

# Seat Belt Use on ND Rural Roads



ISSUE BRIEF: FEBRUARY 2011

North Dakota's rural roads provide vital social and commercial links for a widely dispersed population. Approximately 55% of the state's travel, in vehicle-miles, takes place on rural roads. 26% of travel is attributed to rural roads (U.S. Department of Transportation [DOT] 2007). This high level of rural travel poses an inherent challenge because the risk for serious injury and death on rural roads is relatively high compared to their urban counterparts (U.S. DOT 2005, U.S. DOT 2009a).

With the understanding that seat belts are a relatively low-cost safety device, and are an easy primary protection for occupants in passenger vehicles, North Dakota continues to work to measure rural road seat belt use. The U.S. Department of Transportation works with states to measure seat belt use through the annual National Occupant Passenger Use Survey (NOPUS). However, NOPUS does not include observation sites on local rural roads—the location for 1 in every 3 fatal crashes during the past five years (NDDOT 2008).

In 2009, a pilot project was initiated to develop a more rigorous and consistent metric for measuring rural seat belt use in North Dakota (Vachal et al. 2009). This study is a follow-up to the 2009 project, replicating the previous methodology to measure North Dakota rural seat belt use for 2010.

**METHODS** A direct observation survey method was used for this study. Sampling was conducted based on rural county populations and geographic representation of counties into quadrants based on the ND Safe Communities regions. Twenty-three of the 37 counties excluded from the annual NOPUS surveys in North Dakota were considered for this project (Figure 1).

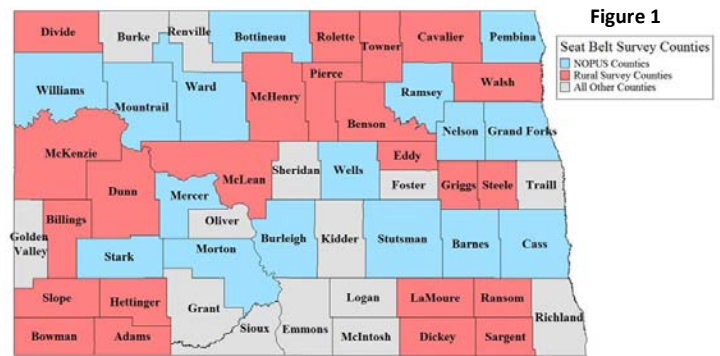


Figure 1

Observations were conducted in July, August and September 2010 in partnership with the NDDOT Traffic Safety Office and the ND Community Traffic Safety Program (CTSP).

General site and timeline guidelines were provided to observers. They were asked to observe at one site per town, up to two towns per county. They were also asked to observe at no more than four "non-town" sites. In addition, sites chosen must have been a minimum of 20 miles from the interstate and each site must have been observed for a minimum of 30 minutes up to one hour to obtain a minimum of 30 observations.

**RESULTS** A total of 5,735 observations of driver seat belt use were collected during surveys conducted at 152 sites across the state.

**RURAL SEAT BELT USE** Unweighted seat belt use by drivers in rural counties in 2010 was 49.2%, up from 44.4% in 2009 (Figure 2). The increase in

Table 1. Driver Seat Belt Use by County 2009-2010

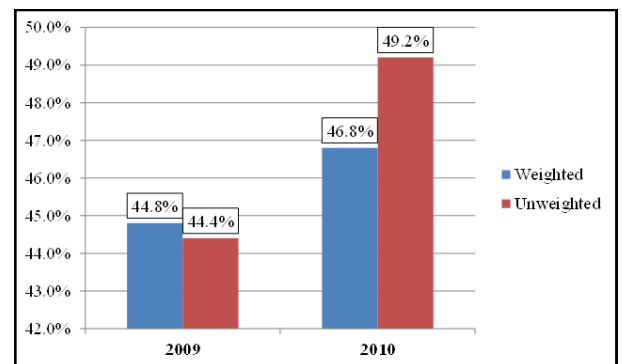
County	2010	2009	% Difference
Adams	59.0%	53.5%	5.5%
Benson	44.7%	39.9%	4.8%
Billings	63.0%	64.6%	-1.6%
Bowman	42.8%	29.6%	13.2%
Cavalier	42.6%	46.4%	-3.8%
Dickey	52.1%	50.0%	2.1%
Divide	70.7%	74.0%	-3.3%
Dunn	50.0%	52.1%	-2.1%
Eddy	42.3%	46.5%	-4.2%
Griggs	48.6%	42.8%	5.8%
Hettinger	45.5%	51.5%	-6.0%
LaMoure	45.3%	34.6%	10.7%
McHenry	58.0%	48.0%	10.0%
McKenzie	72.3%	57.0%	15.3%
McLean	60.7%	36.6%	24.1%
Pierce	39.8%	42.6%	-2.8%
Ransom	45.0%	39.6%	5.4%
Rolette	35.6%	37.5%	-1.9%
Sargent	52.9%	41.5%	11.4%
Slope	56.4%	61.7%	-5.3%
Steele (2010)	61.1%		
Towner	48.3%	41.8%	6.5%
Traill (2009)		39.4%	
Walsh	58.5%	56.6%	1.9%

\*NOTE: In 2010 Steele County replaced Traill County, which was deemed an invalid county due to the proximity to the interstate.

use may be related to the balance of highway and town observations or changes in driver behavior. An adjusted statewide rural seat belt use rate of 46.8% is estimated, based on county population weights, up from 44.8% in 2009.

County seat belt use in 2010 ranged from a low of 35.6% in Rolette County to a high of 72.3% in McKenzie County (Table 1). Overall, most counties saw relatively small declines to substantial increases from 2009 to 2010.

Figure 2. Driver Seat Belt Use 2009-2010



**Table 2. Driver Seat Belt Use by Gender by Road Type by County: 2009-2010**

	2009				2010			
	Rural Highway		Rural Town		Rural Highway		Rural Town	
	Male	Female	Male	Female	Male	Female	Male	Female
Adams	47.8%*	71.4%**			67.7%	66.7%*	40.0%*	44.8%*
Benson	48.3%	53.1%	15.8%	27.2%	58.2%	69.2%	24.4%	33.3%
Billings	62.9%	70.8%*			63.5%	60.0%*	NA	NA
Bowman	21.7%	44.0%*			47.3%	70.5%	15.6%	24.4%
Cavalier	55.1%	55.7%	31.3%	25.6%	44.2%	74.1%	19.7%	34.0%
Dickey	51.4%	89.7%	22.5%	64.2%	63.0%	81.3%	36.4%	47.2%
Divide	72.0%	81.3%			70.3%	71.8%	NA	NA
Dunn	48.3%	68.4%	47.9%	42.9%*	50.0%	64.7%*	38.6%	63.3%
Eddy	51.1%	62.0%	30.1%	37.8%	39.7%	58.6%	11.8%*	11.1%*
Griggs	78.1%	69.2%	31.0%	45.7%	51.1%	76.5%*	42.7%	45.2%*
Hettinger	46.8%	63.2%*			51.8%	65.5%*	11.1%*	7.7%*
LaMoure	36.7%	70.2%	19.2%	34.7%	58.3%	74.2%	15.4%	33.3%
McHenry	52.6%	68.3%	35.2%	45.9%	65.6%	76.2%	21.4%*	28.6%*
McKenzie	48.7%	72.2%	54.0%	41.5%	80.2%	88.5%*	54.3%	64.7%
McLean	50.0%	69.0%	19.8%	36.5%	80.6%	90.5%*	46.8%	43.9%
Pierce	48.3%	73.4%	17.6%	41.5%	33.3%	64.0%*	18.2%*	47.8%*
Ransom	56.8%	63.0%	25.2%	33.0%	59.5%	68.0%*	40.5%	49.6%
Rolette	47.9%	56.8%	32.5%	39.5%	33.3%	53.1%	28.1%	36.3%
Sargent	57.0%	63.1%	27.4%	28.8%	64.4%	78.6%*	31.0%	55.0%*
Slope	54.8%	77.8%*			56.6%	70.8%*	52.0%	46.7%*
Steele					74.0%	100.0%*	41.1%	52.4%*
Towner	46.2%	60.7%	25.8%	38.1%	62.6%	82.9%	16.1%	43.4%
Trails			31.0%	50.0%				
Walsh	50.0%	86.0%	43.2%	66.7%	58.8%	85.1%	41.1%	59.1%

**ROAD TYPE** There is greater risk associated with travel beyond town as only 3% of fatal crashes on rural roads occur in town (NDDOT 2009). Therefore, rural highways are given special attention. Observed seat belt use for rural highway drivers is 59.3%, compared to 36.6% in rural towns. Based on county populations, adjusted state use rates are 57.2% and 36.6% for rural highways and rural towns, respectively. Both figures fall below the NOPUS rate of 75%. However highway use increased from 55.2% to 57.2%, while town use increased from 35.6% to 36.6%.

Highway seat belt use by county ranged from 84.2% in McLean to 40.6% in Rolette. Rural town seat belt use ranged from 57.4% in McKenzie County to 9.7% in Hettinger County. The largest increases in highway seat belt use were found in Bowman and McLean Counties whereas the largest declines were found in Eddy, Rolette and Pierce Counties. Once again, variations might be due to driver behavior or a variety of other reasons.

**DRIVER GENDER** Of the 5,707 drivers observed 3,755 were male. Females made up a smaller share of the driver population, with the share higher in town at 42.3% compared to 31.3% on the highways. The lower propensity for males to use seat belts, as found in this study, is consistent with other research (U.S. DOT 2008, Gross et al. 2007, Vivida et al 2007, McCartt and Northrup 2004). Adjusted female use was 68% compared to 52.2% for males on rural highways. Rates in rural towns were 42.8% for female drivers and 32% for males.

Table 2 shows county-level seat belt use rates on rural highways and in rural towns by gender. Highest female use rates for 2010 on rural highways are in Steele, McLean, McKenzie, Walsh, Towner, and Dickey Counties. The lowest rates among female drivers were in Rolette and Eddy Counties. McLean, McKenzie, Steele, and Divide Counties had the highest use rates among male drivers on rural highways. The lowest rates among male drivers were in Eddy, Pierce, and Rolette Counties.

**VEHICLE TYPE** The rural seat belt observations included 2,306 pickup trucks and 2,027 cars, along with 900 sport utility vehicles (SUVs) and 502 vans. A significant variation in seat belt use is found across vehicle types (Table 3). From 2009 to 2010, car and SUV use rates stayed relatively stable, while van rates declined slightly and truck rates increased from 34.4% to 40.0%.

**Table 3. Driver Seat Belt Use by Vehicle Type: 2009-2010**

	2009		2010	
	Weighted	Unweighted	Weighted	Unweighted
Car	48.0%	47.4%	48.4%	52.1%
Truck	34.4%	34.5%	40.0%	42.5%
SUV	50.6%	50.2%	52.2%	53.9%
Van	63.7%	63.7%	59.1%	59.8%

**PASSENGER SEAT BELT USE** Of the 1,330 passenger observations, 54.5% were wearing seatbelts, an increase from 51% in 2009. Unlike the driver population, a majority of passengers were female; 58.3%. As with driver observations, gender was a significant factor in seat belt use. Female passengers used seat belts 62.5% of the time, compared to 43.3% for males. While female passenger belt use increased only slightly from 2009, male passenger belt use increased considerably from 26.2% in 2009 to 43.3% in 2010.

Driver and passenger seat belt use rates were strongly correlated, which is consistent with earlier research (Nambisan and Vasudevan 2007), and the 2009 results (Vachal et al. 2009). Although males were driving in a majority of the cases where passenger information was recorded, passenger seat belt use was not significantly related to driver gender. Figure 3 shows seat belt use in passenger observations.

Seat belt use on the state's rural roads was found to be significantly less than the statewide seat belt use rate collected in the annual NOPUS survey. The relative risk and significant difference in use rates between rural highways and towns should be considered in future research related to rural seat belt use. In addition, continued assessment of programs to increase local rural road seat belt enforcement or awareness is suggested.



To read the entire research report and find references, please visit the RTSSC website: <http://www.ugpti.org/rtssc>

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