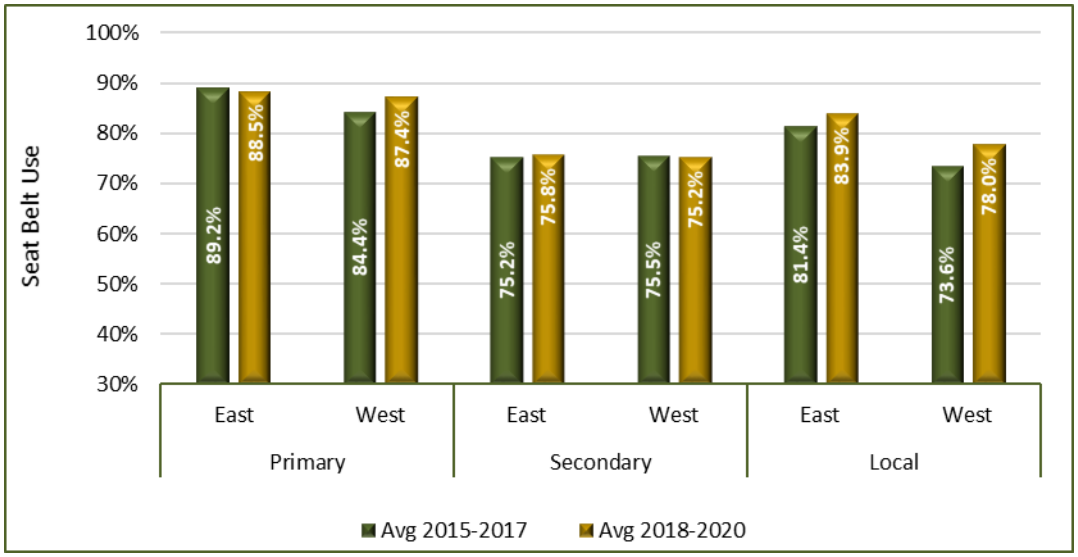


Figure 19: Seat Belt Use by Roadway Type, Three-Year Averages, Unweighted

Additional insight is found in delineating restraint use by road type and metropolitan statistical areas (MSA). MSA counties are defined as a core area consisting of a larger population nucleus and adjacent communities with high economic and social involvement (U.S. Census Bureau). The designated MSA counties in the North Dakota observational seat belt survey are Burleigh/Morton, Cass, and Grand Forks. The data shown in Figure 20 are unweighted and do not account for the allocation of sites by road type in the two categories. Analysis shows higher restraint use in MSA counties on primary and secondary roads compared with the same road types in non-MSA counties. Vehicle occupants in MSA counties were buckled up at a relatively high rate of 95.1% on primary

roads followed by 86.1% on secondary roads. Occupants on local roads in MSA counties were restrained at a lower rate, 80.6%. Local road sites were outside the sampling frame in non-MSA counties, so a comparison of that road type is not available.

Sample size and restraint use by MSA designation, road type, and region are shown in Table 14. Vehicle

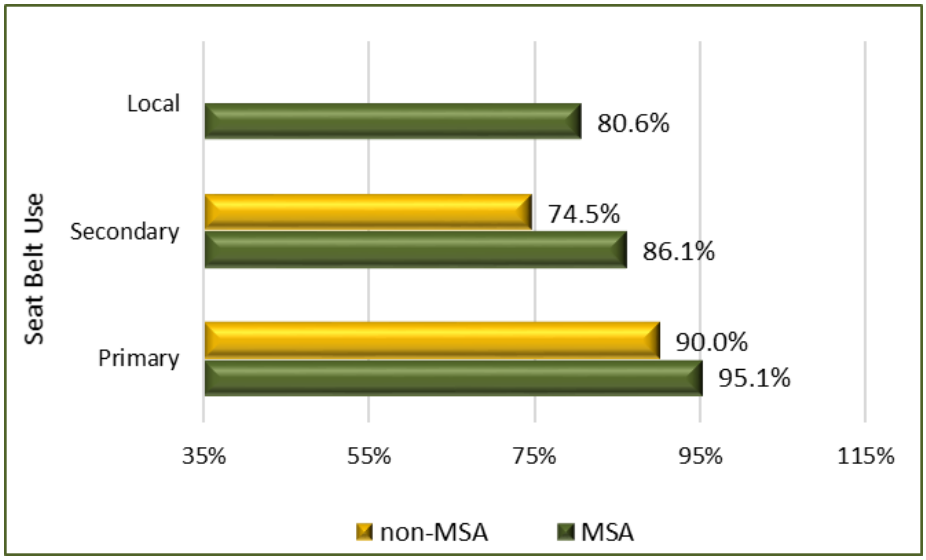


Figure 20: Percent Belted by Road Type & Metropolitan Statistical Areas, 2020, Unweighted

observations from primary roads were predominantly collected in non-MSA counties in the east (n=5,811) compared with the west (n=2,037). Survey data indicated the rate of belted occupants on primary road segments was 89.4% in the east and 91.7% in the west. Primary roads in MSA counties were observed to have similar rates in the east and west, 96.8% and 94.3% respectively.

For occupants traveling on secondary roads, 98% of the overall observations were collected in non-MSA counties. Noting the disparate size of the sample between regions, the rates were comparable at 76.3% in the east and 74.0% in the west. Likewise, vehicle occupants on secondary roads in MSA counties were observed to have similar rates of use, 86.5% in the east and 84.1% in the west. As mentioned previously, observations were collected on local roads in MSA counties only per NHTSA protocol guidance. The sample size by region was similar, with rates somewhat higher in the east than the west at 82.6 and 79.0% respectively.

Table 14: Seat Belt Use by Region and MSA Designations

		East		West	
		Sample	Belted	Sample	Belted
Primary	**MSA**	218	96.8%	439	94.3%
	non-MSA	5811	89.4%	2037	91.7%
Secondary	**MSA**	207	86.5%	44	84.1%
	non-MSA	2742	76.3%	8532	74.0%
Local	**MSA**	939	82.6%	1150	79.0%
	non-MSA	n.a.	n.a.	n.a.	n.a.

FIELD SURVEY PROTOCOL

Table 15: Summary of the Seat Belt Use Survey

Methodology	Multistage stratified cluster design with probability proportional to size sampling
Source of Samples	NHTSA supplied FARS, VMT, and road segment data
Geographic Coverage	State of North Dakota
Identified Regions	East West
Selected Counties	East Region: Barnes, Benson, Cass, Grand Forks, Griggs, Richland, Stutsman, Traill West Region: Burke, Burleigh, McKenzie, Morton, Mountrail, Stark, Ward, Williams
Number of Sites	320
Survey Period	June 1-7, 2020
Observation Duration Per Site	60 minutes
Sample Size	22,119 vehicle occupants (includes all vehicles where either the driver or passenger or both had a known protection status)

Standard Error and Confidence Intervals

The standard error of the state seat belt use rate measures the amount of random sampling error in the survey results. The smaller the standard error, the more accurate the seat belt use rate when compared with the true, but unknown, seat belt use rate for North Dakota. Assuming the design of the survey accurately measures the variable of interest, the larger the survey sample the more accurate the results.

The standard error for the state seat belt use was calculated to be 0.011% using SAS statistical software. From this, a 95% confidence interval for state seat belt use can be determined. The 95% confidence interval means that, statistically, there is only a 5% chance the actual statewide seat belt percentage falls outside the 82.5% to 84.9% range.

Table 16: Confidence Interval

95% Confidence Interval and Estimated Standard Error for 2018 State Seat Belt Use				
Occupants	**State Rate**	**Standard Error**	**95% CI Lower Limit**	**95% CI Upper Limit**
22,119	83.66%	0.011%	81.67%	85.65%

Nonresponse Rate

A factor that could potentially bias the results and invalidate the survey is exceedingly high nonresponse rates. A nonresponse occurs when the observer tries but cannot determine an occupant's seat belt use. In the 2020 survey, 17,836 drivers and 4,283 passengers were observed for a total of 22,119 vehicle occupants. Seat belt use could not be determined for 1,033 vehicle occupants, resulting in a nonresponse rate of 4.6%. As stipulated in NHTSA's guidelines, the nonresponse rate did not exceed the allowable maximum of 10%, so no resampling was necessary.

Protocols

Observers

Observers contracted to conduct the 2020 statewide seat belt survey were required to complete online training. The training module covered survey methods, observer responsibilities, and instructions for operation of tablets for electronic data collection. Knowledge points required the trainee's correct responses in order to move forward in the module. Completion of training was verified by the survey administrator.

All observers were required to have a current driver's license with proof of adequate vehicle insurance. They were required to use seat belts and wear safety vests while conducting field observations.

Observational Protocols

The observational protocols used in the 2020 study adhere to the uniform criteria as outlined in the Federal Register.

Observations were conducted Monday through Sunday. The day of the week and time of day were randomly chosen for one site within each county. The remaining sites within each county were arranged based on the first site to minimize travel time and costs. This predetermined order of daily observation sites was provided to each observer before the survey. A complete list of county observation sites is available in the survey certification documentation submitted to NHTSA. The traffic direction of vehicles to be observed was randomly chosen in advance and was limited to one direction.

An 11-hour block of daylight, from 7 a.m. to 6 p.m., was identified as the observational period. Observations at each site occurred in the predetermined time slot, requiring a 60-minute observation period, which began at the start of the predetermined time slot—or the first five-minute interval after arrival at the site if the observer was delayed—and ended 60 minutes later.

Traffic Conditions and Data Collection Problems

Observers were trained to cope with traffic problems in the following manner:

- When traffic was heavy and there were too many vehicles to observe, recording was done as long as possible and then stopped until the observer could catch up with observations. Some vehicles were, therefore, outside the sample. When this occurred, counting resumed after no more than a one-minute pause. Once an observer's eyes were locked on a vehicle, a record of that vehicle was required on the

observation form.

- At sites with more than one lane of traffic in the predetermined direction, observations were made from the lane closest to the observer.

Site Accessibility Problems

Field observers could terminate observations at a preselected site if any of the following circumstances arose: (1) weather conditions that would hinder the accuracy of the observations, (2) heavy traffic flow that might endanger the safety of the observer, or (3) road conditions that rendered observations unfeasible, such as road construction, detoured traffic, or a crash site. In these circumstances, observers were directed to contact the project coordinator immediately for assignment of an alternate site if a suitable vantage point could not be established approximate to the detour.

Observed Vehicles

All vehicles with a gross vehicle weight up to 10,000 lbs. were observed and classified on the observation form as cars, vans, sport utility vehicles, and trucks. Large trucks (semi or large box), large emergency vehicles (ambulance/fire), and RVs/motor homes were not included in the survey.

Observations

Type of vehicle, gender, and seat belt use for both drivers and right front seat passengers were recorded. Observations occurred from within the observer's vehicle whenever possible. The observer was parked as close as possible to the road for accurate observation without compromising observer safety. If observations could not be conducted from within the vehicle, the observer was allowed to stand off the roadway. Observers were required to wear an ANSI-approved Type-2 safety vest at all times to enhance the visibility of the observer.

Problems Encountered by Observers

If traffic, observer safety, or construction issues were problematic, alternate sites were available through the project coordinator. Observer placement was managed according to site protocols. Intermittent problems relating to road construction and inclement weather did not seriously impede schedules, and hour-long observations were fulfilled as described in the protocol with on-time arrival at subsequent sites not seriously impacted. In accordance with the Federal Register, if scheduled observations were not carried out for any of the above reasons, a return visit would have been arranged the following week while adhering to the original prescribed schedule for data collection.

Quality Assurance

Observers

Online training was offered at the observers' convenience. All contracted observers were required to complete the online training prior to survey week. Completion was verified and follow-up phone calls were made to first-time observers to answer any questions and ensure full understanding of observer duties and survey protocols.

During observation week, quality control personnel carried out unannounced site visits (one per county) to verify observers were located within valid road segments, conforming to the prearranged day of week/time of day schedules, and properly recording seat belt data. It is required that quality control personnel visit any new observers during their initial observation day to assure protocol compliance and verify safe observation practices.

Data Entry

Steps were taken to ensure quality control with respect to data entry. Each site packet was checked to ensure the number of observation sheets submitted was the same as that noted by the observers. Database records were verified to match the number of observations. An accuracy check was done on a systematic sample of records and was measured at greater than 99.9% for every field. Errors discovered during quality assurance checks were corrected prior to completion of all analyses.

CONCLUSION

Uniform Criteria published in 2011 guided the development of methodology used for seat belt surveys in North Dakota from 2012 through 2016. This methodology changed the focus from population-based criterion to traffic-crash-related fatality data for county sampling. The federal criteria mandated a reselection of observation sites at five-year intervals. This reselection requirement was carried out in 2017 without further modifications to the survey design.

For the 2020 statewide survey, observers recorded seat belt use for 17,836 drivers and 4,283 right front-seat passengers, for a total of 22,119 vehicle occupants. The unweighted estimates of seat belt use were 79.7% for drivers, 88.3% for passengers, and 80.8% overall. Adjusting the raw state rate for the survey design and weights resulted in an overall weighted state rate of 83.7%, which is the generalizable seat belt use rate for the state. Rates by strata such as gender, vehicle type, region, roadway, population density, and distraction, are unweighted due to the sample design.

North Dakota's weighted seat belt rate of 83.7% falls below the national estimate of 90.7% according to the most recent NHTSA report (December, 2019). The gap is less disparate when compared to states with similar seat belt laws (secondary) where NHTSA reports a restraint use rate of 86.2% (2019). In general, the findings in the 2019 North Dakota statewide survey are consistent with the findings of previous surveys. Experiences from other states indicate that improvement in seat belt use will likely only occur through some type of significant change, such as implementation of a primary seat belt law, increased funding for additional enforcement, or possibly higher fines (NHTSA).