

# SEAT BELT USE IN SOUTH DAKOTA



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By

Kimberly Vachal<sup>1</sup>, Jaclyn Andersen<sup>2</sup>

Upper Great Plains Transportation Institute

North Dakota State University, Dept. 2880

P.O. Box 6050

Fargo, North Dakota 58108-6050

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<sup>1</sup>Senior Researcher, Program Director, <sup>2</sup>Research Specialist

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# EXECUTIVE SUMMARY

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South 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 South Dakota Department of Public Safety (SDDPS) with a systematic evaluation of seat belt use rates within the state. The National Highway Traffic Safety Administration (NHTSA) funds NOPUS through the SDDPS's Office of Highway Safety.

In April 2011, NHTSA issued new uniform criteria for the state observational survey of seat belt use in an effort to improve the survey's representativeness. One of the primary changes NHTSA implemented was to focus county selection using crash-related fatalities data, as reported by the Fatality Analysis Reporting System (FARS), instead of the population-based exclusion criterion previously used. The revised criteria, implemented for the 2012 survey and outlined in the Federal Register, Vol. 76 No. 63, resulted in substantial changes to the county selection, sites, road type classifications, and weighting procedures.

The federal rule directs states to update sampling frame data every five years to ensure accurate fatality distribution and a representative inventory of road segments. Accordingly, in 2017 a review of fatalities over the five-year period 2010 to 2014 was performed, resulting in changes in county involvement and a complete reselection of sites.

To choose the survey counties, all 66 counties in South Dakota were listed in descending order based on the average number of motor vehicle crash-related fatalities from 2010 to 2014. The top 38 counties accounted for at least 85% of the state's total crash-related fatalities. These 38 counties were then stratified by region based on statistical differences in seat belt use observed in prior surveys among counties in the western and eastern parts of the state. Therefore, the 38 counties in the sampling frame were stratified according to geographical region with 18 counties in the west and 20 counties in the east. Eight counties were selected from each region using probability proportional to size (PPS) sampling with vehicle miles traveled (VMT) as the measure of size (MOS).

Road segments within each county were then stratified by the MAF/TIGER Feature Class Code (MTFCC) road type and sorted by segment length. A systematic random sample of 20 road segments was selected within each county using PPS sampling with road segment length as the MOS. This represents the second stage of sample selection. This process resulted in the selection of 320 road segments (16 counties with 20 sites per county). Additional sites were also selected for use as alternate sites.

During the week of June 14-20, 2021, trained observers visited each site in their assigned counties to survey seat belt use for drivers and right front-seat passengers in vehicles with a gross vehicle weight up to 10,000 lbs.

For the 2021 statewide survey, observers recorded seat belt use for 23,034 drivers and 7,657 right front-seat passengers, for a total of 30,691 vehicle occupants. The unweighted estimates of seat belt use were 86.4% for drivers, 92.5% for passengers, and 87.9% overall. Adjusting the raw state rate for the survey design and weights resulted in an overall weighted state rate of 86.9% which is the generalizable seat belt use rate for the state. This compares to a weighted rate of 68.3% in 2020. Rates by strata such as gender, vehicle type, region, roadway, and population density are unweighted due to the sample design.

Male occupants were less likely to wear seatbelts than females with overall rates of 84.4% and 92.7%, respectively. When considering occupant position, more drivers, 66.5%, were male. Restraint use for male drivers was 84.1%, compared with female drivers at 90.9%. Passengers, on the other hand, were more likely to be female, at 70.6%. The observed seat belt use for female passengers was 95.2%, compared with 86.1% for male passengers.

Overall seat belt use rates by vehicle type ranged from 82.6% to 93.0%. The trend toward higher female seat belt use rates held for each vehicle type as well; female use ranged from 88.2% to 95.2% over the four vehicle types, while male use ranged from 80.1% to 90.5%. Rates by region indicated occupants in the east were more likely to buckle up (89.4%) than those in the west (87.0%).

Seat belt use was highest on primary roads, 95.2%, followed by local roads, 84.9%, and secondary roads, 80.1%. Rates by road type also showed higher restraint use for more road classes in the east region than the west region. When separating survey counties into metropolitan statistical areas (MSAs) and non-MSAs, higher use on primary roads was found in non-MSA counties compared with MSAs, 95.3% and 94.1%, respectively. On secondary roads, higher use was demonstrated in MSA counties (93.2%) compared with non-MSAs (79.4%). Local roads were only selected in MSA counties according to survey methodology, and restraint use was 84.9%. There was substantial variation, not only between the different county designations, but also within regions and road classifications.

South Dakota's weighted seat belt rate of 86.9% falls below the most recent seat belt results published in 2020 by NHTSA of 90.3% nationally. The gap is slightly less disparate when compared to states with similar seat belt laws (secondary) where NHTSA reports restraint use of 87.6%. Overall, the findings in the 2021 South Dakota statewide survey shows an increase in restraint use compared to the findings of previous surveys.

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# INTRODUCTION

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The Upper Great Plains Transportation Institute (UGPTI), a research, education, and outreach center at North Dakota State University (NDSU) was contracted by the South Dakota Department of Public Safety (SDDPS) to conduct a field survey of seat belt use in 2021. The study replicates the sampling methodology previously revised and approved by the NHTSA and the SDDPS 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 South Dakota. In 2017, survey researchers implemented a 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.

## OBJECTIVE

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The objective of this study was to estimate the statewide rate of seat belt use of drivers and right front-seat passengers in the state of South 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. Table 1 summarizes the 2021 survey. Survey sample design methods were employed to ensure that 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.



**Table 1: Summary of the Seat Belt Use Survey**

<b>Methodology</b>	Multistage Stratified Cluster Design with Probability Proportional to Size Sampling
<b>Source of Samples</b>	NHTSA supplied FARS, VMT, and road segment data
<b>Geographic Coverage</b>	State of South Dakota
<b>Identified Regions</b>	East West
<b>Selected Counties</b>	<u>East Region:</u> Aurora, Bon Homme, Day, Hamlin, Lincoln, Minnehaha, Moody, Spink <u>West Region:</u> Harding, Jones, Lawrence, Lyman, Meade, Oglala Lakota, Pennington, Ziebach
<b>Number of Sites</b>	320
<b>Survey Period</b>	June 14-20, 2021
<b>Observation Duration Per Site</b>	60 minutes
<b>Sample Size</b>	30,691 vehicle occupants (includes all vehicles where either the driver or passenger or both had a known protection status)

## METHODOLOGY

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Uniform criteria published in 2011 guided the development of methodology used for seat belt surveys in South Dakota from 2012 through 2016. This methodology changed the focus for county sampling from a population-based criterion to a traffic-crash-related fatality criterion. 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. A comprehensive explanation of survey methodology is found in Appendix A.

### 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 South 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 state seat belt use was calculated to be 0.006% 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 that the actual statewide seat belt percentage falls outside the range of 85.5 to 88.2%.

**Table 2: Confidence Interval**

<b>95% Confidence Interval and Estimated Standard Error for State Seat Belt Use</b>				
<b>Occupants</b>	<b>State Rate</b>	<b>Standard Error</b>	<b>95% CI Lower Limit</b>	<b>95% CI Upper Limit</b>
30,691	86.9%	0.006%	85.5%	88.2%

## Nonresponse Rate

A factor that could potentially bias the results and invalidate the survey is the high nonresponse rate. A nonresponse occurs when the observer tries but cannot determine an occupant’s seat belt use. In the 2021 survey, 23,034 drivers and 7,657 passengers were observed for a total of 30,691 vehicle occupants. Seat belt use could not be determined for 496 vehicle occupants, resulting in a nonresponse rate of 1.6%. As stipulated in NHTSA’s guidelines, the nonresponse rate was well within the allowable maximum of 10%, so no additional sampling was necessary.

## Protocols

### Observers

Observers contracted to conduct the 2021 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 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 pre-determined 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.

### **Observed Vehicles**

All vehicles with a gross vehicle weight of 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 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 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 adhering to the original prescribed schedule for data collection. Detailed site information is found in Appendix D.

## **Quality Assurance**

### **Observers**

Online training was offered at the observers' convenience. All contracted observers were required to complete the online training. Completion was verified prior to survey week.

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.

# SEAT BELT SURVEY RESULTS

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## Statewide Results

### Sample Size by Year

**Table 3: Survey Sample by Occupant Position**

Occupants Observed	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample	2021	% of Sample
Drivers	20,401	75.6%	21,813	74.4%	22,579	74.4%	18,614	74.4%	23,034	75.1%
Passengers	6,583	24.4%	7,503	25.6%	7,784	25.6%	5,297	25.6%	7,657	24.9%
Total	26,984	100.0%	29,316	100.0%	30,363	100.0%	23,911	100.0%	30,691	100.0%

Table 3 shows the sample size of annual seat belt surveys from 2017-2021 by occupant position. In the current year 30,691 vehicle occupants were counted, consisting of 23,034 drivers representing 75.1% of the sample, and 7,657 passengers for a 24.9% share. 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. Apart from last year's considerable decrease, likely an effect of the coronavirus pandemic, the overall sample size has increased year-to-year. This year's sample size resumes the upward trend. According to the South Dakota Department of Tourism<sup>1</sup>, the state has exceeded 2019 levels for both visitation (+15%) and visitor spending (+9%) YTD through May 2021, which could explain the increase. It is not uncommon to have several individual sites capture only a limited number of vehicles. However, these sites are still important to the aggregate measurement of statewide and county seat belt use, therefore, are captured each year. Complete details on the number of observations and restraint use by site are found in Appendix C.

The driver-to-passenger ratio can influence overall use rates. This year the ratio was 3.0 drivers for every occupant, meaning drivers represent 75.1% of the sample. Table 4 shows only minor variations in the most recent five-year period with the driver share of the sample deviating less than 4 percentage points.

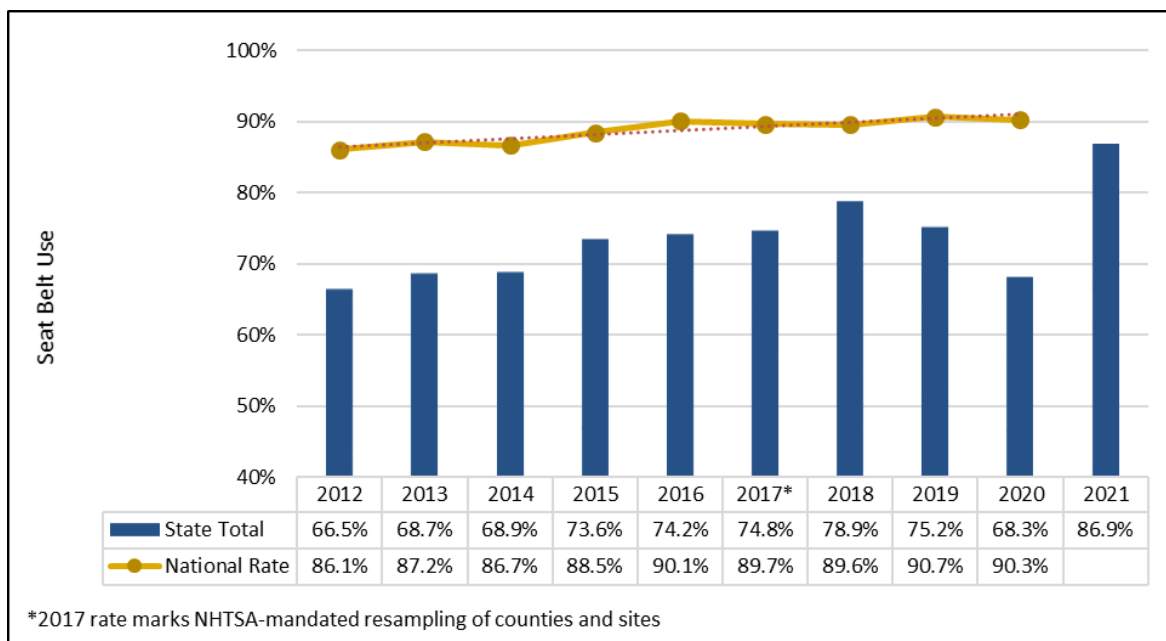
**Table 4: Ratio of Drivers to Passengers**

Ratio	2017	2018	2019	2020	2021
Drivers:Passengers	3.1:1	2.9:1	2.9:1	3.5:1	3.0:1
Drivers as % of Sample	75.6%	74.4%	74.4%	77.8%	75.1%

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<sup>1</sup> South Dakota Department of Tourism. Monthly Indicator Dashboard. July, 2021. [Research & Reports | South Dakota Tourism Industry \(sdvisit.com\)](#)

Overall unweighted statewide survey results indicated 87.9% of vehicle occupants were observed wearing seat belts on South 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 the formulas and design weights from the methodology section. Using those formulas, the overall weighted rate of seat belt use in South Dakota was 86.9% for 2021. 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<sup>2</sup>, with the most recent data showing a rate of 90.3% in 2020. Nationally, NOPUS survey data confirm that vehicle occupants in states with primary enforcement of seat belt laws demonstrate higher restraint use (91.1%) than states with secondary laws (87.6%). Accordingly, South Dakota aligns more closely with states without primary seat belt laws.



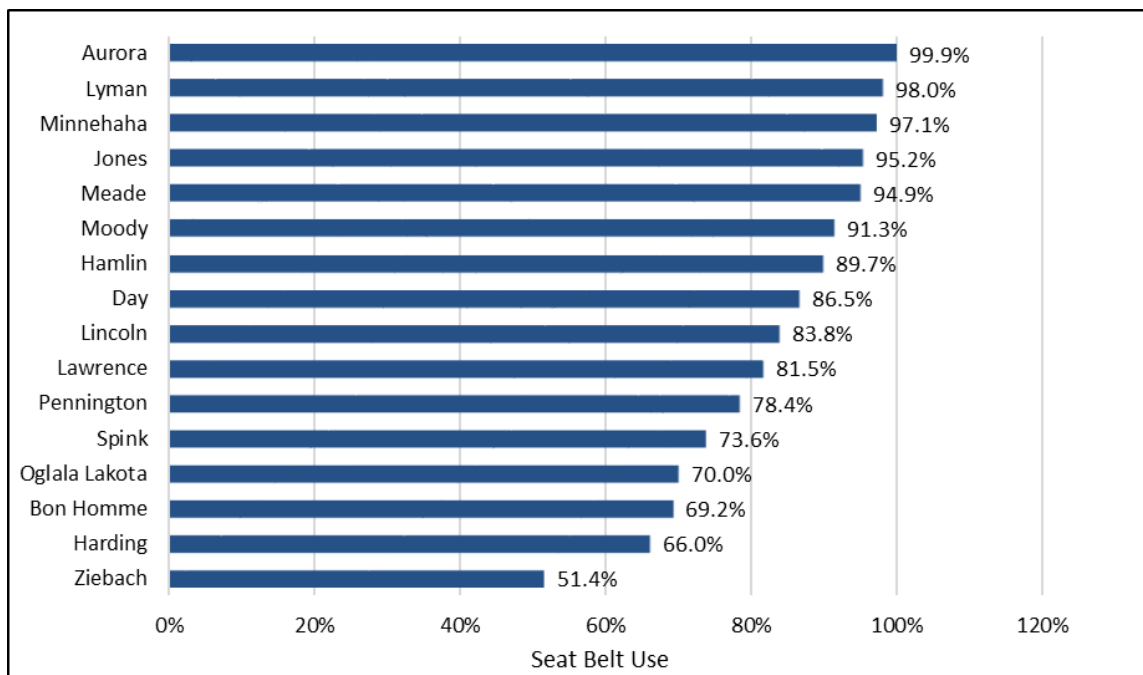
**Figure 1: Statewide Seat Belt Use, Weighted**

<sup>2</sup> National Highway Traffic Safety Administration. Traffic Safety Facts Research Note. February, 2021. [Seat Belt Use in 2020 – Overall Results \(dot.gov\)](https://www.nhtsa.gov/press-releases/2021/02/02/seat-belt-use-in-2020-overall-results)

## County Results

The 2021 weighted seat belt rates by county are shown in Figure 2. Restraint use ranged from a high of 99.9% in Aurora County to a low of 51.4% in Ziebach County. Higher seat belt use is often observed in counties that follow interstate corridors. The six counties demonstrating the highest rates this year, all above 90%, have a share of this road type, which may influence use rates.

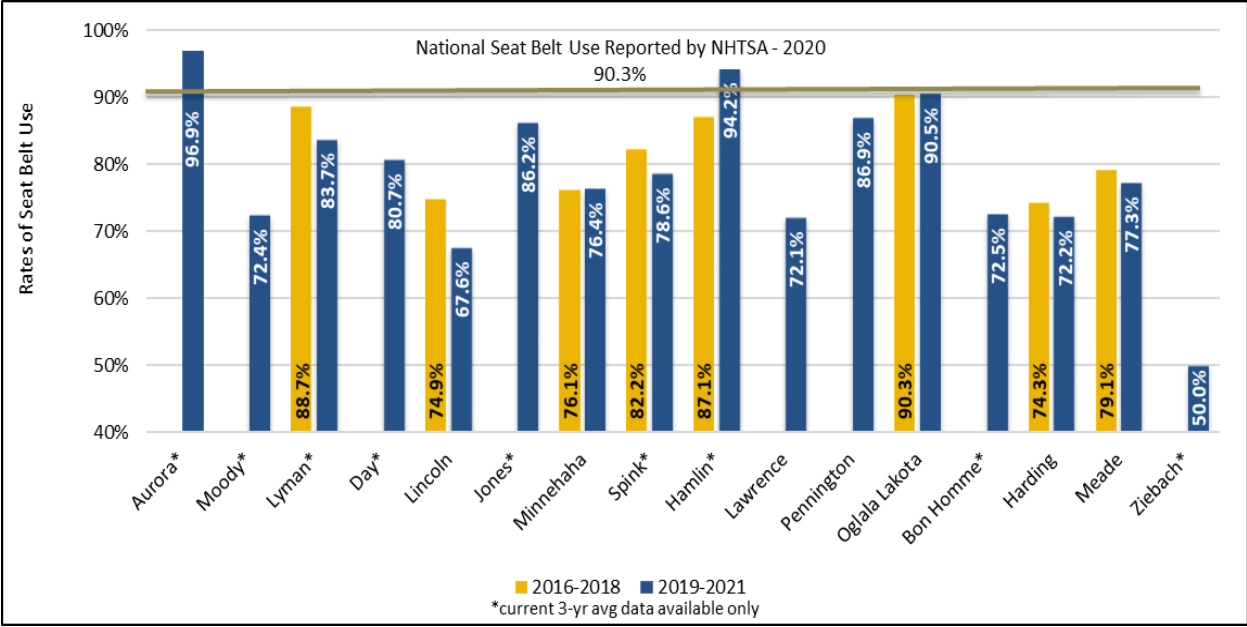
Rates vary from year-to-year at the county level due to factors such as site locations, traffic patterns, sample size, road type, road construction projects, and weather impacts. The variations can represent these sampling differences and are not likely to be statistically significant, especially for 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, 2021, Weighted**

To smooth the annual variability, three-year averages are shown in Figure 3 to provide a representation of county rates and trend comparison. This analysis does not offer the earlier three-year average comparisons for counties that were first-year additions in 2017 due to the reselection process. Rather, occupant use collected during the latter three surveys is averaged for Aurora, Bon Homme, Day, Hamlin, Jones, Lyman, Moody, Spink, and Ziebach 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, Aurora County leads in belt use at 96.9%. Lyman, Day, Jones, Hamlin, Pennington, and Oglala Lakota counties all register rates above 80%. Ziebach County's three-year average (50.0%) shows the lowest rate among counties.



**Figure 3: Seat Belt Use by County, Three-Year Weighted Average**

The preceding statewide data are weighted based on the sampling methodology. However, the following sections of this report describe frequencies that are unadjusted due to survey design.



## Results for Vehicle Occupants by Position

Figure 4 illustrates seat belt use by occupant position in 2021. At the county level, driver use ranged from a low in Ziebach County of 50.3% to a high of 99.7% in Aurora County. The spread in passenger use was 71.1% to 99.8% in Harding and Aurora counties, respectively. Annual surveys confirm that, as a rule, passengers buckle up at higher rates than drivers.

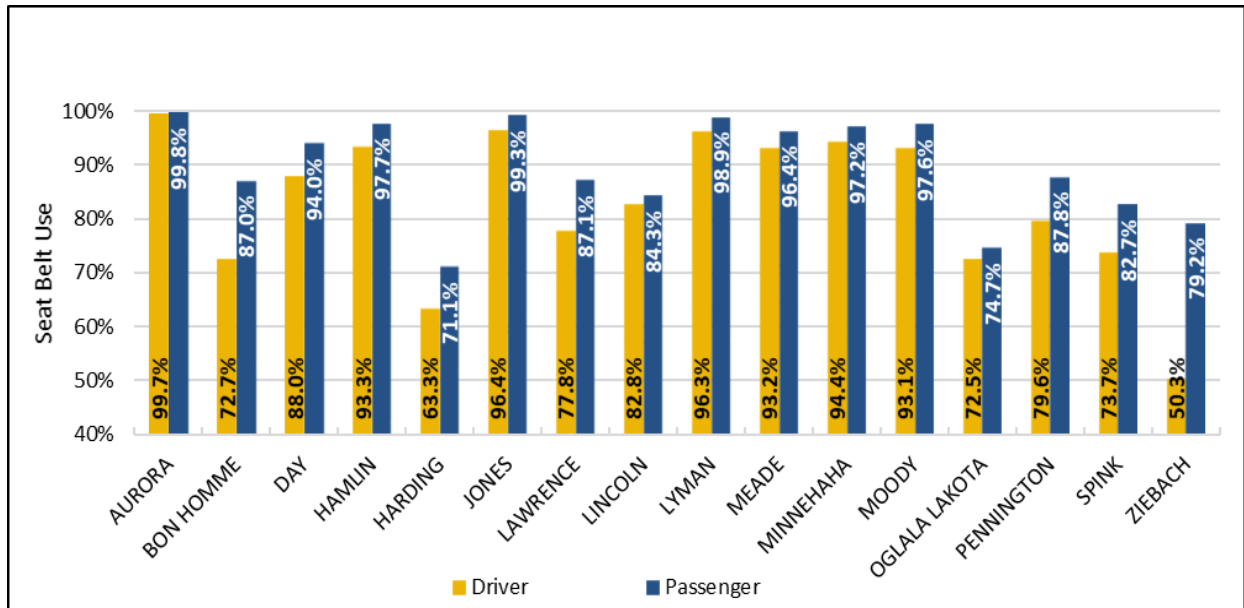


Figure 4: Percent Belted by Occupant Position and County, 2021, Unweighted

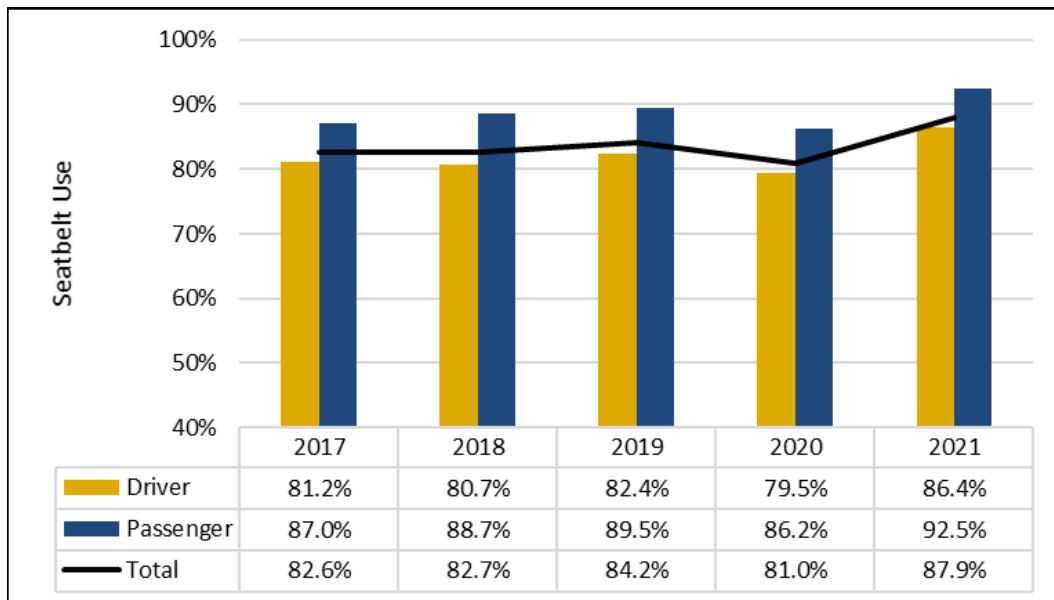


Figure 5: Percent Belted by Position, Annual, Unweighted

Considering the state as a whole, the unweighted estimates of seat belt use in 2021 were 86.4% for drivers and 92.5% for passengers, with an overall estimate of the seat belt use rate of 87.9% for drivers and passengers combined (Figure 5). The observed rates of seat belt use this year, for both occupant positions and the state as a whole, are the highest in the current five-year interval.

It could be suggested that the increase in out-of-state traffic contributed to higher rates of seat belt use. According to the South Dakota Department of Tourism, the majority of visitors (year-to-date) to South Dakota's national parks are from Minnesota, which is a primary seat belt law state.

Efforts to address seat belt use in South Dakota are ongoing. 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 South 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.

## Results by South Dakota Regions

The survey sampling methodology groups the state into an east/west regional division (Figure 6). The west region contains three “certainty” counties and five additional counties selected from the remaining counties in the region. The east region is composed of one “certainty” county and seven additional counties from the region.<sup>3</sup>

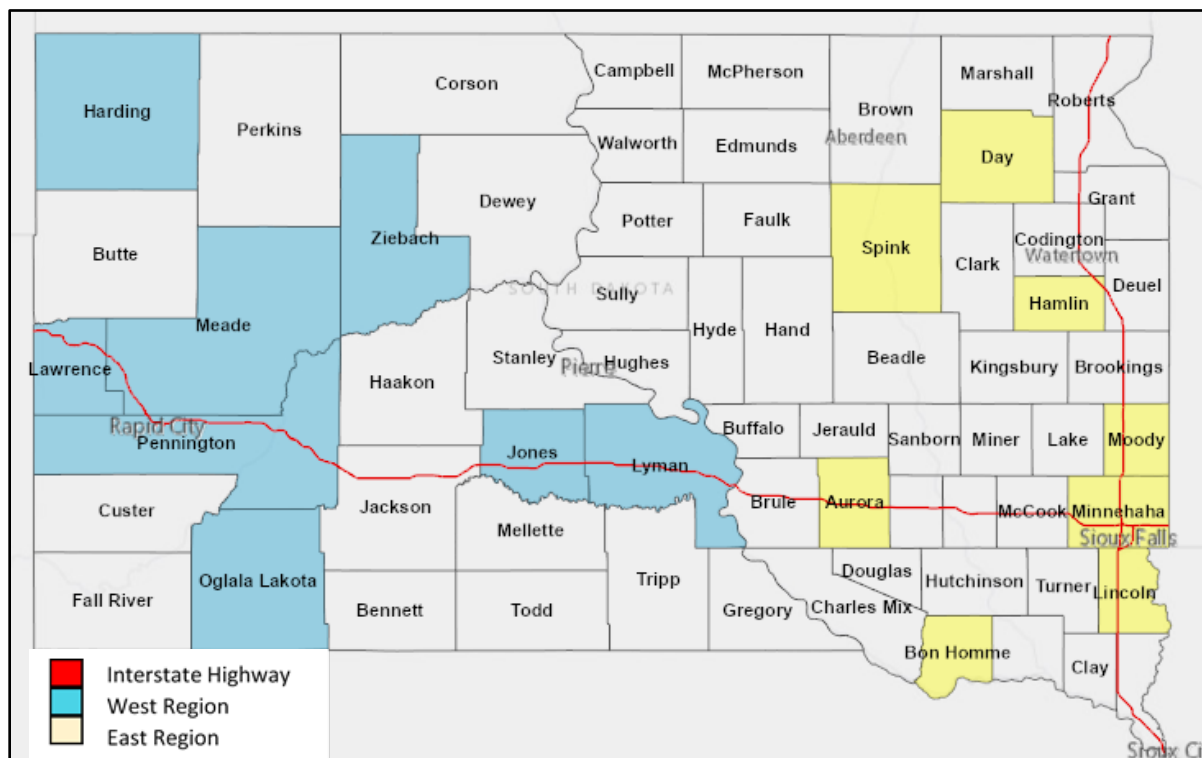


Figure 6: South Dakota County Stratification

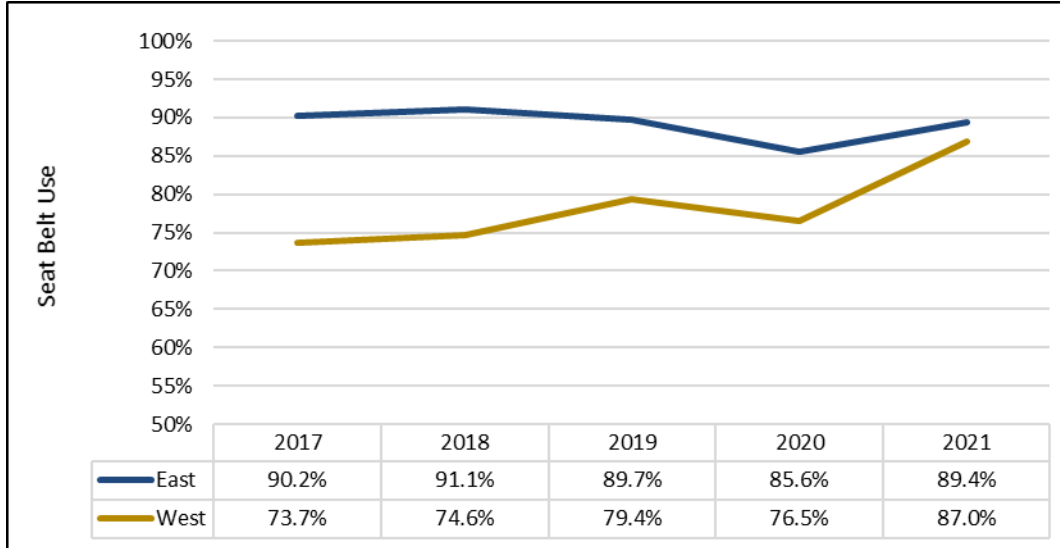
Table 5: Sample Size by Region

Region	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample	2021	% of Sample
East	14,687	54.4%	14,422	49.2%	14,181	46.7%	11,788	49.3%	11,884	38.7%
West	12,297	45.6%	14,894	50.8%	16,185	53.3%	12,123	50.7%	18,807	61.3%
Total	26,984	100.0%	29,316	100.0%	30,366	100.0%	23,911	100.0%	30,691	100.0%

Year-to-year variations in sample size may be associated with revised sites and/or changes in travel levels and patterns. Table 5 shows a proportionate sample distribution between regions throughout the five-year period, with the exception of the current year, where the majority of the sample (61.3%) comes from the west.

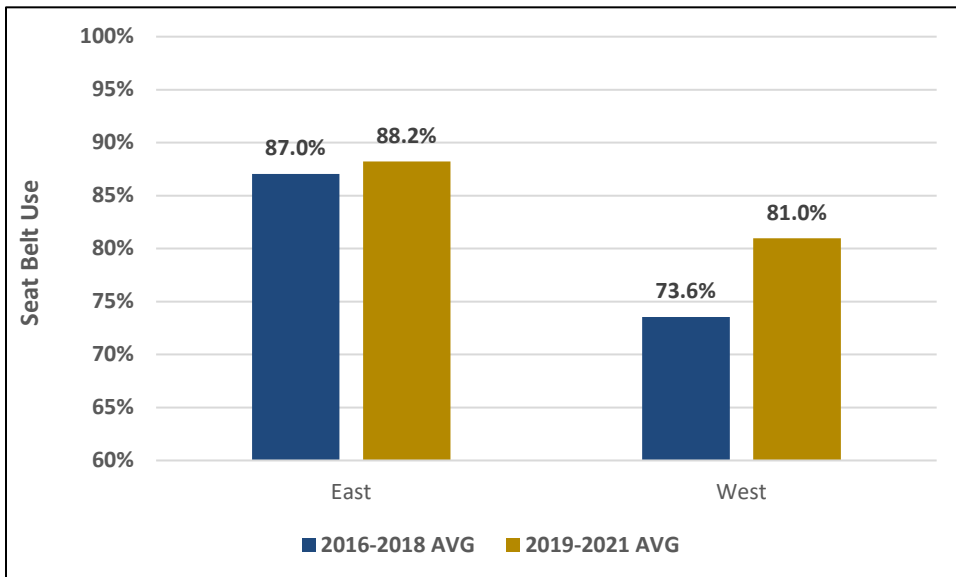
<sup>3</sup> See the discussion of the sampling methodology for details on certainty counties and the selection processes.

Seat belt use is routinely higher in the east than the west, as shown annually in Figure 7. Occupants from the east region have maintained fairly consistent usage, roughly 90%, throughout the years shown. Rates in the west indicate more annual fluctuation with increasing rates from 73.7% in 2017 to 87.0% in 2021. Both regions were observed to have a modest reduction in rates in the previous survey year.



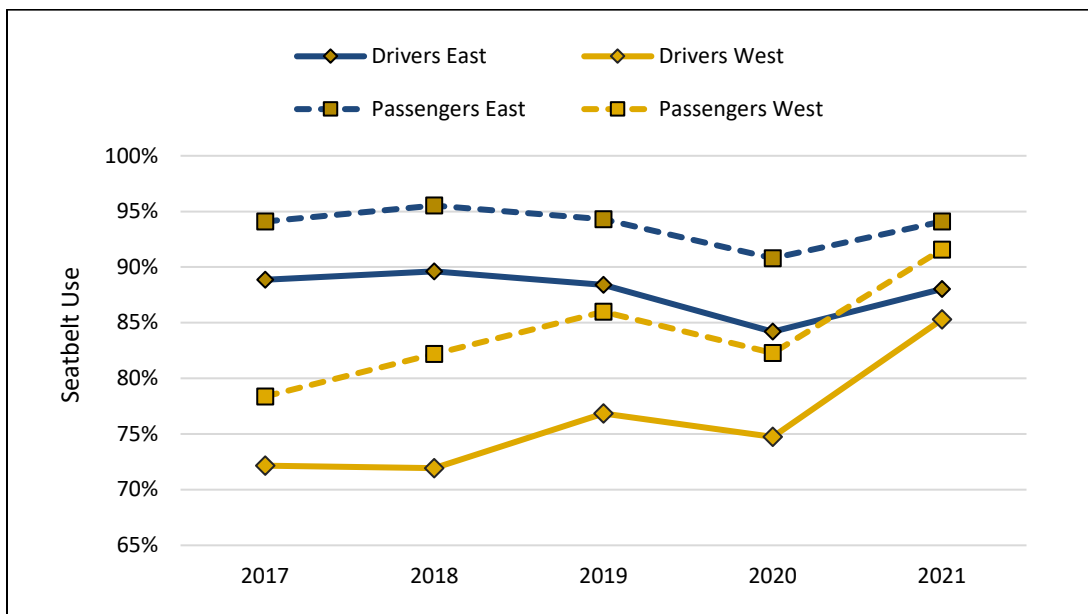
**Figure 7: Percent Belted by Region, Annually, Unweighted**

The three-year average use rates by region are shown in Figure 8. The east region’s rates show little change, from 87.0% in 2016-2018 to 88.2% in 2019-2021. However, the west region’s rate increased from 73.6% in 2016-2018 to 81.0% in 2019-2021, which reflects the region’s record high rate of 87.0% in 2021.



**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. Rates for occupant positions fluctuated year to year, in particular with significant increases in driver and passenger rates in the west. It is noted that driver rates increased from 72.2% in 2017 to 85.3% in 2021; and passenger rates rose from 78.4% to 91.6% during those same years within the region. Passenger use in the eastern region continually remains above all other groups. Nonetheless, in 2021, west region passengers approached rates of use seen in east region passengers. Drivers from the east were also observed with higher belted rates than all occupants in the west through last year, but have currently fallen below western passenger rates. The decreasing point-spread between the four groups should be noted as well, where 2018 held the largest point-spread of 23 percentage points to this year's smallest spread of just under nine percentage points. Moreover, this year's rates have bounced back from last year's overall decrease in belt use.



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

## Results by Vehicle Type

Beginning with the 2012 statewide seat belt survey, South Dakota incorporated the expanded uniform criteria vehicle eligibility to define a fleet that included all passenger vehicles with a gross vehicle weight of up to 10,000 pounds. This change necessitated the inclusion of various small trucks. Commercial-use trucks, indicated by logos on doors or truck bodies, are within the survey scope.<sup>4</sup>

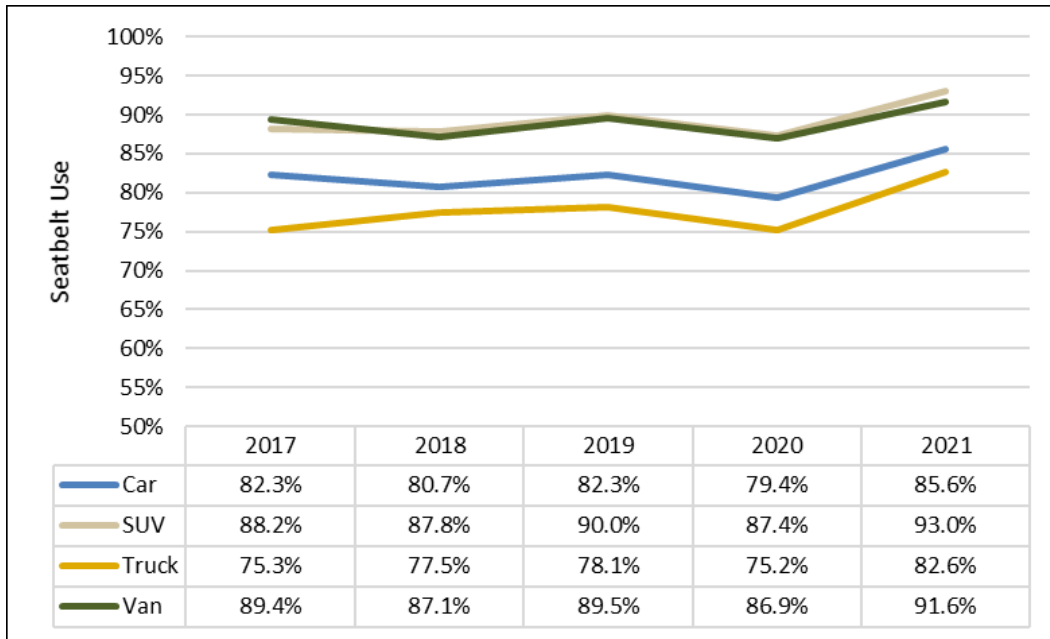
Table 6 shows the annual fleet distribution for the past five years. Throughout this period trucks and SUVs have sustained a vehicle share of approximately 30% each. Vans regularly make up around 10% of the sample, and the share of cars has steadily decreased from 28.2% in 2017 to 22.1% in 2021.

**Table 6: Sample by Vehicle Type**

Vehicles Observed	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample	2021	% of Sample
Car	7,607	28.2%	7,216	24.6%	7,245	23.9%	5,706	23.9%	6,795	22.1%
SUV	8,212	30.4%	9,931	33.9%	10,003	33.1%	7,438	31.1%	11,285	36.8%
Truck	8,374	31.0%	9,349	31.9%	9,873	32.6%	8,745	36.6%	9,843	32.1%
Van	2,971	10.3%	2,820	9.6%	3,145	10.4%	2,022	8.5%	2,768	9.0%
Total	26,984	100.0%	29,316	100.0%	30,266	100.0%	23,911	100.0%	30,691	100.0%

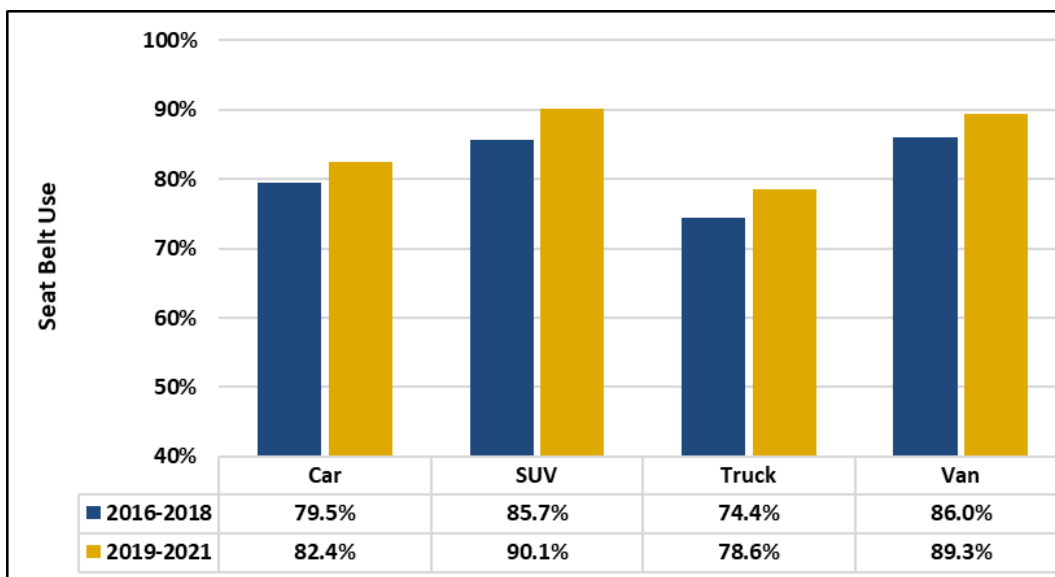
Annual results for overall seat belt use by vehicle type are shown in Figure 10. SUV and van occupants continue to demonstrate the highest usage rates across the five-year span - this year at 93.0% and 91.6%, respectively. This was followed by cars (85.6%), which continually rank below SUVs and vans yet above trucks (currently 82.6%). While trucks remain the vehicle type with the least belted occupants, the rates of use have increased from 75.3% in 2017 to this year's all-time high of 82.6%. Despite the all-around decrease in rates seen last year, the upward trend in belt use by occupants of all vehicle types appears to have resumed.

<sup>4</sup> Truck definition is trucks with a gross vehicle weight of less than 10,000 lbs., including pickups, wrecker tow vehicles, flatbed three- or four-ton trucks, and utility service trucks; excludes semi or large box trucks, and large emergency vehicles.



**Figure 10: Percent Belted by Vehicle Type, Annually, Unweighted**

Truck rates were not uniformly low in each county in 2021. However, some counties not only had low seat belt use in trucks, but a large proportion of trucks as a share of the total county sample. For example, truck observations in Ziebach County totaled 40.2% of the county sample with a use rate of 41.7% in 2021. In Spink County, the truck share was 46.1% of the sample with restraint use of 64.4%. While seat belt use by occupants in trucks has increased over the years, Table 7 shows this demographic with rates of less than 80% in eight 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.



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

A comparison of averages shown in Figure 11 indicates greater seat belt use for all vehicle types in the 2019-2021 period than the 2016-2018 period. The current three-year averages exceed the earlier averages in each vehicle type by 3% to 5%. Individual county rates by vehicle type are outlined in Table 7. Aurora County demonstrated the highest rate of seat belt use across all vehicle types, ranging from 99.0% to 100.0%. Ziebach County demonstrated the lowest rates (ranging from 41.7% to 62.5%) of seat belt use across all vehicle types other than cars, which was lower in Harding County (58.8%).

**Table 7: Percent Belted by County and Vehicle Type, Unweighted**

2021							
Car		SUV		Truck		Van	
Aurora	100.0%	Aurora	100.0%	Aurora	99.0%	Aurora	100.0%
Bon Homme	73.3%	Bon Homme	85.6%	Bon Homme	64.7%	Bon Homme	86.7%
Day	90.9%	Day	93.4%	Day	85.4%	Day	87.5%
Hamlin	95.0%	Hamlin	97.2%	Hamlin	90.8%	Hamlin	93.4%
Harding	58.8%	Harding	71.5%	Harding	60.2%	Harding	72.7%
Jones	94.8%	Jones	98.8%	Jones	96.1%	Jones	97.4%
Lawrence	83.5%	Lawrence	88.2%	Lawrence	71.0%	Lawrence	85.7%
Lincoln	79.4%	Lincoln	90.8%	Lincoln	74.5%	Lincoln	81.2%
Lyman	98.0%	Lyman	99.3%	Lyman	93.4%	Lyman	96.0%
Meade	93.6%	Meade	94.1%	Meade	93.3%	Meade	95.5%
Minnehaha	95.3%	Minnehaha	96.8%	Minnehaha	89.9%	Minnehaha	96.4%
Moody	89.9%	Moody	96.5%	Moody	92.9%	Moody	95.9%
Oglala Lakota	65.1%	Oglala Lakota	79.7%	Oglala Lakota	69.3%	Oglala Lakota	86.4%
Pennington	82.5%	Pennington	86.4%	Pennington	74.7%	Pennington	90.1%
Spink	77.0%	Spink	89.0%	Spink	65.4%	Spink	77.6%
Ziebach	59.6%	Ziebach	59.4%	Ziebach	41.7%	Ziebach	62.5%

The 2021 results by vehicle type are consistent with long-term trends for seat belt use in South Dakota and other states that do not have primary seat belt laws, are largely rural in nature, and have a high proportion of trucks.

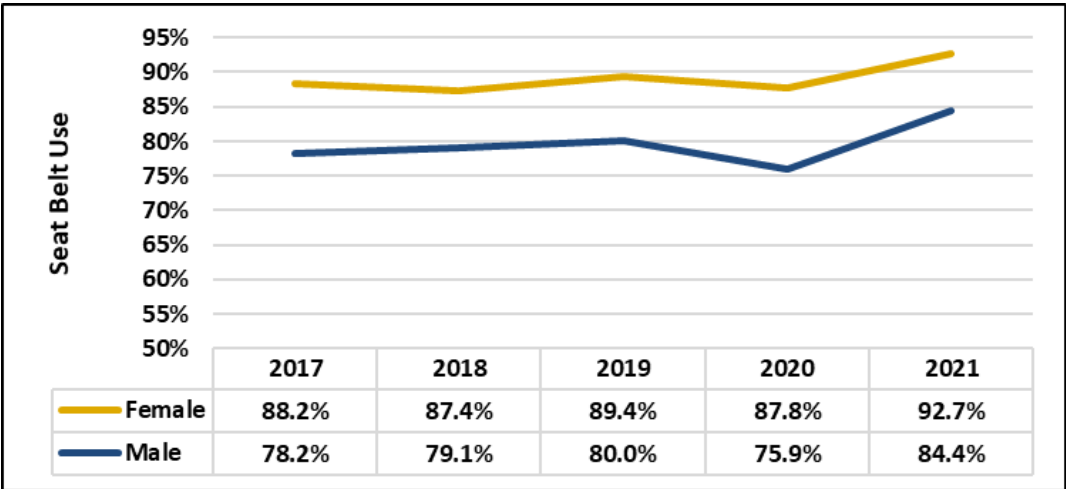


# Results by Occupant Gender and Position

**Table 8: Sample by Gender**

Occupants Observed	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample	2021	% of Sample
Male	15,147	56.1%	16,728	57.1%	16,921	55.7%	13,831	57.8%	17,502	57.0%
Female	11,761	43.6%	12,350	42.1%	13,197	43.5%	9,623	40.2%	13,068	42.6%
Unknown:	76	0.3%	238	0.8%	248	0.8%	457	1.9%	121	0.4%
<b>Total</b>	<b>26,984</b>	<b>100.0%</b>	<b>29,316</b>	<b>100.0%</b>	<b>30,366</b>	<b>100.0%</b>	<b>23,911</b>	<b>100.0%</b>	<b>30,691</b>	<b>100.0%</b>

Minimal year-to-year variation in gender composition of the sample is observed in the past five years, as summarized in Table 8. Males occupants were 57.0% of the overall sample in the current survey while females were 42.6%. In a small percentage of observations, occupant gender could not be determined (less than 1%), 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 from these parts of the analyses had no effect on the overall numbers, but is mentioned here for comprehensive reporting.



**Figure 12: Percent Belted by Gender, Annually, Unweighted**

Gender use and disparity continued an annual pattern, whereby females had higher rates of seat belt use than males, and the gap between gender usage persisted (Figure 12). The 2021 survey results showed female restraint use of 92.7%, compared with 84.4% for males. Both genders demonstrated an increase in use rates compared to the previous year, and further, the highest rates in the five-year time period.

Table 9 shows restraint use by county and gender. The lowest rates were found in Ziebach County for both females (63.3%) and males (45.3%). The highest rates were found in Aurora County for both females (100.0%) and males (99.4%) as well. Female occupants were observed to have rates of use above 85% in thirteen of sixteen counties, whereas male occupants demonstrated the same level in eight counties.

**Table 9: Percent Belted by Gender and County, 2021**

2021			
FEMALE OCCUPANTS		MALE OCCUPANTS	
Aurora	100.0%	Aurora	99.4%
Bon Homme	86.9%	Bon Homme	67.1%
Day	95.6%	Day	85.4%
Hamlin	97.9%	Hamlin	91.5%
Harding	72.9%	Harding	60.4%
Jones	98.7%	Jones	96.2%
Lawrence	88.5%	Lawrence	75.4%
Lincoln	92.7%	Lincoln	74.2%
Lyman	98.7%	Lyman	96.1%
Meade	95.9%	Meade	92.3%
Minnehaha	96.1%	Minnehaha	93.7%
Moody	96.3%	Moody	92.0%
Oglala Lakota	76.2%	Oglala Lakota	70.4%
Pennington	87.4%	Pennington	77.1%
Spink	91.1%	Spink	65.8%
Ziebach	63.3%	Ziebach	45.3%

The sample by gender and occupant position also remains quite stable from year to year with the 2021 sample indicating a gender distribution proportionate to past surveys. As defined in Table 10, drivers were twice as likely to be male than female (49.7% to 25.0%). In contrast, passengers were nearly two and a half times more likely to be female than male (17.5% to 7.3%).

**Table 10: Sample by Gender and Position**

Occupants Observed	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample	2021	% of Sample
<b>Drivers:</b>										
Male	13,294	49.3%	14,582	49.7%	14,790	48.7%	12,290	51.4%	15,267	49.7%
Female	7,045	26.1%	7,126	24.3%	7,618	25.1%	6,074	25.4%	7,685	25.0%
<b>Passengers:</b>										
Male	1,853	6.9%	2,146	7.3%	2,131	7.0%	1,541	6.4%	2,235	7.3%
Female	4,716	17.5%	5,224	17.8%	5,579	18.4%	3,549	14.8%	5,383	17.5%
<b>Unknown:</b>	76	0.3%	238	0.8%	248	0.8%	457	1.9%	121	0.4%
<b>Total</b>	26,984	100.0%	29,316	100.0%	30,366	100.0%	23911	100.0%	30,691	99.9%

Current survey results corroborate higher rates of use by females regardless of occupant position (Figure 13). Female passengers demonstrated the highest usage rate (95.2%) of all gender and occupant positions. This was followed by female drivers at 90.9%, male passengers at 86.1%, and male drivers at 84.1%. These measures of restraint use resume the upward trend that was disrupted in 2020 among all occupants, and is most noticeable among male occupants.

**Figure 13: Percent Belted by Gender and Position, Annual, Unweighted**

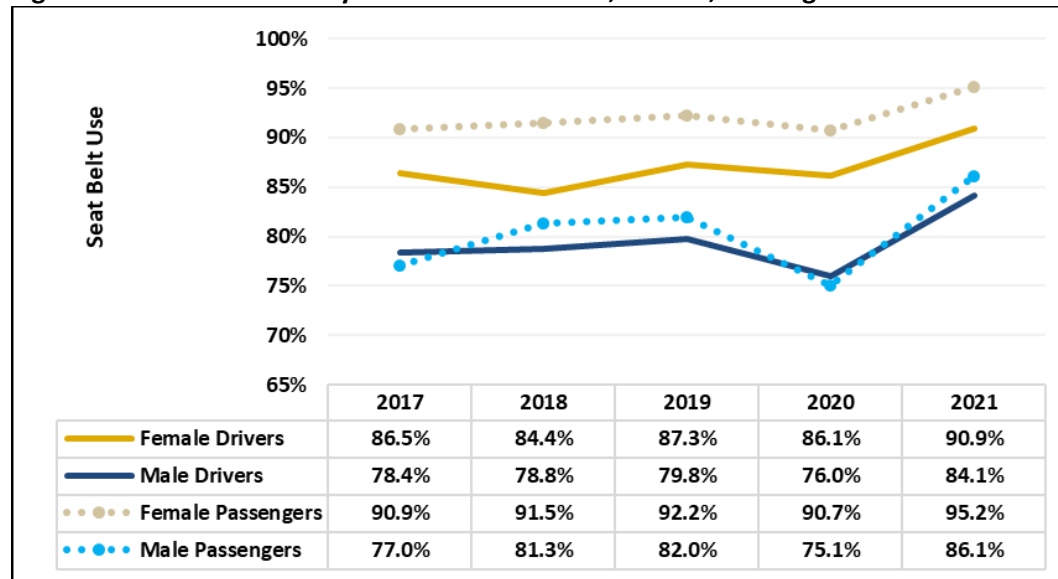
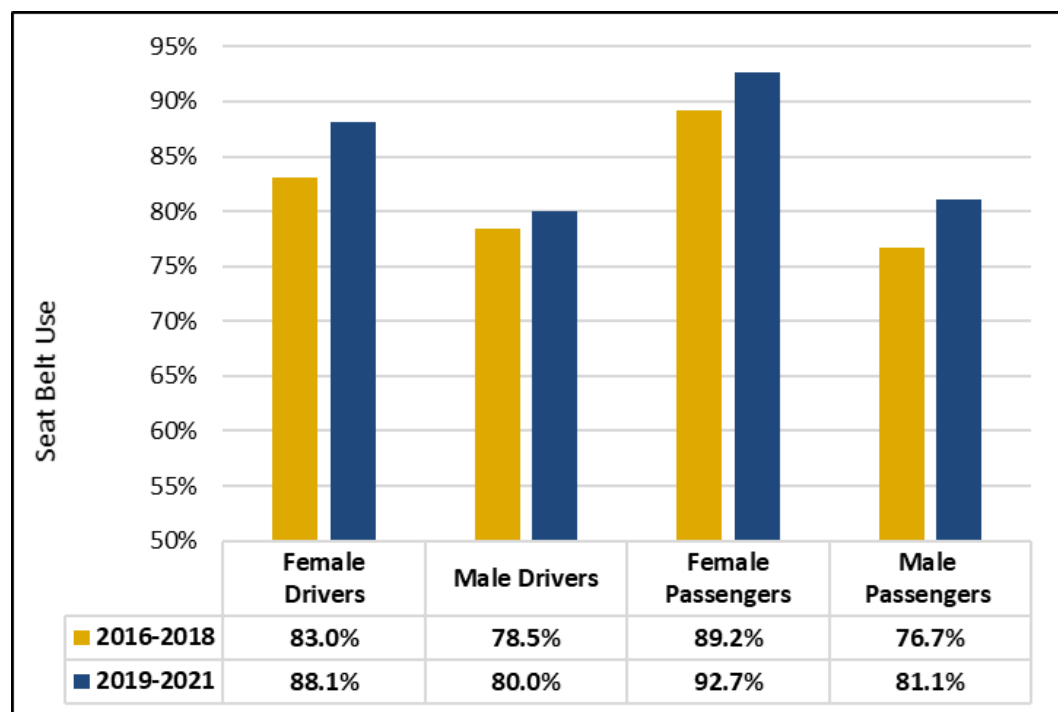


Figure 14 identifies the three-year average rates of seat belt use by all gender and occupant positions. Male drivers demonstrated an average rate of 78.5% in 2016-2018, and increased to 80.0% in the most recent three years. The female driver group demonstrated the biggest increase between the two time



**Figure 14: Seat Belt Use by Gender & Position, Three-Year Averages, Unweighted**

periods, from 83.0% to 88.1%. Passenger rates also increased for both females and males, from 89.2% to 92.7% and 76.7% to 81.1%, respectively.

There are wide-ranging seat belt use rates in individual counties in all occupant positions, as seen in Table 11. At the county level, female drivers' rates were generally high, with only three counties belted below 80%, compared to males in eight counties that were belted at the same rate. A similar pattern was seen in passenger rates as well.

**Table 11: Percent Belted by Gender, Position, and County, 2021, Unweighted**

2021							
FEMALE DRIVERS		FEMALE PASSENGERS		MALE DRIVERS		MALE PASSENGERS	
Aurora	100.0%	Aurora	100.0%	Aurora	99.5%	Aurora	99.0%
Bon Homme	83.8%	Bon Homme	93.7%	Bon Homme	67.1%	Bon Homme	67.3%
Day	95.0%	Day	96.2%	Day	84.6%	Day	89.6%
Hamlin	98.2%	Hamlin	97.4%	Hamlin	90.7%	Hamlin	98.3%
Harding	65.6%	Harding	79.6%	Harding	62.3%	Harding	49.1%
Jones	97.9%	Jones	99.4%	Jones	95.8%	Jones	98.8%
Lawrence	84.3%	Lawrence	93.5%	Lawrence	75.2%	Lawrence	76.2%
Lincoln	92.8%	Lincoln	92.4%	Lincoln	74.9%	Lincoln	68.4%
Lyman	98.4%	Lyman	99.0%	Lyman	95.5%	Lyman	98.7%
Meade	95.5%	Meade	96.7%	Meade	91.9%	Meade	95.6%
Minnehaha	95.3%	Minnehaha	100.0%	Minnehaha	93.9%	Minnehaha	90.5%
Moody	94.9%	Moody	98.6%	Moody	91.9%	Moody	93.3%
Oglala Lakota	76.6%	Oglala Lakota	75.5%	Oglala Lakota	69.8%	Oglala Lakota	73.8%
Pennington	85.8%	Pennington	89.9%	Pennington	76.1%	Pennington	82.9%
Spink	90.7%	Spink	92.2%	Spink	65.1%	Spink	71.4%
Ziebach	57.1%	Ziebach	94.4%	Ziebach	45.6%	Ziebach	33.3%

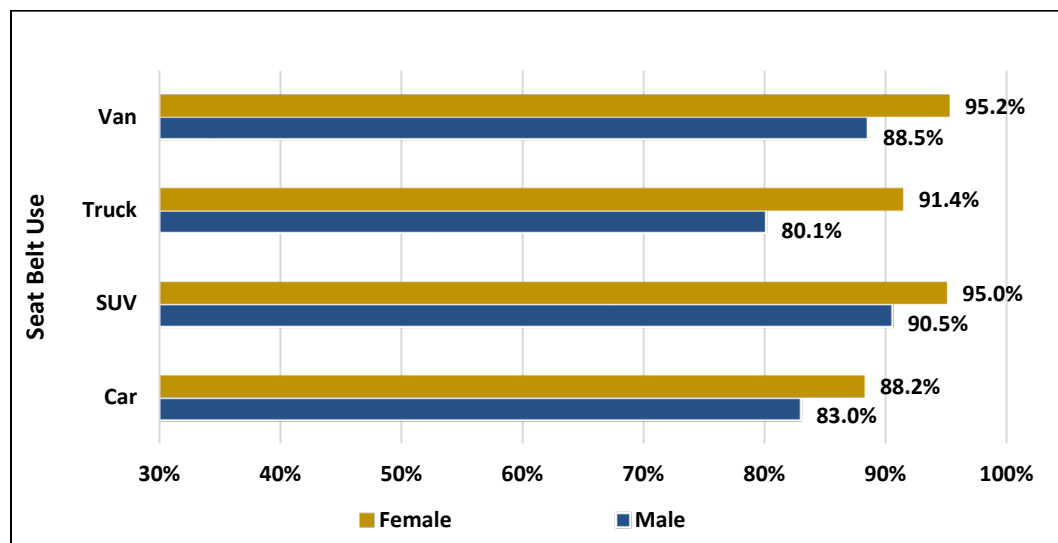
## Results by Gender and Vehicle Type

Examining the survey sample size without respect to the driver/passenger demographic shows the ratio of male to female occupants is about 1.3 to 1, as can be seen in Table 12. When considering vehicle type, males show lower representation than females in SUVs, but hold higher shares in all other vehicle types. A large gender imbalance continues to be noticed in the truck category, where males represented 77.5% of the occupant share in this vehicle type.

**Table 12: Sample by Vehicle Type and Gender**

Occupants Observed	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample	2021	% of Sample
<b>Male</b>										
Car	3,649	13.5%	3,629	12.4%	3,536	11.6%	2,800	11.7%	3,400	11.1%
SUV	3,719	13.8%	4,488	15.3%	4,323	14.2%	3,145	13.2%	5,041	16.4%
Truck	6,403	23.7%	7,164	24.4%	7,516	24.8%	6,865	28.7%	7,610	24.8%
Van	1,376	5.1%	1,447	4.9%	1,546	5.1%	1,021	4.3%	1,451	4.7%
<b>Female</b>										
Car	3,940	14.6%	3,507	12.0%	3,740	12.3%	2,792	11.7%	3,363	11.0%
SUV	4,467	16.6%	5,372	18.3%	5,588	18.4%	4,082	17.1%	6,196	20.2%
Truck	1,948	7.2%	2,128	7.3%	2,304	7.6%	1,772	7.4%	2,204	7.2%
Van	1,406	5.2%	1,343	4.6%	1,565	5.2%	977	4.1%	1,305	4.3%
<b>Unknown:</b>	76	0.3%	238	0.8%	245	0.8%	457	1.9%	121	0.4%
<b>Total</b>	26,984	100.0%	29,316	100.0%	30,363	100.0%	23,911	100.0%	30,691	100.0%

Differences in seat belt use by gender varied across vehicle types (Figure 15). In the recent survey, male occupants were belted from a low of 80.1% in trucks to a high of 90.5% in SUVs. Females were belted at higher rates than males in all vehicle types, ranging from a low of 88.2% in cars to a high of 95.2% in vans.



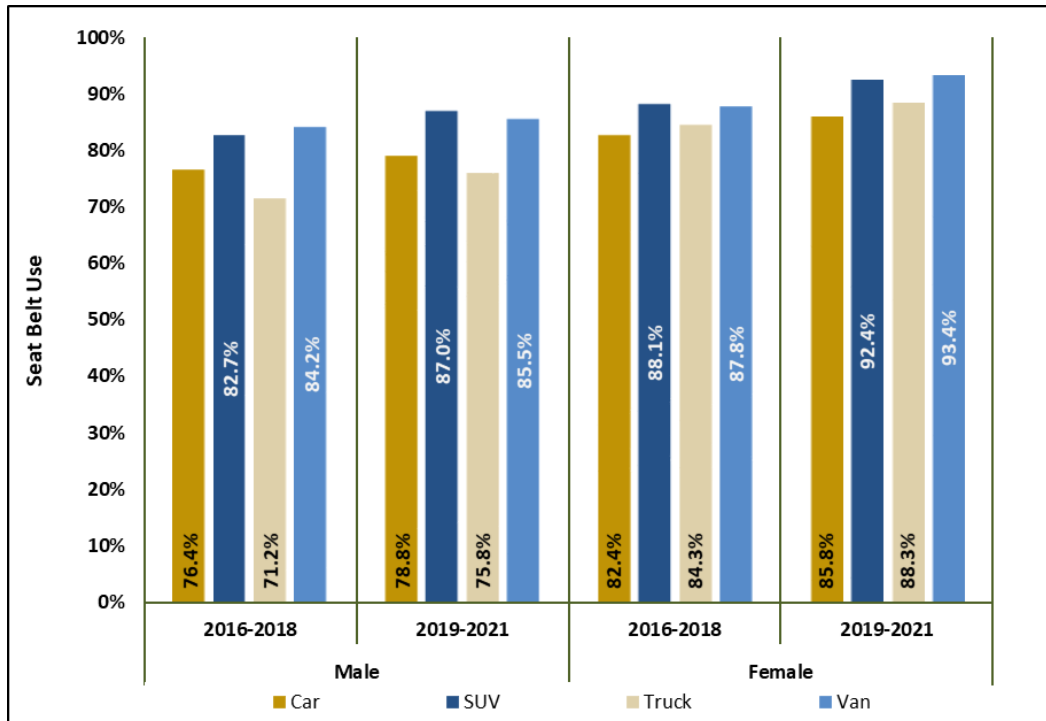
**Figure 15: Percent Belted by Gender and Vehicle Type, 2021, Unweighted**

Although the size of the disparity between male and female seat belt use varies from year to year as seen in Table 13, male use is shown to be lower than female use in every vehicle type in every year by as much as 14.2 percentage points (2017, trucks) to as little as 3.8 percentage points (2018, SUVs). Annual rates of belt use for both genders are highest in SUVs and vans. Males are observed to have the lowest use in trucks, but have increased belt use in all vehicle types in 2021. Females are observed to be least often belted in cars, but have also increased use in all vehicle types.

**Table 13: Annual Percent Belted by Gender and Vehicle Type, Unweighted**

Male	2017	2018	2019	2020	2021
Car	78.9%	77.5%	78.9%	74.6%	83.0%
SUV	85.2%	85.7%	87.6%	83.0%	90.5%
Truck	71.9%	74.7%	75.0%	72.3%	80.1%
Van	86.8%	84.9%	86.2%	81.8%	88.5%
Female	2017	2018	2019	2020	2021
Car	85.4%	83.8%	85.5%	83.8%	88.2%
SUV	90.6%	89.5%	91.8%	90.4%	95.0%
Truck	86.1%	86.7%	87.8%	85.6%	91.4%
Van	91.8%	89.3%	92.8%	92.1%	95.2%

The three-year averages in Figure 16 demonstrate improvement in rates of seat belt use by both genders across all vehicle types when comparing the 2019-2021 period with the previous three years.



**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, with more comprehensive definitions provided in Appendix E:

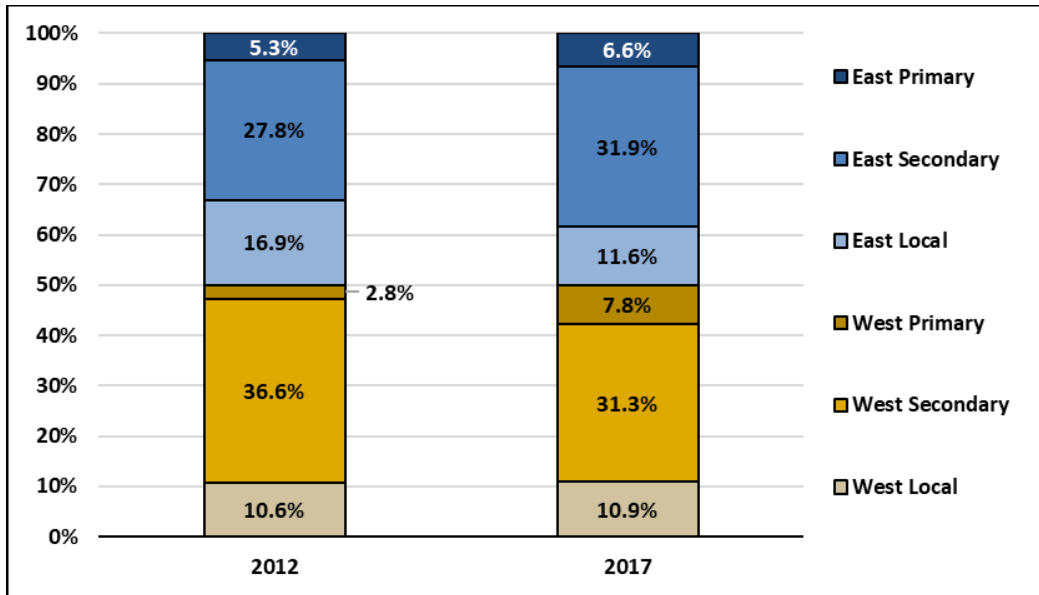
- Primary road: divided, limited-access, e.g., interstates
- Secondary road: main arteries usually in the U.S./state/county highway systems
- Local neighborhood road/rural road/city street: paved, non-arterial streets

There were 18,807 observations collected from the west region, making up 61.3% of the sample, while the east region contributed the remaining 11,884 (38.7%) observations. Primary, secondary, and local roadways accounted for 46.5%, 37.4%, and 16.1% of total vehicle occupants, respectively. As previously noted, this difference is likely associated with the increase in travel to tourist destinations, with the west region housing the more popular state and national parks.

**Table 14: Sample by Road Type**

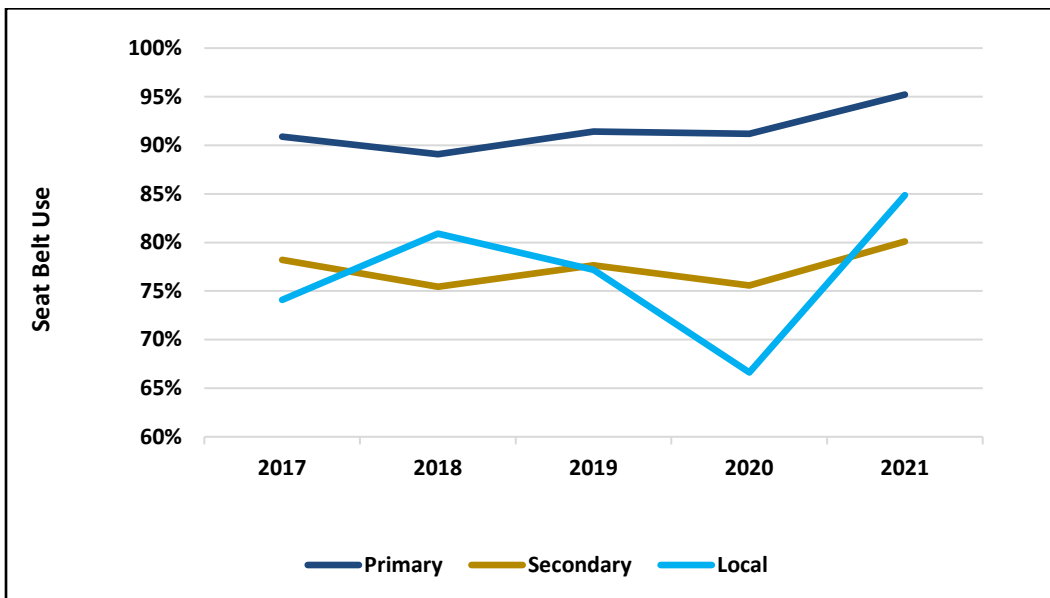
Occupants Observed	2017	% of Sample	2018	% of Sample	2019	% of Sample	2020	% of Sample	2021	% of Sample
<b>East</b>										
Primary	7,161	26.5%	7,245	24.7%	6,775	22.3%	5,228	21.9%	4,363	14.2%
Secondary	5,747	21.3%	5,482	18.7%	5,739	18.9%	5,078	21.2%	5,713	18.6%
Local	1,779	6.6%	1,695	5.8%	1,667	5.5%	1,482	6.2%	1,808	5.9%
<b>Total East</b>	<b>14,687</b>	<b>54.4%</b>	<b>14,422</b>	<b>49.2%</b>	<b>14,181</b>	<b>46.7%</b>	<b>11,788</b>	<b>49.3%</b>	<b>11,884</b>	<b>38.7%</b>
<b>West</b>										
Primary	3,856	14.3%	6,694	22.8%	7,875	25.9%	5,357	22.4%	9,918	32.3%
Secondary	5,384	20.0%	5,647	19.3%	5,570	18.3%	4,230	17.7%	5,769	18.8%
Local	3,057	11.3%	2,553	8.7%	2,740	9.0%	2,536	10.6%	3,120	10.2%
<b>Total West</b>	<b>12,297</b>	<b>45.6%</b>	<b>14,894</b>	<b>50.8%</b>	<b>16,185</b>	<b>53.3%</b>	<b>12,123</b>	<b>50.7%</b>	<b>18,807</b>	<b>61.3%</b>
<b>Total</b>	<b>26,984</b>	<b>100.0%</b>	<b>29,316</b>	<b>100.0%</b>	<b>30,366</b>	<b>100.0%</b>	<b>23,911</b>	<b>100.0%</b>	<b>30,691</b>	<b>100.0%</b>

While it is typical to see annual variations in the regional sample size by road class, the NHTSA-mandated reselection of sites for the 2017 survey heightened the disparities. A noticeable difference was seen on primary roads, which historically produced 22% to 25% of the overall South Dakota sample. This increased to 40.8% in 2017, and to 46.5% in 2021. A further difference was a sizable decline on secondary roads that had previously provided 57% to 63% of the overall sample. This share was reduced to 41.3% in 2017 and 37.4% in 2021.



**Figure 17: Survey Sites by Road Type, 2012 and 2017**

Sample variations were associated with revisions in the number of sites drawn for each road type, as well as traffic volumes at new site locations. Contextual information is provided in Figure 17, identifying the proportion of sites by road type established with the amended methodology in 2012 followed by the reselection in 2017. 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 18: Percent Belted by Road Type, Annually, Unweighted**

Vehicle occupants on primary roadways have historically been belted at a higher rate than those on local and secondary roads, as shown in Figure 18. Occupants on primary roads were belted at 95.2%, followed



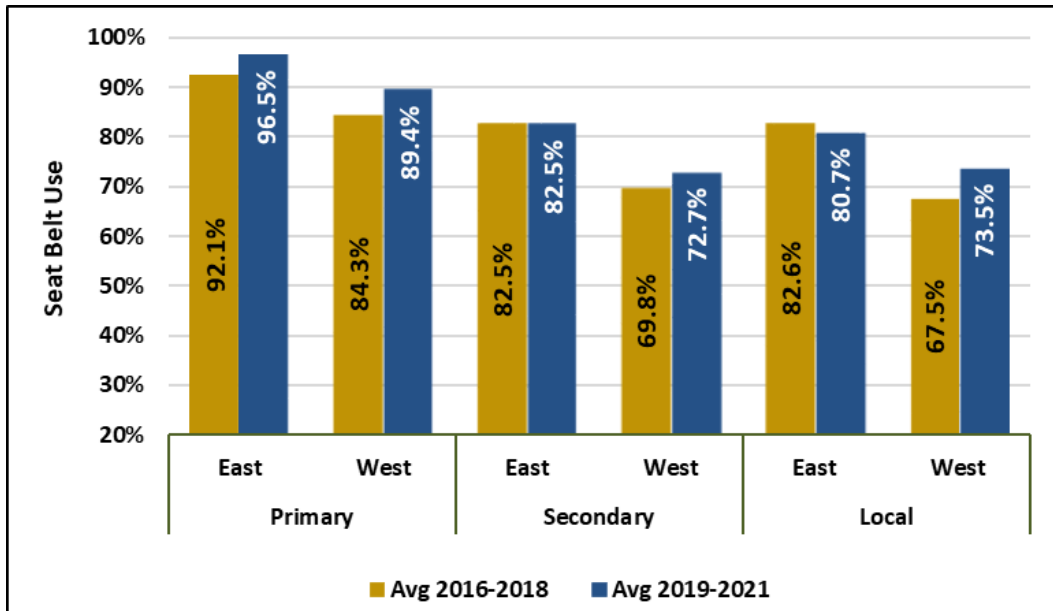
by 84.9% on local roads, and 80.1% on secondary roads. The most noticeable fluctuation of seat belt use is seen on local roads, despite the sample size remaining relatively steady.

Annual rates stratified by region and road type for the most recent five years are shown in Table 15. Restraint use on primary roads in the east region ranged from 94.5% to 97.8%. Rates on primary roads in the west region ranged from 80.4% to 94.1%. Use on secondary roads ranged between 79.4% and 85.1% in the east, and 67.7% and 75.9% in the west. Occupants traveling local road were belted at rates ranging from 66.0% to 91.4% in the east region, and 67.0% to 84.9% in the west region. Rates for all road types were higher in the east than the west in all five years, with the exception of local road rates in 2020 and 2021, where rates were reasonably equal.

**Table 15: Annual Percent Belted by Region & Road Type, Unweighted**

<b>EAST</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Primary	96.2%	97.1%	94.5%	97.0%	97.8%
Secondary	85.1%	83.4%	83.7%	79.4%	84.4%
Local	82.2%	90.6%	91.4%	66.0%	84.8%
<b>WEST</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Primary	81.0%	80.4%	88.7%	85.5%	94.1%
Secondary	70.8%	67.7%	71.5%	70.9%	75.9%
Local	69.4%	74.5%	68.6%	67.0%	84.9%
<b>TOTAL</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Primary	90.9%	89.1%	91.4%	91.2%	95.2%
Secondary	78.2%	75.4%	77.7%	75.6%	80.1%
Local	74.1%	80.9%	77.2%	66.6%	84.9%

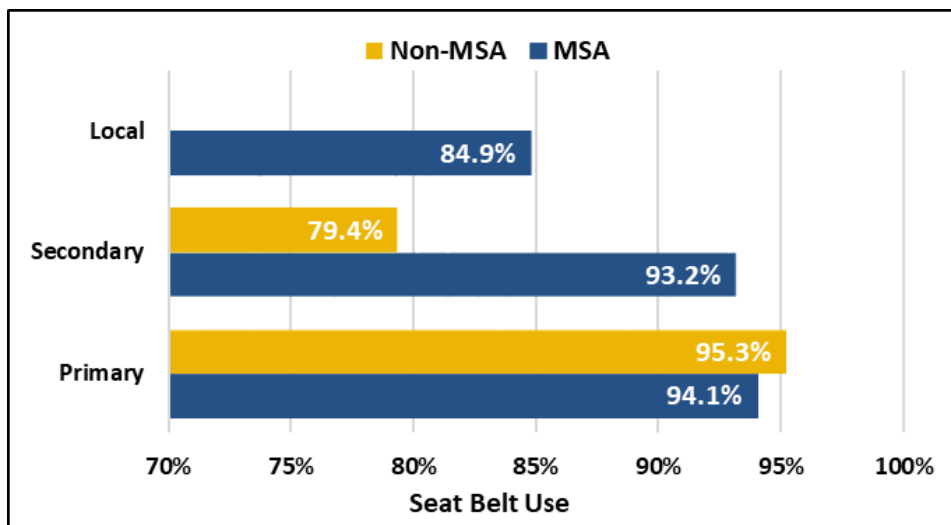
Increases in rates are evident in most road classifications and regions when comparing three-year averages (Figure 19). Although the extent of the increases varies, the largest improvement over time is found in belt use on local roads in the west region, increasing by 6.0 percentage points. Contrarily, results from the same road type in the east region find a decrease of nearly 2.0 percentage points.



**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 South Dakota observational seat belt survey are Lincoln, Meade, Minnehaha, and Pennington.

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 the highest restraint use rates on primary roads in both non-MSA counties (95.3%) and MSA counties (94.1%). The most disparity was found in occupants traveling on secondary roads, where those in MSA counties were belted at 93.2%, compared to those in non-MSA counties at 79.4%, which demonstrated the lowest rate of use. Occupants on local roads in MSA counties were restrained at a rate of 84.9%, which shows a vast improvement from the 2020 rate of 66.6%. Because local road sites were outside the sampling frame in non-MSA counties, a comparison of that road type is not available.



**Figure 20: Percent Belted by Road Type & Metropolitan Statistical Areas, 2021, Unweighted**

Table 16 shows a regional breakdown of sample size and restraint use by county designation and road type. A preponderance of observations for the primary road type was collected in non-MSA counties. The rate for this group was higher in the east (97.8%) than in the west (94.2%). Occupants on primary roads in MSA counties were restrained at a rate of 99.5% in the east, compared with 91.0% in the west. Secondary road occupants were also sampled more heavily in non-MSA counties than MSA counties. Occupants in non-MSA counties on this road type demonstrated rates of 84.1% in the east and 74.6% in the west, while MSA county rates were 91.2% and 94.6% in the east and west regions, respectively. As mentioned previously, observations were collected on local roads in MSA counties only per NHTSA protocol guidance. The rates on local roads were comparable between regions, the east at 84.8% and west at 84.9%.

**Table 16: Seat Belt Use by Region and MSA Designations**

Occupants Observed		East		West	
Road Type	MSA	Sample	Belted	Sample	Belted
Primary	MSA	183	99.5%	324	91.0%
	non-MSA	4180	97.8%	9594	94.2%
Secondary	MSA	239	91.2%	349	94.6%
	non-MSA	5474	84.1%	5420	74.6%
Local	MSA	1808	84.8%	3120	84.9%
	non-MSA	n.a	n.a.	n.a.	n.a.

# SUMMARY

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Observers collected data on seat belt use for 23,034 drivers and 7,657 right front-seat passengers for a total of 30,691 vehicle occupants. The observations were conducted at 320 sites across 16 counties. Based on the sampling methodology weighting procedures, the final estimate for statewide seat belt use was 86.9%. 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).

The following is a summary of major findings from the 2021 survey regarding seat belt use in South Dakota:

- **County.** Weighted rates of seat belt use by county showed Aurora with the highest use at 99.9%. Ziebach County had the lowest use at 51.4%. Bon Homme and Harding counties were also observed to be restrained at rates less than 70% in 2021. Trend comparisons for seven counties where historical data were available showed varied rates expressed in three-year averages, comparing 2016-2018 with 2019-2021. Trends were not available in the majority of counties due to the NHTSA-mandated reselection process, which is required every five years as a standard part of the survey process.
- **Vehicle Occupant.** Statewide, driver seat belt use was 86.4% while passenger use was 92.5%. At the county level, Aurora reflected the highest rate of driver use as well as the highest passenger use, 99.7% and 99.8%, respectively. These were followed by Hamlin, Jones, Lyman, Meade, Minnehaha, and Moody counties with rates for both occupant positions above 90%. Harding and Ziebach counties demonstrated driver usage of less than 70%. Passenger use was lowest in Harding County at 71.1%.
- **Region.** Overall rates of seat belt use were higher in the east region at 89.4%, compared with 87.0% in the west region. This regional disparity is noted throughout the 2017 to 2021 timeframe. Rates in the east ranged from a low of 85.6% in 2020 to a high of 91.1% in 2018. Rates in the west were considerably lower, ranging from a low of 73.7% in 2017 to a high of 87.0% in 2021. Regional disparity in use rates was also evident in occupant position. Drivers and passengers in the east registered use rates of 88.0% and 94.1%, respectively, compared with their counterparts in the west, with use rates of 85.3% for drivers and 91.6% for passengers.
- **Vehicle Type.** The results of the 2021 statewide survey indicated occupants of SUVs and vans demonstrated relatively high restraint use, 93.0%, and 91.6%, respectively. Car and truck occupants, on the other hand, were belted at lower rates, 85.6% and 82.6%, respectively. The sample size of the truck demographic (32.1%), combined with the lower use, continues to negatively influence the overall South Dakota rate.

- **Gender.** In 2021, female occupants continued to show higher rates of seat belt use overall than male occupants, 92.7% and 84.4%, respectively. When considering rates at the county level, approximately 81% of the survey counties registered female use at or above 80%, whereas male rates were less than that level in half of the counties. The rates by gender within the counties varied from less than 1 to as much as 25 percentage points. Higher rates hold for females whether they are drivers or passengers, not only in South Dakota, but across the nation.
- **Gender and Vehicle Type.** Females had higher rates of seat belt use than males for every vehicle type. The highest rate for males, 90.5%, was found in SUVs and the lowest, 80.1%, in trucks. By comparison, female rates were slightly more consistent across vehicle types, ranging from a high of 95.2% in vans to a low of 88.2% in cars. Male truck occupants continue to be the least belted group at 80.1% in 2021, compared with 91.4% for females.
- **Road Type.** Primary roads produced the largest share of occupants in the sample at 46.5%, followed by secondary roads with a 37.4% share. Local roads had the smallest share (16.1%) mainly due to their selection in only MSA counties per NHTSA protocol. Seat belt use in 2021 was highest on primary roads (95.2%), followed by local roads (84.9%), and secondary roads (80.1%). A comparison of results defined by MSA versus non-MSA county designation showed variations in sample size and rates of use. Approximately 20% of the sample was from designated MSA counties, with rates of 94.1%, 93.2%, and 84.9% on primary, secondary, and local roads, respectively. The majority of the sample was from non-MSA counties, with rates of 95.3% on primary roads and 79.4% on secondary roads. Regional differences in shares and use rates by road type were also noticed.

## APPENDICES

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## **Appendix A: Survey Methodology**

## Methodology Overview

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On April 1, 2011, NHTSA published revised uniform criteria for the state observational seat belt surveys to guide occupant protection programs. The new rule changed many aspects of the survey design. One of these changes was to include counties in the sampling frame based on a fatality-based inclusion criterion as opposed to the population-based criterion of the past. This methodology was used for surveys from 2012 to 2016. The federal rule directs states to update sampling frame data every five years to ensure accurate fatality distribution as well as a representative inventory of road segments. Accordingly, in 2017, a review of fatalities over the five-year period 2010 to 2014 was performed, resulting in changes in county involvement and a complete reselection of sites.

It was determined that 44 counties accounted for at least 85% of South Dakota's total crash-related fatalities from 2010 to 2014. A subsample of 16 counties was selected for the survey of seat belt use in South Dakota. Counties represent the primary sampling unit. Half of the counties were selected from the western part of the state and the other eight were selected from the eastern half. Within each of those 16 counties, a sample of 20 sites were selected, providing a total of 320 site locations across the state. In the event that any original sites could not be observed due to unforeseen circumstances, a reserve sample of sites was also selected. The sites within the counties are the secondary sampling unit. The sites were stratified by road types, identified within three MAF/TIGER Feature Class Code (MTFCC) classifications: primary roads, secondary roads, and local roads.

The formulas contained in this report use the following definitions.

- $g$  – denotes the county strata (east or west)
- $c$  – denotes the county
- $h$  – denotes the road segment strata (primary, secondary, or local)
- $i$  – denotes the road segment
- $j$  – denotes the time segment
- $k$  – denotes the vehicles direction of travel
- $l$  – denotes the lane of observation
- $m$  – denotes the vehicle
- $n$  – denotes the front-seat occupant (driver or passenger)

Within each stratum, east and west, counties were selected with probability proportional to size (PPS) with the measure of size (MOS) being vehicle miles traveled (VMT). If we let  $g = 1,2$  be the first stage strata,  $v_{gc}$  be the VMT for county  $c$  in stratum  $g$ , and  $v_g = \sum_{all\ c\ in\ g} v_{gc}$  be the total VMT for all counties in first stage stratum  $g$ , then the primary sampling unit (PSU) inclusion probability is:  $\pi_{gc} = n_g v_{gc} / v_g$ , here  $n_g$  is the PSU sample size for first stage stratum  $g$  that was allocated. First, each strata was analyzed to identify if any certainty counties existed. A county was selected with certainty if its MOS was equal to or exceeded  $v_g / n_g$ . Each certainty county identified was set aside and the stratum MOS was reduced by that county's VMT and  $n_g$  was reduced by one. This process was repeated until no



county's MOS was equal to or greater than  $v_g/n_g$  based on the reduced values for  $v_g$  and  $n_g$ . The probabilities of selection for the remaining counties in the stratum were calculated based on the new values for  $v_g$  and  $n_g$ . Three certainty counties were identified in the west region: Pennington, Meade, and Lawrence. Minnehaha was the only county selected with certainty from the east region. The remaining counties for each region were selected using the SAS procedure PROC SURVEYSELECT based on the re-calculated probabilities of selection.

Next, road segments within each county were stratified by their MTFCC class; primary, secondary and local. The list of eligible road segments within each county was then sorted by segment length within each MTFCC group to obtain an ordered list. Road segments were selected with PPS using length as the MOS. The same procedure that was used to identify certainty counties was used to identify any certainty sites. Only one certainty road segment was identified. A sampling interval ( $l$ ) was calculated as the total length across all remaining road segments within the county divided by the number of road segments to select within each county (i.e., 20 less the number of certainty sites). A random starting point ( $RS$ ) was selected between 0 and  $l$ , which determined the first road segment selected. Subsequent road segments selected were determined by adding multiples of  $l$  to  $RS$  until the desired number of road segments was selected and/or the end of the sorted list was reached.

Once the sites were chosen, a random order of the sites to observe within each county was constructed. One of the sites in each county was randomly chosen as the starting site. This site was then randomly assigned to one of the 77 one-hour time slots within the week as mandated by the uniform criteria. The time slots cover Monday through Sunday from 7 a.m. to 6 p.m. Once the initial site was selected and assigned to a time slot, the remaining sites were clustered and arranged within the county to achieve administrative and economic efficiencies. After each site was identified, the direction of travel was chosen randomly as either N/W or S/E. The lane of traffic was chosen as the closest lane to where the observer could find a suitable and safe place to make observations.

Under the stratified multistage sample design, the inclusion probability for each observed vehicle is the product of selection probabilities at all stages:

$\pi_{gc}$  for county,  $\pi_{hi|gc}$  for road segment,  $\pi_{j|gchi}$  for time segment,  $\pi_{k|gchij}$  for direction,  $\pi_{l|gchij}$  for lane, and  $\pi_{m|gchijl}$  for vehicle.

So the overall vehicle inclusion probability is:

$$\pi_{gchijklm} = \pi_{gc} \cdot \pi_{hi|gc} \cdot \pi_{j|gchi} \cdot \pi_{k|gchij} \cdot \pi_{l|gchij} \cdot \pi_{m|gchijl}$$

The sampling weight (design weight) for vehicle  $m$  is:

$$w_{gchijklm} = \frac{1}{\pi_{gchijklm}}$$

Noting that all front-seat occupants were observed and letting the driver/passenger seat belt use status be:

$$y_{gchijklmn} = \begin{cases} 1, & \text{if belt used} \\ 0, & \text{otherwise} \end{cases}$$

Then the seat belt use rate estimator is a ratio estimator calculated as follows:

$$\rho = \frac{\sum_{\text{all } gchijklmn} w_{gchijklm} y_{gchijklmn}}{\sum_{\text{all } gchijklmn} w_{gchijklm}}$$

This estimator captures traffic volume and vehicle miles traveled through design weights (which will include nonresponse adjustment factors) at various stages and it does not require knowledge of VMT/DVMT.

## **Appendix B: Survey Instrument**

**Seat Belt Survey Form**

Page # \_\_\_\_\_ of \_\_\_\_\_

Date \_\_\_\_\_

Start Time: \_\_\_\_\_ AM/PM

End Time \_\_\_\_\_ AM/PM

County \_\_\_\_\_

Observer Name: \_\_\_\_\_

Site Location Description (including city/town where applicable): \_\_\_\_\_

Site ID Number: \_\_\_\_\_ (if applicable)

Traffic Type Being Observed:     Town/City     Highway/County Road (outside of city/town)     Interstate

Obs	Vehicle Type					Driver						Passenger					
						Gender			Protection			Gender			Protection		
	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
1	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
2	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
3	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
4	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
5	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
6	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
7	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
8	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
9	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
10	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
11	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
12	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
13	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
14	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
15	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
16	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
17	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
18	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
19	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
20	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
21	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
22	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
23	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
24	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
25	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
26	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
27	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
28	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
29	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK
30	Car	Trck	SUV	Van	Mcycl	M	F	DK	Y	N	DK	M	F	DK	Y	N	DK

**Appendix C: Seat Belt Use Rates with Site  
and County Weights**

**Aurora County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.05035	0.191885	159	159	100.0%
2	0.10222	0.191885	132	132	100.0%
3	0.14767	0.191885	144	144	100.0%
4	0.20058	0.191885	205	205	100.0%
5	0.27463	0.191885	143	143	100.0%
6	0.30301	0.191885	171	171	100.0%
7	0.30591	0.191885	187	187	100.0%
8	0.44173	0.191885	138	139	99.3%
9	0.01473	0.191885	42	42	100.0%
10	0.06036	0.191885	29	29	100.0%
11	0.09658	0.191885	12	12	100.0%
12	0.12607	0.191885	33	33	100.0%
13	0.14341	0.191885	49	50	98.0%
14	0.15693	0.191885	29	29	100.0%
15	0.16507	0.191885	10	13	76.9%
16	0.16856	0.191885	17	17	100.0%
17	0.17007	0.191885	21	21	100.0%
18	0.17101	0.191885	40	40	100.0%
19	0.172	0.191885	27	27	100.0%
20	0.19845	0.191885	34	34	100.0%

**Bon Homme County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.00677	0.123939	3	12	25.0%
2	0.01354	0.123939	33	46	71.7%
3	0.0213	0.123939	57	88	64.8%
4	0.02624	0.123939	2	7	28.6%
5	0.0326	0.123939	7	8	87.5%
6	0.03993	0.123939	19	31	61.3%
7	0.04383	0.123939	57	74	77.0%
8	0.04734	0.123939	53	58	91.4%
9	0.05213	0.123939	143	206	69.4%
10	0.05662	0.123939	27	35	77.1%
11	0.06199	0.123939	8	10	80.0%
12	0.06954	0.123939	52	59	88.1%
13	0.07733	0.123939	140	174	80.5%
14	0.08431	0.123939	1	2	50.0%
15	0.08981	0.123939	49	56	87.5%
16	0.09959	0.123939	26	30	86.7%
17	0.1146	0.123939	79	106	74.5%
18	0.12924	0.123939	14	21	66.7%
19	0.143	0.123939	125	170	73.5%
20	0.17121	0.123939	24	29	82.8%

**Day County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.00763	0.166738	45	61	73.8%
2	0.01587	0.166738	24	27	88.9%
3	0.02587	0.166738	155	163	95.1%
4	0.03766	0.166738	99	107	92.5%
5	0.04626	0.166738	39	44	88.6%
6	0.05194	0.166738	116	143	81.1%
7	0.06034	0.166738	73	93	78.5%
8	0.07156	0.166738	141	149	94.6%
9	0.08272	0.166738	102	107	95.3%
10	0.09304	0.166738	30	35	85.7%
11	0.0997	0.166738	64	73	87.7%
12	0.10886	0.166738	16	24	66.7%
13	0.12871	0.166738	23	23	100.0%
14	0.13554	0.166738	81	84	96.4%
15	0.14992	0.166738	152	162	93.8%
16	0.16337	0.166738	20	24	83.3%
17	0.17701	0.166738	87	105	82.9%
18	0.20885	0.166738	146	161	90.7%
19	0.21114	0.166738	132	141	93.6%
20	0.22351	0.166738	132	140	94.3%



**Hamlin County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.15358	0.132847	214	218	98.2%
2	0.23698	0.132847	252	255	98.8%
3	0.01384	0.132847	40	49	81.6%
4	0.02658	0.132847	22	23	95.7%
5	0.04188	0.132847	23	27	85.2%
6	0.05948	0.132847	17	17	100.0%
7	0.07491	0.132847	29	30	96.7%
8	0.0876	0.132847	8	12	66.7%
9	0.10508	0.132847	19	19	100.0%
10	0.1161	0.132847	31	31	100.0%
11	0.12552	0.132847	13	15	86.7%
12	0.13577	0.132847	21	25	84.0%
13	0.15665	0.132847	37	43	86.0%
14	0.17134	0.132847	21	27	77.8%
15	0.18804	0.132847	42	47	89.4%
16	0.19998	0.132847	17	19	89.5%
17	0.21429	0.132847		0	
18	0.21527	0.132847	38	40	95.0%
19	0.21612	0.132847	21	24	87.5%
20	0.37343	0.132847	30	30	100.0%

## Harding County

June, 2021

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.02008	0.212035	20	31	64.5%
2	0.04026	0.212035	40	53	75.5%
3	0.05132	0.212035	4	7	57.1%
4	0.05907	0.212035	11	16	68.8%
5	0.0663	0.212035		0	
6	0.07584	0.212035	57	90	63.3%
7	0.0862	0.212035	39	60	65.0%
8	0.09559	0.212035	13	18	72.2%
9	0.10437	0.212035	12	22	54.5%
10	0.10704	0.212035	11	20	55.0%
11	0.11705	0.212035	41	64	64.1%
12	0.12407	0.212035	9	14	64.3%
13	0.14668	0.212035	13	16	81.3%
14	0.1613	0.212035	5	6	83.3%
15	0.18339	0.212035	8	24	33.3%
16	0.21183	0.212035	3	7	42.9%
17	0.24223	0.212035	7	14	50.0%
18	0.27401	0.212035	52	84	61.9%
19	0.34095	0.212035	45	57	78.9%
20	0.49021	0.212035	38	49	77.6%

**Jones County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.04197	0.372739	398	418	95.2%
2	0.05313	0.372739	451	456	98.9%
3	0.06438	0.372739	418	419	99.8%
4	0.07633	0.372739	602	623	96.6%
5	0.09061	0.372739	560	570	98.2%
6	0.10413	0.372739	489	501	97.6%
7	0.1228	0.372739	606	627	96.7%
8	0.14236	0.372739	120	123	97.6%
9	0.20049	0.372739	636	655	97.1%
10	0.33076	0.372739	659	671	98.2%
11	0.36963	0.372739	411	413	99.5%
12	0.00525	0.372739	53	69	76.8%
13	0.03489	0.372739	2	6	33.3%
14	0.05222	0.372739	3	3	100.0%
15	0.07942	0.372739	22	26	84.6%
16	0.10054	0.372739	14	17	82.4%
17	0.13721	0.372739	4	4	100.0%
18	0.16655	0.372739	2	2	100.0%
19	0.20673	0.372739		0	
20	0.36671	0.372739	6	6	100.0%

Lawrence County

June, 2021

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.03584	1	311	409	76.0%
2	0.04487	1	256	315	81.3%
3	0.07269	1	168	197	85.3%
4	0.09063	1	308	400	77.0%
5	0.12581	1	331	398	83.2%
6	0.19099	1	328	402	81.6%
7	0.003	1	244	286	85.3%
8	0.01134	1	206	252	81.7%
9	0.0195	1	235	311	75.6%
10	0.02725	1	27	39	69.2%
11	0.03695	1	121	157	77.1%
12	0.04993	1	56	66	84.8%
13	0.06129	1	148	199	74.4%
14	0.07615	1	40	41	97.6%
15	0.09037	1	99	128	77.3%
16	0.10017	1	93	121	76.9%
17	0.11583	1	23	26	88.5%
18	0.16564	1	223	263	84.8%
19	0.26954	1	109	132	82.6%
20	0.36665	1	116	139	83.5%

**Lincoln County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.00075	0.955171	121	135	89.6%
2	0.00113	0.955171	22	35	62.9%
3	0.00064	0.955171	210	249	84.3%
4	0.00275	0.955171	344	404	85.1%
5	0.00321	0.955171	20	29	69.0%
6	0.00422	0.955171	39	55	70.9%
7	0.00063	0.955171	22	27	81.5%
8	0.00233	0.955171		0	
9	0.00085	0.955171	9	11	81.8%
10	0.00321	0.955171	205	255	80.4%
11	0.00113	0.955171	11	17	64.7%
12	0.00421	0.955171	14	16	87.5%
13	0.00763	0.955171	19	21	90.5%
14	0.01149	0.955171	10	10	100.0%
15	0.0062	0.955171	3	9	33.3%
16	0.00657	0.955171	112	131	85.5%
17	0.00318	0.955171	14	17	82.4%
18	0.00396	0.955171	33	37	89.2%
19	0.01162	0.955171	8	11	72.7%
20	0.00196	0.955171	55	62	88.7%

**Lyman County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.01033	0.73276	301	301	100.0%
2	0.023	0.73276	336	340	98.8%
3	0.04714	0.73276	303	305	99.3%
4	0.06524	0.73276	357	358	99.7%
5	0.07863	0.73276	165	172	95.9%
6	0.11631	0.73276	334	335	99.7%
7	0.13672	0.73276	186	186	100.0%
8	0.00314	0.73276	9	11	81.8%
9	0.01797	0.73276	93	105	88.6%
10	0.02754	0.73276	10	13	76.9%
11	0.03447	0.73276	16	19	84.2%
12	0.04179	0.73276	27	40	67.5%
13	0.05414	0.73276	18	23	78.3%
14	0.06812	0.73276	23	29	79.3%
15	0.07054	0.73276	25	27	92.6%
16	0.09146	0.73276	2	5	40.0%
17	0.1104	0.73276	14	17	82.4%
18	0.1365	0.73276	10	10	100.0%
19	0.18173	0.73276	3	5	60.0%
20	0.25105	0.73276	21	21	100.0%

**Meade County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.00173	1	57	58	98.3%
2	0.00988	1	73	73	100.0%
3	0.00032	1	75	83	90.4%
4	0.00032	1	61	76	80.3%
5	0.00348	1	27	27	100.0%
6	0.00032	1	317	318	99.7%
7	0.00175	1	205	213	96.2%
8	0.00143	1	26	30	86.7%
9	0.00121	1	157	159	98.7%
10	0.04477	1	42	42	100.0%
11	0.00681	1	24	24	100.0%
12	0.00435	1	133	137	97.1%
13	0.0067	1	20	27	74.1%
14	0.00978	1	22	22	100.0%
15	0.00249	1	26	43	60.5%
16	0.01388	1	19	33	57.6%
17	0.0144	1	4	6	66.7%
18	0.00484	1	36	36	100.0%
19	0.00084	1	7	9	77.8%
20	0.01092	1	22	27	81.5%

## Minnehaha County

June, 2021

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.00306	1	182	183	99.5%
2	0.00191	1	97	104	93.3%
3	0.00024	1	143	143	100.0%
4	0.00047	1	2	3	66.7%
5	0.00047	1	15	15	100.0%
6	0.00067	1	1	5	20.0%
7	0.00086	1	1	1	100.0%
8	0.00053	1	10	11	90.9%
9	0.00131	1	7	9	77.8%
10	0.00086	1	11	12	91.7%
11	0.00198	1	41	52	78.8%
12	0.00245	1	14	15	93.3%
13	0.00105	1	19	20	95.0%
14	0.00366	1	11	11	100.0%
15	0.00131	1	3	3	100.0%
16	0.00305	1	23	26	88.5%
17	0.00565	1	35	37	94.6%
18	0.00365	1	18	18	100.0%
19	0.00047	1	27	29	93.1%
20	0.00053	1	2	2	100.0%



**Moody County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.05083	0.323816	239	252	94.8%
2	0.08886	0.323816	191	197	97.0%
3	0.10728	0.323816	219	221	99.1%
4	0.15578	0.323816	232	235	98.7%
5	0.20432	0.323816	202	216	93.5%
6	0.23366	0.323816	302	313	96.5%
7	0.34741	0.323816	240	253	94.9%
8	0.36261	0.323816	215	223	96.4%
9	0.55812	0.323816	214	219	97.7%
10	0.55932	0.323816	288	298	96.6%
11	0.02071	0.323816	103	119	86.6%
12	0.05203	0.323816	70	102	68.6%
13	0.0721	0.323816	19	23	82.6%
14	0.09211	0.323816	36	39	92.3%
15	0.10583	0.323816	39	40	97.5%
16	0.13445	0.323816	44	52	84.6%
17	0.15909	0.323816	73	77	94.8%
18	0.19919	0.323816	75	89	84.3%
19	0.20421	0.323816	40	44	90.9%
20	0.20578	0.323816	23	30	76.7%

## Oglala Lakota County

June, 2021

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.01929	0.425099	60	88	68.2%
2	0.03308	0.425099	89	140	63.6%
3	0.04394	0.425099	111	158	70.3%
4	0.05114	0.425099	97	135	71.9%
5	0.06254	0.425099	127	195	65.1%
6	0.07509	0.425099	36	41	87.8%
7	0.08333	0.425099	167	228	73.2%
8	0.10421	0.425099	81	105	77.1%
9	0.12402	0.425099	74	104	71.2%
10	0.13727	0.425099	57	74	77.0%
11	0.15818	0.425099	90	137	65.7%
12	0.18245	0.425099	31	37	83.8%
13	0.20438	0.425099	42	47	89.4%
14	0.26934	0.425099	37	48	77.1%
15	0.29136	0.425099	31	33	93.9%
16	0.3031	0.425099	54	82	65.9%
17	0.33269	0.425099	38	46	82.6%
18	0.36616	0.425099	44	48	91.7%
19	0.4375	0.425099	18	22	81.8%
20	0.46074	0.425099	45	53	84.9%

**Pennington County**

**June, 2021**

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.00417	1	295	324	91.0%
2	0.00206	1	173	190	91.1%
3	0.01345	1	27	28	96.4%
4	0.00071	1	12	12	100.0%
5	0.00052	1	3	3	100.0%
6	0.00035	1	41	48	85.4%
7	0.00095	1	264	313	84.3%
8	0.00124	1	234	284	82.4%
9	0.00095	1	149	207	72.0%
10	0.00158	1	321	398	80.7%
11	0.00294	1	2	9	22.2%
12	0.00346	1	27	34	79.4%
13	0.00477	1	6	8	75.0%
14	0.00411	1	7	8	87.5%
15	0.00035	1	232	321	72.3%
16	0.00123	1	10	13	76.9%
17	0.00147	1	5	7	71.4%
18	0.00343	1	8	8	100.0%
19	0.00444	1	16	21	76.2%
20	0.00206	1	89	114	78.1%

## Spink County

June, 2021

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.01126	0.178679	12	25	48.0%
2	0.02329	0.178679	36	47	76.6%
3	0.03309	0.178679	78	98	79.6%
4	0.04366	0.178679	30	40	75.0%
5	0.05127	0.178679	20	29	69.0%
6	0.05746	0.178679	20	31	64.5%
7	0.06522	0.178679	5	12	41.7%
8	0.07646	0.178679	46	55	83.6%
9	0.08227	0.178679	22	47	46.8%
10	0.09032	0.178679	79	106	74.5%
11	0.10165	0.178679	11	14	78.6%
12	0.11261	0.178679	20	24	83.3%
13	0.11342	0.178679	8	9	88.9%
14	0.11365	0.178679	22	27	81.5%
15	0.11381	0.178679	120	138	87.0%
16	0.11398	0.178679	72	86	83.7%
17	0.11414	0.178679	18	21	85.7%
18	0.11429	0.178679	68	92	73.9%
19	0.11733	0.178679	9	15	60.0%
20	0.18051	0.178679	17	30	56.7%

## Ziebach County

June, 2021

Site Rates With Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.05346	0.122003	6	11	54.5%
2	0.07036	0.122003	6	9	66.7%
3	0.08918	0.122003	9	13	69.2%
4	0.09439	0.122003	7	16	43.8%
5	0.10966	0.122003	21	54	38.9%
6	0.12806	0.122003	5	14	35.7%
7	0.15963	0.122003	12	21	57.1%
8	0.18352	0.122003	7	8	87.5%
9	0.20028	0.122003	7	12	58.3%
10	0.2103	0.122003	19	36	52.8%
11	0.21676	0.122003	14	26	53.8%
12	0.22885	0.122003	19	32	59.4%
13	0.25846	0.122003	21	45	46.7%
14	0.30727	0.122003	5	11	45.5%
15	0.35155	0.122003	2	6	33.3%
16	0.41238	0.122003	1	1	100.0%
17	0.47518	0.122003	8	8	100.0%
18	0.58634	0.122003	1	1	100.0%
19	0.74696	0.122003	1	1	100.0%
20	1	0.122003	1	3	33.3%

## Appendix D: Site Locations

### Aurora County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-98.71103597	43.71707521	W	0.295807
2	I- 90	-98.77545066	43.73705404	W	0.600553
3	I- 90	-98.33453718	43.69590596	W	0.867614
4	I- 90	-98.64313649	43.70854155	W	1.178463
5	I- 90	-98.46574191	43.6978363	W	1.613522
6	I- 90	-98.69065487	43.71457055	W	1.780276
7	I- 90	-98.57659899	43.70841846	W	1.797319
8	I- 90	-98.3914534	43.69492717	E	2.595301
9	388th Ave	-98.44421879	43.69561138	S	0.086549
10	388th Ave	-98.45161146	43.9343449	S	0.354612
11	US Hwy 16	-98.61927927	43.72134435	E	0.567449
12	388th Ave	-98.43967678	43.53625578	N	0.7407
13	388th Ave	-98.44543813	43.73677104	N	0.842584
14	US Hwy 16	-98.45394157	43.71187576	W	0.922033
15	253rd St	-98.53635068	43.71541564	W	0.969811
16	US Hwy 16	-98.39536403	43.71089606	W	0.990334
17	US Hwy 16	-98.4152227	43.71122493	E	0.999214
18	388th Ave	-98.44276207	43.65077172	S	1.00475
19	Hwy 281	-98.44548819	43.78179036	N	1.010563
20	US Hwy 281	-98.43206486	43.52008869	N	1.165928

### Bon Homme County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	W 2nd Ave	-98.0695045	43.0063435	W	0.039539
2	State Hwy 50 Alt	-98.08832704	43.0099235	E	0.079136
3	303rd St	-97.89117968	42.99304934	E	0.124469
4	State Hwy 50 Alt	-98.08063949	43.00673208	W	0.153352
5	State Hwy 52	-97.8506035	42.9083735	E	0.190537
6	Hwy 46 Sd	-98.066293	43.0826525	E	0.233354
7	303rd St	-97.90687648	42.99582135	W	0.256148
8	State Hwy 37	-97.970135	43.1301595	N	0.276641
9	304th St	-97.8417754	42.98056143	E	0.304679
10	State Hwy 25	-97.71589443	43.12849339	N	0.330905
11	State Hwy 46	-97.691682	43.082467	W	0.362295
12	State Hwy 37	-97.9704635	43.143101	N	0.406405
13	State Hwy 50	-97.77909303	42.9758641	W	0.451929
14	State Hwy 52	-97.86592249	42.90835372	W	0.492761
15	State Hwy 46	-98.00424849	43.08233654	E	0.524872
16	Hwy 50 Sd	-98.0780165	43.01005757	W	0.582009
17	State Hwy 50	-97.88305034	42.98974999	E	0.669763
18	Hwy 25 Sd	-97.71430422	42.98984802	S	0.755341
19	State Hwy 52	-97.666447	42.908575	E	0.835726
20	State Hwy 46	-98.07848554	43.08268167	W	1.000613



### Day County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	US Hwy 12	-97.2923115	45.340932	W	0.03648
2	Bryant Ave	-97.490984	45.5002775	E	0.075864
3	US Hwy 12	-97.9056675	45.41398	W	0.123693
4	US Hwy 12	-97.84931798	45.38584463	S	0.180041
5	State Hwy 25	-97.43048386	45.54553702	S	0.22114
6	US Hwy 12	-97.312833	45.3409805	E	0.248293
7	US Hwy 12	-97.61934851	45.34092213	W	0.288462
8	US Hwy 12	-97.4109925	45.341006	E	0.342129
9	US Hwy 12	-97.59582854	45.340735	E	0.395454
10	State Hwy 27	-97.83695234	45.52644744	S	0.444825
11	State Hwy 25	-97.53534719	45.16961803	S	0.476645
12	State Hwy 27	-97.83760871	45.46783586	S	0.520453
13	State Hwy 27	-97.83790863	45.43792105	S	0.615331
14	US Hwy 12	-97.2334427	45.33547429	E	0.647995
15	US Hwy 12	-97.88582549	45.41386495	E	0.716732
16	State Hwy 27	-97.8368168	45.53853858	S	0.781051
17	US Hwy 12	-97.357186	45.34101207	W	0.846239
18	US Hwy 12	-97.66344951	45.34096418	W	0.998437
19	US Hwy 12	-97.92978663	45.41497659	E	1.009388
20	US Hwy 12	-97.3346935	45.34101188	E	1.068562

## Hamlin County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 29	-96.89381348	44.75278323	N	0.71176
2	I- 29	-96.949954	44.79302409	N	1.098312
3	State Ave	-96.904386	44.5727535	E	0.064163
4	192nd St	-97.048644	44.602546	E	0.123204
5	Hwy 28	-97.3083795	44.587005	W	0.194079
6	E Hwy 22	-96.98332099	44.73177872	E	0.275641
7	Hwy 28	-97.367072	44.586982	W	0.34719
8	Sd 22	-97.103578	44.73121617	E	0.406006
9	E Hwy 22	-97.011204	44.7317625	W	0.486994
10	Hwy 22	-97.18373347	44.75759505	W	0.538064
11	463rd Ave	-96.9455614	44.73904036	W	0.581707
12	Hwy 28	-97.03626123	44.59997926	E	0.629229
13	S Dakota Highway 28	-97.19810485	44.58593707	E	0.726019
14	Hwy 28	-97.31839252	44.58700023	W	0.794093
15	454th Ave	-97.127786	44.6506905	S	0.871483
16	E Hwy 22	-96.99553554	44.73175645	W	0.926795
17	188th St	-97.1787236	44.65893586	E	0.993124
18	Hwy 22	-97.27909482	44.76048803	W	0.997691
19	Hwy 28	-97.27983475	44.58704482	E	1.001614
20	181st St	-97.15080604	44.76033838	W	1.730673

### Harding County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	State Hwy 79	-103.0945773	45.53077606	S	0.164416
2	US Hwy 85	-103.3943827	45.7896552	S	0.329652
3	State Hwy 20	-103.8932997	45.56124138	E	0.420237
4	State Hwy 79	-102.997048	45.6438532	S	0.483704
5	State Hwy 20	-103.5581095	45.58157139	W	0.542908
6	US Hwy 85	-103.3979978	45.7832563	N	0.621028
7	US Hwy 85	-103.3799622	45.81508701	S	0.705853
8	State Hwy 79	-103.0048478	45.58343862	N	0.782695
9	State Hwy 79	-103.0952715	45.46462887	S	0.854613
10	State Hwy 79	-102.9840197	45.78999561	S	0.876451
11	US Hwy 85	-103.5566506	45.3887682	S	0.958474
12	State Hwy 79	-102.9633347	45.88531228	N	1.015966
13	State Hwy 79	-102.9842133	45.8258342	N	1.201053
14	State Hwy 20	-103.2016986	45.53107562	E	1.320746
15	State Hwy 79	-103.1223903	45.42044925	S	1.50165
16	State Hwy 20	-103.7854401	45.58248398	E	1.734573
17	State Hwy 20	-102.9843437	45.53667758	W	1.983486
18	US Hwy 85	-103.4835989	45.66761631	S	2.24367
19	US Hwy 85	-103.5457812	45.53927546	S	2.791817
20	US Hwy 85	-103.5456735	45.4876375	S	4.013973

## Jones County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-100.3725107	43.91099732	E	0.251204
2	I- 90	-100.8857315	43.88794408	E	0.317985
3	I- 90	-100.7318449	43.8844004	W	0.385335
4	I- 90	-100.4713945	43.90858555	W	0.456865
5	I- 90	-100.4814035	43.90858697	E	0.542319
6	I- 90	-100.3818934	43.91037003	W	0.623233
7	I- 90	-100.6451782	43.90589385	E	0.735012
8	I- 90	-100.6877802	43.88356025	W	0.852081
9	I- 90	-100.5652695	43.90855905	W	1.199989
10	I- 90	-100.506666	43.90886669	E	1.979688
11	I- 90	-100.44477	43.90885329	W	2.212306
12	I- 90 Business Lp	-100.7135555	43.8866465	E	0.031408
13	State Hwy 16	-100.787837	43.87943526	W	0.208849
14	State Hwy 16	-100.8700658	43.87999813	E	0.312541
15	US Hwy 83	-100.681902	43.76067348	N	0.475371
16	US Hwy 83	-100.6824018	43.73528773	S	0.601738
17	State Hwy 16	-100.4358944	43.91722065	W	0.821211
18	State Hwy 16	-100.8810698	43.88566429	E	0.996826
19	State Hwy 16	-101.0335751	43.89385671	W	1.237321
20	US Hwy 83	-100.6925452	43.80759275	S	2.194835

## Lawrence County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-103.7436086	44.47720881	E	0.296513
2	I- 90	-103.67538	44.47886498	E	0.371163
3	I- 90	-103.9898342	44.54642041	E	0.601389
4	I- 90	-103.8559605	44.50114152	W	0.749744
5	I- 90	-103.6612967	44.47739486	W	1.040799
6	I- 90	-103.5799549	44.43498683	W	1.579981
7	US Hwy 14 Alt	-103.5858675	44.394714	E	0.02481
8	US Hwy 385	-103.7370034	44.34955758	N	0.093836
9	US Hwy 85	-103.7289127	44.46587435	S	0.161352
10	US Hwy 85	-103.9747997	44.21640646	N	0.225462
11	US Hwy 14 Alt	-103.6503244	44.39145129	W	0.305658
12	US Hwy 385	-103.6380942	44.19707368	N	0.41303
13	US Hwy 14 Alt	-103.7839572	44.33909597	N	0.507002
14	Spearfish Canyon Hwy	-103.8493784	44.46938179	N	0.629992
15	S Dakota Hwy 34	-103.769577	44.58471644	S	0.747612
16	S Dakota Hwy 34	-103.6944015	44.52211693	S	0.828685
17	US Hwy 85	-104.0096591	44.20062659	W	0.958227
18	US Hwy 14 Alt	-103.6345628	44.38879954	E	1.370309
19	Spearfish Canyon Hwy	-103.881504	44.41423388	S	2.229856
20	Spearfish Canyon Hwy	-103.8646123	44.44995797	N	3.03321

## Lincoln County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	478th Ave	-96.6486475	43.334568	N	0.057989
2	S Chuck Dr	-96.76177818	43.49372128	N	0.087256
3	W 57th St	-96.72689	43.5003495	E	0.049149
4	473rd Ave	-96.74734706	43.49115666	N	0.213002
5	481st Ave	-96.58908119	43.33170351	N	0.248319
6	297th St	-96.8618635	43.0836938	W	0.32641
7	W 1st St	-96.8410355	43.4464795	W	0.049143
8	476th Ave	-96.68734701	43.12855649	N	0.179965
9	Cottonwood Dr	-96.71478442	43.42511193	N	0.065616
10	271st St	-96.743985	43.4606875	W	0.24842
11	Redstone Ave	-96.76236312	43.48045512	N	0.087248
12	472nd Ave	-96.7670665	43.2844475	N	0.326184
13	Spur Ave	-96.48003786	43.0908945	S	0.590145
14	278th St	-96.8349925	43.35946274	E	0.889302
15	476th Ave	-96.68736763	43.10426896	S	0.479907
16	276th St	-96.65354793	43.38800737	E	0.508127
17	288th St	-96.6364655	43.2140165	W	0.246062
18	481st Ave	-96.58912165	43.33774699	N	0.306513
19	469th Ave	-96.82624407	43.32386552	S	0.89958
20	466th Ave	-96.88591164	43.29489498	N	0.152026

**Lyman County**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-100.307926	43.91252484	E	0.151331
2	I- 90	-100.2897441	43.91225847	E	0.337013
3	I- 90	-100.1971852	43.91250769	W	0.690732
4	I- 90	-99.36422292	43.80656006	W	0.955945
5	I- 90	-99.42161506	43.81177907	W	1.152128
6	I- 90	-99.54280257	43.84719324	W	1.704269
7	I- 90	-99.98578302	43.89716216	E	2.003365
8	Hwy 16	-100.0846205	43.90525813	W	0.046021
9	I- 90 Bus	-99.38109135	43.80266666	E	0.263351
10	State Hwy 49	-99.58160584	43.67086691	N	0.403507
11	Hwy 16	-99.920628	43.8982005	E	0.505072
12	State Hwy 47	-99.44621227	44.03986218	S	0.612317
13	State Hwy 47	-99.606019	43.89948849	S	0.793347
14	State Hwy 47	-99.60596063	43.92698829	N	0.998141
15	US Hwy 183	-100.0452075	43.83964749	N	1.033591
16	Hwy 16	-99.75276308	43.88395213	E	1.340262
17	Hwy 16	-99.98963201	43.89804086	E	1.617713
18	US Hwy 183	-100.041115	43.774969	N	2.000214
19	State Hwy 1806	-99.952271	44.16310366	N	2.662931
20	State Hwy 47	-99.56091125	43.77745996	N	3.678782

## Meade County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	State Hwy 34	-102.9477225	44.50483256	W	0.156862
2	State Hwy 34	-102.4570678	44.58609787	E	0.893845
3	Sturgis Rd	-103.359905	44.2043905	S	0.029141
4	Stage Stop Rd	-103.339911	44.19847359	E	0.029113
5	New Underwood Rd	-102.843425	44.39129398	N	0.315142
6	Sturgis Rd	-103.328103	44.1734745	N	0.029085
7	Sturgis Rd	-103.3175466	44.16632964	S	0.158732
8	Silver St	-103.530318	44.4208	E	0.129507
9	Sturgis Rd	-103.342957	44.18907639	N	0.109085
10	New Underwood Rd	-102.8018524	44.42735609	S	4.050788
11	New Underwood Rd	-102.8138412	44.47200626	N	0.616616
12	Elk Creek Rd	-103.36285	44.22626056	W	0.393408
13	Elk Creek Rd	-103.2444921	44.22772221	W	0.606507
14	New Underwood Rd	-102.8290418	44.3055105	N	0.884841
15	Peaceful Pines Rd	-103.285787	44.15477	W	0.22491
16	New Underwood Rd	-102.843401	44.3633773	N	1.255786
17	Alkali Rd	-103.3441083	44.42399003	E	1.302863
18	New Underwood Rd	-102.8239621	44.51223253	N	0.438112
19	Fulton St	-103.506331	44.40604154	N	0.076444
20	New Underwood Rd	-102.8294892	44.20496404	N	0.987751



### Minnehaha County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-96.59588599	43.609146	W	0.387272
2	265th St	-97.04703	43.543327	W	0.241868
3	E 49th St	-96.6996855	43.5075445	E	0.029999
4	E Crestview Dr	-96.70927906	43.50673724	E	0.059132
5	S Dundee Dr	-96.81355531	43.53638492	S	0.059111
6	David Roe Dr	-96.93941101	43.625961	W	0.085362
7	S Camellia Ave	-96.66482777	43.50917408	N	0.109013
8	Clark Ave	-96.713684	43.82577918	N	0.067455
9	W Nancy St	-96.797614	43.5380125	W	0.166238
10	S Chestnut Blvd	-96.552071	43.58809065	N	0.108827
11	N Foss Ave	-96.660701	43.549372	N	0.250194
12	484th Ave	-96.531631	43.65388285	N	0.310694
13	E Redwood Blvd	-96.57094601	43.60188623	W	0.132459
14	256th St	-96.846515	43.674152	E	0.463835
15	S Goldenrod Ln	-96.66949794	43.5129694	N	0.166221
16	250th St	-96.51578548	43.761364	W	0.386356
17	250th St	-96.57922352	43.761314	E	0.716209
18	478th Ave	-96.651169	43.70752967	S	0.462746
19	S Alpine Ave	-96.6674535	43.525767	S	0.059104
20	S Gill Ave	-96.83572545	43.5366415	S	0.067448

## Moody County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 29	-96.759888	44.1542675	S	0.248652
2	I- 29	-96.75831731	43.88247312	S	0.434707
3	I- 29	-96.75892155	44.04064568	S	0.52482
4	I- 29	-96.75914588	44.06029601	N	0.762099
5	I- 29	-96.7592165	44.1162105	S	0.999548
6	I- 29	-96.75794542	43.87100939	S	1.143086
7	I- 29	-96.75855848	43.99557751	N	1.699543
8	I- 29	-96.75971577	44.13629133	S	1.773871
9	I- 29	-96.75830736	43.9550877	S	2.730349
10	I- 29	-96.75866061	43.95513461	N	2.736208
11	SW 3rd St	-96.847908	43.97898802	E	0.101311
12	W Pipestone Ave	-96.61029353	44.04848322	W	0.254549
13	481st Ave	-96.58761032	44.02546299	N	0.352698
14	230th St	-96.7530575	44.0514095	W	0.450598
15	233rd St	-96.54112152	44.007588	E	0.517702
16	230th St	-96.73552699	44.05141344	W	0.657724
17	SW 3rd St	-96.88097197	43.97878	E	0.778271
18	235th St	-96.77844415	43.97877656	W	0.974431
19	235th St	-96.71878493	43.97874659	W	0.999014
20	481st Ave	-96.5886291	44.17463991	S	1.006655

### Oglala Lakota County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	US Hwy 18	-102.708446	43.174903	S	0.058104
2	US Hwy 18	-102.5669485	43.06226279	S	0.099659
3	White Clay Rd	-102.5545256	43.01323498	N	0.132384
4	US Hwy 18	-102.5666381	43.05803144	S	0.154064
5	US Hwy 18	-102.579648	43.07529499	N	0.18843
6	US Hwy 18	-102.1225474	43.1264563	N	0.226221
7	US Hwy 18	-102.6042633	43.09552669	N	0.251056
8	US Hwy 18	-102.7046601	43.17096878	S	0.313964
9	US Hwy 18	-102.6857293	43.15053846	N	0.373646
10	US Hwy 18	-102.9604696	43.18829196	W	0.413565
11	US Hwy 18	-102.5873402	43.08340237	S	0.476543
12	US Hwy 18	-102.1574611	43.10176309	N	0.549677
13	US Hwy 18	-102.970655	43.188399	W	0.615742
14	US Hwy 18	-102.2506786	43.04655371	W	0.811445
15	US Hwy 18	-102.1676098	43.09459313	N	0.877784
16	US Hwy 18	-102.8466976	43.18830345	W	0.913149
17	US Hwy 18	-102.3672965	43.046542	W	1.002304
18	US Hwy 18	-102.8666505	43.18834317	W	1.103142
19	State Hwy 391	-102.2121177	43.00875358	S	1.318075
20	US Hwy 18	-102.2765561	43.04713296	W	1.388081

**Pennington County**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-102.8156285	44.10342651	E	0.691297
2	State Hwy 44	-103.3717046	44.06033701	E	0.340958
3	E Hwy 44	-102.4973622	43.74719135	S	2.231841
4	City View Dr	-103.2373129	44.04977818	W	0.117876
5	Major Lake Dr	-103.5679644	43.93632475	N	0.085682
6	West Blvd N	-103.2327611	44.09874795	N	0.058277
7	Catron Blvd	-103.2582076	44.02454293	E	0.157108
8	E Saint Patrick St	-103.178733	44.06749384	W	0.205004
9	E Minnesota St	-103.2132486	44.04483477	W	0.157106
10	Sheridan Lake Rd	-103.2615097	44.06584184	N	0.261684
11	Lower Spring Creek Rd	-103.0491769	43.89620043	W	0.4885
12	Deerfield Rd	-103.6405428	43.97287933	S	0.574091
13	Creighton Rd	-102.21804	44.11030085	E	0.790902
14	Samco Rd	-103.2660805	44.10144926	S	0.681675
15	N Haines Ave	-103.221707	44.112149	N	0.058273
16	Flormann St	-103.2433882	44.06347213	W	0.204848
17	Quinn Rd	-102.127648	43.9979195	S	0.244201
18	Deerfield Rd	-103.8333814	44.01665331	S	0.568243
19	Deerfield Rd	-103.8120142	44.00596423	N	0.736512
20	Sheridan Lake Rd	-103.3909098	43.99313465	E	0.34201

## Spink County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	406th Ave	-98.10455087	45.16041301	N	0.098914
2	172nd St	-97.984907	44.89230638	W	0.204589
3	385th Ave	-98.52354635	44.8626845	N	0.290642
4	172nd St	-98.2370235	44.89434421	E	0.383492
5	172nd St	-98.70077059	44.89691807	E	0.450251
6	154th St	-98.4880425	45.15796769	E	0.504624
7	154th St	-98.30356	45.15607129	E	0.572837
8	172nd St	-98.1527255	44.8936035	W	0.671567
9	US Hwy 212	-98.55757003	44.88910848	E	0.722513
10	386th Ave	-98.514633	45.23652642	N	0.793278
11	154th St	-98.23655349	45.15580656	W	0.892749
12	157th St	-98.0532825	45.11017947	W	0.989022
13	400th Ave	-98.22076566	44.842365	N	0.996164
14	State Hwy 20	-98.60563	45.15897083	E	0.998133
15	386th Ave	-98.51381165	45.22348979	S	0.999569
16	386th Ave	-98.51422467	45.22349816	S	1.001067
17	154th St	-98.15597598	45.15485521	E	1.00249
18	386th Ave	-98.51301301	44.93356253	N	1.003791
19	177th St	-98.53376072	44.82148244	E	1.030456
20	406th Ave	-98.10416999	45.19468546	S	1.585336

## Ziebach County

Site	Location	Longitude	Latitude	Direction	Segment Length
1	US Hwy 212	-101.570648	45.05242073	E	0.24799
2	US Hwy 212	-101.7895761	45.05508807	E	0.326353
3	US Hwy 212	-101.7513815	45.0529014	E	0.41366
4	US Hwy 212	-101.5930554	45.0558271	W	0.437826
5	State Hwy 34	-101.9298537	44.53497949	S	0.508649
6	US Hwy 212	-101.7989078	45.05428094	W	0.594028
7	State Hwy 20	-101.642382	45.38585336	E	0.740459
8	State Hwy 20	-101.927706	45.4202245	W	0.851245
9	State Hwy 20	-101.594656	45.385819	E	0.928981
10	US Hwy 212	-101.5181472	45.0507347	E	0.975489
11	State Hwy 20	-101.8709685	45.40014204	E	1.005468
12	State Hwy 20	-101.7475971	45.39309183	E	1.06154
13	State Hwy 20	-101.572793	45.38579728	W	1.198868
14	State Hwy 63	-101.2669871	44.78501753	N	1.42529
15	State Hwy 63	-101.2787597	44.81760856	N	1.630667
16	State Hwy 63	-101.2785601	44.84299323	N	1.912845
17	State Hwy 65	-101.5680876	45.12671997	S	2.204117
18	State Hwy 65	-101.5425743	45.17735496	S	2.719772
19	State Hwy 63	-101.2529509	44.75205077	S	3.464786
20	State Hwy 34	-101.9358781	44.57186743	S	4.660425

## **Appendix E: Roadway Classifications**

### Roadway Type Classifications

Code	Name	Definition
S1100	Primary Road	Primary roads are generally divided, limited-access highways within the Interstate Highway System or under state management, and are distinguished by the presence of interchanges. These highways are accessible by ramps and may include some toll highways.
S1200	Secondary Road	Secondary roads are main arteries, usually in the U.S. Highway, State Highway or County Highway system. These roads have one or more lanes of traffic in each direction, may or may not be divided, and usually have at-grade intersections with many other roads and driveways. They often have both a local name and a route number.
S1400	Local Neighborhood Road, Rural Road, City Street	Generally paved non-arterial streets, roads, or byways that usually have a single lane of traffic in each direction. Roads in this feature class may be privately or publicly maintained. Scenic park roads would be included in this feature class, as would (depending on the region of the country) some unpaved roads.