

**Pilot Study to Assess Sustained and Multifaceted Traffic Safety Activity  
on North Dakota's Rural Roads**

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## **ABSTRACT**

North Dakota consistently experiences a relatively high level of crashes and injuries on rural roads, considering lane miles and vehicle miles traveled. Approximately 55% of the state's travel, in vehicle-miles, takes place on rural roads. North Dakota fatal crash reports from 2003 to 2007 show that 89% of serious injuries, including fatal and disabling injuries, occurred on rural roads. The state continues to assess and deploy resources to reduce crashes and injuries on rural roads as outlined in work plans such as the Highway Safety Improvement Plan and the Highway Safety Plan. An important aspect of successfully pursuing a state and federal emphasis on rural road safety is to understand the effectiveness of individual and coordinated safety interventions. The overall goal of this project was to measure effectiveness for alternative levels of intervention designed to heighten awareness and safety on rural roads in a targeted corridor. A multi-county case study was designed to include sustained and multifaceted safety interventions. Two counties in North Dakota were selected to be included in a designated Traffic Safety Corridor where safety interventions would occur. Another county beyond the corridor was monitored as a control case. Metrics used to measure effectiveness were a multi-phase driver survey, direct seat belt observations which occurred pre-intervention, mid-intervention, and post-intervention, and county-level crash/citation data. Overall, results of this research indicate that the project interventions that were implemented had little effect on overall seat belt use of the targeted counties.



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# 1. INTRODUCTION

North Dakota consistently experiences a relatively high level of crashes and injuries on rural roads, considering lane miles and vehicle miles traveled. Approximately 55% of the state's travel, in vehicle-miles, takes place on rural roads. This level of rural driving is relatively high compared to the national level of about 26% (U.S. Department of Transportation [DOT] 2007). From a safety perspective, this level of rural travel poses an inherent challenge because the risk for serious injury and death on these roads is relatively high compared to their urban counterparts (U.S. DOT 2005, U.S. DOT 2009a). For North Dakota, the danger is even more pronounced, as fatal crash reports from 2003 to 2007 show that 89% of serious injuries, including fatal and disabling injuries, occurred on rural roads (U.S. DOT 2009a).

The state continues to assess and deploy resources to reduce crashes and injuries on rural roads as outlined in work plans such as the Highway Safety Improvement Plan and the Highway Safety Plan (North Dakota Department of Transportation [NDDOT] 2010a, b). In addition, the Strategic Highway Safety Plan (SHSP) provides an overarching strategy for coordinated efforts to reduce traffic injuries and deaths through education, engineering, enforcement, and emergency medical service efforts (NDDOT 2010c).

Rural road safety has received attention at the federal level with programs such as the FHWA High Risk Rural Roads (HR3) program that is designed to focus data collection, evaluation, and engineering improvements on dangerous and often neglected types of roads in the most rural areas. In addition, NHTSA offers several programs to promote rural road safety through education and policy initiatives such as local Safe Communities traffic safety coalitions and High Visibility Enforcement (HVE) efforts. Recently, the U.S. Department of Transportation announced a department-wide Rural Safety Initiative to increase awareness of safety issues and interventions surrounding the nation's rural roads (U.S. DOT 2008). This initiative seeks to determine the most efficient use of existing programs and resources to assist leaders in traffic safety implement solutions in rural areas more quickly.

An understanding of the effectiveness of individual and coordinated safety interventions is an extension of the Rural Safety Initiative and an important aspect of successfully pursuing state and federal emphases on rural road safety. The ability to leverage public and private resources in an integrated effort may be beneficial in providing increased returns relative to a stove-pipe type approach to traffic safety. The research outlined in this report will contribute to the understanding of local effectiveness for alternative levels of safety intervention.

The overall goal of this project was to measure effectiveness for alternative levels of intervention designed to heighten awareness and safety on rural roads in a targeted corridor. A multi-county case study was designed to include sustained and multifaceted safety interventions. Two counties in North Dakota – Sargent and Ransom Counties - were selected to be included in a designated Traffic Safety Corridor where traffic safety interventions would occur. Another county beyond the corridor, Griggs County, was monitored as a control case.

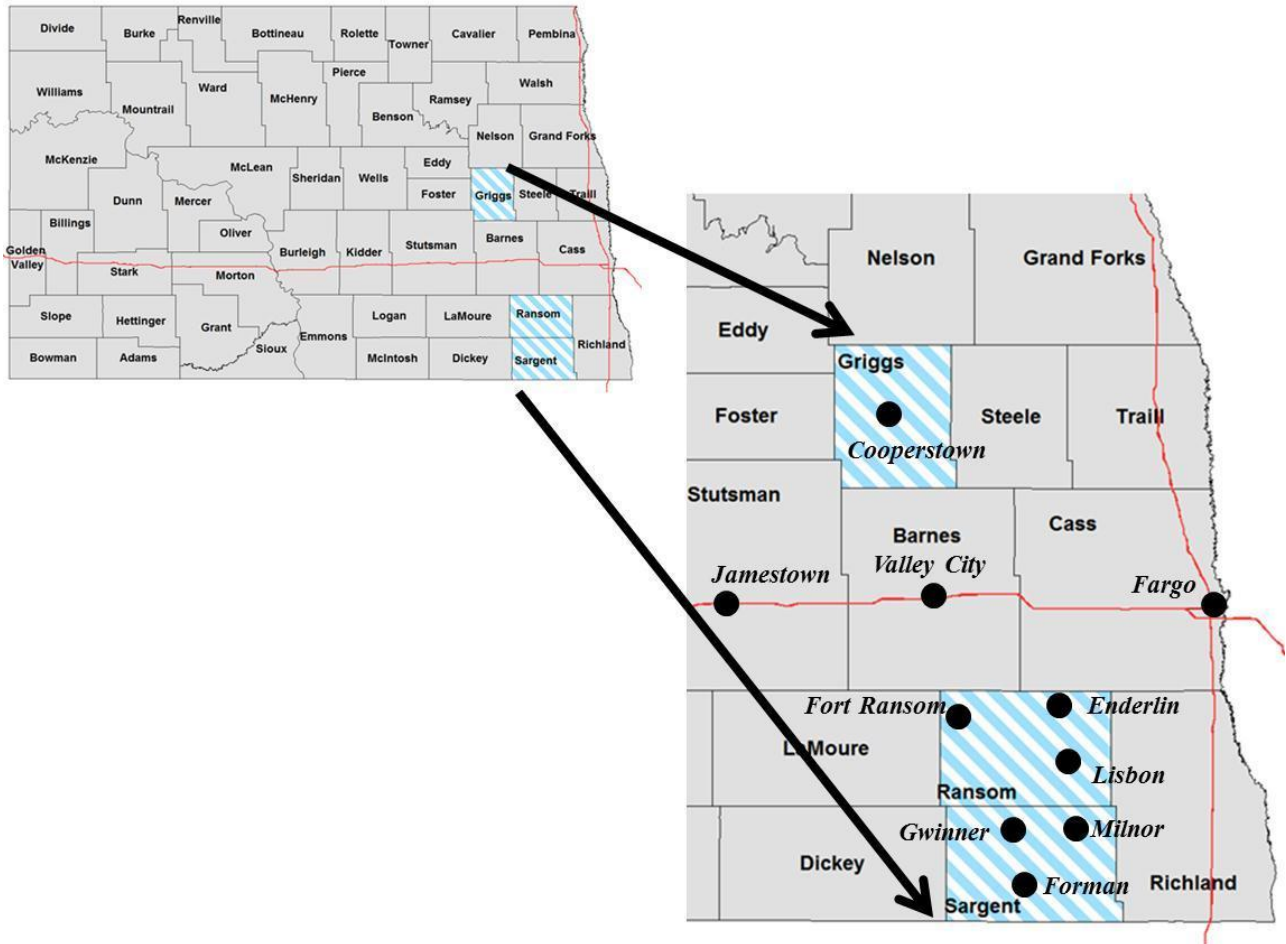
Safety corridors have been utilized in other regions with some success in improving safety for motorists (California 2009, Washington 2009, Minnesota 2009). Washington State's Corridor Safety Program best reflects what was attempted in this project. The goal of the Corridor Safety Program in Washington is to reduce motor vehicle fatalities by using inexpensive solutions with local community groups, businesses, law enforcement agencies, schools, and emergency services. Each of the programs is a grassroots effort in that it is led locally and all coordination takes place within each community. The first step in the process is selecting a corridor, which is designated based on evidence of higher-than-average motor vehicle crashes with potential low-cost fixes, and support at the local level to undertake the project.

Following selection of the safety corridor, a task force is formed consisting of local law enforcement agencies, state highway agencies, emergency response agencies, businesses, schools, and a multitude of other local agencies, organizations and individuals. Washington's safety corridors exist for a finite period of time – in this case 18 months to two years. See Appendix A for more information regarding Washington State's Corridor Safety Program.

The following sections outline characteristics of the counties included in this project, project background and interventions, and summaries of the metrics used to measure project success.

## 2. PROJECT BACKGROUND

The North Dakota counties selected for the project were designated as either a control county, a high visibility-only (HVE) county, or a HVE and education county. Griggs County was designated as the control county, with Ransom County selected as the HVE and education county, and Sargent County designated as the HVE-only county (Figure 2.1). Griggs County (the control county) did not receive any instruction as to HVE or education opportunities, and was assumed to maintain its traditional traffic safety enforcement and education activity levels.



**Figure 2.1** Project Counties in Perspective

All three counties are rural in nature, with Griggs County having the smallest population at 2,346 people, followed by Sargent County at approximately 3,951 people, and Ransom County at 5,500 people (Table 2.2). All three counties have experienced population loss in the past decade, and all are located almost equidistant from the nearest interstate. The population of the three counties included in this project are older, on average, than the state population and the national population overall (Tables 2.1, 2.2).

**Table 2.1** County Population: 2000 and 2009 (est)

County	2000 Pop 18 or Older (1)	2009 Est Pop 18 or Older (1)	% Change 2000-2009
Griggs County	2,133	1,943	-8.9%
Sargent County	3,211	3,044	-5.2%
Ransom County	4,419	4,221	-4.5%

(1) Source: U.S. Census Bureau – [www.census.gov](http://www.census.gov)

**Table 2.2** Age Distribution: 2009 (1)

Geography		Griggs County	Ransom County	Sargent County	North Dakota	United States
<b>2009 Estimates (1)</b>		2,346	5,500	3,951	646,844	307,006,550
<b>17 or Younger</b>	N	403	1,279	907	143,971	74,548,215
	% of TOTAL	17.2%	23.3%	23.0%	22.3%	24.3%
<b>18 to 24</b>	N	157	386	289	88,808	30,412,035
	% of TOTAL	6.7%	7.0%	7.3%	13.7%	9.9%
<b>25 to 44</b>	N	381	1,143	772	153,582	83,096,278
	% of TOTAL	16.2%	20.8%	19.5%	23.7%	27.1%
<b>45 to 64</b>	N	806	1,621	1,230	165,613	79,379,432
	% of TOTAL	34.4%	29.5%	31.1%	25.6%	25.9%
<b>65 or Older</b>	N	599	1,071	753	94,870	39,570,590
	% of TOTAL	25.5%	19.5%	19.1%	14.7%	12.9%
<b>Median Age</b>		51.8	44.4	45.1	36.3	36.8

(1) Source: U.S. Census Bureau – [www.census.gov](http://www.census.gov)

An initial meeting of stakeholders was convened in September of 2009 to discuss initial project tasks. Stakeholders included representatives from the Ransom County State's Attorney office, Enderlin and Lisbon Public Schools, North Dakota Highway Patrol, Ransom County Public Health, Ransom County Sheriff's Office, Ransom County Social Services and Safe Communities of North Dakota. They received information concerning the state of traffic safety in North Dakota and project specifics. The goals of the initial meeting were to inform stakeholders of the upcoming project and to gain project buy-in to aid in intervention implementation.

Stakeholders were informed that the project recommended scheduled monthly education activities in the schools and in the communities coupled with sustained enforcement. The project would only be successful with the cooperation of school, community, and county leadership. Safe Communities of North Dakota agreed to facilitate the intervention activities at the community and school level. The Upper Great Plains Transportation Institute (UGPTI) would assist with resource development and would provide program assessment. At the meeting, participants from both counties committed to the project, with plans to work through the Safe Communities office for collaboration on education and enforcement activities.



### **3. PROJECT INTERVENTIONS**

As previously mentioned, counties in the project were designated as a control county, a high visibility enforcement (HVE) only county, or a HVE and education county. Griggs County was designated as the control county, with Ransom County selected as the HVE and education county, and Sargent County designated as the HVE-only county.

#### **3.1 Control County**

Griggs County, as the control county, did not receive any instruction as to HVE or education opportunities, but was left to its own devices in regards to traffic safety.

#### **3.2 High Visibility Enforcement**

The Sheriff's Departments in the two HVE counties (Sargent and Ransom Counties) agreed to provide sustained seat belt enforcement activities within Sargent and Ransom Counties to include the following:

1. Increased law enforcement visibility at schools including both arrival and departure traffic, at least weekly. This would include high schools and grade schools.
2. Increased visibility and seat belt enforcement around community events.
3. Sustained enforcement activities on rural roads as permitted.

Enforcement activities were scheduled to begin October 15, 2009 and scheduled to end no later than April 15, 2010.

The sheriff's departments were also asked to provide monthly reports on activities, citations, warnings, and contacts as per the STEARR form, in addition to monthly citation/warning information for the previous three years (if possible).

In compensation for their enforcement activities, the two counties' sheriff's departments were to receive \$2,000 to assist with overtime salaries. Ultimately, Sargent County did follow through with the contracted activities and, upon receipt of their data, was issued \$2,000 for their part in this project. However, Ransom County, after repeated attempts at contact, appeared to have opted out of this project.

#### **3.3 Community/School Activities**

Ransom County was tasked with providing educational activities/opportunities in addition to the HVE provided by the sheriff's department. These activities were to be conducted following the increased law enforcement activities – starting October 2009 and ending in April 2010. The Region 6 North Dakota Safe Communities Coordinator partnered with UGPTI to provide leadership with this endeavor, as they already had local ties, using existing relationships for community involvement. Unfortunately, this was not the case. It proved difficult to get the area high schools and communities to conduct seat belt related activities, or if they did conduct activities, to get a calendar and list of activities they conducted. It is unsure whether this was a result of timing issues, a lack of interest, budgetary issues, or a combination of any of these items. The Region 6 SC Coordinator did attempt to obtain this information on several occasions, but to no avail.

One community activity that was scheduled in Ransom County was ‘Porch Lights on for Seat Belt Use.’ Ransom County Public Health worked with UGPTI, using funds from AAA, to conduct this event on March 31, 2010. Media consisted of posters distributed throughout Ransom County, in addition to an ad placed in the Ransom County Gazette advertising this event. Ransom County citizens were asked to turn on their porch lights on the evening of Wednesday, March 31, 2010 after 6 p.m. in support of seat belt use in Ransom County. No feedback regarding this event is available.



## 4. PROJECT METRICS

Several measures were selected to track project success:

1. County driver surveys conducted prior to any interventions and immediately after project completion.
2. Seat belt observations conducted at four distinct time periods – 1) before the project; 2) project midpoint; 3) immediately following the end of the project; and 4) four months after the project.
3. Seat belt use reported in county crash/citation data.

### 4.1 Driver Survey

#### 4.1.1 Methodology

A mail survey was conducted in the fall of 2009 before any educational or high visibility enforcement activities. A second survey was disseminated in the spring of 2010 – immediately after the project. The purpose of the surveys was twofold. First, researchers wanted to measure the effects of the interventions on self-reported seat belt use for each of the counties. Second, researchers wanted to measure the effects of the interventions on respondents' perceptions of their likelihood of being ticketed for not wearing their seat belts. The survey mailing included a cover letter, on letterhead which included both the Safe Communities logo and the UGPTI logo. The letter invited driver participation and explained the survey goals. The survey was limited to respondents aged 18 or older with a valid driver's license.

A sampling frame for Griggs, Ransom, and Sargent Counties was purchased from an independent vendor. A total of 766 addresses were obtained for Griggs County, 1,844 for Ransom County, and 1,303 for Sargent County. Overall sample size as a percent of population age 18 or older per county was approximately 40% for all counties, with a slightly higher representation in Sargent and Ransom Counties (Table 4.1).

**Table 4.1** Sample Received as Percent of Population Aged 18 or Older

County	2009 Est Pop 18 or Older (1)	Sample Size	Sample Size as % of Pop
Griggs County	1,943	766	39.4%
Sargent County	3,044	1,303	42.8%
Ransom County	4,221	1,844	43.7%

(1) U.S. Census Bureau – [www.census.gov](http://www.census.gov)

#### 4.1.2 Results

The response rate for the November 2009 survey ranged between 11% in Sargent County to 36% in Griggs County, with Ransom County at 30% (Table 4.2). The response rate for the May 2010 survey ranged from 24% in Ransom County to 30% in Sargent County. Note that the November 2009 Sargent County response rate was lower than the May 2010 response rate due to issues with survey returns.

**Table 4.2** Survey Response Rate

County	County Status	Responses		Response Rate	
		November 2009	May 2010	November 2009	May 2010
Griggs County	Control	274	209	35.8%	27.3%
Sargent County	Enforcement Only	145	390	11.1%	29.9%
Ransom County	Education and Enforcement	551	450	29.9%	24.4%

**4.1.2.1 Demographics**

A majority of respondents for all three counties for both surveys were aged 45 or older (Table 4.3).

**Table 4.3** Respondent Age Distribution

	November 2009						May 2010					
	Griggs		Sargent		Ransom		Griggs		Sargent		Ransom	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>18 to 24</b>	3	1.1%	4	2.8%	3	0.5%	2	1.0%	3	0.8%	5	1.1%
<b>25 to 34</b>	13	4.7%	11	7.6%	48	8.7%	10	4.8%	28	7.2%	28	6.2%
<b>35 to 44</b>	15	5.4%	25	17.4%	75	13.6%	15	7.2%	40	10.3%	52	11.5%
<b>45 to 54</b>	45	16.3%	27	18.8%	94	17.1%	26	12.4%	80	20.5%	82	18.1%
<b>55 to 64</b>	77	27.9%	33	22.9%	134	24.4%	62	29.7%	101	25.9%	109	24.1%
<b>65 to 74</b>	60	21.7%	25	17.4%	97	17.6%	40	19.1%	72	18.5%	95	21.0%
<b>75 or older</b>	63	22.8%	19	13.2%	99	18.0%	54	25.8%	66	16.9%	82	18.1%
<b>TOTAL</b>	<b>276</b>		<b>144</b>		<b>550</b>		<b>209</b>		<b>390</b>		<b>453</b>	

A majority of respondents for all three counties for both surveys were female (Table 4.4).

**Table 4.4** Respondent Gender

	November 2009						May 2010					
	Griggs		Sargent		Ransom		Griggs		Sargent		Ransom	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>Male</b>	126	46.0%	62	42.8%	230	42.2%	87	42.2%	166	43.1%	206	46.2%
<b>Female</b>	148	54.0%	83	57.2%	315	57.8%	119	57.8%	219	56.9%	240	53.8%
<b>TOTAL</b>	<b>274</b>		<b>145</b>		<b>545</b>		<b>206</b>		<b>385</b>		<b>446</b>	

Most respondents regularly drove cars (41% to 51% - Pre; 44% to 49% - Post), followed by pickups, SUVs, and vans (Table 4.5).

**Table 4.5** Type of Vehicle Most Often Driven by Respondents

	November 2009						May 2010					
	Griggs		Sargent		Ransom		Griggs		Sargent		Ransom	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>Car</b>	113	41.4%	73	50.3%	278	50.5%	93	44.7%	182	46.7%	222	49.2%
<b>Pickup</b>	74	27.1%	37	25.5%	132	24.0%	56	26.9%	97	24.9%	99	22.0%
<b>SUV</b>	33	12.1%	20	13.8%	89	16.2%	19	9.1%	61	15.6%	78	17.3%
<b>Van</b>	48	17.6%	13	9.0%	45	8.2%	34	16.3%	41	10.5%	48	10.6%
<b>Other</b>	5	1.8%	2	1.4%	7	1.3%	6	2.9%	5	1.3%	3	0.7%
<b>DNK/ Refuse</b>	0	0.0%	0	0.0%	0	0.0%	0	0.0%	4	1.0%	1	0.2%
<b>TOTAL</b>	<b>273</b>		<b>145</b>		<b>551</b>		<b>208</b>		<b>390</b>		<b>451</b>	

A vast majority of respondents stated they drove either in a small town or on rural highways/county roads (Table 4.6).

**Table 4.6** Location of Majority of Respondent Drive Time

	November 2009						May 2010					
	Griggs		Sargent		Ransom		Griggs		Sargent		Ransom	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>Small town</b>	136	49.3%	61	42.4%	288	52.2%	92	44.7%	145	37.1%	208	46.0%
<b>Rural highway/ county road</b>	134	48.6%	77	53.5%	243	44.0%	112	54.4%	237	60.6%	226	50.0%
<b>Larger city</b>	2	0.7%	4	2.8%	10	1.8%	0	0.0%	2	0.5%	5	1.1%
<b>Interstate</b>	2	0.7%	2	1.4%	11	2.0%	2	1.0%	7	1.8%	12	2.7%
<b>DNK/ Refuse</b>	2	0.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.2%
<b>TOTAL</b>	<b>276</b>		<b>144</b>		<b>552</b>		<b>206</b>		<b>391</b>		<b>452</b>	

Most respondents stated they drove most, if not all, days of the week (Table 4.7). There were very few respondents who stated they drove only a few days a month or a few days a year.

**Table 4.7** Frequency of Driving

	November 2009						May 2010					
	Griggs		Sargent		Ransom		Griggs		Sargent		Ransom	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>Most days/ All days</b>	189	69.0%	112	78.3%	432	78.4%	149	71.3%	287	73.4%	355	78.9%
<b>Few days a week</b>	67	24.5%	28	19.6%	107	19.4%	53	25.4%	88	22.5%	86	19.1%
<b>Few days a month</b>	15	5.5%	2	1.4%	9	1.6%	6	2.9%	14	3.6%	8	1.8%
<b>Few days a year</b>	2	0.7%	1	0.7%	3	0.5%	1	0.5%	1	0.3%	0	0.0%
<b>DNK/Refuse</b>	1	0.4%	0	0.0%	0	0.0%	0	0.0%	1	0.3%	1	0.2%
<b>TOTAL</b>	<b>274</b>		<b>143</b>		<b>551</b>		<b>209</b>		<b>391</b>		<b>450</b>	

Annual miles driven was almost equally distributed between less than 5,000 miles, 5,000 to 10,000 miles, 10,001 to 15,000 miles and more than 15,000 miles across all counties for both the November and May surveys (Table 4.8).

**Table 4.8** Miles Driven by Respondents during Past Year

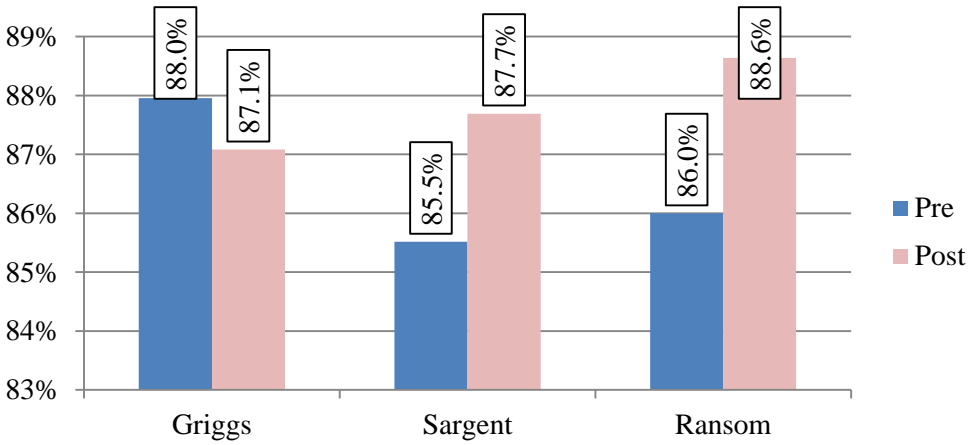
	November 2009						May 2010					
	Griggs		Sargent		Ransom		Griggs		Sargent		Ransom	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>LT 5,000 miles</b>	60	21.8%	23	15.9%	116	21.0%	52	24.9%	63	16.1%	83	18.4%
<b>5,000 to 10,000 miles</b>	94	34.2%	52	35.9%	152	27.5%	63	30.1%	120	30.7%	142	31.4%
<b>10,001 to 15,000 miles</b>	54	19.6%	34	23.4%	133	24.1%	47	22.5%	101	25.8%	108	23.9%
<b>More than 15,000 miles</b>	58	21.1%	36	24.8%	143	25.9%	39	18.7%	103	26.3%	104	23.0%
<b>DNK/Refuse</b>	9	3.3%	0	0.0%	9	1.6%	8	3.8%	4	1.0%	15	3.3%
<b>TOTAL</b>	<b>275</b>		<b>145</b>		<b>553</b>		<b>209</b>		<b>391</b>		<b>452</b>	

#### 4.1.2.2 Seat Belt Usage

Several survey questions dealt specifically with seat belt usage. Respondents were asked how often they wear their seat belt while driving. More than 85% of respondents in all counties for both the November and May surveys stated they wear their seat belt most of the time or always (Figure 4.1). In the post survey, 1.5 percentage points separated the county with the lowest self-reported seat belt use with the county with the highest self-reported seat belt use (Griggs – 87.1%; Ransom – 88.6%). There was very little change in self-reported seat belt use between the pre survey and the post survey for all counties, and the small changes that did occur for all three counties, whether increase or decline, were not significant. Note that the counties that saw small increases were the two intervention counties, while Griggs County saw a small decline in the percent of respondents who self-reported they wear their seat belt most of the time or always.

While females reported higher self-reported seat belt use than males in all three counties for both the pre and post surveys (Table 4.9), differences were not significant for males or females for self-reported seat belt use between the pre and post surveys for any of the three counties.

Self-reported seat belt use overall is lower among the respondents aged 18 to 44 and slightly higher among respondents aged 45 or older for both the pre and post surveys (Table 4.10). Differences are not significant for those aged 18 to 44 and 45 or older for self-reported seat belt use between the pre and post surveys, with the exception of respondents aged 18 to 44 in Ransom County, where a significant difference in self-reported seat belt use was found between the pre and post surveys ( $\chi^2=4.128$ ,  $p=0.045$ ,  $n=210$ ).



**Figure 4.1** Respondents Who Wear Their Seat Belts Most of the Time or Always

**Table 4.9** Frequency of Self-Report Seat Belt Use by Gender

		<b>Rarely/ Never</b>	<b>Sometimes</b>	<b>Most of the Time/ Always</b>
<b>Pre</b>				
<b>Griggs</b>	<b>Female</b>	4.1%	2.7%	93.2%
	<b>Male</b>	9.7%	8.9%	81.5%
<b>Sargent</b>	<b>Female</b>	1.2%	4.8%	94.0%
	<b>Male</b>	11.3%	14.5%	74.2%
<b>Ransom</b>	<b>Female</b>	3.2%	6.7%	90.2%
	<b>Male</b>	6.6%	13.2%	80.2%
<b>Post</b>				
<b>Griggs</b>	<b>Female</b>	0.0%	5.9%	94.1%
	<b>Male</b>	8.0%	14.9%	77.0%
<b>Sargent</b>	<b>Female</b>	0.9%	5.9%	93.2%
	<b>Male</b>	7.8%	10.8%	81.3%
<b>Ransom</b>	<b>Female</b>	3.3%	5.0%	91.6%
	<b>Male</b>	4.9%	10.3%	84.7%
<b>Pre-Post Percentage Change</b>				
<b>Griggs</b>	<b>Female</b>	-4.1%	3.2%	0.9%
	<b>Male</b>	-1.6%	6.1%	-4.4%
<b>Sargent</b>	<b>Female</b>	-0.3%	1.1%	-0.8%
	<b>Male</b>	-3.5%	-3.7%	7.1%
<b>Ransom</b>	<b>Female</b>	0.2%	-1.6%	1.5%
	<b>Male</b>	-1.7%	-2.9%	4.6%

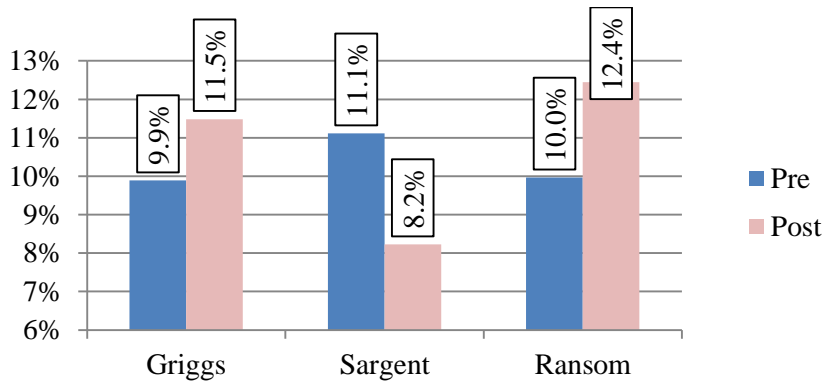
**Table 4.10** Frequency of Self-Report Seat Belt Use by Age

		Rarely/ Never	Sometimes	Most of the Time/ Always
<b>Pre</b>				
<b>Griggs</b>	<b>18-44</b>	9.7%	6.5%	83.9%
	<b>45 or Older</b>	6.2%	5.3%	88.5%
<b>Sargent</b>	<b>18-44</b>	10.0%	15.0%	75.0%
	<b>45 or Older</b>	3.9%	6.7%	89.4%
<b>Ransom</b>	<b>18-44</b>	10.4%	16.8%	72.8%
	<b>45 or Older</b>	2.8%	7.1%	90.1%
<b>Post</b>				
<b>Griggs</b>	<b>18-44</b>	3.7%	7.4%	88.9%
	<b>45 or Older</b>	3.2%	9.9%	86.9%
<b>Sargent</b>	<b>18-44</b>	5.6%	9.9%	84.5%
	<b>45 or Older</b>	3.5%	8.2%	88.3%
<b>Ransom</b>	<b>18-44</b>	4.7%	10.6%	84.7%
	<b>45 or Older</b>	3.8%	6.6%	89.6%
<b>Pre-Post Percentage Change</b>				
<b>Griggs</b>	<b>18-44</b>	-6.0%	0.9%	5.0%
	<b>45 or Older</b>	-3.0%	4.6%	-1.6%
<b>Sargent</b>	<b>18-44</b>	-4.4%	-5.1%	9.5%
	<b>45 or Older</b>	-0.4%	1.5%	-1.1%
<b>Ransom</b>	<b>18-44</b>	-5.7%	-6.2%	11.9%
	<b>45 or Older</b>	1.0%	-0.5%	-0.5%

When asked how their seat belt use has changed in the past two months, respondents in Griggs and Ransom Counties were more likely to say in the post survey that their seat belt use increased, while respondents in Sargent County were less likely to report that their seat belt use increased (Figure 4.2). Self-report seat belt use increases did not exceed 13% for any of the counties. It should be reiterated that Griggs County was the control county, with no scheduled interventions, while Sargent and Ransom Counties were the designated intervention counties. Differences were not found to be statistically significant for any of the three counties.

There is a greater gender difference with this question among respondents in Griggs County than in Sargent and Ransom Counties, where males and females were more likely to respond similarly (Table 4.11). Differences between the pre and post surveys by gender were not statistically significant for any of the counties.

Respondents aged 18 to 44 in Griggs County were most likely to have stated that their seat belt use increased in the past two months in the post survey (Table 4.12). Very little difference in the other counties/age groupings was seen. Differences between the pre and post surveys by age grouping were not statistically significant for any of the counties.



**Figure 4.2** Self-Reported Increase in Seat Belt Use in Past 2 Months

**Table 4.11** Change in Seat Belt Use in Past Two Months by Gender

		Increased	Decreased	Stayed the Same
<b>Pre</b>				
<b>Griggs</b>	<b>Female</b>	5.4%	0.0%	94.6%
	<b>Male</b>	14.5%	0.8%	83.9%
<b>Sargent</b>	<b>Female</b>	11.0%	1.2%	87.8%
	<b>Male</b>	11.3%	0.0%	88.7%
<b>Ransom</b>	<b>Female</b>	10.5%	1.0%	88.5%
	<b>Male</b>	9.1%	0.9%	89.6%

<b>Post</b>				
<b>Griggs</b>	<b>Female</b>	5.9%	0.0%	94.1%
	<b>Male</b>	17.2%	1.1%	81.6%
<b>Sargent</b>	<b>Female</b>	6.0%	0.9%	92.7%
	<b>Male</b>	10.2%	0.6%	89.2%
<b>Ransom</b>	<b>Female</b>	13.1%	0.4%	86.1%
	<b>Male</b>	11.7%	0.5%	87.4%

<b>Pre-Post Percentage Change</b>				
<b>Griggs</b>	<b>Female</b>	0.4%	0.0%	-0.4%
	<b>Male</b>	2.7%	0.3%	-2.3%
<b>Sargent</b>	<b>Female</b>	-5.0%	-0.3%	4.9%
	<b>Male</b>	-1.0%	0.6%	0.4%
<b>Ransom</b>	<b>Female</b>	2.6%	-0.5%	-2.5%
	<b>Male</b>	2.5%	-0.4%	-2.2%



**Table 4.12** Change in Seat Belt Use in Past Two Months by Age

		Increased	Decreased	Stayed the Same
<b>Pre</b>				
<b>Griggs</b>	<b>18-44</b>	6.5%	3.2%	90.3%
	<b>45 or Older</b>	10.3%	0.0%	89.3%
<b>Sargent</b>	<b>18-44</b>	10.0%	0.0%	90.0%
	<b>45 or Older</b>	11.7%	1.0%	87.4%
<b>Ransom</b>	<b>18-44</b>	5.5%	0.8%	92.9%
	<b>45 or Older</b>	11.3%	0.9%	87.7%

<b>Post</b>				
<b>Griggs</b>	<b>18-44</b>	14.8%	0.0%	85.2%
	<b>45 or Older</b>	11.0%	0.5%	88.5%
<b>Sargent</b>	<b>18-44</b>	5.6%	1.4%	93.0%
	<b>45 or Older</b>	8.8%	0.6%	90.3%
<b>Ransom</b>	<b>18-44</b>	9.4%	1.2%	89.4%
	<b>45 or Older</b>	13.2%	0.3%	86.0%

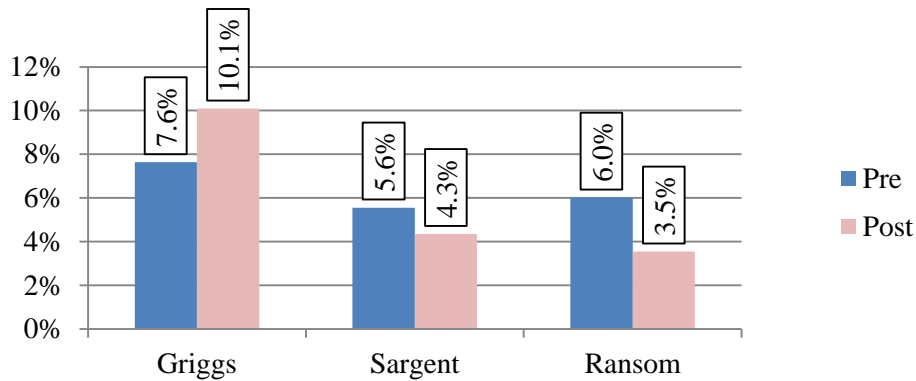
<b>Pre-Post Percentage Change</b>				
<b>Griggs</b>	<b>18-44</b>	8.3%	-3.2%	-5.1%
	<b>45 or Older</b>	0.7%	0.5%	-0.8%
<b>Sargent</b>	<b>18-44</b>	-4.4%	1.4%	3.0%
	<b>45 or Older</b>	-2.9%	-0.4%	2.9%
<b>Ransom</b>	<b>18-44</b>	3.9%	0.4%	-3.5%
	<b>45 or Older</b>	1.9%	-0.6%	-1.7%

In the post survey, respondents in Griggs County were more than twice as likely as respondents in Sargent County, and three times as likely as respondents in Ransom County to have been ticketed for not wearing their seat belt (Figure 4.3). Also, of the three counties, Griggs County was the only county to have had an increase in respondents from the pre survey to the post survey stating they had been picked up for not wearing their seat belt. None of the changes between the pre and post surveys for any of the counties were statistically significant.

Although not statistically significant, Griggs County was the only county to have seen increases in the percentage of respondents stating they had ever been picked up for not wearing their seat belts for both males and females (Table 4.13). Ransom and Sargent Counties both saw negligible increases to declines in the percent of respondents who had been ticketed for not wearing their seat belts by gender. Ransom County saw a statistically significant decline in the percentage of males who stated they had been ticketed for not wearing their seat belt ( $\chi^2=6.344$ ,  $\rho=0.012$ ,  $n=433$ ).

By age, Griggs County saw increases in the percentage of respondents aged 18 to 44 and aged 45 or older who stated they had been ticketed for not wearing their seat belt (Table 4.13). Sargent County saw increases in the percentage of respondents aged 18 to 44 who stated they had been ticketed for not wearing their seat belt, and declines in the percent of respondents aged 45 or older who had ever been ticketed. Ransom County saw declines in both age groups (18 to 44 and 45 or older) and saw a

statistically significant decline in the percent of respondents aged 18 to 44 who stated they had been ticketed for not wearing their seat belt ( $\chi^2=4.351$ ,  $\rho=0.037$ ,  $n=214$ ). Declines seen in respondents reporting ever having been ticketed for not wearing a seat belt could be due to non-response bias in the May 2010 survey. In addition, note that these declines were only seen in the intervention counties, not the control county.



**Figure 4.3** Respondents Who Have Ever Been Ticketed for Not Wearing a Seat Belt

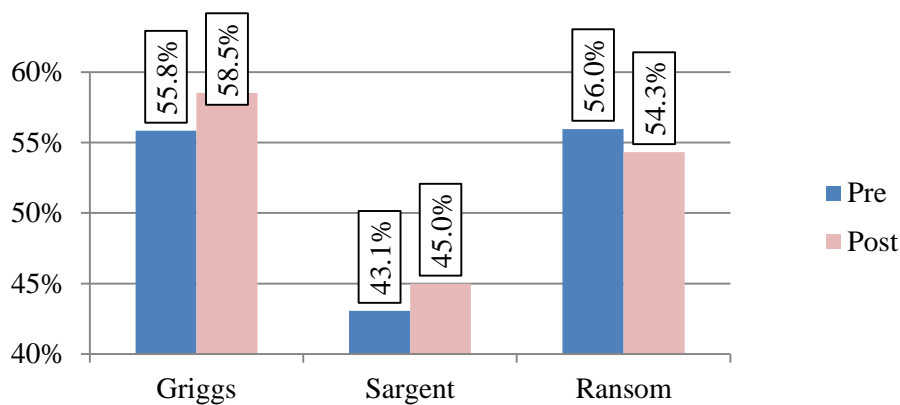
**Table 4.13** Respondents Who Have Ever Been Ticketed for Not Wearing a Seat Belt by Gender and Age

	By Gender		By Age	
	Female	Male	18-44	45 or Older
<b>Pre</b>				
<b>Griggs</b>	4.1%	12.0%	16.1%	6.5%
<b>Sargent</b>	2.4%	9.7%	7.5%	4.8%
<b>Ransom</b>	3.2%	10.1%	16.5%	2.8%
<b>Post</b>				
<b>Griggs</b>	5.9%	16.1%	22.2%	8.2%
<b>Sargent</b>	2.3%	7.2%	11.3%	2.8%
<b>Ransom</b>	3.4%	3.9%	6.9%	2.7%
<b>Pre-Post Percentage Change</b>				
<b>Griggs</b>	1.8%	4.1%	6.1%	1.7%
<b>Sargent</b>	-0.1%	-2.5%	3.8%	-2.0%
<b>Ransom</b>	0.2%	-6.2%	-9.6%	-0.1%

Respondents were asked the likelihood of being ticketed if they don't wear their seat belts. More than half of Griggs and Ransom County respondents stated it was somewhat to very likely they would be ticketed if they didn't wear their seat belt, while 45% of Sargent County respondents stated that it was somewhat to very likely they would be ticketed if they didn't wear their seat belt (Figure 4.4). Changes between the pre and post surveys were not statistically significant for any of the three counties.

Respondents aged 18 to 44 for Griggs and Sargent Counties were less likely than respondents aged 45 or older to state it was somewhat to very likely they would be ticketed if they didn't wear their seat belt (Table 4.14). Ransom County respondents for both age groups were equally as likely to state it was somewhat to very likely they would be ticketed if they didn't wear their seat belt. None of the three counties saw statistically significant changes by gender between the pre and post surveys in the percent of respondents who stated it would be somewhat or very likely they would be ticketed if they did not wear their seat belt.

More than half of respondents for the pre and post surveys in Griggs and Ransom Counties for both age groupings stated it would be somewhat or very likely they would be ticketed if they didn't wear their seat belt (Table 4.14). Less than 44% of Sargent County respondents for either age grouping stated it would be somewhat or very likely they would be ticketed if they didn't wear their seat belt. None of the three counties saw statistically significant changes by age in the percent of respondents who stated it would be somewhat or very likely they would be ticketed if they didn't wear their seat belt.



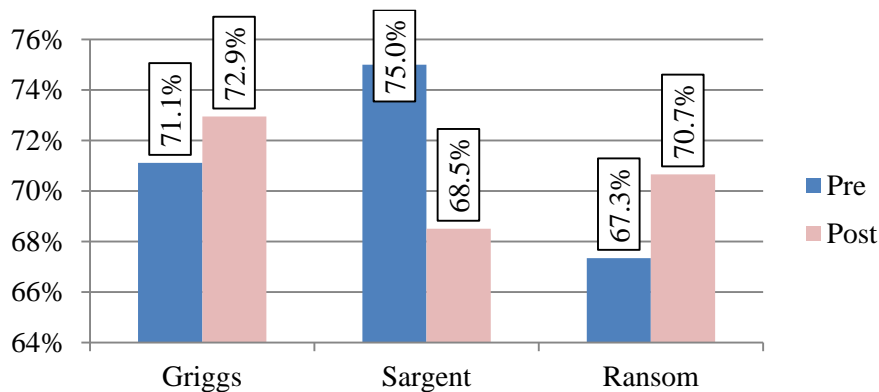
**Figure 4.4** Somewhat/Very Likely to Be Ticketed if No Seat Belt

**Table 4.14** Somewhat/Very Likely to Be Ticketed if No Seat Belt by Gender and Age

	By Gender		By Age	
	Female	Male	18-44	45 or Older
<b>Pre</b>				
<b>Griggs</b>	54.8%	57.1%	45.2%	57.9%
<b>Sargent</b>	43.4%	42.6%	32.5%	47.2%
<b>Ransom</b>	56.1%	55.5%	57.1%	55.4%
<b>Post</b>				
<b>Griggs</b>	52.6%	66.3%	51.8%	59.1%
<b>Sargent</b>	47.5%	40.2%	35.2%	47.6%
<b>Ransom</b>	56.5%	52.2%	59.7%	53.1%
<b>Pre-Post Percentage Change</b>				
<b>Griggs</b>	-2.2%	9.2%	6.6%	1.2%
<b>Sargent</b>	4.1%	-2.4%	2.7%	0.4%
<b>Ransom</b>	0.4%	-3.3%	2.6%	-2.3%

#### 4.1.2.3 Seat Belt Enforcement

Respondents were asked if they had seen, heard or read anything about seat belt enforcement in the last two months. Respondents in Griggs and Ransom Counties were more likely to have said they had been exposed to media related to seat belt enforcement in the past two months in the post survey than the pre survey, while Sargent County respondents were less likely to have said they were exposed to seat belt enforcement-related media (Figure 4.5). However, the differences in seat belt enforcement-related media between the pre and post surveys were not statistically significant for any of the three counties.



**Figure 4.5** Exposure to Media Related to Seat Belt Use in Past 2 Months

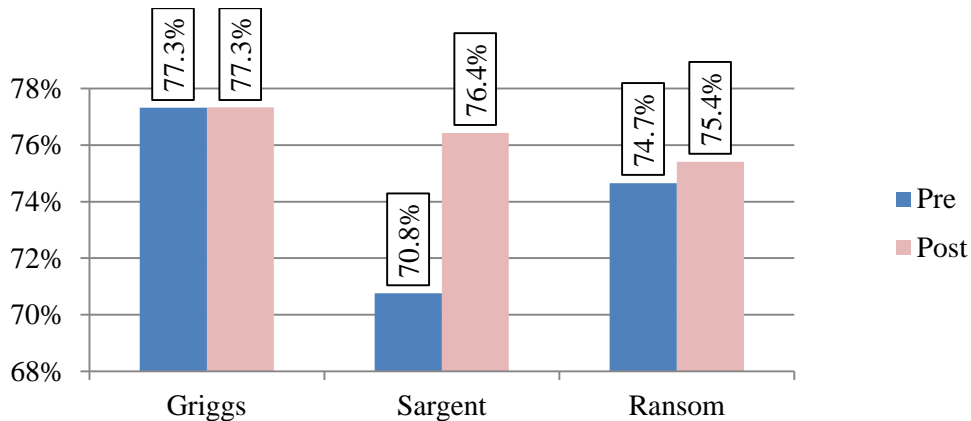
Of the respondents who stated they had been exposed to information related to seat belt use in the past two months, a vast majority in all three counties stated they saw this information via television (Table 4.15). More respondents chose television as an information source in the post survey than the pre survey. More respondents also chose radio as an information source in the post survey than the pre survey. Fewer respondents chose the local paper as an information source in the post survey than the pre survey.

Several other responses were given including, but not limited to, billboards/road signs, schools, and speaking with other people (Table 4.16). Only one respondent listed the Lights on for Seat Belt event held in Ransom County.

**Table 4.15** Sources of Seat Belt Enforcement-Related Information

	Pre Survey						Post Survey					
	Griggs (n=192)		Sargent (n=108)		Ransom (n=365)		Griggs (n=151)		Sargent (n=261)		Ransom (n=313)	
	N	%	N	%	N	%	N	%	N	%	N	%
<b>Local paper</b>	89	46.4%	50	46.3%	165	45.2%	59	39.1%	104	39.8%	140	44.7%
<b>TV</b>	138	71.9%	72	66.7%	273	74.8%	118	78.1%	206	78.9%	245	78.3%
<b>Radio</b>	63	32.8%	33	30.6%	120	32.9%	57	37.7%	88	33.7%	109	34.8%
<b>Other</b>	11	5.7%	8	7.4%	26	7.1%	10	6.6%	32	12.3%	36	11.5%

For respondents who said they had been exposed to seat belt enforcement-related media, more than three-fourths of respondents in all three counties stated the information they had been exposed to would be somewhat or very effective at increasing seat belt use (Figure 4.6). Sargent County saw a six percentage point increase in the number of respondents who stated that the enforcement-related media to which they had been exposed would be somewhat or very effective at increasing seat belt use. No changes were seen for respondents in Griggs County in regard to an increase in the percent of respondents feeling that the information they had been exposed to would be somewhat or very effective at increasing seat belt use, and a negligible change was observed in Ransom County. None of the counties saw statistically significant changes in the percent of respondents who stated that the enforcement-related media to which they had been exposed would be somewhat or very effective at increasing seat belt use.



**Figure 4.6** Effectiveness of Seat Belt Enforcement Information (Somewhat or Very Effective)

**Table 4.16** “Other” Sources of Seat Belt Enforcement-Related Information

	Pre Survey						Post Survey					
	Griggs (n=11)		Sargent (n=8)		Ransom (n=26)		Griggs (n=10)		Sargent (n=32)		Ransom (n=36)	
	N	%	N	%	N	%	N	%	N	%	N	%
<i>Billboards/road signs</i>	5	45.5%			8	30.8%	3	30.0%	14	43.8%	12	33.3%
<i>Internet/email</i>	2	18.2%			1	3.8%	1	10.0%	1	3.1%	1	2.8%
<i>Conversations/ Other people</i>	1	9.1%	3	37.5%	4	15.4%	2	20.0%	2	6.3%	4	11.1%
<i>Law enforcement</i>	1	9.1%			1	3.8%			1	3.1%	1	2.8%
<i>Bumper stickers</i>	1	9.1%										
<i>Click It or Ticket</i>	1	9.1%					1	10.0%				
<i>DOT office</i>	1	9.1%										
<i>Magazine</i>	1	9.1%					1	10.0%				
<i>Child at school/school</i>			5	62.5%	4	15.4%			7	21.9%		
<i>Posters</i>			1	12.5%	2	7.7%					1	2.8%
<i>Accident reports</i>					1	3.8%						
<i>Mail</i>					1	3.8%						
<i>Minnesota has it</i>					1	3.8%						
<i>Ad campaign</i>											1	2.8%
<i>Common sense</i>									1	3.1%		
<i>Driving safely class</i>							1	10.0%			1	2.8%
<i>Fire Department</i>							1	10.0%				
<i>Key job</i>											1	2.8%
<i>Mock car crash</i>									1	3.1%		
<i>ND Air National Guard</i>											1	2.8%
<i>Persa</i>											1	2.8%
<i>Porch Lights on for Seat Belts Event</i>											1	2.8%
<i>When there has been an accident</i>											1	2.8%
<i>WIC</i>											1	2.8%

### 4.1.3 Survey Summary

Results from the driver survey in Griggs, Sargent, and Ransom Counties did not reveal statistically significant results definitively demonstrating that any of the county interventions were successful. The next section focuses on behavioral metrics which might give a better indication of whether or not the activities were valuable.

## 4.2 Seat Belt Observations

### 4.2.1 Methodology

A direct observation survey method was used for the seat belt observations. Within the selected counties (Griggs, Ransom and Sargent), sites selected for observation were based on local traffic knowledge. Each observer was supplied and asked to become familiar with the “Rural Seat Belt Observation Training Guide” which outlined specific procedures recommended for conducting rural seat belt observations in North Dakota, including the data collection tool. The training guide is located in Appendix C. The following outline lists general site selection and timeline guidance provided to observers:

1. One site per town, up to three towns per county,
2. Two to four ‘non-town’ sites to cover higher traffic intersections on non-interstate/non-urban roads in the county,
3. Sites chosen had to be a minimum of 20 miles away from the interstate (to avoid bias associated with urban commuter traffic),
4. Each site had to be observed for a minimum of 30 minutes, up to one hour if extra time was needed to meet the 30 observation minimum for a site. After the additional 30 minutes, the site was considered “complete” regardless if the 30 observation minimum was met or not,
5. Hours for collection were generally between the hours of 9 a.m. and 3 p.m.

In addition to the guidelines above, observers observed at each high school located within each of the counties. Sites remained constant throughout the four observation periods.

Observations were conducted at four time periods throughout the lifespan of the project. Observations were conducted prior to commencing with interventions (April-September 2009 - “pre”), approximately half way through the scheduled intervention time period (January 2010 – “mid”), immediately following completion of the intervention period (May 2010 – “post”), and four months following the completion of the intervention period (August/September 2010 – “post-post”).

**Table 4.17** Observation Sites by County

County	Town	High School	Rural Highway
<i>Griggs County</i>	1. Cooperstown	1. Griggs County Central High School	1. Highway 200 and 1 N
	2. Hannaford	(Cooperstown)	2. Highway 45 and 65
<i>Ransom County</i>	1. Enderlin	1. Enderlin High School	1. Highway 32 and 77th St
	2. Lisbon	2. Lisbon High School	2. Highway 46 and 132nd St
<i>Sargent County</i>	1. Forman	1. Sargent Central High School (Forman)	1. Highway 13 E
	2. Gwinner	2. North Sargent High School (Gwinner)	2. Mile Marker 16 and 17
		3. Milnor High School	

## 4.2.2 Results

More than 1,200 vehicles were observed in Griggs, Ransom and Sargent Counties in the spring and fall of 2009 (pre-observations), with 745 being observed in the winter of 2010 (mid-observations), 651 observed in spring of 2010 (post-observations), and 658 observed in the fall of 2010 (post-post observations) (Table 4.18). Cars and trucks were the type of vehicle most often observed in these three counties, followed by SUVs and vans. Males comprised most of the vehicle driver observations.

### 4.2.2.1 Overall Seat Belt Use by County

All three counties saw increases in observed seat belt usage from the pre-observations to the post-post observations, with Sargent and Griggs Counties seeing the largest increases (Figure 4.9). Sargent County saw an increase from 36.2% observed usage in the pre-observations to 50.7% in the post-post observations, while Griggs County saw an increase from 42.7% in the pre-observations to 50% in the post-post observations. Ransom County saw a small increase – from 38% in the pre-observations to 40.8% in the post-post observations, which may be related to halo effects from Sargent County.

Sargent County seat belt use was relatively stable in the pre-, mid-, and post-observations, and didn't see a definite increase in usage until the post-post observations (Figure 4.7). A one-way ANOVA was used to test for specific differences in seat belt usage during the different observation times. Tukey HSD comparisons of seat belt usage during the four observation periods indicate that significant differences exist in Sargent County between pre- to post-post- ( $p=0.003$ ), mid- to post-post- ( $p=0.018$ ) and post- to post-post ( $p=0.041$ ) observations (Table 4.19). Ransom County saw a decline in seat belt usage from the pre- to the mid- observations, and then a steady increase from the mid- to the post-observations and from the post- to the post-post observations. Ransom County's increase in usage from the mid-observations to the post-post observations was statistically significant ( $p=0.037$ ). Griggs County had a decline in seat belt use from the pre- to the mid-observations, a statistically significant spike in usage from the mid- to the post-observations ( $p=0.012$ ), followed by a sharp decline in usage from the post- to the post-post observations.

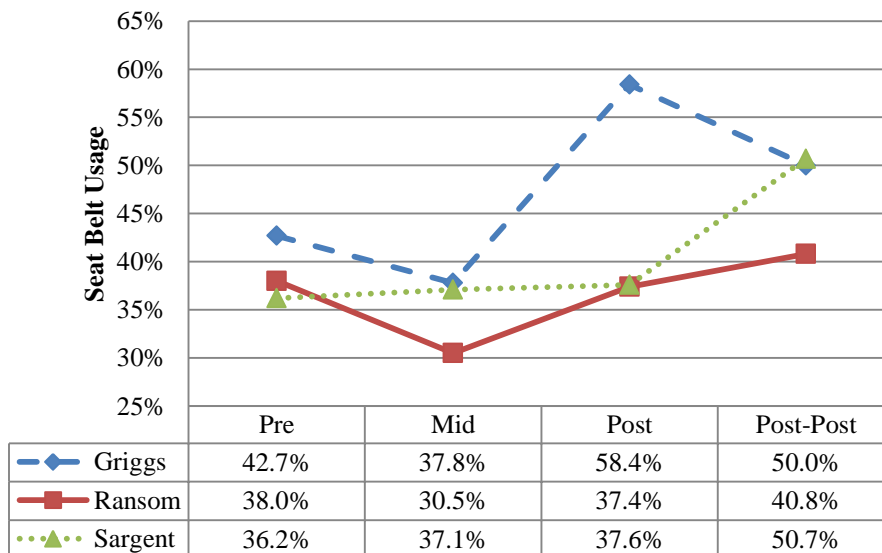


Figure 4.7 Seat Belt Usage by County



**Table 4.18** Observations by County, Vehicle, Gender, and Road Type

		<b>Pre</b>	<b>Mid</b>	<b>Post</b>	<b>Post-Post</b>
<b>Total Observations</b>		<b>1,201</b>	<b>745</b>	<b>651</b>	<b>658</b>
<b>Griggs</b>		372	180	77	152
<b>Ransom</b>		442	341	396	289
<b>Sargent</b>		387	224	178	217
<b>Observations by Vehicle Type</b>					
<b>Griggs</b>	<b>Car</b>	170	69	23	55
	<b>SUV</b>	70	24	11	15
	<b>Truck</b>	119	63	40	69
	<b>Van</b>	13	24	3	13
<b>Ransom</b>	<b>Car</b>	192	164	197	119
	<b>SUV</b>	63	52	49	47
	<b>Truck</b>	156	104	115	99
	<b>Van</b>	31	21	35	24
<b>Sargent</b>	<b>Car</b>	186	102	83	113
	<b>SUV</b>	47	39	22	36
	<b>Truck</b>	129	67	61	53
	<b>Van</b>	25	16	12	15
<b>Observations by Gender</b>					
<b>Griggs</b>	<b>Male</b>	239	112	49	90
	<b>Female</b>	133	68	28	62
<b>Ransom</b>	<b>Male</b>	266	193	238	186
	<b>Female</b>	176	148	158	103
<b>Sargent</b>	<b>Male</b>	246	133	118	143
	<b>Female</b>	141	91	60	74
<b>Observations by Road Type</b>					
<b>Griggs</b>	<b>Rural High School</b>	33	38	NA	32
	<b>Rural Town</b>	223	97	28	63
	<b>Rural Highway</b>	116	45	49	57
<b>Ransom</b>	<b>Rural High School</b>	104	116	115	91
	<b>Rural Town</b>	213	143	200	116
	<b>Rural Highway</b>	125	82	81	82
<b>Sargent</b>	<b>Rural High School</b>	105	93	49	96
	<b>Rural Town</b>	158	75	74	62
	<b>Rural Highway</b>	124	56	55	59

**Table 4.19** Significance of Changes in Seat Belt Use by County

		<i>p</i> -values		
		<i>Pre</i>	<i>Mid</i>	<i>Post</i>
<b>Griggs</b>	<i>Mid</i>	0.686		
	<i>Post</i>	0.055	0.012*	
	<i>Post-Post</i>	0.423	0.113	0.614
<b>Ransom</b>	<i>Mid</i>	0.133		
	<i>Post</i>	0.998	0.214	
	<i>Post-Post</i>	0.866	0.037*	0.790
<b>Sargent</b>	<i>Mid</i>	0.997		
	<i>Post</i>	0.987	0.999	
	<i>Post-Post</i>	0.003*	0.018*	0.041*

\* $p < 0.05$

#### 4.2.2.2 Seat Belt Use by Road Type

By analyzing seat belt use by road type (rural high school, rural highway, and rural town) one may better be able to see where problem areas lie in regards to seat belt use and where the scheduled interventions might have been most/least useful.

Griggs County consistently had the highest seat belt use for rural high schools among the three counties throughout three of the four observation periods (pre - 42%, mid - 42%, and post-post - 56%, respectively) (Table 4.20). However, because of scheduling difficulties during the post-observation period, high school observations were unavailable for Griggs County during this time period. Both Griggs and Sargent Counties saw increases in seat belt use for their rural high schools from the pre- to post-post observation periods, while Ransom County's usage rate remained stable. Sargent County saw significant changes in usage from the pre- to post-post observation period ( $p < 0.001$ ) and post- to post-post-observation period ( $p = 0.001$ ).

All three counties saw increases in seat belt use on the rural highways from the pre- to post-post observation periods (Table 4.20). With the exception of Ransom County which saw a usage rate of 44% during the mid-observation period, all of the counties during all of the observations periods saw highway seat belt usage rate at or above 50%. However, none of the changes in seat belt usage for any of the time periods for any of the counties were statistically significant (Table 4.21).

Rural town seat belt usage rates were at or below rates seen at the high schools (Table 4.20). Rates were inconsistent throughout all four observation periods, with no county seeing a clear trend of increasing or declining seat belt use. However, Griggs County saw a decline in seat belt usage from 36% during the pre-observations to 32% during the post-post observations. Sargent County had an increase in usage from 28% during pre-observations to 39% during post-post observations. Ransom County had a negligible increase from 29% in the pre-observation period to 30% in the post-post observation period. None of the changes in seat belt use were significant with the exception of rural highway usage in Ransom County from mid-observations to post-post observations ( $p = 0.036$ ).

**Table 2.20** Seat Belt Usage by County and Road Type

Survey Scheduling	Rural High School			Rural Highway			Rural Town		
	Griggs	Ransom	Sargent	Griggs	Ransom	Sargent	Griggs	Ransom	Sargent
<i>Pre</i>	42%	33%	22%	55%	58%	59%	36%	29%	28%
<i>Mid</i>	42%	26%	33%	53%	44%	61%	29%	27%	24%
<i>Post</i>	NA	29%	18%	67%	63%	62%	43%	32%	32%
<i>Post-post</i>	56%	33%	48%	67%	65%	68%	32%	30%	39%

**Table 4.21** Significance of Changes in Seat Belt Use by County and Road Type

		p-values								
		High School			Rural Town			Rural Highway		
		<i>Pre</i>	<i>Mid</i>	<i>Post</i>	<i>Pre</i>	<i>Mid</i>	<i>Post</i>	<i>Pre</i>	<i>Mid</i>	<i>Post</i>
<b>Griggs</b>	<i>Mid</i>	1.000			0.570			0.997		
	<i>Post</i>	NA	NA		0.903	0.518		0.466	0.511	
	<i>Post-Post</i>	0.510	0.471	NA	0.907	0.982	0.733	0.471	0.524	1.000
<b>Ransom</b>	<i>Mid</i>	0.688			0.975			0.162		
	<i>Post</i>	0.918	0.966		0.878	0.699		0.915	0.065	
	<i>Post-Post</i>	1.000	0.686	0.911	0.991	0.922	0.986	0.808	0.036*	0.996
<b>Sargent</b>	<i>Mid</i>	0.291			0.932			0.995		
	<i>Post</i>	0.970	0.244		0.892	0.674		0.982	0.999	
	<i>Post-Post</i>	0.000*	0.123	0.001*	0.389	0.241	0.856	0.656	0.865	0.915

\* $p < 0.05$

#### 4.2.2.3 Seat Belt Use by Gender

Examining seat belt usage by gender finds that females consistently had higher seat belt usage for all three counties across all observation periods (Table 4.22). Consistent with the results discussed earlier in this section, no clear trend exists for seat belt increases or declines for either males or females for any of the three counties. Both males and females for all three counties saw usage rates increase from the pre-observation period to the post-post observation period. The change in usage rates for Griggs County females from the mid- to post-post observation periods was statistically significant ( $p=0.038$ ) as was the change in usage for Sargent County males from mid- to post-post ( $p=0.028$ ) and Sargent County females from pre- to post-post ( $p=0.012$ ) (Table 4.23).

**Table 4.22** Seat Belt Use by County and Gender

	Griggs		Ransom		Sargent	
	Male	Female	Male	Female	Male	Female
<i>Pre</i>	37.2%	52.6%	36.1%	40.9%	35.4%	37.6%
<i>Mid</i>	35.7%	41.2%	24.9%	37.8%	30.1%	47.3%
<i>Post</i>	55.1%	64.3%	30.3%	48.1%	34.7%	43.3%
<i>Post-Post</i>	40.0%	64.5%	37.1%	47.6%	46.2%	59.5%

**Table 4.23** Significance of Changes in Seat Belt Use by County and Gender

		<i>p-values</i>					
		Male			Female		
		<i>Pre</i>	<i>Mid</i>	<i>Post</i>	<i>Pre</i>	<i>Mid</i>	<i>Post</i>
<b>Griggs</b>	<i>Mid</i>	0.993			0.407		
	<i>Post</i>	0.091	0.094		0.670	0.162	
	<i>Post-Post</i>	0.968	0.925	0.301	0.402	0.038*	1.000
<b>Ransom</b>	<i>Mid</i>	0.054			0.945		
	<i>Post</i>	0.497	0.632		0.547	0.269	
	<i>Post-Post</i>	0.996	0.053	0.438	0.699	0.419	1.000
<b>Sargent</b>	<i>Mid</i>	0.735			0.466		
	<i>Post</i>	0.999	0.868		0.875	0.964	
	<i>Post-Post</i>	0.142	0.028*	0.224	0.012*	0.392	0.239

\* $p < 0.05$

#### 4.2.2.4 Seat Belt Use by Vehicle Type

Examining seat belt use by vehicle type can be telling as well. Griggs County had across the board increases for all vehicle types between the pre-observation period and the post-post observation period, with the largest increases occurring in SUVs and vans, and the highest usage rates for SUVs and vans (Table 4.24). Ransom County saw increases in seat belt usage rates for cars and vans, but declines for SUVs and trucks, with vans having the highest usage rate. Sargent County also saw increases in seat belt use for all vehicle types from the pre-observation period to the post-post observation period, with vans having the highest usage rate. For all three counties, trucks consistently had the lowest seat belt usage rates with approximately one-third of drivers of pick-up trucks wearing their seat belts.

**Table 4.24** Seat Belt Use by County and Vehicle Type

		<i>Pre</i>	<i>Mid</i>	<i>Post</i>	<i>Post-Post</i>
<b>Griggs</b>	<b>Car</b>	51.8%	47.8%	82.6%	60.0%
	<b>SUV</b>	45.7%	45.8%	63.6%	73.3%
	<b>Truck</b>	27.7%	20.6%	45.0%	33.3%
	<b>Van</b>	46.2%	45.8%	33.3%	69.2%
<b>Ransom</b>	<b>Car</b>	35.9%	39.0%	39.6%	42.0%
	<b>SUV</b>	49.2%	19.2%	38.8%	48.9%
	<b>Truck</b>	33.3%	19.2%	26.1%	30.3%
	<b>Van</b>	51.6%	47.6%	60.0%	62.5%
<b>Sargent</b>	<b>Car</b>	36.6%	37.3%	45.8%	55.8%
	<b>SUV</b>	29.8%	48.7%	31.8%	50.0%
	<b>Truck</b>	33.3%	22.4%	23.0%	34.0%
	<b>Van</b>	60.0%	68.8%	66.7%	73.3%

**Table 4.25** Significance of Changes in Seat Belt Use by County and Vehicle Type

		<i>p-values</i>								
		Griggs			Ransom			Sargent		
		<i>Mid</i>	<i>Post</i>	<i>Post-Post</i>	<i>Mid</i>	<i>Post</i>	<i>Post-Post</i>	<i>Mid</i>	<i>Post</i>	<i>Post-Post</i>
<b>Car</b>	<i>Pre</i>	0.944	0.027*	0.704	0.934	0.882	0.710	0.999	0.484	0.006*
	<i>Mid</i>		0.019*	0.522		1.000	0.957		0.642	0.03*
	<i>Post</i>			0.254			0.710			0.496
<b>SUV</b>	<i>Pre</i>	1.000	0.685	0.214	0.005	0.661	1.000	0.282	0.999	0.246
	<i>Mid</i>		0.760	0.341		0.171	0.012*		0.565	0.999
	<i>Post</i>			0.961			0.725			0.516
<b>Truck</b>	<i>Pre</i>	0.749	0.163	0.848	0.062	0.551	0.952	0.379	0.455	1.000
	<i>Mid</i>		0.042*	0.379		0.669	0.292		1.000	0.508
	<i>Post</i>			0.570			0.902			0.568
<b>Van</b>	<i>Pre</i>	1.000	0.979	0.655	0.992	0.906	0.856	0.942	0.979	0.834
	<i>Mid</i>		0.978	0.543		0.809	0.755		0.999	0.994
	<i>Post</i>			0.689			0.998			0.985

\*p<0.05

**4.2.2.5 Seat Belt Use by Gender and Road Type**

Seat belt use by males and females in Griggs County increased from the pre-observation period to the post-post observation period at area high schools and on the highways. However, there was a decline in usage in rural towns (Table 4.26). Seat belt use by males in Ransom County increased from the pre-observation period to the post-post observation period at area high schools, but remained constant for towns and highways, while females saw increases in towns and highways but decreases at area high schools. Seat belt use by males in Sargent County saw increases for all road types, while females saw increases in towns and highways, but a decline at area high schools. The only changes in usage which were significant were female usage rates at the high school from pre- to post-post (p=0.033) and post- to post-post (p=0.029) (Table 4.27).

**Table 4.26** Seat Belt Use by County, Road Type and Gender

		Male				Female			
		<i>Pre</i>	<i>Mid</i>	<i>Post</i>	<i>Post-post</i>	<i>Pre</i>	<i>Mid</i>	<i>Post</i>	<i>Post-post</i>
<b>Griggs</b>	<b>High School</b>	40%	40%	NA	50%	46%	60%	NA	70%
	<b>Rural Town</b>	31%	26%	45%	22%	46%	33%	38%	44%
	<b>Rural Highway</b>	48%	67%	62%	53%	69%	33%	75%	84%
<b>Ransom</b>	<b>High School</b>	23%	18%	17%	33%	42%	34%	42%	33%
	<b>Rural Town</b>	25%	22%	23%	25%	33%	33%	47%	40%
	<b>Rural Highway</b>	57%	38%	62%	57%	63%	53%	65%	83%
<b>Sargent</b>	<b>High School</b>	17%	26%	16%	43%	61%	43%	21%	55%
	<b>Rural Town</b>	27%	14%	24%	31%	29%	39%	50%	55%
	<b>Rural Highway</b>	57%	56%	58%	64%	63%	70%	75%	79%

**Table 4.27** Significance of Changes in Seat Belt Use by County, Road Type, and Gender

			p-values								
			High School			Rural Town			Rural Highway		
			Pre	Mid	Post	Pre	Mid	Post	Pre	Mid	Post
Griggs	Male	Mid	1.000			0.900			1.000		
		Post	NA	NA		0.575	0.385		0.578	0.714	
		Post-Post	0.798	0.777	NA	0.734	0.982	0.283	0.964	0.982	0.899
	Female	Mid	1.000			0.499			0.998		
		Post	NA	NA		0.970	0.994		0.965	0.955	
		Post-Post	0.513	0.513	NA	0.999	0.763	0.985	0.565	0.682	0.906
Ransom	Male	Mid	0.931			0.939			0.132		
		Post	0.848	0.996		0.970	0.998		0.934	0.069	
		Post-Post	0.640	0.265	0.178	1.000	0.962	0.984	1.000	0.199	0.952
	Female	Mid	0.810			1.000			0.831		
		Post	1.000	0.830		0.254	0.377		0.998	0.760	
		Post-Post	0.822	1.000	0.840	0.870	0.907	0.891	0.415	0.090	0.539
Sargent	Male	Mid	0.654			0.289			0.999		
		Post	1.000	0.758		0.969	0.652		0.999	0.996	
		Post-Post	0.010*	0.203	0.054	0.968	0.248	0.868	0.846	0.854	0.933
	Female	Mid	0.436			0.807			0.952		
		Post	0.952	0.290		0.295	0.828		0.872	0.991	
		Post-Post	0.033*	0.639	0.029*	0.176	0.647	0.986	0.721	0.953	0.997

\* $p < 0.05$

### 4.2.3 Observation Summary

As with the driver survey results, the observation results do not reveal statistically significant effects of any of the interventions for either of the two intervention counties, or changes in seat belt usage which are larger than the control county. The final section of metrics contains county-specific statistics regarding seat belt citations and crash statistics to determine if clear differences exist at this level among the project counties.

## 4.3 Crash/Citation Data

This section will detail the seat belt activity as reported on crash and citation data. As was previously stated, Ransom County opted out of the project, so county level data regarding law enforcement activity specific to cite location (in town, school, outside of town) is not available for this county. Information on crash and citation activities was collected from the North Dakota Department of Transportation.

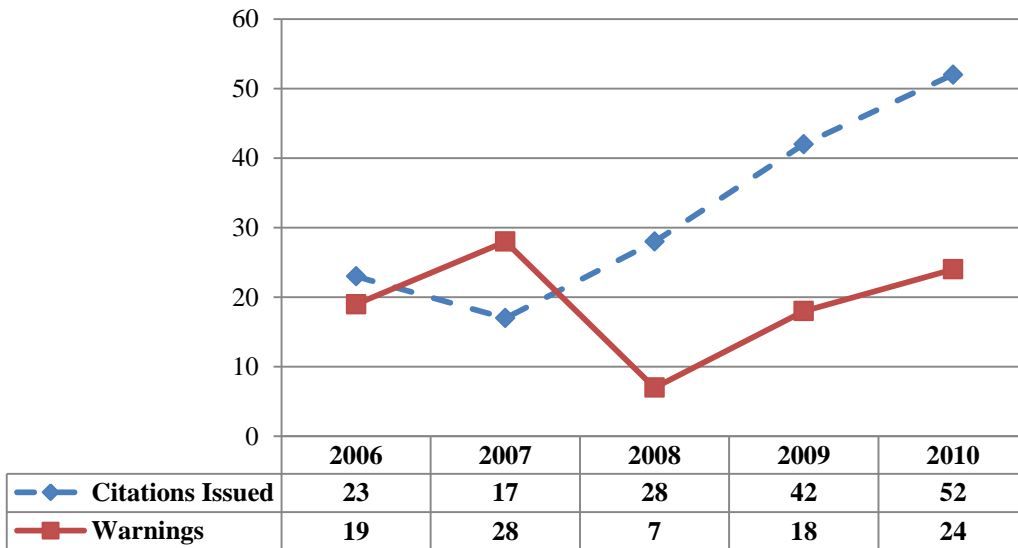
### 4.3.1 Methodology

The Sargent County Sheriff's Department tabulated its seat belt activity, including citations, warnings, and other activity, by month for the duration of the seat belt project (October 2009 through April 2010), and by year for 2006 to 2010. County-level crash data for each of the three counties was also obtained, detailing seat belt use by motor vehicle crash for seven months prior to the project, seat belt use in crashes during the project, and seat belt use in crashes for seven months immediately following the completion of the project. Crash data did not include those crashes where seat belt use was unknown, and included all

crashes, including those that did not result in an injury. In addition, North Dakota driver data was mined to collect county-level information on seat belt violations which occurred during October 2009 through April 2010. Data included citations given by highway patrol, county sheriff, and city law enforcement agencies.

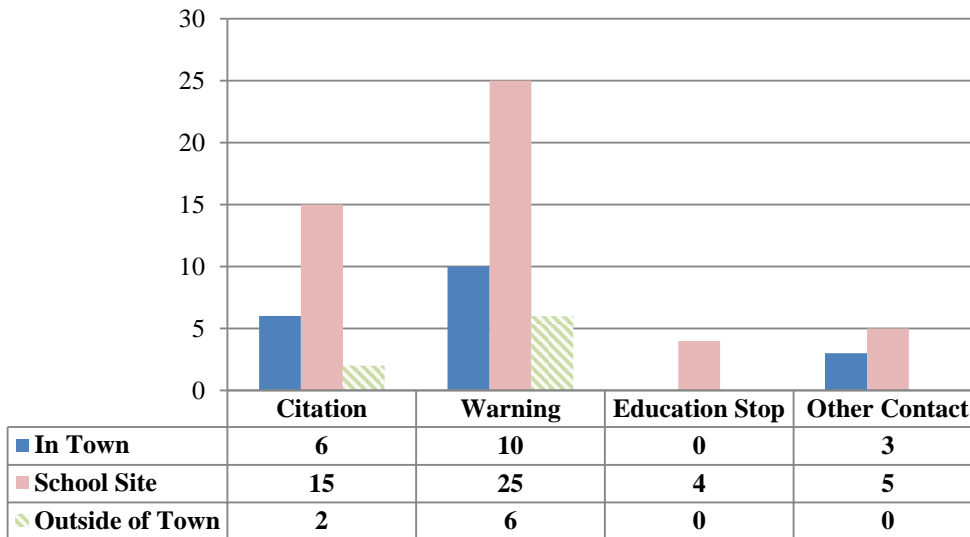
### 4.3.2 Results

Seat belt citations issued by the Sargent County Sheriff’s Department have been increasing annually since 2007 (Figure 4.8). Seat belt warnings have been steadily increasing since 2008, after a sharp dip from 2007 to 2008. It appears the activity was on the increase prior to any enforcement interventions related to this project.



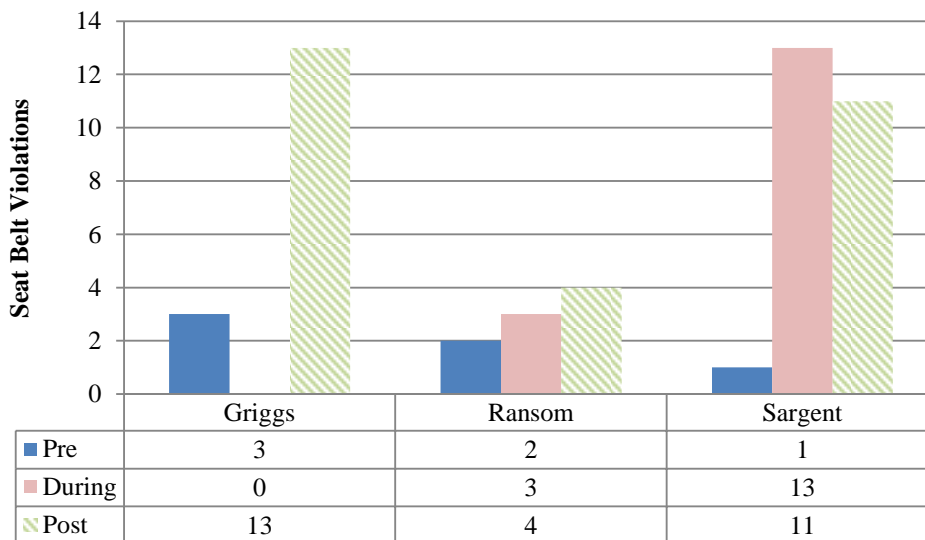
**Figure 4.8** Sargent County Sheriff’s Department Seat Belt Activity: 2006-2010

From October 2009 through April 2010, the Sargent County Sheriff's Department issued 23 seat belt citations, 15 of those near a school site (Figure 4.9). They also gave 41 warnings, 25 of those near a school site and made four education stops – all of those near a school site.



**Figure 4.9** Sargent County Sheriff's Department Seat Belt Activity: October 2009-April 2010

When examining the seat belt citations given by city police or the county sheriff's department for each of the three counties during the project time period, the control county (Griggs) lagged behind Ransom and Sargent Counties (Figure 4.10). However, during the post period, Griggs County had more seat belt citations than either of the intervention counties. Note that seat belt violations issued during mobilization events in May/June in Sargent County for 2009 and 2010 were excluded from the analysis – which included 24 violations in May 2009 and 26 violations in June 2010.

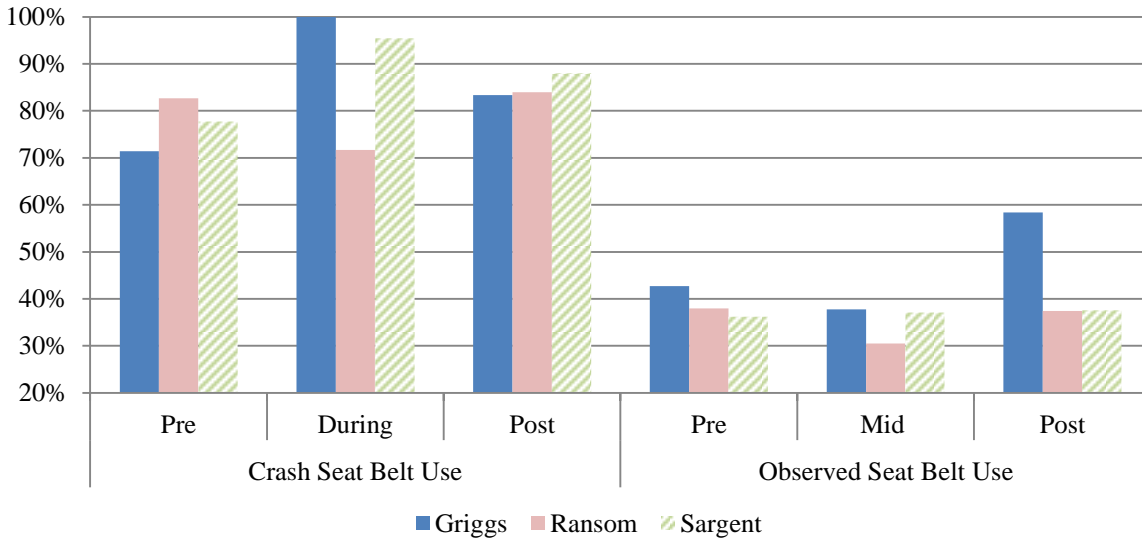


**Figure 4.10** Seat Belt Violations by County

*Pre: February 2009 through September 2009; During: October 2009 through April 2010; Post: May 2010 through November 2010; Source: North Dakota Department of Transportation, 2011a.*



Generally seat belt use for the North Dakota crash data is self-reported, except for the most serious incapacitating injuries where the occupants are unable to exit the vehicle unassisted. This is made apparent in Figure 4.11, where seat belt use in motor vehicle crashes is significantly higher than observed seat belt use for all counties.



**Figure 4.11** Motor Vehicle Crash Seat Belt Use versus Observed Seat Belt Use

*Pre: February 2009 through September 2009; During: October 2009 through April 2010; Post: May 2010 through November 2010*

*Source: North Dakota Department of Transportation, 2011b.*



## 5. CONCLUSION

The overall goal of this project was to measure effectiveness for alternative levels of intervention designed to increase awareness and safety on rural roads in a targeted corridor. A multi-county case study was designed to include sustained and multifaceted safety interventions. Two North Dakota counties (Sargent and Ransom Counties) volunteered to take part in a designated Traffic Safety Corridor, with another county beyond the corridor monitored as a control case (Griggs County). Sargent County was selected as the increased enforcement county, while Ransom County was chosen as the education/enforcement county. Ultimately, Ransom County opted out of the enforcement piece of the intervention, and participated partly in the education portion of the project. The research outlined in this report was intended to contribute to the understanding of local effectiveness for alternative levels of safety intervention.

Results of the driver survey indicated a small increase in self-reported seat belt use in the two intervention counties following project interventions, and a small decline in self-reported seat belt use in the control county; however none of the changes seen in the three counties were statistically significant. Seat belt observations conducted in each of the counties found that the greatest increase in seat belt use occurred in Griggs County, where no interventions were being conducted, while Ransom and Sargent Counties saw small overall increases in seat belt use from the pre-intervention observations to the post-post observations. Note that the changes in seat belt use from pre-intervention to post-post intervention were significant only in Sargent County. Crash/citation data revealed little more than seat belt violations were being committed in the three counties, but with little difference in the actual numbers of citations given among the counties, in addition to self-reported seat belt use being much higher than the actual observed use in all counties, results of this analysis were inconclusive.

Overall, results of this research indicate that the project interventions that were implemented had little effect on overall seat belt use of the intervention counties. However, project limitations may have precluded any effects that may have occurred if the methodologies were implemented as outlined. One significant limitation of this research was the lack of unanimous buy-in from the project stakeholders. It is imperative to receive cooperation from all county stakeholders prior to conducting any of the interventions. Additionally, compiling a list of educational activities prior to the initial project meeting, from which the education/enforcement stakeholders would choose the most appropriate to be conducted in their respective county would be beneficial. This would allow the participants to become aware of the requirements of the project, and the time commitment from them that would be necessary for successful completion of the project. Future research conducted in this area should take heed of these project weaknesses.



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**APPENDIX A. WASHINGTON STATE CORRIDOR SAFETY  
PROGRAM BROCHURE**

**For More Information**

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ringj@wsdot.wa.gov



**Web Site**

[www.wsdot.wa.gov/TA/AboutUs/](http://www.wsdot.wa.gov/TA/AboutUs/)  
[www.wa.gov/wtsc/programs/corridor.htm](http://www.wa.gov/wtsc/programs/corridor.htm)

**Program History/Results**

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**State Route Projects Engineering**

Traffic Office  
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**Enforcement/Education**

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Washington Traffic Safety Commission  
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# Corridor Safety Program

July 2008

The goal of the Corridor Safety Program is to reduce fatalities and serious injuries in Washington State. The program is a joint effort between the Washington State Department of Transportation and the Washington Traffic Safety Commission. Many partner agencies are also involved, including the Washington State Patrol, county public works and sheriff's offices, and city public works and police departments. The Corridor Safety Program works to reduce collisions on roadways using low-cost, near-term solutions through the

use of partnerships with engineering, enforcement, education, and emergency services. The program is locally coordinated in each community. This local coordination includes providing local leadership to chair meetings of the steering committee. It also requires local involvement including local agency governments, interested citizens, businesses, schools, and any other agencies that have a vested interest in the safety of their roadways.



Colville, 1998



Lake Stevens, 2000



Vancouver, 2005

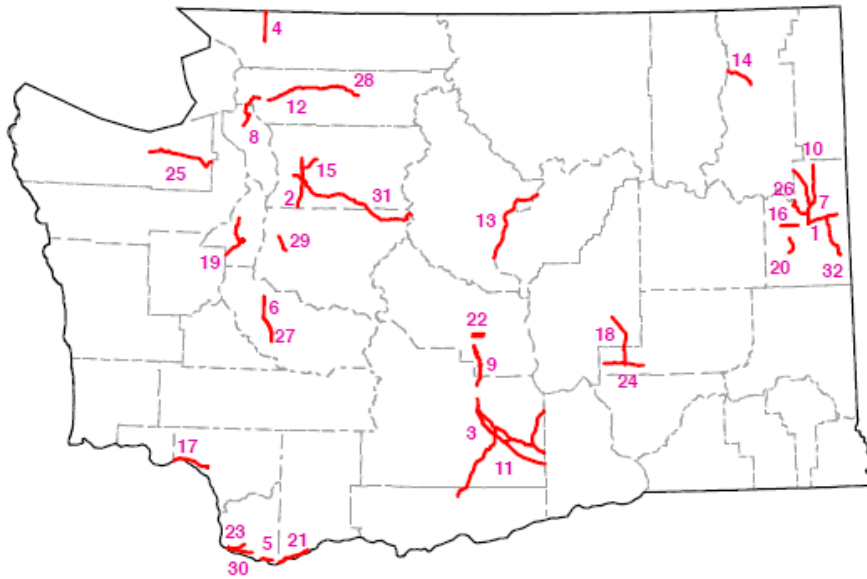


Moses Lake, 2002

0706-0278



### Corridor Safety Program Project Locations 1991-2008



- |                           |                               |                         |
|---------------------------|-------------------------------|-------------------------|
| 1. East Trent             | 12. Burlington/Sedro Woolley  | 23. Fourth Plain        |
| 2. Snohomish County       | 13. 97A                       | 24. Othello             |
| 3. US 97                  | 14. Columbia Gateway          | 25. Driving 101         |
| 4. Guide Meridian         | 15. Lake Stevens              | 26. Francis to 9 Mile   |
| 5. SR 14                  | 16. Airway Heights            | 27. Mountain Highway 2  |
| 6. Mountain Highway       | 17. SR 4                      | 28. Upper Skagit Valley |
| 7. D-Zone                 | 18. Moses Lake                | 29. Rainier Ave S       |
| 8. Island/Skagit Counties | 19. Cross-Kitsap              | 30. Mill Plain          |
| 9. Yakima River Canyon    | 20. Memorial Highway          | 31. US 2                |
| 10. Y-Zone                | 21. Cape Horn                 | 32. Spokane Valley      |
| 11. Lower Yakima Valley   | 22. Kittitas/Vantage Highways |                         |

The Corridor Safety Program began in 1991 on state routes in Washington. In 2003 the program expanded to include projects on city streets and county roads.

Above is a map showing project locations around the state since the program began, from the earliest (# 1) to the most recent (# 32).

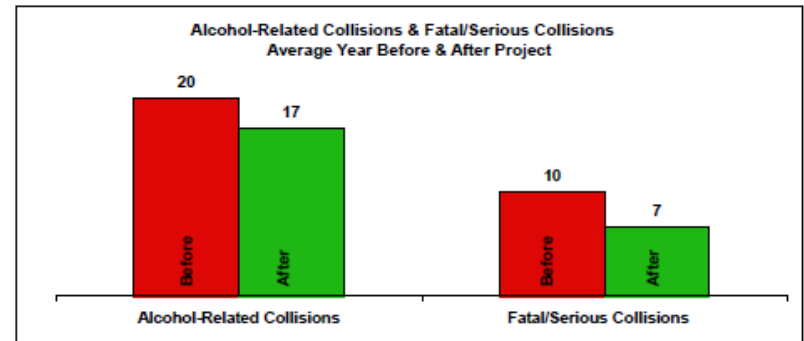
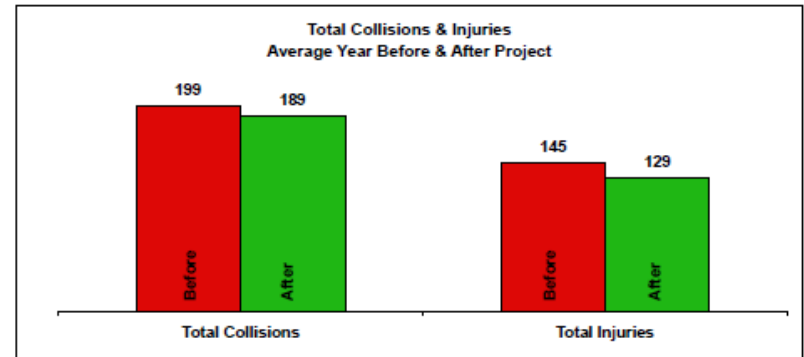
### Corridor Timeline

- Roadway with significant crash history is identified and community leadership and support for a project is found
- Collect/prepare collision data and organize/advertise initial meeting (1-3 months)
- Initial meeting to review Corridor process and examine collision history, followed by decision from community on whether to move forward with a project
- Action Plan development – first involves problem identification then is followed by development of solutions (6-12 months)
- Public kickoff
- Active work on project: engineering, enforcement, education, emergency services (18-24 months)
- Project completion (measure results)

### Results

The Corridor Safety Program has been successful at increasing road safety in addition to building community relationships. In 28 completed corridors around the state (measuring the average of 3 years before a project versus 2 years after a project) the collision reductions below have been measured. In comparison, statewide crash information for 2001 to 2007 is shown in parentheses. Note that this time period for a statewide comparison (2001 compared to 2007) was chosen due to the fact that these are the earliest and latest years available with complete statewide crash information for all public roads.

- Total collisions are down 5% (statewide up 1%).
- Total injuries are down 11% (statewide down 12%).
- Alcohol-related collisions are down 15% (statewide up 6%).
- Fatal and serious injury collisions are down 34% (statewide down 17%).
- Costs to society (based on collisions) have dropped from \$16.0 million per year to \$11.8 million per year, a savings of over \$4 million per year per project.





## **APPENDIX B. SEAT BELT OBSERVATION SHEET**

# Seat Belt Survey Form

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

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

Date \_\_\_\_\_

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

County: \_\_\_\_\_

Site ID Number: \_\_\_\_\_

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

Site Location Description:  
\_\_\_\_\_

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

**APPENDIX C. SEAT BELT OBSERVATION TRAINING GUIDE**

# SEAT BELT OBSERVATION TRAINING GUIDE

---

## Purpose

The purpose of this training guide is to outline procedures recommended for conducting rural seat belt observations in North Dakota.

## Site Selection

- Please observe at 1-2 sites WITHIN towns and 3-4 sites OUTSIDE of towns. This will result in 4-6 total observation sites.
- Select sites which are a minimum of 20 miles away from any interstate (I-29, I-94).

## Collection Form

Observers will document seat belt use of drivers and front seat **outboard** passengers on a seat belt survey form. A sample form is found in Appendix A. Helmet use is recorded for motorcycle drivers and passengers on the same form.

- On each form observers will record the date, county, observer name, page number, start time, end time, site location description, vehicle type, driver gender, driver protection, passenger gender, and passenger protection.
- Eligible vehicles include cars, pickup trucks, SUVs (including crossover vehicles), vans, and motorcycles.

**DO NOT count large trucks (semi or large box trucks), commercial vehicles (taxi cabs, delivery vans, city vehicles), emergency vehicles (police/fire vehicles), or RVs/motor homes.**

- Children riding in the front seat (NOT in a child car seat) are counted the same as other front seat passengers.
- Your observations should include all eligible vehicles regardless of state of origin, i.e. count both in-state and out-of-state vehicles.

### QUICK REFERENCE

- *Eligible vehicles include:*
  - *Cars*
  - *Pickups*
  - *SUVs (including crossover vehicles)*
  - *Vans*
  - *Motorcycles (helmet use)*

## Time

- Observers will observe between 7am and 7pm.

## Observation Methods

Observers will record seat belt use for eligible occupants in cars, pickups, SUVs, and vans, as well as helmet use for motorcycle occupants. Eligible occupants are the driver of the vehicle and the outboard front seat passenger. (Example: If there are three passengers in the front seat of the vehicle, only count the driver and outermost passenger.)

- Observers will be supplied with observation forms, and site descriptions from the previous year.
- There will be 1 observer per site. If traffic is too heavy to observe all vehicles, stop/catch up, and resume recording seat belt observations as soon as possible; waiting no longer than 1 minute to resume.
- Position vehicle so observations can be conducted safely and without distraction to other vehicle drivers. Where possible, observers should remain in their vehicles to record seat belt use. If it is not possible to observe from a vehicle vantage point, the observer may leave the vehicle but must remain off the roadside.
- **Each observer will observe for a minimum of 30 minutes. If a minimum of 30 observations cannot be recorded in 30 minutes, the observer will continue observing up to an hour. If 30 observations still cannot be recorded after an hour of observing, the observation should be considered complete.**
- Do not record observations of vehicles with windows that are excessively tinted because accuracy may be compromised.
- Only properly worn seat belts are recorded as using protection. Incorrect seat belt use is recorded as no seat belt (Example: shoulder strap under arm, behind the back, lap belt only).
- If observations at a site are terminated due to inclement weather or observer safety issues etc., record the time and reason that observations halted, and move to an alternate location.

### QUICK REFERENCE

- *Observers must attempt to record all vehicles they view. If observers cannot determine SB use, the vehicle must still be recorded on the observation survey form. If traffic is too busy to record all vehicles, observers should stop to catch up then resume as soon as possible, waiting no longer than 1 minute to continue. Once an observer's eyes are locked on a vehicle, a count of that vehicle must be recorded.*

## Safety

Safety of the observers and vehicle occupants is paramount in conducting the seat belt use survey.

- Observations can be made from the observer's vehicle. To ensure the safety of the observers and other vehicle occupants, observers' vehicles must not hinder traffic flow. Park off the road away from the pavement's edge.
- When observations from inside a vehicle are not possible, observers should ensure they do not stand on the roadway when recording seat belt use. Always practice safety when crossing roads.
- Observers must not distract drivers of vehicles they are observing.
- When in their vehicle, observers must always wear seat belts.
- Observers must stay alert at all times. Do not work while under the influence of alcohol, drugs, or prescription medications.
- Dress appropriately for the weather.
- Do not bring children or pets with you to the observation sites.

## Conclusion

Dress for the work. A hat, sunscreen and sun glasses are essential.

Be thoroughly familiar with all the procedures in this manual. Accurate information is of paramount importance.

Each observer is ultimately responsible for his/her work, as well as safety. Remember, observation requires that are within close proximity to traffic. Stay alert and be ready to react.

Any questions or concerns should be reported to Andrea Huseh: 701-231-6427.



**APPENDIX D. COUNTY COVER LETTER/SURVEY**



December 14, 2010

Dear Griggs County Resident,

Safe Communities of North Dakota in conjunction with the Upper Great Plains Transportation Institute at NDSU are conducting a study of the driving habits and attitudes of people in your county. We are inviting you to participate in this research project. Enclosed with this letter is a brief survey that asks a variety of questions regarding your driving habits and seat belt use. The purpose of this survey is to determine the effects of seat belt enforcement and education activities on seat belt use, driving habits, and traffic safety attitudes. We are asking you to look over the survey and, if you choose to do so, complete it and return it in the enclosed postage paid envelope no later than November 25, 2009. Please do not include your name or address on the return envelope or the survey.

Your participation is completely voluntary and because no identifying information is being collected, your identification will remain anonymous.

We hope you will take a few minutes to complete this survey. There are no risks to you or to your privacy if you decide to participate in this study by completing the enclosed survey. You are not required to participate. However, your participation in this survey will aid in making decisions about seat belt enforcement and education programs.

If you have any questions or concerns about the survey or about participating in this study, feel free to contact Andrea Huseth at (701) 231-6427 or at [andrea.huseth-zosel@ndsu.edu](mailto:andrea.huseth-zosel@ndsu.edu). If you have any questions about your rights as a research subject or if you would like to file a complaint regarding this research, you may contact the NDSU Human Research Protection Program at (701) 231-8908, [ndsu.irb@ndsu.edu](mailto:ndsu.irb@ndsu.edu), or NDSU HRPP Office, NDSU Dept. 4000, PO Box 6050, Fargo, ND 58108-6050. The role of the IRB is to see that your rights are protected in this research; more information about your rights can be found at: [www.ndsu.edu/research/irb](http://www.ndsu.edu/research/irb). This project is funded by the Mountain-Plains Consortium through a grant from the U.S. Department of Transportation. NDSU leads a group of five universities involved in the transportation research consortium.

Sincerely,

Two handwritten signatures in black ink. The first signature is "Kasey" and the second is "Jennifer Mauch".

Kasey Skalicky and Jennifer Mauch  
Safe Communities of North Dakota

A handwritten signature in black ink that reads "Andrea Huseth".

Andrea Huseth  
Upper Great Plains  
Transportation Institute

NDSU Dept. 2880  
P.O. Box 6050  
Fargo, ND 58108-6050  
Tel: 701.231.7767  
[www.ugpti.org](http://www.ugpti.org)

**Driver's Seat Belt Use Survey: November 2009**  
**You must be at least 18 years old to complete this survey.**

1. Do you have a valid driver's license?

- Yes – IF YES, please continue to question #2.  No – IF NO, please continue to question #6.

2. Which of the following best describes how often you drive (a motor vehicle)?

- Most days/all days  Few days a week  Few days a month  Few days a year  Do Not Know/Refuse

3. What type of vehicle do you drive most often?

- Car  Pick-Up  SUV  Van  Other  Do Not Know/Refuse

4. Which of the following best describes how often you wear your seat belt when driving?

- Never  Rarely  Sometimes  Most of the time  Always

5. In the last 2 months, has your seat belt use:

- Increased  Decreased  Stayed the same  Do Not Know/Refuse

6. In the last 2 months, have you seen, heard, or read anything about seat belt enforcement?

- Yes  No - IF NO, continue to question #7  Do Not Know/Refuse – IF DNK/REF, continue to question #7



IF YES, where did the information about seat belt enforcement come from? (please mark all that apply)

- Local Paper  TV  Radio  Other \_\_\_\_\_  Do Not Know/Refuse

IF YES, how effective will the seat belt enforcement information you were exposed to be at increasing seat belt use?

- Very Effective  Somewhat Effective  Somewhat Ineffective  Very Ineffective  
 Do Not Know/Refuse

7. Have you ever been ticketed for not wearing your seat belt?  Yes  No  Do Not Know/Refuse

8. In your opinion, how likely is it you will get a ticket if you don't wear your seat belt?

- Very Likely  Somewhat Likely  Somewhat Unlikely  Very Unlikely  Do Not Know/Refuse

9. Where do you do most of your driving?

- Small town  Rural Highway/County Road  Larger City  Interstate  Do Not Know/Refuse

10. How many miles have you driven in the past year?

- Less than 5,000 miles  5,000 to 10,000 miles  10,001 to 15,000 miles  More than 15,000 miles  
 Do Not Know/Refuse

11. What is your age?

- 18 to 24  25 to 34  35 to 44  45 to 54  55 to 64  65 to 74  75 or older

12. What is your gender?

- Male  Female

**Thank you for your response!**

**Please return your completed survey in the envelope that was provided to you.**

North Dakota State University does not discriminate on the basis of race, color, national origin, religion, sex, disability, age, Vietnam Era Veteran's status, sexual orientation, marital status, or public assistance status. Discrimination in the Workplace: 2025-2026. 725.01A.0605. Form ND-2025-0221-2210-2204.



**APPENDIX E. PORCH LIGHTS ON FOR SEAT BELT USE  
ADVERTISEMENT**



Porch Lights  
**ON**  
for Seat Belt Use

Help us bring seat belt use  
into the LIGHT in Ransom  
County by turning on your  
PORCH LIGHT

Wednesday, March 31, 2010  
after 6:00 PM

sponsored by AAA of North Dakota