

# SEAT BELT USE IN SOUTH DAKOTA



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## EXECUTIVE SUMMARY

South Dakota's seat belt use study provides statistically reliable data from which generalizations, comparative analyses and recommendations can be developed. The National Occupant Protection Use Survey (NOPUS) provides the South Dakota Department of Public Safety (SDDPS) with a system that monitors 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 state observational surveys of seat belt use in an effort to improve the survey's representativeness. The revised criteria, implemented for the 2012 survey and outlined in the Federal Register Vol. 76 No. 63, resulted in changes to the county selection, sites, road type classifications and weighting procedures. One of the main changes NHTSA implemented was to focus county selection by using crash-related fatalities data, as reported by Fatality Analysis Reporting System (FARS), instead of population-based exclusion criterion used in the past.

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 2006 to 2010. The top 38 counties accounted for at least 85% of the state's total crash-related fatalities. This comprised the first stage sampling frame. These 38 counties were then stratified by region based on statistical differences in seat belt use observed in prior surveys between the 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 MAF/TIGER Feature Class Code (MTFCC) road type and sorted by segment length. A random, systematic sample of 20 road segments was selected using PPS with road segment length by road segment type within each sampled county as the MOS. This represents the second stage of sample selection. This process resulted in the selection of 320 road segments (16 counties x 20 sites per county). Additional sites were also selected for use as alternate sites.

During the week of June 9-15, trained observers visited each site in their assigned counties to collect seat belt use data as prescribed in the handbook they received. Drivers and right front seat passengers in vehicles with a gross vehicle weight up to 10,000 lbs. were observed for seat belt use.

For the 2014 statewide survey, observers tracked seat belt use for 19,634 drivers and 5,998 right front-seat passengers, for a total of 25,632 vehicle occupants. The estimates of seat belt use were 69.1% for drivers, 78.1% for passengers, and an overall unweighted estimate of 71.2% belted for drivers and passengers combined. Adjusting the raw state rate for the survey design and weights resulted in a weighted state rate of 68.9%.

Overall, males were less likely than females to wear seat belts (66.9% vs. 77.1%). Male rates were observed to be anywhere from 3% to 22% lower than female use rates across the counties surveyed, with the exception of Shannon County where male use exceeded female use by 5%. The trend of higher female use rates holds for each vehicle type as well – female use ranged from 74.5% to 82.1% over the four vehicle types, while male use ranged from 60.0% to 77.1%. Van occupants had the highest seat belt use rate at 79.7% followed by SUVs (76.4%), cars (72.0%), and pickups/small trucks (63.2%).

Although drivers outnumbered passengers by a ratio of approximately 3 to 1, passengers buckled up at a rate of 78.1% compared to drivers at 69.1%. This may be mainly due to the fact that drivers are more likely to be men than women (65.4% vs. 34.6%), and their seat belt use rates are much lower than women – 66.7% compared to 73.5% respectively. For passengers, the reverse is true. Women represented 67.8% of the passengers with a use rate of 83.1%, while men represented 32.2% of the passengers with a use rate of 67.5%.

Rates by region indicate occupants in the east were more likely to buckle up (74.8%) than those in the west (68.0%). Regional differences in seat belt use were also reflected by road type. Occupants from the east half of the state had a greater propensity for seat belt use on both local and secondary road types. Occupants from the west, however, registered higher use on primary roads.

NHTSA reports the national average seat belt use rate was 87% in 2013. South Dakota falls below this average with a weighted rate of 68.9%. This compares to last year's weighted rate of 68.7%. Comparisons to prior years should be made with caution because of changes in the sampling methodology implemented in 2012.

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## INTRODUCTION

The Upper Great Plains Transportation Institute (UGPTI), a research and education center at North Dakota State University (NDSU) located in Fargo, ND, was contracted by the South Dakota Department of Public Safety (SDDPS) to conduct a field survey of seat belt use in 2014. The study replicates the sampling methodology previously revised and approved by the National Highway Transportation Safety Administration (NHTSA) and the SDDPS for the 2012 survey. Requirements for conducting statewide seat belt surveys are published in the Federal Register, Vol. 76 No. 63, April 1, 2011, Rules and Regulations, pp. 18042 – 18059. The methodology was designed to yield a more statistically valid estimate of the current seat belt use rate on all roadways in South Dakota.

## OBJECTIVE

The objective of this study was to determine the rate of seat belt use of drivers and right front-seat passengers in the state of South Dakota.

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

- Occupant (driver, passenger)
- Gender (male, female)
- Type of vehicle (car, van, sport utility vehicle, pickup/small truck)
- Region of state (east, west)
- Roadway type (primary, secondary, local)

A description of the tasks involved in conducting the statewide seat belt survey is provided in this report which also includes general information about the methods and protocols. Table 1 summarizes the 2014 survey.

**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>	2011 revised methodology, approved by SDDPS and NHTSA; Westat* supplied list of road segments using 2010 TIGER data developed by the U.S. Census Bureau based on the MAF/TIGER Feature Class Code (MTFCC); three classifications: 1) Primary Roads, 2) Secondary Roads, and 3) Local Roads
<b>Geographic Coverage</b>	State of South Dakota
<b>Identified Regions</b>	East West
<b>Selected Counties</b>	<u>East Region:</u> Beadle, Brookings, Brown, Codington, Lincoln, Minnehaha, Roberts, Union <u>West Region:</u> Corson, Custer, Harding, Hughes, Lawrence, Meade, Pennington, Shannon
<b>Number of Sites</b>	320
<b>Survey Period</b>	June 9-15, 2014
<b>Observation Duration Per Site</b>	60 minutes
<b>Sample Size</b>	19,660 vehicles (includes all vehicles where either the driver or passenger or both had a known protection status)

\*A research and statistical survey organization

## METHODOLOGY OVERVIEW

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 fatality-based inclusion criterion as opposed to the population-based criterion of the past.

It was determined that 38 counties accounted for at least 85% of South Dakota's total crash-related fatalities from 2006 to 2010. 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. A reserve sample of sites was also selected for observations if needed to replace the original site if unforeseen circumstances arose. The sites within the counties are the secondary sampling unit. The sites were stratified by road type, identified within three classifications: primary roads, secondary roads, and local roads.

The formulas contained in this report use the following definitions.

- $g$  – denotes the 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 vehicle's 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 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  $n_g$ . Pennington, Meade, and Lawrence counties were selected with certainty from the west region, while Minnehaha and Lincoln counties were selected with certainty from the east region. The remaining counties for each region were selected using the SAS 9.2 procedure PROC SURVEYSELECT based on the re-calculated probabilities of selection.

Next, road segments within each county were implicitly stratified by its MAF/TIGER Feature Class Code - primary, secondary and local. The list of eligible road segments within each county was then sorted by segment length within 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. With no certainty road segments being identified, a sampling interval (I) 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 the calculated I, which determined the first road segment selected. Subsequent road segments selected were determined by adding multiples of I 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 their observations.

Under this 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:

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

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.

The weighted average seat belt use rate for South Dakota calculated using this estimator was found to be 68.9% for 2014. This compares to the 2013 weighted rate of 68.7, and 66.5% in 2012.

## 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 to 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 estimated standard error for the state seat belt use rate is found by taking the square root of the variance, so

$$SE(\hat{p}_s) = \sqrt{V(\hat{p}_s)}$$

Where:

$SE(\hat{p}_s)$  = the estimated standard error for the state seat belt use rate

$V(\hat{p}_s)$  = the estimated variance for the state seat belt use rate

$\hat{p}_s$  = the estimated state seat belt use rate

Using SAS callable SUDAAN statistical software, the standard error for the state seat belt use was calculated to be 1.2%. From this, we can build a 95% confidence interval for the state seat belt use. The 95% confidence interval formula is  $\hat{p}_s \pm 1.96 * SE(\hat{p}_s)$ , where each of the terms has the meaning above and the value 1.96 is the tabled value from the standard normal distribution for a 95% confidence interval.

**Table 2: Confidence Interval**

<b>95% Confidence Interval and Estimated Standard Error for the 2014 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>
25,632	68.9%	1.2%	66.6%	71.3%

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 66.6% to 71.3%.

## Nonresponse Rate

A factor that could potentially bias the results and invalidate the survey is if results have exceedingly high nonresponse rates. A nonresponse occurs when the observer tries but cannot determine an occupant's seat belt use. As stipulated in NHTSA's guidelines, the nonresponse rate (4.26%) did not exceed 10% over the entire survey. Had the rate exceeded the allowable maximum, individual counties that registered above the 10% threshold would have been revisited to acquire additional observations.

## Observational Protocols

The observational protocols used in the 2014 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 and costs. This predetermined order of observation sites to be visited each day was provided to each observer. A complete list of county observation sites are found in Appendix A of this report. 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 a predetermined time slot, requiring a 60-minute observation period which began at the start of the pre-determined time slot or the first 5-minute interval after arrival at the site if the observer was delayed, and ending exactly 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 count visually, recording was done as long as possible and then stopped until the observer could catch up with observations. Some vehicles were, of necessity, 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 count 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 up to 10,000 lbs. were observed and classified on the observation form as cars, vans, sport utility vehicles, and pickups (includes other small trucks, i.e. flatbed, utility service, and small box trucks, etc.) 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 characteristics and seat belt use for both drivers and right front-seat passengers were recorded. Observations occurred from within the observer's vehicle whenever possible. The observer was parked as close as possible to the road for accurate observation without compromising observer safety. If observations could not be conducted from within the vehicle, the observer was allowed to stand off the roadway. Observers were required to wear an ANSI-approved Type-2 safety vest at all times to enhance visibility of the observer.

## **Problems Encountered by Observers**

No site-related issues were reported during the 2014 survey. Complete information on site locations is found in Appendix A.

## **QUALITY ASSURANCE**

### **Observers**

The SDDPS contracted directly with a nonprofit organization for observers to complete the field work, as they have with previous surveys. As part of the quality control process, training materials were provided for distribution to the observers to ensure accuracy in conducting the field observations. All observers were required to have a current license with proof of adequate vehicle insurance if not using state fleet vehicles, and were required to wear seat belts while conducting observations.

### **Data Entry**

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

# RESULTS

## Sample Size by Year



Figure 1: Driver and Passenger Observations, 2012-2014

The 2014 survey yielded seat belt use on 19,634 drivers and 5,998 passengers for a total of 25,632 occupants (Figure 1). Several county sites captured only a limited number of observed vehicles because of low traffic volume. However, these sites are important to the aggregate measurement of statewide and county seat belt use and therefore are captured each year. Complete details on the number of observations and use by site are found in Appendix E.

## Statewide Results

The overall unweighted results of the 2014 statewide survey indicate 71.2% of vehicle occupants were observed wearing seat belts on South Dakota roads. Because the survey employs a two-stage stratified

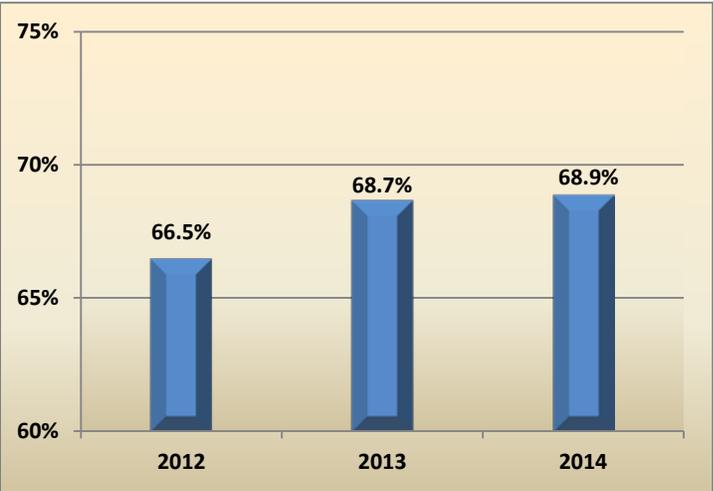


Figure 2: Statewide Results, 2012-2014, Weighted

random sampling scheme, a more appropriate estimate of the seat belt use rate is found by weighting the unadjusted rate using the formulas from the methodology section. Using those formulas, the overall weighted seat belt use rate in South Dakota was 68.9% for 2014. Figure 2 shows a comparison of years of seat belt use since implementation of the amended methodology in 2012.

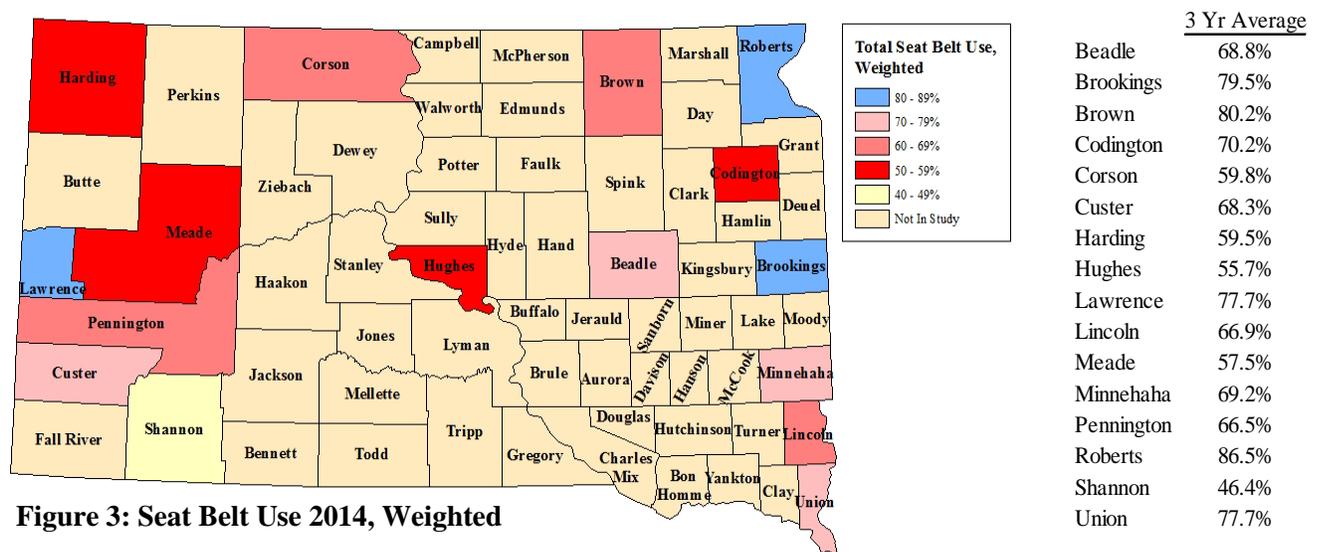
Driver to passenger ratios can influence overall use rates. The ratio has increased slightly in each of the last three years. In 2014, the ratio was 3.3 drivers for every passenger (Table 3).

**Table 3: Driver Passenger Ratio, 2012 - 2014**

	2012	2013	2014	Difference Baseline (2012 ) to Current Year
<b>Ratio</b>				
Drivers:Passengers	2.7	3.0	3.3	+0.6
Drivers as % of Sample	72.7%	74.7%	76.6%	+3.9

## County Results

Weighted seat belt use rates for all vehicle occupants in the 16 counties included in the sample are mapped in Figure 3, with the adjacent table providing a three-year average of the weighted rates. Figure 4 shows the counties by descending order of use for 2014. Belt use ranged from a low of 43.6% in Shannon County to a high of 89.3% in Roberts County. Use rates can vary considerably from year-to-year and caution should be used when interpreting changes from one year to the next at the county level. The changes can often represent sampling difference and may not be statistically significant, especially for counties where there are few total observations.<sup>1</sup> However, even the rates for counties with more observations may be volatile over time.



**Figure 3: Seat Belt Use 2014, Weighted**

<sup>1</sup>The frequencies of observations by county are presented in Appendix E of the report.

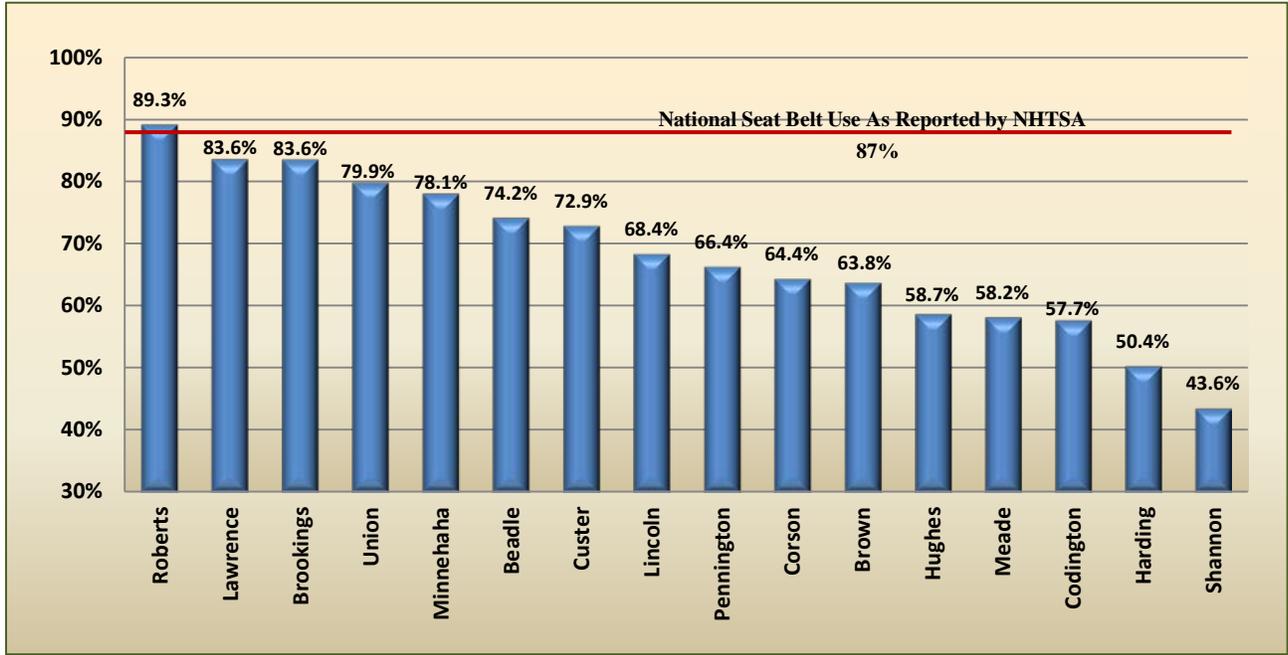


Figure 4: Seat Belt Use by County – 2014, Weighted

## Results for Vehicle Occupants

The unweighted estimates of seat belt use were 60.1% for drivers, 78.1% for passengers, and an overall estimate of seat belt use of 71.2% for drivers and passengers combined (Figure 5).

In 2014, one-fourth of the counties surveyed reflected driver seat belt use at or above 80% (Figure 6). Driver seat belt use was highest in Roberts County at 84.5%, followed by: Lawrence – 83.1%, Brookings – 80.4%, and Union – 80.0%. The majority of the remaining counties had driver use between 60% and 79%. However, Meade, Harding, and Shannon had lower driver rates of 59.4%, 50.4%, and 48.1% respectively.

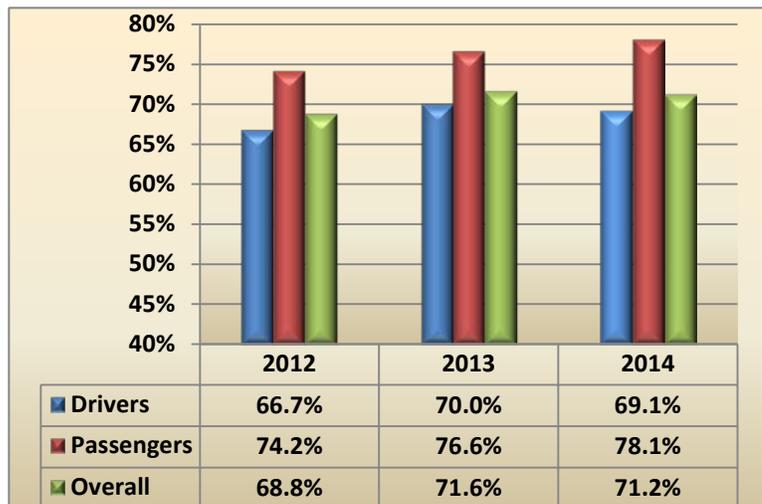
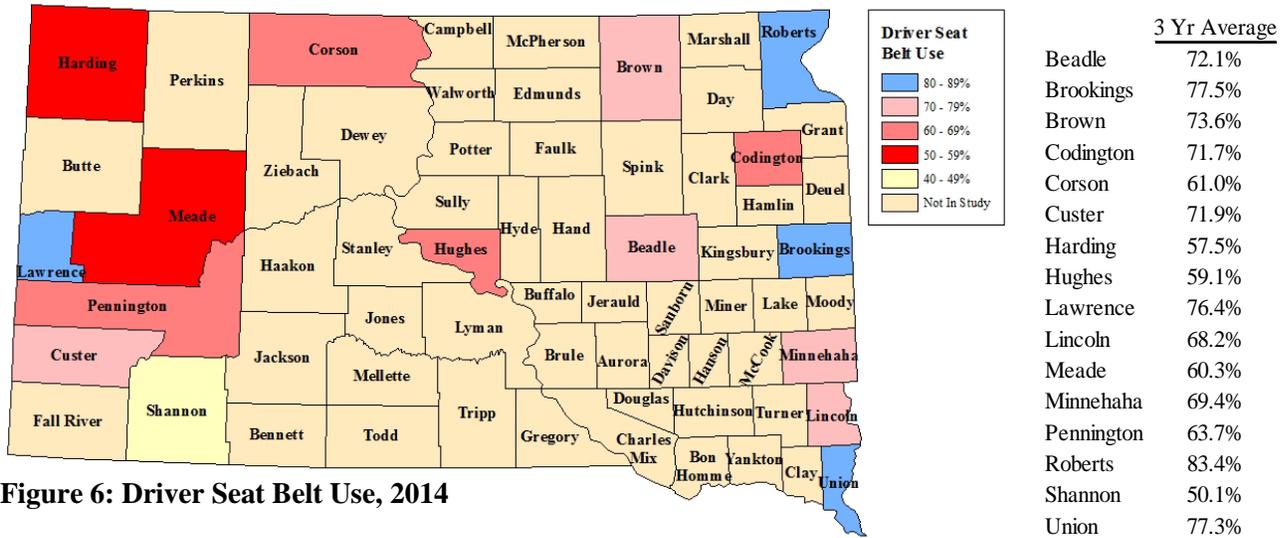
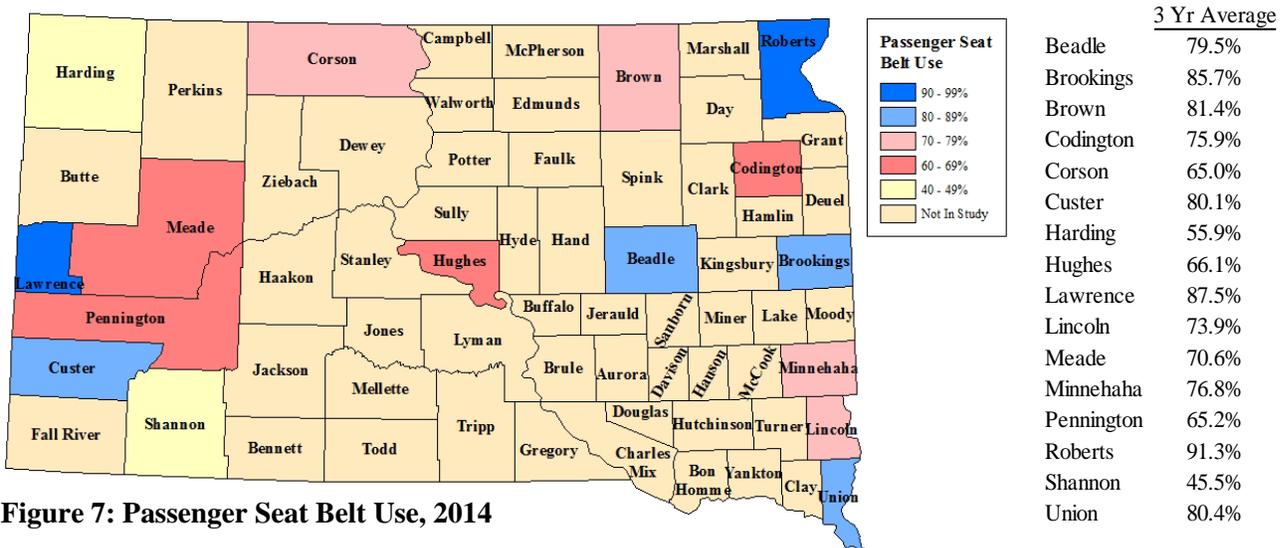


Figure 5: Percent Belted by Vehicle Occupant, Unweighted



**Figure 6: Driver Seat Belt Use, 2014**

Passenger use outpaced driver use in all but two counties - Harding and Shannon have lower passenger than driver use rates. Passenger rates range from a low of 46.9% in Harding to a high of 92.6% in Lawrence (Figure 7).



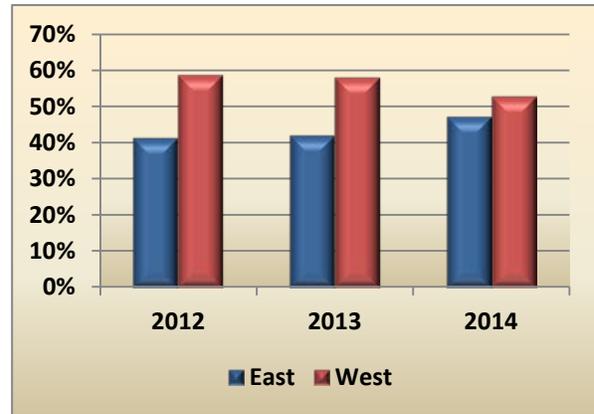
**Figure 7: Passenger Seat Belt Use, 2014**

Efforts to address seat belt use in South Dakota are ongoing. The weighted rate of 68.9% realized this year is lower than the national average of 87% (2013) reported by NHTSA. 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%. Another related possibility is increased enforcement.

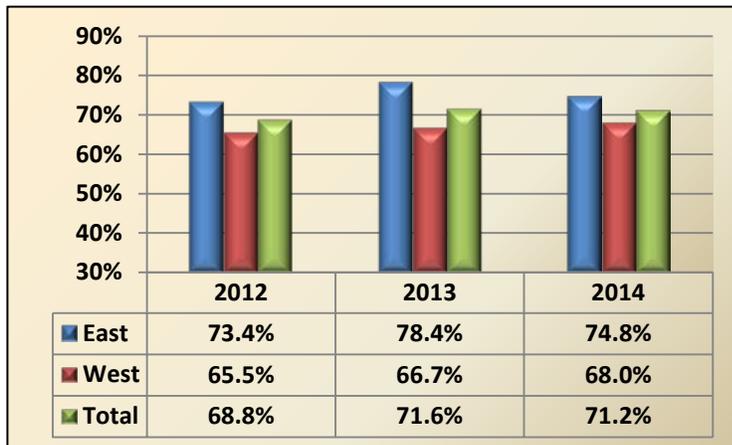
Some factors that may be useful in discussions about increasing seat belt use in South Dakota are found in the remainder of this report, which focuses on differences in seat belt use among regions of the state, gender, vehicle type, and roadway type.

## Results by South Dakota Regions

The survey sampling methodology groups the state into east and west regions. Both east and west regions contain “certainty” counties and additional counties selected from the remaining counties in each region for a total of eight counties.<sup>2</sup> The results for the 2014 survey indicated a relatively even distribution of observations with 13,546 collected in the west, and 12,086 in the east. The sample distribution by region is illustrated in Figure 8.



**Figure 8: Percent of Sample by Region**



**Figure 9: Percent Belted by Region, Unweighted**

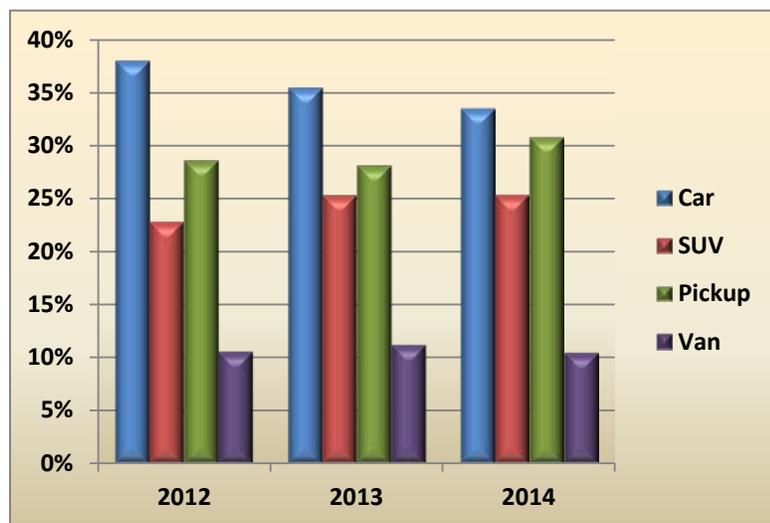
Rates of seat belt use were higher in the east region (74.8%) than the west region (68.0%) in 2014.

Rates within each region were fairly consistent with prior years. Seat belt use has traditionally been higher in the east than the west as shown in Figure 9.

<sup>2</sup> See the discussion of the sampling methodology for details on certainty counties and the selection processes.

## Results by Vehicle Type

Beginning with the 2012 statewide seat belt survey, South Dakota incorporated the expanded Uniform Criteria vehicle eligibility to include all passenger vehicles with a gross vehicle weight up to 10,000 pounds. This change necessitated the inclusion of various small trucks (i.e. flatbed, utility service, and small box trucks, etc.) These additional truck observations are hereafter included in the “pickup” category to prevent confusion with larger truck activity.

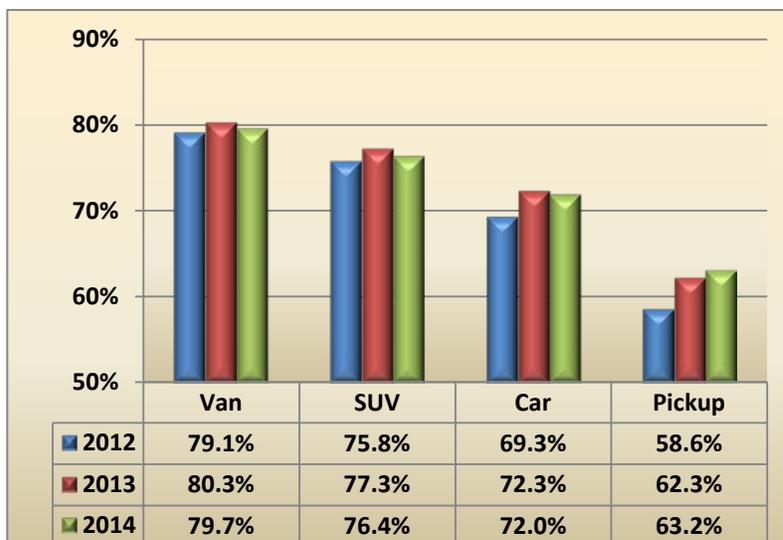


**Figure 10: Composition of Sample by Vehicle Type**

In general, vehicle distribution in the 2014 sample was consistent with previous survey years since incorporating the changes to vehicle eligibility. Only marginal variations in share were noticed with a slight increase in pickups and a corresponding decrease in cars. Cars continued to represent the largest share of vehicle type (33.5%) in the sample (Figure 10).

Seat belt use rates were higher than the unweighted 2014 statewide rate of 71.2% for all vehicle types except pickups. This demographic (pickups) typically demonstrates lower seat belt use and this use rate, coupled with its share of the sample, can depress the overall state rate. Pickup occupants have observed seat belt use rates considerably lower than the rates in other vehicle types, and 11% lower than the overall unweighted state rate. These results are consistent with the long-term trends for seat belt use in South Dakota and other states that are largely rural and have a high

Seat belt use rates were higher than



**Figure 11: Percent Belted by Vehicle Type for All Occupants, Unweighted**

proportion of pickup trucks. The results for overall seat belt use by vehicle type are shown in Figure 11. Maps detailing seat belt use by county and vehicle type are found in Figures 12 through 15.

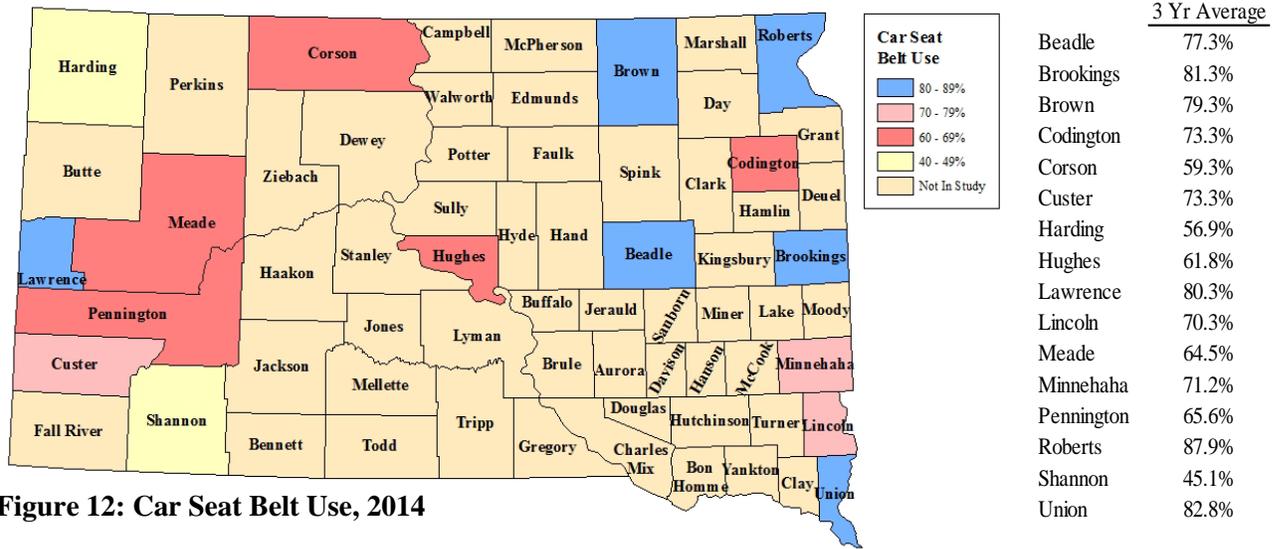


Figure 12: Car Seat Belt Use, 2014

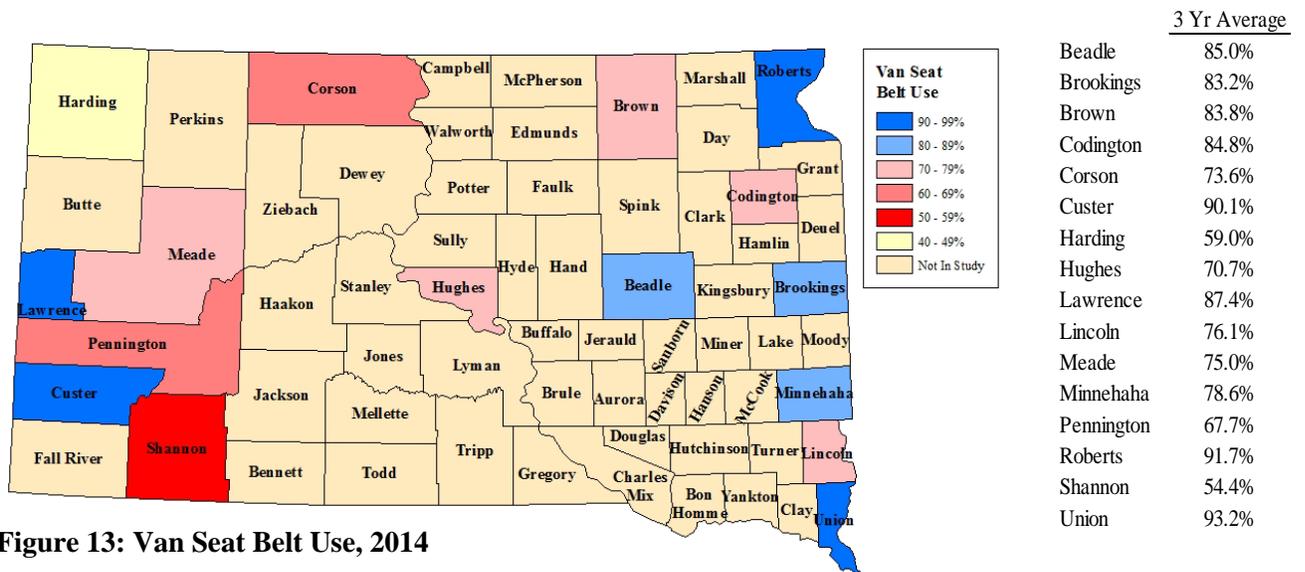


Figure 13: Van Seat Belt Use, 2014

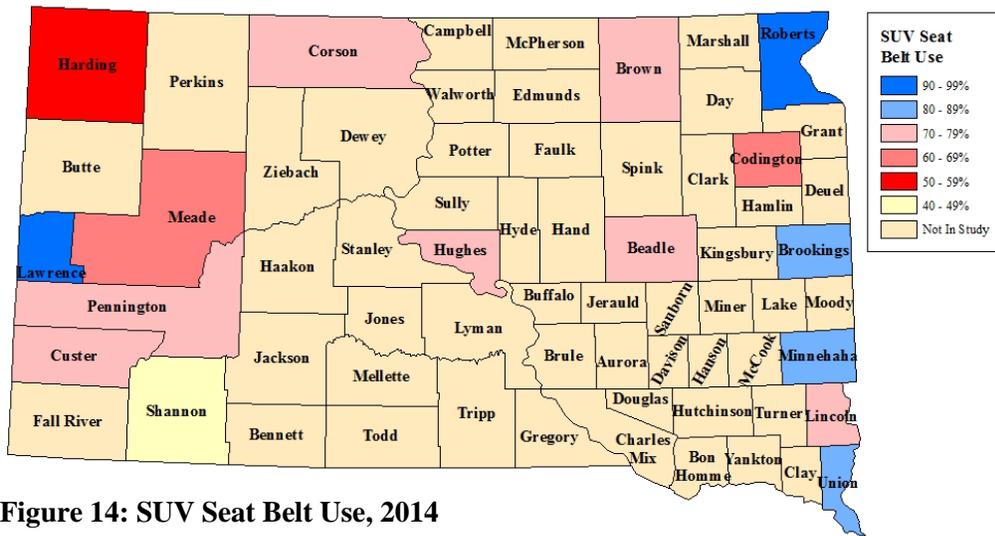


Figure 14: SUV Seat Belt Use, 2014

	3 Yr Average
Beadle	81.1%
Brookings	86.9%
Brown	78.1%
Codington	77.9%
Corson	71.2%
Custer	80.7%
Harding	65.3%
Hughes	66.6%
Lawrence	84.6%
Lincoln	76.9%
Meade	71.0%
Minnehaha	78.4%
Pennington	69.8%
Roberts	89.7%
Shannon	52.6%
Union	84.5%

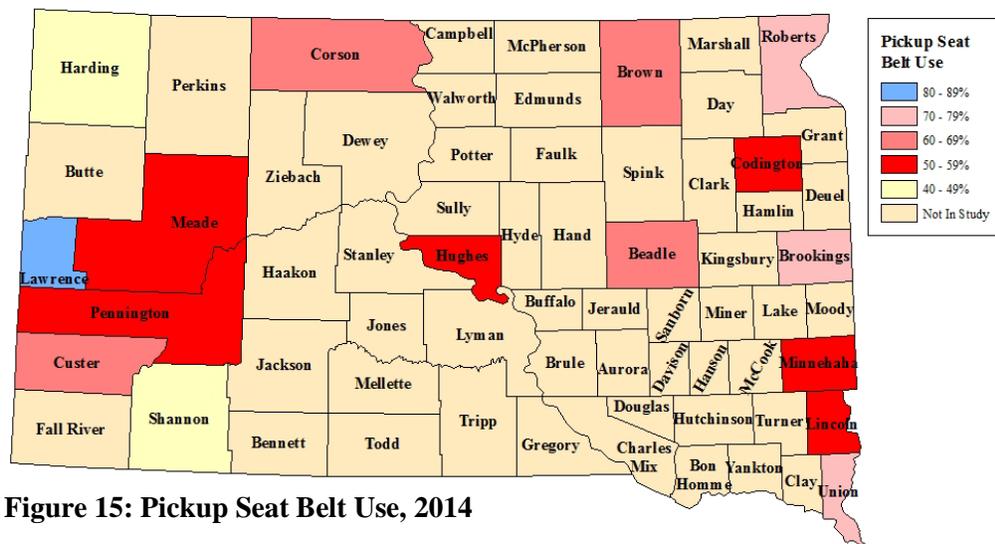
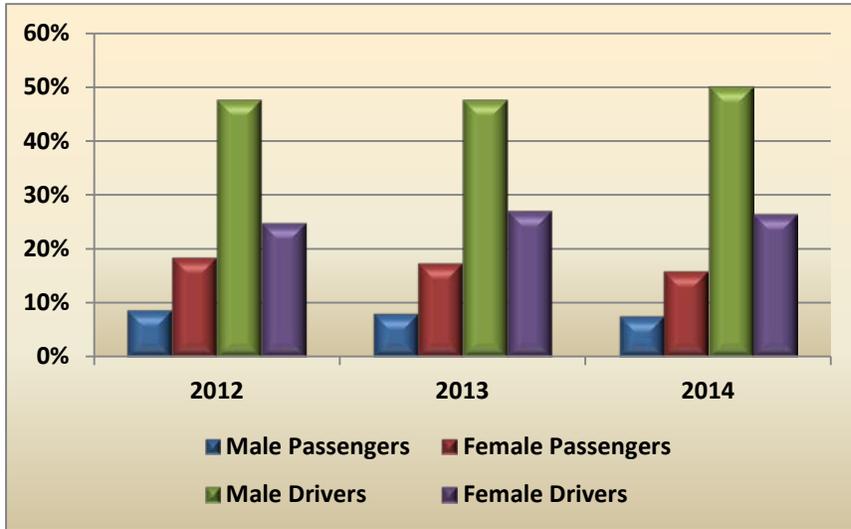


Figure 15: Pickup Seat Belt Use, 2014

	3 Yr Average
Beadle	62.4%
Brookings	69.1%
Brown	66.9%
Codington	63.3%
Corson	56.5%
Custer	63.0%
Harding	52.4%
Hughes	53.8%
Lawrence	73.0%
Lincoln	56.5%
Meade	51.0%
Minnehaha	58.5%
Pennington	54.0%
Roberts	75.9%
Shannon	48.2%
Union	64.1%

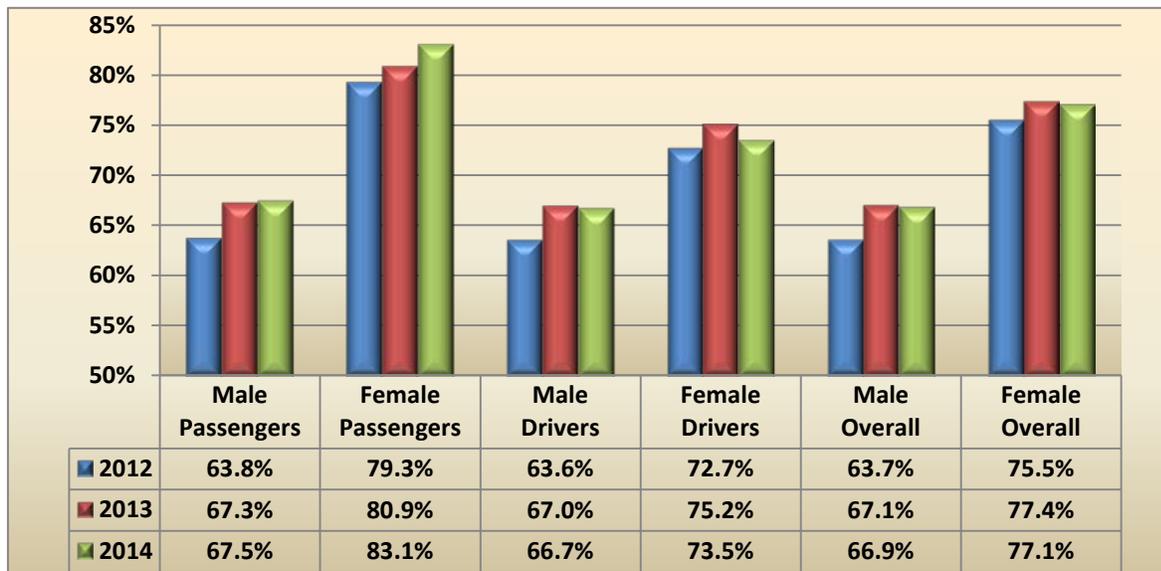
## Results by Gender and Seat Belt Use

Overall, males represented 57.6% and females 42.3% of the 2014 sample. When considering occupant position, drivers were roughly twice as likely to be male than female, with only half the representation in the passenger demographic (Figure 16). In a small percentage of observations, occupant gender was unable to be determined, but occupant protection was still recorded. These cases are included in all of the analyses except where gender is one of the variables of interest. Removing these observations for these parts of the analyses has no effect on the overall numbers, but is mentioned here for comprehensive reporting.



Females, regardless of occupant position, consistently demonstrated higher seat belt use than males (Figure 17). Female passengers led seat belt use rates at 83.1% followed by female driver use rates of 73.5%. Rates for male occupants were essentially equal, irrespective of position.

**Figure 16: Percent of Sample by Gender and Vehicle Occupant**



**Figure 17: Percent Belted by Gender and Vehicle Occupant**

The following maps (Figures 18 and 19) show both genders with higher seat belt use in the eastern half of the state. Harding and Shannon Counties demonstrated the lowest rates for both female and male occupants.

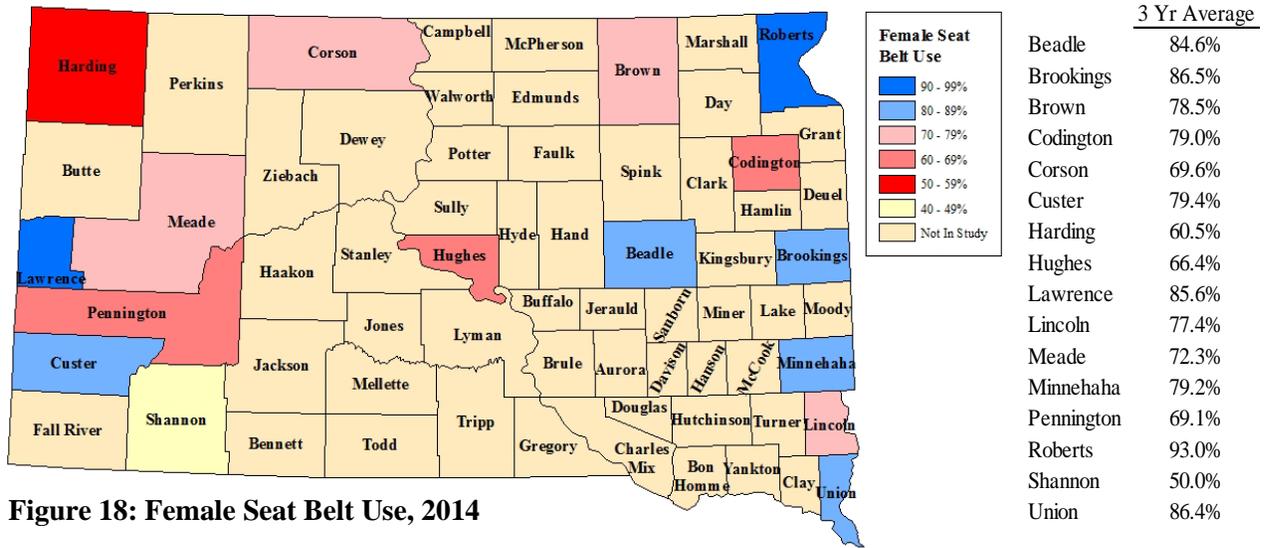


Figure 18: Female Seat Belt Use, 2014

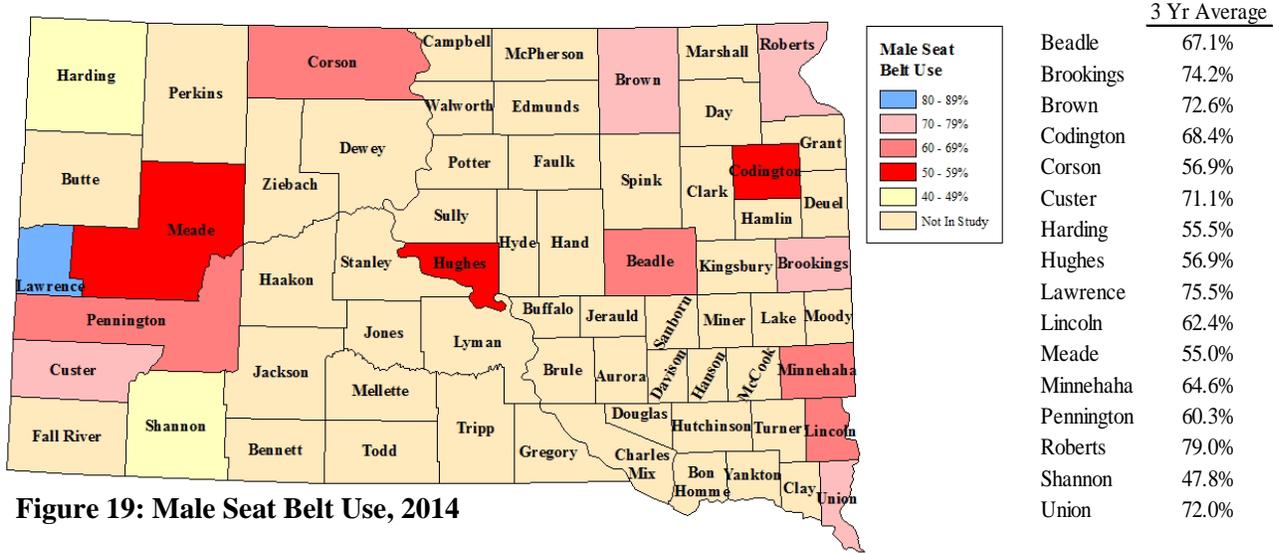
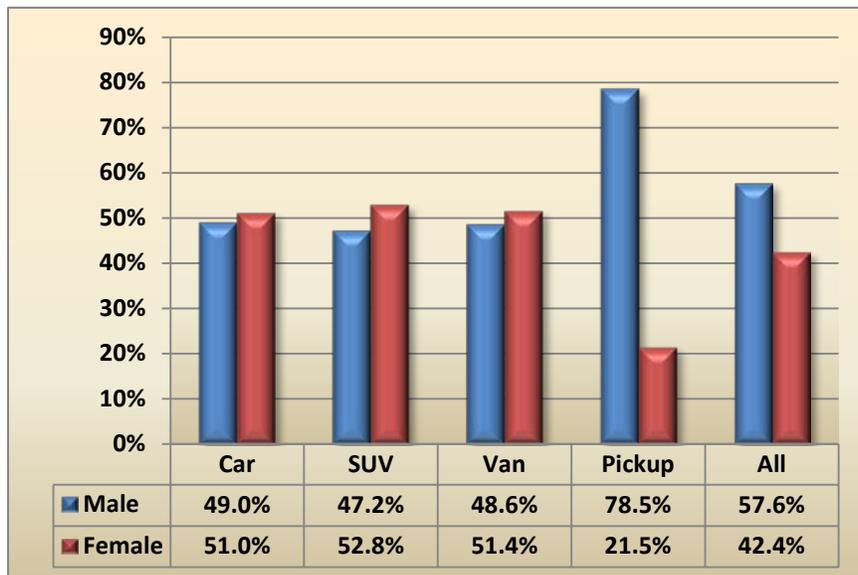


Figure 19: Male Seat Belt Use, 2014

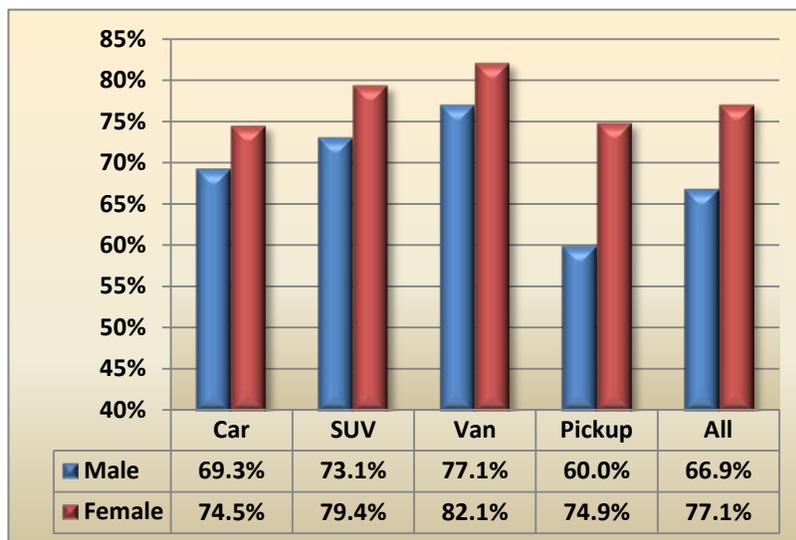
## Results by Gender and Vehicle Type

When considering the data without respect to the driver/passenger demographic, females had higher representation in all vehicle types except pickups. For pickups, males made up 78.5% of the sample, outnumbering female occupants by a ratio greater than 3 to 1. The gender breakdown of the other vehicle types was fairly uniform. The distribution of vehicle occupants by gender, expressed as percentages of the vehicle type, are illustrated in Figure 20.



**Figure 20: Percent of Sample by Vehicle Type and Gender, 2014**

Female seat belt use ranged from a low of 74.5% (car) to a high of 82.1% (van) across the vehicle types. Further breakdown showed females exhibited higher rates than males for every type of vehicle, although the size of the difference varied (Figure 21). Male use ranged between 60.0% (pickup) and 77.1% (van). Although observed use for both genders is lowest in pickups, the male rate dropped off precipitously to 60.0% versus 74.9% for females. Female seat belt use was higher than the unweighted state rate (71.2%) across all vehicle types, whereas, male seat belt use outpaced the state rate in vans and SUVs only.



	3 Yr Average	
	Male	Female
Car	68.3%	74.0%
SUV	73.3%	79.3%
Van	75.8%	83.3%
Pickup	58.1%	72.9%

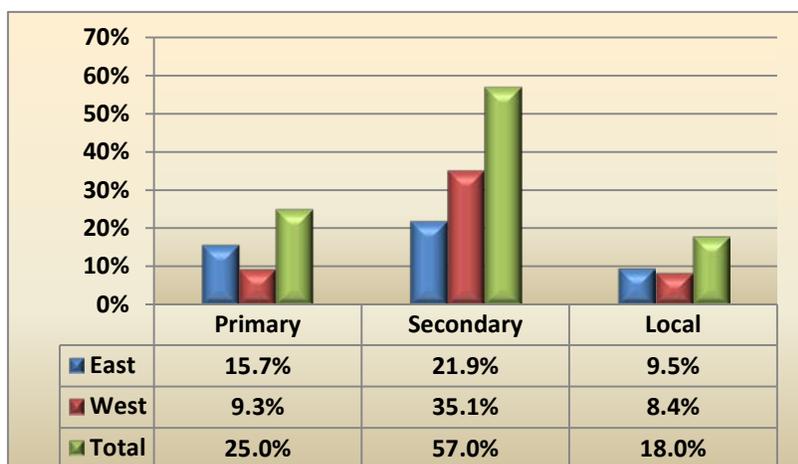
**Figure 21: Percent Belted by Gender and Vehicle Type, 2014**

## Results by Roadway Type

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

- Primary road – divided, limited-access, i.e. interstates
- Secondary road – main arteries usually in U.S./State/County highway system
- Local neighborhood road/rural road/city street – paved, non-arterial streets

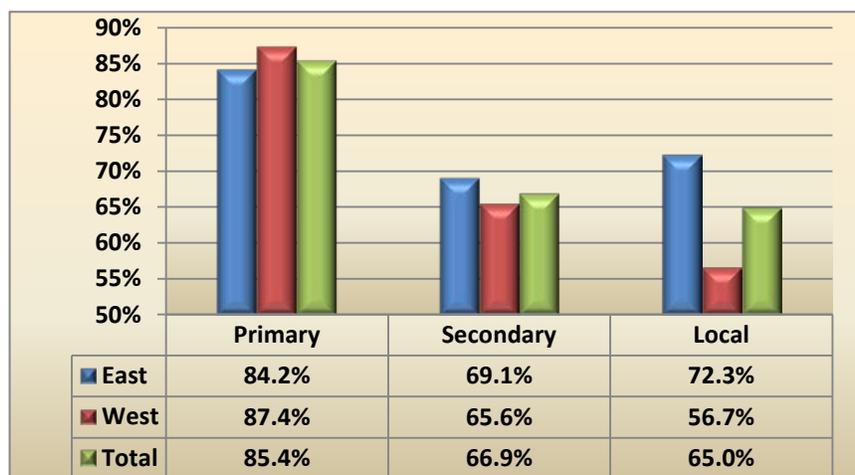
Comprehensive definitions of road type are provided in Appendix F. In the 2014 survey, primary, secondary and local roadways accounted for 25.0%, 57.0%, and 18.0% of the vehicle occupants respectively (Figure 22).



**Figure 22: Percent of Sample by Roadway Type, 2014**

Differences in seat belt use rates were found across the road types. Vehicle occupants on interstate roadways typically have the highest rates of seat belt use. Predictably, vehicle occupants on primary roads were belted at considerably higher rates than those on secondary and local roads (Figure 23). While secondary roads represented 57.0% of the sample, seat belt use on this road type was only 66.9%, negatively influencing the overall unweighted state rate. Local roads had the lowest overall rate of 65.0%.

Seat belt use stratified by region and roadway revealed that the west half of the state had a slightly higher rate of use on primary roads, while belt use on secondary and local road types was higher in the east. The largest variation in east/west use was found on local roads, 72.3% and 56.7% respectively.



**Figure 23: Seat Belt Use by Roadway Type, 2014**

## SUMMARY

Observers collected data on seat belt use for 19,634 drivers and 5,998 right front-seat passengers, for a total of 25,632 vehicle occupants. The observations were collected at 320 sites across 16 counties. Based on the sampling methodology weighting procedures, the final estimate for the statewide seat belt use was 68.9% belted. 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).

A summary of major findings regarding seat belt use in South Dakota for 2014 are:

- **Region.** In 2014, rates of seat belt use were higher in the east region overall at 74.8% versus the west region at 68.0%. The driver population from the east recorded a rate of 73.3% compared to 65.2% in the west. Passenger use rates showed a less pronounced contrast than the driver population: 80.2% (east) and 76.5% (west).
- **County.** Roberts was the only county with seat belt use above the national average with a use rate of 89.3%. Brookings and Lawrence counties followed with 83.6% in both. Of the 16 counties observed, five registered seat belt use of less than 60% - Codington, Harding, Hughes, Meade, and Shannon.
- **Vehicle Type.** The results of the 2014 statewide survey indicated that rates of seat belt use were above the unweighted statewide average in every vehicle type except pickups. Seat belt use among pickup occupants continues to depress the overall rate in South Dakota because occupants of these vehicles made up 30.8% of the sample and the use is very low – 63.2% overall, with male occupants at 60.0%.
- **Gender.** Females consistently have higher rates of use when compared to males not only in South Dakota, but across the nation. In the 2014 survey, female occupants were observed to have belt use of 77.1%, and male occupants with 66.9%. Higher rates hold for females whether they are drivers or passengers in all counties except Shannon where male drivers had a slight edge. The lowest county rate of seat belt use for both female and male occupants was measured in Shannon County with 46.6% and 49.1% respectively.
- **Gender and Vehicle Type.** Females had higher rates of seat belt use than males for every vehicle type. The highest rate for males was found in vans, 77.1%, and the lowest in pickups, 60.0%. Females also registered the highest rate in vans, 82.1%, while the lowest use was in cars, 74.5%.

- **Road Type.** Secondary roads held the largest share of occupants in the sample, 57.0%, with primary and local roads representing smaller shares, 25.0% and 18.0% respectively. Frequency of seat belt use was highest on primary roads, 85.4%, followed by secondary roads, 66.9%, and local roads, 65.0%.

## **APPENDICES**

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## **Appendix A: Site Locations**

**BEADLE COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	387th St	-98.498895	44.522873	N	1.003615
2	208th St	-98.387149	44.370637	S	0.948403
3	387th St	-98.498886	44.507727	S	0.915376
4	US Hwy 14	-98.498879	44.449455	N	0.833306
5	387th St	-98.502482	44.595344	N	0.745207
6	400th Ave	-98.220528	44.608293	S	0.656662
7	400th Ave	-98.214157	44.482487	N	0.561295
8	US Hwy 281	-98.457806	44.243787	N	0.49878
9	US Hwy 14	-98.148824	44.370366	E	0.475124
10	400th Ave	-98.213894	44.228642	N	0.436569
11	US Hwy 14	-98.139611	44.37033	W	0.382748
12	400th Ave	-98.220394	44.572158	N	0.3362
13	400th Ave	-98.213895	44.237984	S	0.297515
14	US Hwy 14	-98.252737	44.372232	E	0.245804
15	US Hwy 14	-98.122248	44.370073	W	0.199272
16	4th St NW	-98.24397	44.3739	E	0.156425
17	400th Ave	-98.213651	44.297289	N	0.120626
18	Dakota Ave N	-98.214312	44.390622	N	0.085825
19	US Hwy 14	-98.214886	44.370353	E	0.06802
20	Commercial Ave NW	-98.474983	44.41188	S	0.016778

## BROOKINGS COUNTY

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 29	-96.757764	44.202619	N	0.952568
2	I- 29	-96.75863	44.302921	N	0.626889
3	I- 29	-96.756588	44.43353	S	0.366034
4	I- 29	-96.757208	44.242807	N	0.021472
5	454th Ave	-97.129114	44.246424	S	0.99894
6	454th Ave	-97.128871	44.289628	N	0.995382
7	217th St	-96.536516	44.239011	E	0.94024
8	203rd St	-96.495146	44.441352	W	0.936691
9	217th St	-96.676288	44.239197	E	0.889083
10	203rd St	-96.614595	44.441411	W	0.791415
11	454th Ave	-97.12785	44.535477	S	0.750972
12	203rd St	-96.458418	44.441446	E	0.602246
13	211th St	-97.053475	44.325961	W	0.488795
14	212th St	-96.602759	44.311142	W	0.461913
15	212th St	-96.542978	44.3114	W	0.385221
16	18th St	-96.784745	44.325845	E	0.337574
17	State Hwy 30	-96.624937	44.439892	W	0.253343
18	486th Ave	-96.486455	44.304882	N	0.174208
19	211th St	-96.922732	44.326003	W	0.099283
20	211th St	-97.089758	44.325752	E	0.046174

**BROWN COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	406th Ave	-98.103942	45.595938	N	1.006492
2	406th Ave	-98.103675	45.75544	S	1.002944
3	410th Ave	-98.020694	45.697386	N	1.002026
4	386th Ave	-98.517549	45.785753	N	1.000464
5	US Hwy 281	-98.516562	45.26407	N	0.999634
6	404th Ave	-98.144879	45.842465	N	0.993632
7	US Hwy 12	-98.649964	45.444478	W	0.945343
8	US Hwy 12	-98.691079	45.442245	E	0.940394
9	110th St	-98.073129	45.791782	E	0.882096
10	386th Ave	-98.515631	45.337809	N	0.801075
11	US Hwy 12	-98.25485	45.458767	W	0.700769
12	406th Ave	-98.104027	45.346018	N	0.580441
13	406th Ave	-98.104286	45.323667	N	0.510549
14	406th Ave	-98.10358	45.403601	N	0.47402
15	US Hwy 12	-98.609729	45.445577	E	0.436772
16	US Hwy 12	-98.176592	45.458327	W	0.374865
17	State Hwy 10	-98.164118	45.790993	E	0.267636
18	US Hwy 281	-98.515457	45.421979	N	0.188533
19	US Hwy 281	-98.509427	45.476435	N	0.09484
20	US Hwy 281	-98.510658	45.479158	W	0.003334

**CODINGTON COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 29	-96.973333	44.809857	S	1.041215
2	I- 29	-96.990917	44.822432	S	0.645341
3	I- 29	-97.054647	45.046186	S	0.46683
4	I- 29	-97.056258	44.903271	S	0.203797
5	State Hwy 20	-97.300819	45.012227	N	1.115274
6	455th Ave	-97.106101	44.999026	N	0.995289
7	158th St	-97.462863	45.093964	E	0.928586
8	157th St	-96.994626	45.107221	E	0.845082
9	173rd St	-97.317396	44.876562	E	0.739059
10	N Hwy 20	-97.16221	44.934711	S	0.632751
11	Csd Hwy 20	-96.97097	45.106918	E	0.544547
12	9th Ave SW	-97.21316	44.890669	W	0.489164
13	173rd St	-97.345274	44.876349	E	0.43279
14	State Hwy 20	-97.208377	44.958699	N	0.359389
15	172nd St	-97.253817	44.890413	E	0.319874
16	State Hwy 20	-97.291881	45.005432	S	0.250894
17	4th St NE	-97.106841	44.917754	S	0.196801
18	10th St NW	-97.131878	44.909088	S	0.140532
19	N Hwy 20	-97.178566	44.946605	N	0.097374
20	N Hwy 20	-97.17622	44.94493	E	0.064402

**CORSON COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	State Hwy 1806	-100.500043	45.535099	N	3.239461
2	State Hwy 65	-101.325951	45.690413	N	1.819116
3	US Hwy 12	-101.115406	45.91585	E	1.482052
4	State Hwy 1806	-100.514881	45.618676	S	1.19243
5	State Hwy 65	-101.359739	45.653559	N	1.061596
6	State Hwy 1806	-100.479733	45.796725	N	0.9968
7	US Hwy 12	-101.896796	45.934691	E	0.944626
8	US Hwy 12	-101.191423	45.920239	E	0.921158
9	State Hwy 1806	-100.479323	45.825258	S	0.866219
10	US Hwy 12	-100.550761	45.560948	E	0.795394
11	State Hwy 20	-100.566303	45.52481	N	0.712288
12	US Hwy 12	-101.604299	45.927439	E	0.656735
13	US Hwy 12	-100.509408	45.561393	E	0.607807
14	US Hwy 12	-101.850979	45.932714	E	0.554255
15	State Hwy 65	-101.343661	45.685844	N	0.49313
16	US Hwy 12	-100.773446	45.787259	N	0.436926
17	State Hwy 20	-100.579506	45.497457	N	0.36362
18	US Hwy 12	-101.64177	45.932368	W	0.299971
19	State Hwy 1806	-100.527342	45.63764	N	0.181743
20	State Hwy 63	-100.813246	45.687537	S	0.072446

**CUSTER COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	State Hwy 40 E	-103.041873	43.787961	E	2.072713
2	State Hwy 40 E	-103.076779	43.804095	E	1.752638
3	State Hwy 40	-102.894343	43.691094	N	1.55952
4	State Hwy 89	-103.588418	43.598068	S	1.306153
5	US Hwy 16	-103.359977	43.761617	E	1.11231
6	US Hwy 16	-103.639093	43.836384	S	0.9591
7	State Hwy 40 E	-102.904081	43.719273	N	0.82782
8	US Hwy 385	-103.524664	43.603855	N	0.749683
9	Mt Rushmore Rd	-103.846981	43.731147	S	0.640103
10	State Hwy 89	-103.684993	43.491293	S	0.580324
11	State Hwy 87	-103.446392	43.801362	W	0.529306
12	Mt Rushmore Rd	-103.711245	43.7361	E	0.464782
13	State Hwy 40 E	-102.94226	43.740146	W	0.383741
14	State Hwy 40 E	-103.002454	43.761303	E	0.30993
15	State Hwy 89	-103.65109	43.556884	S	0.250165
16	S Dakota Hwy 40	-103.29611	43.855789	W	0.206548
17	US Hwy 385	-103.60484	43.716041	S	0.160916
18	State Hwy 87	-103.47807	43.636626	W	0.119401
19	US Hwy 385	-103.569197	43.608818	E	0.079104
20	Mt Rushmore Rd	-103.671847	43.734483	E	0.024343

## HARDING COUNTY

Site	Location	Longitude	Latitude	Direction	Segment Length
1	State Hwy 20	-103.422523	45.559779	E	2.897667
2	State Hwy 20	-103.273992	45.545268	E	2.478218
3	State Hwy 20	-103.685869	45.588957	W	1.971313
4	State Hwy 79	-103.005879	45.557043	S	1.855378
5	State Hwy 79	-103.187574	45.279672	N	1.622916
6	US Hwy 85	-103.54555	45.438325	N	1.33293
7	State Hwy 79	-102.984213	45.825834	N	1.201049
8	State Hwy 79	-102.963334	45.885312	N	1.015955
9	US Hwy 85	-103.55665	45.388768	N	0.955438
10	State Hwy 20	-103.919233	45.555678	W	0.896214
11	State Hwy 20	-103.98823	45.548916	W	0.8396
12	US Hwy 85	-103.376991	45.9154	N	0.783481
13	US Hwy 85	-103.537659	45.624143	S	0.705345
14	State Hwy 79	-102.991903	45.714844	N	0.633921
15	US Hwy 85	-103.54865	45.249887	N	0.552468
16	State Hwy 79	-102.98421	45.813576	S	0.492015
17	State Hwy 20	-103.147264	45.53743	W	0.423217
18	US Hwy 85	-103.396982	45.785068	S	0.349544
19	US Hwy 85	-103.549059	45.370753	S	0.229225
20	State Hwy 79	-102.960058	45.944489	S	0.077354

## HUGHES COUNTY

Site	Location	Longitude	Latitude	Direction	Segment Length
1	State Hwy 34	-99.875874	44.273293	W	2.862937
2	214th St	-99.703158	44.279956	W	1.772471
3	198th St	-100.012399	44.512272	W	1.378853
4	US Hwy 14	-100.179509	44.444943	S	1.144872
5	197th St	-99.694099	44.526791	W	0.939388
6	197th St	-99.89643	44.527013	E	0.931139
7	State Hwy 1804	-100.3485	44.403178	S	0.798938
8	State Hwy 204	-100.393413	44.455182	E	0.686034
9	305th Ave	-100.067785	44.509284	S	0.637451
10	US Hwy 14	-100.083057	44.495091	N	0.583026
11	US Hwy 14	-100.338508	44.388122	S	0.516488
12	197th St	-99.810125	44.526945	E	0.466993
13	197th St	-99.841588	44.527046	W	0.404145
14	State Hwy 1804	-100.35012	44.413649	N	0.340953
15	State Hwy 1804	-100.416831	44.492329	S	0.262723
16	State Hwy 34	-100.22441	44.339056	W	0.220793
17	US Hwy 14	-100.299812	44.400238	E	0.165573
18	State Hwy 34	-100.126126	44.329717	W	0.12363
19	E Sioux Ave	-100.349219	44.364159	N	0.077619
20	E Sioux Ave	-100.352064	44.365793	N	0.045568

**LAWRENCE COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-103.702793	44.487191	E	1.57221
2	I- 90	-103.784779	44.475369	E	1.068125
3	I- 90	-103.975104	44.546623	E	0.825699
4	I- 90	-103.989834	44.54642	W	0.566426
5	I- 90	-103.803347	44.4766	E	0.374183
6	I- 90	-103.811435	44.477242	E	0.293128
7	I- 90	-103.879719	44.521289	E	0.148868
8	US Hwy 385	-103.721107	44.334879	S	2.154752
9	US Hwy 14 Alt	-103.634562	44.388799	E	1.301671
10	US Hwy 14 Alt	-103.576434	44.401999	N	0.916712
11	S Dakota Hwy 34	-103.694401	44.522116	S	0.806931
12	S Dakota Hwy 34	-103.670367	44.497759	N	0.726028
13	Spearfish Canyon Hwy	-103.912708	44.384074	N	0.623837
14	US Hwy 14 Alt	-103.666128	44.389462	W	0.480602
15	US Hwy 14 Alt	-103.871279	44.304892	N	0.405385
16	US Hwy 85	-103.859572	44.54925	S	0.31646
17	US Hwy 385	-103.570168	44.141893	N	0.226701
18	US Hwy 14 Alt	-103.799085	44.316408	S	0.170558
19	S Dakota Hwy 34	-103.76962	44.594554	S	0.11676
20	Sherman St	-103.729179	44.375422	S	0.063571

**LINCOLN COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 29	-96.796196	43.36485	N	0.766211
2	479th Ave	-96.628656	43.2509	S	0.346855
3	484th Ave	-96.529632	43.163328	N	1.000616
4	483rd Ave	-96.549432	43.381622	S	0.854236
5	289th St	-96.601683	43.199453	S	0.680658
6	477th Ave	-96.668559	43.427218	S	0.5779
7	466th Ave	-96.885593	43.23254	N	0.505339
8	272nd St	-96.88105	43.446599	E	0.467144
9	281st St	-96.782576	43.315856	N	0.421479
10	482nd Ave	-96.569133	43.399759	E	0.370429
11	464th Ave	-96.92426	43.216765	N	0.324943
12	S Grand Arbor Ct	-96.745101	43.478149	E	0.284872
13	287th St	-96.841783	43.228886	E	0.246557
14	477th Ave	-96.668664	43.452433	E	0.209867
15	W Wicklow Ln	-96.744085	43.489084	N	0.175461
16	466th Ave	-96.885123	43.18756	S	0.141103
17	Spur Ave	-96.480027	43.096654	S	0.109966
18	S Pine St	-96.886383	43.352912	N	0.079598
19	Harris St	-96.459633	43.13229	E	0.061179
20	473rd Ave	-96.747489	43.49562	N	0.0386

**MEADE COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-103.558854	44.425562	E	0.979528
2	State Hwy 73	-102.044897	44.986761	S	1.030656
3	206th St	-103.41146	44.426134	N	0.426964
4	Smithville Rd	-102.452739	44.26979	E	2.605253
5	New Underwood Rd	-102.822114	44.485482	W	1.542754
6	Vista Pl	-102.257519	44.459054	S	1.25997
7	Brushy Creek Rd	-102.130172	44.849237	E	1.064164
8	Reef Pl	-102.50212	44.582938	S	0.966341
9	New Underwood Rd	-102.829507	44.234618	N	0.889851
10	Chalk Butte Rd	-102.763562	44.604617	S	0.790674
11	New Underwood Rd	-102.79217	44.421277	S	0.7223
12	Ball Field Rd	-102.608475	44.517377	N	0.632831
13	Dalzell Rd	-102.453854	44.313197	W	0.550549
14	New Underwood Rd	-102.828937	44.323243	S	0.482896
15	165th Ave	-102.758357	44.209118	S	0.421456
16	129th Pl	-103.467915	44.486353	W	0.350643
17	Ricard Rd	-103.272082	44.237983	S	0.275282
18	Hermit Rd	-102.652086	44.81949	W	0.213476
19	220th St	-103.270599	44.213131	W	0.135099
20	Main St S	-102.038423	45.020657	N	0.071195

**MINNEHAHA COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-96.748739	43.611136	W	0.366093
2	475th Ave	-96.709717	43.807389	S	0.419523
3	462nd Ave	-96.970215	43.63791	S	1.005405
4	250th St	-97.079586	43.761424	E	0.941819
5	487th Ave	-96.472499	43.536554	N	0.83262
6	472nd Ave	-96.771483	43.683594	N	0.708438
7	262nd St	-96.943997	43.587172	E	0.588846
8	458th Ave	-97.049438	43.797382	N	0.50388
9	463rd Ave	-96.950293	43.575619	N	0.459549
10	Jasper St	-96.673621	43.825745	E	0.386318
11	253rd St	-96.887211	43.717685	W	0.316262
12	S Main Ave	-96.727509	43.520311	S	0.250466
13	W 46th St	-96.804254	43.512456	W	0.205153
14	486th Ave	-96.491653	43.65853	S	0.165563
15	S Ogorman Dr	-96.759833	43.5158	S	0.131539
16	S Purdue Ave	-96.825803	43.515597	S	0.107217
17	S Clover Ave	-96.665175	43.526771	S	0.08381
18	E 3rd St	-96.719231	43.55514	W	0.066377
19	W 31st St	-96.73436	43.524106	E	0.057866
20	E 38th St	-96.717128	43.518033	E	0.033573

**PENNINGTON COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 90	-102.494337	44.089795	W	0.849619
2	Sn 44	-102.424834	43.729922	S	1.125499
3	E North St	-103.187483	44.089903	S	0.215402
4	FS Rd 301 1-B	-103.881814	43.921456	S	2.31786
5	Big Foote Rd	-102.067662	44.049586	S	1.587918
6	S Castle Creek Rd	-103.837284	44.007136	S	1.190619
7	Higgins Rd	-102.517116	43.8577	E	0.99611
8	169th Ave	-102.668627	44.131519	S	0.880096
9	Cedar Butte Rd	-102.277802	44.110337	E	0.748175
10	235th St	-102.052488	43.994649	N	0.637528
11	195th Ave	-102.147772	44.236541	S	0.520937
12	Soholt Draw	-103.841508	44.03425	E	0.443729
13	Custer Limestone Rd	-103.952413	43.876947	E	0.359907
14	Haddock Dr	-103.409366	44.061034	S	0.285155
15	Clarkson Rd	-103.319171	43.998776	S	0.227436
16	St Charles St	-103.222167	44.069548	E	0.175911
17	173rd Ave	-102.586137	44.02035	S	0.132832
18	E Chicago St	-103.194393	44.083899	E	0.099582
19	West Blvd N	-103.236115	44.077536	N	0.072722
20	Swede Ln	-103.271931	44.125318	S	0.046536

**ROBERTS COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 29	-97.032842	45.391085	S	1.241149
2	I- 29	-97.04892	45.375718	S	0.876855
3	I- 29	-97.052028	45.303332	N	0.595546
4	I- 29	-96.989361	45.467249	S	0.414495
5	I- 29	-96.936198	45.737791	S	0.253593
6	I- 29	-96.989411	45.544419	N	0.084748
7	478th Ave	-96.62597	45.885424	N	1.004897
8	106th St	-96.886112	45.848824	W	0.946227
9	478th Ave	-96.618645	45.928601	N	0.923936
10	106th St	-97.054273	45.848827	E	0.776692
11	State Hwy 109	-96.508924	45.355577	N	0.69524
12	119th St	-97.067476	45.660107	E	0.574803
13	459th Ave	-97.020974	45.811159	S	0.506956
14	105th St	-96.683468	45.863679	W	0.475169
15	467th Ave	-96.862072	45.372553	N	0.433555
16	136th St	-96.805272	45.413033	W	0.363334
17	US Hwy 12	-97.20943	45.335649	W	0.293502
18	105th St	-96.790071	45.863509	W	0.227036
19	459th Ave	-97.021053	45.806297	N	0.164657
20	State Hwy 127	-96.866252	45.849455	E	0.086001

**SHANNON COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	US Hwy 18	-102.276556	43.047132	W	1.306231
2	US Hwy 18	-102.86665	43.188343	W	1.036355
3	US Hwy 18	-102.347508	43.046586	W	0.940724
4	US Hwy 18	-102.846697	43.188303	W	0.858012
5	US Hwy 18	-102.146987	43.109183	S	0.839121
6	US Hwy 18	-102.404454	43.046497	W	0.719701
7	US Hwy 18	-102.970654	43.188399	W	0.578463
8	US Hwy 18	-102.228396	43.046552	W	0.529314
9	US Hwy 18	-102.587257	43.083338	S	0.475903
10	US Hwy 18	-102.475286	43.03327	W	0.397979
11	US Hwy 18	-102.82165	43.189164	E	0.359724
12	US Hwy 18	-102.70466	43.170968	N	0.307706
13	US Hwy 18	-102.701413	43.167597	N	0.250257
14	US Hwy 18	-102.74725	43.18798	E	0.223083
15	US Hwy 18	-102.516773	43.027172	W	0.194428
16	US Hwy 18	-102.583872	43.079054	S	0.153982
17	US Hwy 18	-102.545673	43.02733	W	0.13047
18	US Hwy 18	-102.568452	43.064463	N	0.108266
19	White Clay Rd	-102.55447	43.010212	S	0.066337
20	US Hwy 18	-102.486372	43.031855	W	0.024286

**UNION COUNTY**

Site	Location	Longitude	Latitude	Direction	Segment Length
1	I- 29	-96.781446	42.774955	S	0.740731
2	479th Ave	-96.626372	42.899179	S	0.620276
3	River Rd	-96.519453	42.984558	S	1.307015
4	480th Ave	-96.606999	42.916234	E	1.006861
5	471st Ave	-96.785484	42.946294	N	1.000784
6	328th St	-96.556936	42.633914	N	0.964963
7	306th St	-96.617393	42.952473	W	0.93755
8	320th St	-96.757319	42.749902	N	0.866302
9	322nd St	-96.794372	42.721103	E	0.758175
10	329th St	-96.574042	42.619696	S	0.679306
11	298th St	-96.701078	43.069269	N	0.571377
12	298th St	-96.72052	43.069335	E	0.506603
13	Military Rd	-96.492303	42.536395	N	0.476832
14	474th Ave	-96.726648	42.985706	E	0.448479
15	302nd St	-96.777634	43.011171	E	0.388669
16	302nd St	-96.690414	43.011305	E	0.305261
17	478th Ave	-96.645979	42.889454	W	0.244338
18	477th Ave	-96.663421	42.7348	W	0.187734
19	Leneve St	-96.482527	42.530513	S	0.107367
20	W Wood Ln	-96.522318	42.548066	E	0.061521

## **Appendix B: Code Book**

### Variable Information

Variable	Type	Label
CASENO	Number	Overall Case Number
CTYIDNBR	Number	County ID Number
CTYNAME	Text	County Name
CTY_SEL_PROB	Number	County Probability of Selection
DESCRIP	Text	Description
DIR	Text	Direction of Traffic
DIR_SEL_PROB	Number	Direction Probability of Selection
DIV_ROAD	Text	Number of Lanes
DRGENDER	Text	Driver Gender
DRPROT	Text	Driver Protection
ENDTIME	Date/Time	End of Observations at this Site
FIRSTNAME	Text	Observer First Name
HWYNBR	Text	Highway Number
ID	Number	Overall Site ID
LANE_SEL_PROB	Number	Lane Probability of Selection
LASTNAME	Text	Observer Last Name
LATITUDE	Number	Latitude
LONGITUDE	Number	Longitude
MAPID	Text	MAP ID
NOPUS_Year	Number	Year of NOPUS Data
OBSDATE	Date/Time	Date of Observations at this Site
OBSID	Number	Observer ID
OBSNBR	Number	Site Observation Number
PASSGENDER	Text	Passenger Gender
PASSPROT	Text	Passenger Protection
RDTYPE	Text	Road Type
REGION	Text	Region of the State
SEGLLEN_MI	Number	Segment Length in Miles
SITEDESCNBR	Number	County Site Description Number
SITE_SEL_PROB	Number	Site Probability of Selection
STRATUM	Text	East or West
STTIME	Date/Time	Start of Observations at this Site
TOTLEN	Number	Total County Segment Length
Variable	Data Type	Description
VEHTYPE	Text	Vehicle Type

### Variable Values

County		
Value	Label	Region
1	Beadle	1
2	Brookings	1
3	Brown	1
4	Codington	1
5	Corson	2
6	Custer	2
7	Harding	2
8	Hughes	2
9	Lawrence	2
10	Lincoln	1
11	Meade	2
12	Minnehaha	1
13	Pennington	2
14	Roberts	1
15	Shannon	2
16	Union	1

	Value	Label
<b>Region</b>	1	East
	2	West
<b>Roadway</b>	1	Primary
	2	Secondary
	3	Local
<b>Weekday</b>	1	Sunday
	2	Monday
	3	Tuesday
	4	Wednesday
	5	Thursday
	6	Friday
	7	Saturday

## **Appendix C: Frequencies**

**South Dakota Statewide Survey, June 2014**

Estimated Seat Belt Use (Percent) and Unweighted Frequencies for Vehicle Occupants

<b>Occupant</b>	<b>Status</b>	<b>Estimate Percent</b>	<b>Unweighted Frequency</b>		
<i>Driver</i>	Belted	69.1%			
	Not Belted	30.9%			
	Total	100.0%	19,634		
				<b>Ratio</b>	3.3
<i>Passenger</i>	Belted	78.1%			
	Not Belted	21.9%			
	Total	100.0%	5,998		
<i>All Occupants</i>	Belted	71.2%			
	Not Belted	28.8%			
	Total	100.0%	25,632		

**South Dakota Statewide Survey, June 2014**

Seat Belt Use by Region

<b>Region of State</b>				
<b>Occupant</b>	<b>Status</b>	<b>East</b>	<b>West</b>	<b>Total</b>
<i><b>Drivers</b></i>	Belted	73.3%	65.2%	69.1%
	Not Belted	26.7%	34.8%	30.9%
	Total	100.0%	100.0%	100.0%
	Count	9,446	10,188	19,634
<i><b>Passengers</b></i>	Belted	80.2%	76.5%	78.1%
	Not Belted	19.8%	23.5%	21.9%
	Total	100.0%	100.0%	100.0%
	Count	2,640	3,358	5,998
<i><b>All Occupants</b></i>	Belted	74.8%	68.0%	71.2%
	Not Belted	25.2%	32.0%	28.8%
	Total	100.0%	100.0%	100.0%
	Count	12,086	13,546	25,632

## South Dakota Statewide Survey, June 2014

### Seat Belt Use by County

Note: Based on unweighted percentages		County																	
Occupants	Status	Beadle	Brookings	Brown	Codington	Corson	Custer	Harding	Hughes	Lawrence	Lincoln	Meade	Minnehaha	Pennington	Roberts	Shannon	Union	Total	
<b>Drivers</b>	Belted	73.2%	80.4%	73.8%	62.4%	64.7%	72.4%	50.4%	61.1%	83.1%	70.1%	59.4%	73.2%	62.9%	84.5%	48.1%	80.0%	69.1%	
	Not Belted	26.8%	19.6%	26.2%	37.6%	35.3%	27.6%	49.6%	38.9%	16.9%	29.9%	40.6%	26.8%	37.1%	15.5%	51.9%	20.0%	30.9%	
	Count	913	1615	592	2187	434	1233	585	1405	2351	1583	1048	766	1549	1241	1583	549	19634	
	% of Sample	3.6%	6.3%	2.3%	8.5%	1.7%	4.8%	2.3%	5.5%	9.2%	6.2%	4.1%	3.0%	6.0%	4.8%	6.2%	2.1%	76.6%	
<b>Passengers</b>	Belted	83.3%	88.8%	77.2%	62.4%	71.5%	82.5%	46.9%	69.8%	92.6%	75.4%	67.5%	79.4%	69.3%	92.4%	47.9%	83.3%	78.1%	
	Not Belted	16.7%	11.2%	22.8%	37.6%	28.5%	17.5%	53.1%	30.2%	7.4%	24.6%	32.5%	20.6%	30.7%	7.6%	52.1%	16.7%	21.9%	
	Count	414	429	202	457	200	607	81	371	1069	395	329	194	371	435	330	114	5998	
	% of Sample	1.6%	1.7%	0.8%	1.8%	0.8%	2.4%	0.3%	1.4%	4.2%	1.5%	1.3%	0.8%	1.4%	1.7%	1.3%	0.4%	30.5%	
<b>All Occupants</b>	Belted	76.3%	82.1%	74.7%	62.4%	66.9%	75.8%	50.0%	62.9%	86.1%	71.1%	61.4%	74.5%	64.1%	86.6%	48.1%	80.5%	71.2%	
	Not Belted	23.7%	17.9%	25.3%	37.6%	33.1%	24.2%	50.0%	37.1%	13.9%	28.9%	38.6%	25.5%	35.9%	13.4%	51.9%	19.5%	28.8%	
	Count	1327	2044	794	2644	634	1840	666	1776	3420	1978	1377	960	1920	1676	1913	663	25632	
	% of Sample	5.2%	8.0%	3.1%	10.3%	2.5%	7.2%	2.6%	6.9%	13.3%	7.7%	5.4%	3.7%	7.5%	6.5%	7.5%	2.6%	100.0%	

**South Dakota Statewide Survey, June 2014**

Seat Belt Use by Gender

Occupant	Status	Gender			Total
		Male	Female	Unknown	
<i>Drivers</i>	Belted	66.7%	73.5%	73.3%	69.1%
	Not Belted	33.3%	26.5%	26.7%	30.9%
	Count	12,826	6,793	15	19,634
<i>Passengers</i>	Belted	67.5%	83.1%	80.0%	78.1%
	Not Belted	32.5%	16.9%	20.0%	21.9%
	Count	1,926	4,062	10	5,998
<i>All Occupants</i>	Belted	66.9%	77.1%	76.0%	71.2%
	Not Belted	33.1%	22.9%	24.0%	28.8%
	Count	14,752	10,855	25	25,632

**South Dakota Statewide Survey, June 2014**

Male Seat Belt Use

		Vehicle Type				
Occupant	Status	Car	SUV	Van	Pickup	Total
<i>Male Drivers</i>	Belted	69.5%	72.5%	77.0%	60.0%	66.7%
	Not Belted	30.5%	27.5%	23.0%	40.0%	33.3%
	Count	3,657	2,632	1,109	5,428	12,826
<i>Male Passengers</i>	Belted	68.1%	76.9%	77.4%	59.7%	67.5%
	Not Belted	31.9%	23.1%	22.6%	40.3%	32.5%
	Count	545	424	186	771	1,926
<i>All Male Occupants</i>	Belted	69.3%	73.1%	77.1%	60.0%	66.9%
	Not Belted	30.7%	26.9%	22.9%	40.0%	33.1%
	Count	4,202	3,056	1,295	6,199	14,752

**South Dakota Statewide Survey, June 2014**

Female Seat Belt Use Rate

<b>Vehicle Type</b>						
<b>Occupant</b>	<b>Status</b>	<b>Car</b>	<b>SUV</b>	<b>Van</b>	<b>Pickup</b>	<b>Total</b>
<i><b>Female Drivers</b></i>	Belted	70.8%	76.6%	79.6%	68.2%	73.5%
	Not Belted	29.2%	23.4%	20.4%	31.8%	26.5%
	Count	2,933	2,285	790	785	6,793
<i><b>Female Passengers</b></i>	Belted	82.1%	85.1%	85.5%	80.7%	83.1%
	Not Belted	17.9%	14.9%	14.5%	19.3%	16.9%
	Count	1,438	1,133	580	911	4,062
<i><b>All Female Occupants</b></i>	Belted	74.5%	79.4%	82.1%	74.9%	77.1%
	Not Belted	25.5%	20.6%	17.9%	25.1%	22.9%
	Count	4,371	3,418	1,370	1,696	10,855

## **Appendix D: 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 town/city)  Interstate

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

M=Male; F=Female; DK = Do Not Know

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

**Beadle County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.163642932	0.29495	49	58	84.5%
2	0.154640423	0.29495	42	60	70.0%
3	0.149255255	0.29495	30	35	85.7%
4	0.135873455	0.29495	49	57	86.0%
5	0.121508605	0.29495	27	35	77.1%
6	0.107071033	0.29495	40	53	75.5%
7	0.091521111	0.29495	58	68	85.3%
8	0.081327822	0.29495	20	26	76.9%
9	0.077470628	0.29495	12	17	70.6%
10	0.071184101	0.29495	77	98	78.6%
11	0.062408399	0.29495	34	47	72.3%
12	0.054818585	0.29495	50	59	84.7%
13	0.04851086	0.29495	85	104	81.7%
14	0.040079201	0.29495	47	71	66.2%
15	0.032491996	0.29495	45	55	81.8%
16	0.025505643	0.29495	43	62	69.4%
17	0.019668491	0.29495	119	151	78.8%
18	0.013994066	0.29495	68	89	76.4%
19	0.011090899	0.29495	69	129	53.5%
20	0.002735712	0.29495	49	53	92.5%

**Brookings County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.152945115	0.57693	187	228	82.0%
2	0.100653822	0.57693	180	204	88.2%
3	0.058770725	0.57693	224	244	91.8%
4	0.003447562	0.57693	194	228	85.1%
5	0.160390642	0.57693	36	44	81.8%
6	0.159819366	0.57693	35	57	61.4%
7	0.150965721	0.57693	12	23	52.2%
8	0.15039589	0.57693	27	34	79.4%
9	0.14275191	0.57693	26	32	81.3%
10	0.127070254	0.57693	25	32	78.1%
11	0.120576692	0.57693	57	76	75.0%
12	0.096697121	0.57693	14	18	77.8%
13	0.078481334	0.57693	56	62	90.3%
14	0.074165138	0.57693	54	65	83.1%
15	0.061851406	0.57693	50	62	80.6%
16	0.054201164	0.57693	223	283	78.8%
17	0.040676964	0.57693	24	26	92.3%
18	0.027970982	0.57693	37	45	82.2%
19	0.015940962	0.57693	107	151	70.9%
20	0.007413736	0.57693	111	130	85.4%

**Brown County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.095036157	0.68386	31	36	86.1%
2	0.094701144	0.68386	24	51	47.1%
3	0.094614464	0.68386	41	47	87.2%
4	0.094466975	0.68386	47	72	65.3%
5	0.094388603	0.68386	34	40	85.0%
6	0.093821876	0.68386	6	9	66.7%
7	0.089262275	0.68386	24	32	75.0%
8	0.088794975	0.68386	24	32	75.0%
9	0.083290294	0.68386	39	51	76.5%
10	0.075640035	0.68386	30	40	75.0%
11	0.066168825	0.68386	59	76	77.6%
12	0.054807075	0.68386	10	18	55.6%
13	0.048207651	0.68386	3	5	60.0%
14	0.044758467	0.68386	6	13	46.2%
15	0.041241393	0.68386	63	75	84.0%
16	0.035395939	0.68386	27	33	81.8%
17	0.025271037	0.68386	14	17	82.4%
18	0.017801882	0.68386	54	68	79.4%
19	0.008955093	0.68386	34	41	82.9%
20	0.000314807	0.68386	23	38	60.5%

**Codington County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.164047034	0.55268	128	149	85.9%
2	0.101675713	0.55268	278	363	76.6%
3	0.073550686	0.55268	192	249	77.1%
4	0.032108924	0.55268	247	319	77.4%
5	0.175715287	0.55268	20	50	40.0%
6	0.156811234	0.55268	11	18	61.1%
7	0.146301945	0.55268	53	77	68.8%
8	0.1331456	0.55268	9	18	50.0%
9	0.116441309	0.55268	65	89	73.0%
10	0.099692115	0.55268	99	264	37.5%
11	0.085795268	0.55268	14	27	51.9%
12	0.077069485	0.55268	71	137	51.8%
13	0.068187565	0.55268	58	116	50.0%
14	0.056622983	0.55268	20	38	52.6%
15	0.050397258	0.55268	27	57	47.4%
16	0.03952922	0.55268	37	75	49.3%
17	0.03100668	0.55268	71	114	62.3%
18	0.022141304	0.55268	107	209	51.2%
19	0.015341611	0.55268	34	74	45.9%
20	0.010146758	0.55268	108	201	53.7%

**Corson County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.29812937	0.19204	2	2	100.0%
2	0.167414242	0.19204	2	4	50.0%
3	0.136394057	0.19204	18	31	58.1%
4	0.109739986	0.19204	49	68	72.1%
5	0.097699261	0.19204		0	
6	0.09173605	0.19204	16	19	84.2%
7	0.086934448	0.19204	11	22	50.0%
8	0.084774675	0.19204	11	19	57.9%
9	0.079718609	0.19204	5	6	83.3%
10	0.073200545	0.19204	48	70	68.6%
11	0.065552255	0.19204	32	44	72.7%
12	0.060439682	0.19204	14	19	73.7%
13	0.055936811	0.19204	80	124	64.5%
14	0.051008391	0.19204	20	31	64.5%
15	0.045383024	0.19204	4	7	57.1%
16	0.040210539	0.19204	24	35	68.6%
17	0.033464148	0.19204	30	47	63.8%
18	0.027606495	0.19204	14	20	70.0%
19	0.016725908	0.19204	32	42	76.2%
20	0.006667245	0.19204	12	24	50.0%

**Custer County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.20253372	0.51261	12	19	63.2%
2	0.171257813	0.51261	23	38	60.5%
3	0.152387421	0.51261	56	68	82.4%
4	0.127629839	0.51261	41	64	64.1%
5	0.108688604	0.51261	76	97	78.4%
6	0.093717795	0.51261	354	428	82.7%
7	0.08088986	0.51261	44	56	78.6%
8	0.073254757	0.51261	81	114	71.1%
9	0.062547223	0.51261	101	119	84.9%
10	0.056705959	0.51261	52	75	69.3%
11	0.05172077	0.51261	76	101	75.2%
12	0.045415852	0.51261	55	74	74.3%
13	0.037496987	0.51261	40	50	80.0%
14	0.030284596	0.51261	33	48	68.8%
15	0.0244447	0.51261	51	70	72.9%
16	0.020182695	0.51261	21	34	61.8%
17	0.015723796	0.51261	88	126	69.8%
18	0.011667186	0.51261	15	21	71.4%
19	0.007729593	0.51261	57	74	77.0%
20	0.002378659	0.51261	118	164	72.0%

## Harding County

June, 2014

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.363631771	0.15327	4	9	44.4%
2	0.310994603	0.15327	5	16	31.3%
3	0.247382476	0.15327	2	9	22.2%
4	0.232833651	0.15327	12	17	70.6%
5	0.203661711	0.15327	10	26	38.5%
6	0.167271014	0.15327	33	54	61.1%
7	0.150721106	0.15327	7	15	46.7%
8	0.127493434	0.15327	6	16	37.5%
9	0.119899081	0.15327	40	65	61.5%
10	0.112466989	0.15327	1	5	20.0%
11	0.105362429	0.15327	1	4	25.0%
12	0.098319988	0.15327	32	65	49.2%
13	0.088514605	0.15327	56	86	65.1%
14	0.07955152	0.15327	3	14	21.4%
15	0.069329884	0.15327	31	67	46.3%
16	0.061743563	0.15327	5	21	23.8%
17	0.053110018	0.15327	6	11	54.5%
18	0.043864703	0.15327	35	75	46.7%
19	0.028765725	0.15327	35	77	45.5%
20	0.009707248	0.15327	9	14	64.3%

## Hughes County

June, 2014

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.598212096	0.44826	23	45	51.1%
2	0.370358688	0.44826	8	18	44.4%
3	0.288112014	0.44826	47	63	74.6%
4	0.239221568	0.44826	75	101	74.3%
5	0.196285585	0.44826	33	43	76.7%
6	0.194561953	0.44826	77	83	92.8%
7	0.166938489	0.44826	42	84	50.0%
8	0.143347142	0.44826	19	41	46.3%
9	0.1331957	0.44826	49	67	73.1%
10	0.12182357	0.44826	68	88	77.3%
11	0.107920422	0.44826	56	118	47.5%
12	0.097578417	0.44826	41	52	78.8%
13	0.084446297	0.44826	39	46	84.8%
14	0.071242297	0.44826	85	162	52.5%
15	0.0548961	0.44826	33	65	50.8%
16	0.046134806	0.44826	45	66	68.2%
17	0.03459656	0.44826	105	134	78.4%
18	0.025832549	0.44826	22	34	64.7%
19	0.016218528	0.44826	83	164	50.6%
20	0.009521456	0.44826	167	302	55.3%

**Lawrence County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.196493835	1.00000	213	236	90.3%
2	0.133493603	1.00000	261	288	90.6%
3	0.103195351	1.00000	173	195	88.7%
4	0.070791572	1.00000	203	218	93.1%
5	0.04676516	1.00000	219	249	88.0%
6	0.036634956	1.00000	192	226	85.0%
7	0.018605431	1.00000	192	198	97.0%
8	0.269299574	1.00000	139	155	89.7%
9	0.162682038	1.00000	134	167	80.2%
10	0.1145701	1.00000	98	138	71.0%
11	0.100849738	1.00000	56	68	82.4%
12	0.090738531	1.00000	83	96	86.5%
13	0.077966763	1.00000	56	62	90.3%
14	0.060065341	1.00000	146	158	92.4%
15	0.050664767	1.00000	32	33	97.0%
16	0.039550975	1.00000	168	209	80.4%
17	0.028332951	1.00000	139	149	93.3%
18	0.021316233	1.00000	26	29	89.7%
19	0.014592593	1.00000	63	76	82.9%
20	0.007945064	1.00000	351	470	74.7%

**Lincoln County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.010977694	1.00000	426	559	76.2%
2	0.004969477	1.00000	42	66	63.6%
3	0.014336072	1.00000	15	19	78.9%
4	0.01223885	1.00000	2	2	100.0%
5	0.009751955	1.00000	2	6	33.3%
6	0.008279716	1.00000	4	4	100.0%
7	0.007240116	1.00000	5	7	71.4%
8	0.006692887	1.00000	25	31	80.6%
9	0.006038634	1.00000	9	12	75.0%
10	0.005307228	1.00000	2	4	50.0%
11	0.004655538	1.00000	20	32	62.5%
12	0.004081431	1.00000	2	6	33.3%
13	0.003532483	1.00000	286	399	71.7%
14	0.003006816	1.00000	1	3	33.3%
15	0.002513873	1.00000	261	366	71.3%
16	0.002021617	1.00000	8	14	57.1%
17	0.00157551	1.00000	5	9	55.6%
18	0.00114042	1.00000	44	66	66.7%
19	0.000876527	1.00000	1	4	25.0%
20	0.000553032	1.00000	247	369	66.9%

**Meade County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.011721177	1.00000	347	476	72.9%
2	0.012332982	1.00000	8	29	27.6%
3	0.005109114	1.00000	23	36	63.9%
4	0.031174843	1.00000	4	6	66.7%
5	0.018460823	1.00000	5	14	35.7%
6	0.015076987	1.00000	4	9	44.4%
7	0.012733944	1.00000	47	116	40.5%
8	0.011563379	1.00000	5	7	71.4%
9	0.010648089	1.00000	10	20	50.0%
10	0.009461322	1.00000	21	38	55.3%
11	0.008643149	1.00000	5	20	25.0%
12	0.007572549	1.00000	233	331	70.4%
13	0.006587951	1.00000	2	3	66.7%
14	0.005778405	1.00000	16	27	59.3%
15	0.005043205	1.00000	8	33	24.2%
16	0.004195846	1.00000	52	87	59.8%
17	0.003294065	1.00000	19	34	55.9%
18	0.002554485	1.00000	29	66	43.9%
19	0.001616615	1.00000	2	5	40.0%
20	0.00085193	1.00000	5	20	25.0%

**Minnehaha County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.003041028	1.00000	191	242	78.9%
2	0.003484856	1.00000	92	135	68.1%
3	0.008351608	1.00000		0	
4	0.007823417	1.00000	147	196	75.0%
5	0.006916333	1.00000	6	6	100.0%
6	0.005884789	1.00000	15	23	65.2%
7	0.004891373	1.00000	14	18	77.8%
8	0.004185585	1.00000	14	20	70.0%
9	0.00381734	1.00000	40	69	58.0%
10	0.003209032	1.00000	17	25	68.0%
11	0.002627097	1.00000	75	98	76.5%
12	0.002080548	1.00000	4	4	100.0%
13	0.001704146	1.00000	22	29	75.9%
14	0.001375284	1.00000	11	14	78.6%
15	0.001092656	1.00000	11	13	84.6%
16	0.000890621	1.00000	8	9	88.9%
17	0.000696185	1.00000	2	2	100.0%
18	0.000551374	1.00000	22	29	75.9%
19	0.000480676	1.00000	3	4	75.0%
20	0.000278881	1.00000	21	24	87.5%

**Pennington County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.006560692	1.00000	286	302	94.7%
2	0.008691016	1.00000	3	3	100.0%
3	0.001663318	1.00000	184	289	63.7%
4	0.017898336	1.00000	84	153	54.9%
5	0.01226178	1.00000	10	13	76.9%
6	0.009193868	1.00000	16	24	66.7%
7	0.007691884	1.00000	241	488	49.4%
8	0.006796033	1.00000	12	19	63.2%
9	0.00577735	1.00000		0	
10	0.004922942	1.00000	1	1	100.0%
11	0.004022635	1.00000	34	64	53.1%
12	0.003426441	1.00000	71	112	63.4%
13	0.002779174	1.00000	12	16	75.0%
14	0.002201945	1.00000	10	16	62.5%
15	0.001756243	1.00000	13	19	68.4%
16	0.001358371	1.00000	21	36	58.3%
17	0.001025718	1.00000	1	1	100.0%
18	0.000768965	1.00000	18	42	42.9%
19	0.000561554	1.00000	179	280	63.9%
20	0.000359347	1.00000	35	42	83.3%

**Roberts County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.147279884	0.3647	220	239	92.1%
2	0.104051248	0.3647	177	190	93.2%
3	0.070669957	0.3647	116	128	90.6%
4	0.049185695	0.3647	172	186	92.5%
5	0.030092396	0.3647	160	178	89.9%
6	0.010056549	0.3647	190	197	96.4%
7	0.119245243	0.3647	3	5	60.0%
8	0.112283218	0.3647	23	28	82.1%
9	0.109638075	0.3647	10	11	90.9%
10	0.092165492	0.3647	20	24	83.3%
11	0.08250006	0.3647	44	62	71.0%
12	0.068208506	0.3647	75	99	75.8%
13	0.0601575	0.3647	27	30	90.0%
14	0.056385523	0.3647	31	46	67.4%
15	0.051447433	0.3647	9	12	75.0%
16	0.043114718	0.3647	43	79	54.4%
17	0.034828164	0.3647	38	41	92.7%
18	0.026941033	0.3647	43	63	68.3%
19	0.019538882	0.3647	29	36	80.6%
20	0.010205235	0.3647	21	22	95.5%

**Shannon County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.445220212	0.32952	44	63	69.8%
2	0.353234759	0.32952	16	29	55.2%
3	0.320639564	0.32952	16	30	53.3%
4	0.292447725	0.32952	23	50	46.0%
5	0.286008852	0.32952	39	65	60.0%
6	0.245305334	0.32952	37	66	56.1%
7	0.197165294	0.32952	15	21	71.4%
8	0.180413182	0.32952	32	59	54.2%
9	0.162208395	0.32952	86	150	57.3%
10	0.135648514	0.32952	32	115	27.8%
11	0.12260955	0.32952	12	28	42.9%
12	0.104879558	0.32952	5	9	55.6%
13	0.085298446	0.32952	3	6	50.0%
14	0.076036368	0.32952	30	56	53.6%
15	0.0662695	0.32952	79	195	40.5%
16	0.052483748	0.32952	51	98	52.0%
17	0.044469838	0.32952	103	218	47.2%
18	0.036901751	0.32952	98	159	61.6%
19	0.022610528	0.32952	140	344	40.7%
20	0.008277723	0.32952	59	152	38.8%

**Union County**

**June, 2014**

Site Rates with Weights					
Site	Site Weight	County Weight	Total Belted	Total Occupants	Seat Belt Rate
1	0.015619966	0.62805	112	127	88.2%
2	0.013079903	0.62805	27	31	87.1%
3	0.027561327	0.62805	1	1	100.0%
4	0.02123191	0.62805	3	7	42.9%
5	0.021103763	0.62805	13	13	100.0%
6	0.020348397	0.62805	63	85	74.1%
7	0.019770333	0.62805	149	181	82.3%
8	0.01826791	0.62805	0	3	0.0%
9	0.015987811	0.62805	51	71	71.8%
10	0.014324682	0.62805	9	14	64.3%
11	0.012048759	0.62805	4	5	80.0%
12	0.010682854	0.62805	4	5	80.0%
13	0.010055066	0.62805	22	28	78.6%
14	0.00945718	0.62805	2	2	100.0%
15	0.008195953	0.62805	9	10	90.0%
16	0.006437109	0.62805	12	14	85.7%
17	0.005152412	0.62805	40	48	83.3%
18	0.00395879	0.62805	6	7	85.7%
19	0.002264073	0.62805	4	7	57.1%
20	0.001297308	0.62805	3	4	75.0%

## **Appendix F: 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.