North Dakota Statewide Traffic Safety Survey, 2011

Traffic Safety Performance Measures for States and Federal Agencies

Prepared for

Traffic Safety Office, Safety Division
North Dakota Department of Transportation

Prepared by

Kimberly Vachal, PhD
Laurel Benson, Research Project Specialist
Andrew Kubas, B.A.

Upper Great Plains Transportation Institute
North Dakota State University, Fargo

August 2011

Disclaimer

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

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

The United States lags behind many other industrialized nations in its ability to ensure safety on public roadways as illustrated in Figure 1.1 (World Health Organization 2009). While progress has been made in reducing traffic deaths, the continued epidemic of preventable deaths and injuries related to factors such as impaired driving and a lack of seat belt use shows that more work is needed. A critical asset in monitoring and communicating traffic safety priorities is a reliable and comprehensive means to set and measure goals in this effort (Government Accounting Office 2010). In a national initiative to improve transparency and quantify metrics for behavior-based investments designed to reduce motor vehicle crashes, the Governor's Highway Safety Association (GHSA) and National Highway Traffic Safety Administration (NHTSA) devised a set of performance measures aimed to elucidate traffic safety priorities and progress related to behavioral safety plans and programs (NHTSA 2008).

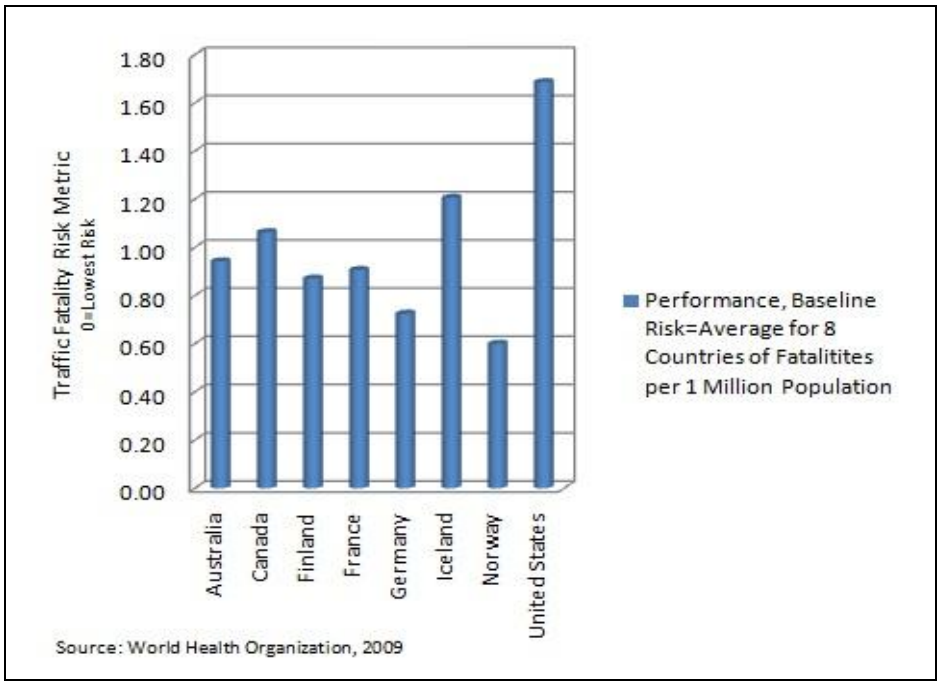

Figure 1.1 International Traffic Fatality Risk for Selected Countries

Within this GHSA-NHTSA effort, 14 measures were agreed upon as *Minimum Performance Measures (MPM)*. These included ten outcome, three activity, and one behavior measure-types. The MPM are designed to create a quantitative core for developing and implementing highway safety plans and programs. Several uses offered for the MPM include: goal setting, goal-action linkages, resource allocation, program evaluation, and communication. Other benefits may be found in improvements to organizational focus, feedback processes, and accountability (FHWA 2009). The measures were defined to monitor overall traffic safety performance, as well as progress related to specific priority behavior issues including occupant protection, alcohol use, speeding, and targeting high-risk population groups. The 10 outcome measures highlight:

- Overall traffic safety performance
- Seat belt use
- Child occupants
- Alcohol-impaired driving
- Speeding and aggressive driving

- Motorcyclists
- Young drivers
- Older drivers
- Pedestrians
- Bicyclists

These 10 core outcome measures combine current exposure data, such as population and vehicle miles traveled (VMT), with the existing national Fatal Crash Reporting System(FARS) to devise performance measures in areas common to state safety plans and data systems. Activity measures focus on actions – such as citations and arrests under grant-funded enforcement initiatives. Seat belt observation was selected as the single initial core behavior measure (NHTSA 2008). The measures used in the outcome highlights are generally calculated as follows:

- Core outcome measures
  - C-1) Number of traffic fatalities (FARS). States are encouraged to report 3-year or 5-year moving averages as appropriate (when annual counts are sufficiently small that random fluctuations may obscure trends). This comment applies to all fatality measures.
  - C-2) Number of serious injuries in traffic crashes (state crash data files).
  - C-3) Fatalities/VMT (FARS, FHWA). States should set a goal for total fatalities/VMT; states should report both rural and urban fatalities/VMT as well as total fatalities/VMT.
  - C-4) Number of unrestrained passenger vehicle occupant fatalities, all seat positions (FARS).
  - C-5) Number of fatalities in crashes involving a driver or motorcycle operator with a BAC of .08 and above (FARS).
  - C-6) Number of speeding-related fatalities (FARS).
  - C-7) Number of motorcyclist fatalities (FARS).
  - C-8) Number of unhelmeted motorcyclist fatalities (FARS).
  - C-9) Number of drivers age 20 or younger involved in fatal crashes (FARS).
  - C-10) Number of pedestrian fatalities (FARS).

- Core behavior measure
  - B-1) Observed seat belt use for passenger vehicles, front seat outboard occupants (survey).

- Activity measures
  - A-1) Number of seat belt citations issued during grant-funded enforcement activities (grant activity reporting).
  - A-2) Number of impaired driving arrests made during grant-funded enforcement activities (grant activity reporting).
  - A-3) Number of speeding citations issued during grant-funded enforcement activities (grant activity reporting).

The MPM publication also included four additional areas for measuring improvement and implementation. These areas included traffic injury outcome; driver attitudes/awareness and behavior; traffic speed; and law enforcement activity. The survey conducted here fulfills the need for improved measurement of driver attitudes/awareness and behavior. A core question set recommendation was developed by a GHSA-NHTSA working group and presented to state DOTs subsequent to the MPM initial recommendations (Hedlund et. al 2009).

The set of 10 core questions was designed to measure attitude/awareness and self-reported behavior trends through periodic statewide traffic safety surveys. It was envisioned that this recommended core will provide the standard for states in tracking performance, not in comparing states or locales, as they pursue program goals to reduce crash injury and death related to high-risk driver behaviors. The core questions will remain consistent while an option to supplement with other questions provides latitude to address additional local interests and solicit other useful information related to topics such as demographics and driving activity.

Currently, federal initiatives in the driver behavior arena focus heavily on impaired driving, seat belt use, and speeding. Thus, the core questions focus on these issues (Hedlund et. al 2009). The core questions within the respective focus areas are:

- Impaired Driving
  - ID-1: In the past 60 days, how many times have you driven a motor vehicle within 2 hours after drinking alcoholic beverages?
  - ID-2: In the past 30 days, have you read, seen or heard anything about alcohol impaired driving (or drunk driving) enforcement by police?
  - ID-3: What do you think the chances are of someone getting arrested if they drive after drinking?

- Safety Belts
  - SB-1: How often do you use safety belts when you drive or ride in a car, van, sport utility vehicle or pick up?
  - SB-2: In the past 60 days, have you read, seen or heard anything about seat belt law enforcement by police?
  - SB-3: What do you think the chances are of getting a ticket if you don't wear your safety belt?

- Speeding
  - SP-1a. On a local road with a speed limit of 30 mph, how often do you drive faster than 35 mph?
  - SP-1b. On a road with a speed limit of 65 mph, how often do you drive faster than 70 mph?
  - SP-2: In the past 30 days, have you read, seen or heard anything about speed enforcement by police?, and
  - SP-3: What do you think the chances are of getting a ticket if you drive over the speed limit?

These questions have been incorporated into the 'ND Driver Survey' that was developed in cooperation with the North Dakota Department of Transportation Traffic Safety Office (TSO) (Appendix A). The TSO expanded the survey to gather additional information pertinent to its goals and responsibilities.

The annual Highway Safety Plan (HSP) offers insight for current priorities and activities (NDDOT 2010). The most recent HSP offers goals related to the overall traffic safety mission, along with specific issues including police training, emergency medical services, traffic records, occupant protection, motorcycle safety, speed management, seat belt use, alcohol-impairment, high-risk drivers, community traffic safety projects, and distracted driving. Metrics are included to indicate progress on the overall safety mission, in light of traffic fatalities and serious injuries. The single core behavior measure shows observed seat belt use at 81.5%. Results here will enhance understanding of behavior by providing more robust coverage, expanded issues, and an increased number of measures.

2. METHOD

A mail survey was selected as the method for the driver traffic safety survey. A draft survey was designed by blending the 10 core questions with additional NDDOT designated questions related to education, policy, and enforcement. The questions were developed based on a review of literature, including previous surveys of this type, and guidelines offered by the GHSA-NHTSA working group. The mailing to drivers included a TSO cover letter which invited driver participation and explained the survey goals. The survey was mailed to drivers on March 1, 2011, and was open to response until March 31, 2011.

State DOT driver registration records provided the population for the sampling. Initially, the North Dakota Department of Transportation mail list consisted of 7,140 driver addresses. Prior to mailing, 132 were removed from the list because of invalid addresses. Thus, 7,008 surveys were mailed. Of these, 279 were flagged as "problem" addresses that may not reach their final destination. Furthermore, of the 7,008 initially mailed, 6,515 were verified as North Dakota addresses and 493 were discovered to be directed to out-of-state addresses. It is unknown how many of the 279 "problem" addresses were in-state and how many were out-of-state. Of the useable survey responses received, 1,433 were verified as North Dakota responses and form the valid driver response sample used in the analysis.

The sample size was based on a 95% confidence level, with a 5% confidence interval. The expected response was estimated at 20%. Although mail survey response is typically low, with 10% not uncommon, a slightly better response rate was expected because of the parameters used in the survey design and administration. These parameters included keeping the survey to a single page, including the state agency cover letter, using state agency mail envelopes, and offering "Do Not Know/Refuse to Answer" options in the survey responses.

A disproportionate stratified random survey sample was used to select drivers. The North Dakota driver population was stratified by region (east/west) and geography (rural/urban). County jurisdictional boundaries were used to define both region and geography (Figure 2.1). In addition, oversampling was conducted for a target driver group of 18 to 34 year-old male drivers.

The regional geography was defined by aggregating ND health regions into two regions that most closely represented an east/west delineation of the state. The urban geography includes the largest urban population counties according to the rural and urban population figures in the most recently published U.S. Census data. Four urban counties are located in the east and five in the west, as indicated by the population density geography definitions used in the study. The nine counties represent 93% of the urban population in the state. The sampling probabilities for the survey are shown in Table 2.1.

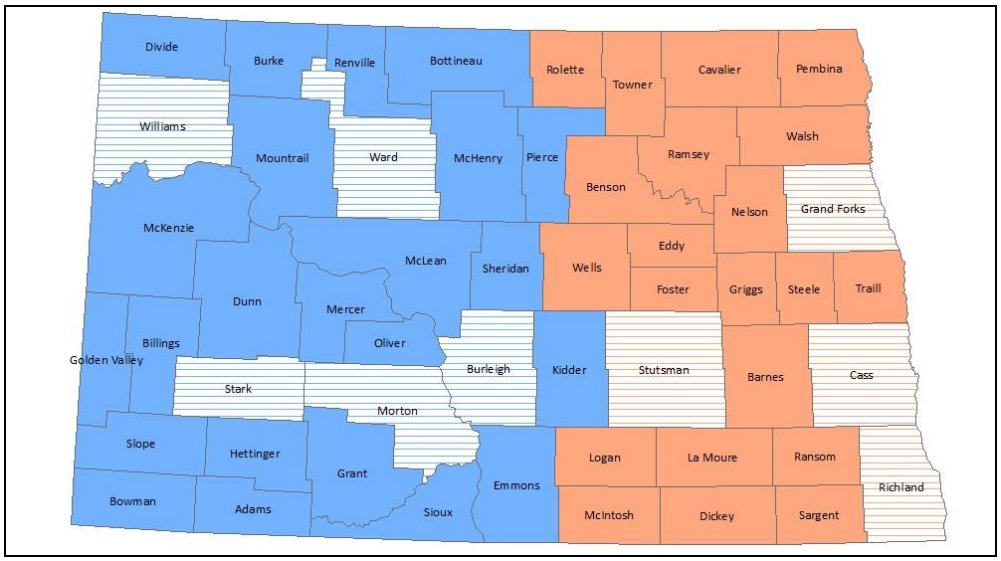

Figure 2.1 County Stratification

Table 2.1 Sampling Probabilities

Region	Geography: Size & Census Designation	Driver Age/Sex	Sampling Probability
East	Urban	18-34M	0.034
East	Urban	Other	0.006
East	Rural	18-34M	0.072
East	Rural	Other	0.012
West	Urban	18-34M	0.039
West	Urban	Other	0.007
West	Rural	18-34M	0.104
West	Rural	Other	0.018

A disproportionate stratified sampling structure was used to elicit sufficient driver participation to allow robust analysis of responses by region, geography, and a target driver group. Using these simple average responses, however, would provide skewed results in representing the state driver population. For instance, drivers age 35 to 44 were 22.9% of the survey sample and account for 25.9% of the survey responses; however, they account for only 14.6% of the driver population in the state. Therefore, the post-stratification weighting process is used to give an appropriate weight to responses for statewide estimates. Results from post-stratification weighting reflect the views, perceptions, and behaviors of the statewide driving population. Note that questions which have 30 or fewer responses are not considered large enough to be extrapolated to the entire population. These instances are indicated with asterisks throughout the analysis.

3. RESPONSE

Survey response rate was 20.4%, with 1,433 valid responses received from the sample mailing to 7,008 drivers. As expected, oversampling of the 18-34 male driver target group was needed to achieve a sample sufficient for statistical analysis. The target group response was 6.5% compared to 35.4% for other drivers. Sampling to elicit response by region and geography was moderately successful as shown in Table 3.1. The responses include an acceptable level of participation with nearly 1,000 responses from the east and urban locations. Responses from the west and rural locations were significantly smaller with 390 and 430 responses, respectively.

Table 3.1 Survey Response by Region and Geography

	Geography		
Region	Rural	Urban	Total
	# Responses (share)		
East	217 (16.0%)	749 (55.24%)	966 (71.24%)
West	213 (15.71%)	177 (13.05%)	390 (28.76%)
Total	430 (31.71%)	926 (68.29%)	1,356

Frequency Missing = 77

The sample design did not account for age or gender beyond the target males. Unlike 2010, responses have an unacceptable distribution among age groups but an acceptable distribution among gender (Table 3.2). This pattern appears to be related to changes in the sampling process. The issue will be addressed for sampling in 2012. The highest share of responses is among drivers 34 to 55 years, with lower responses among the older driver groups. Drivers age 65-74 and 75 and older only had a share of 3.9% and 0.1% of the survey, respectively. Because the response rate was so low, individuals over the age of 75 were collapsed into the 65 to 74 year age group. Therefore, only five age categories were used for the analysis: age 18-34, 35-44, 45-54, 55-64, and 65 and older. Gender response for drivers over age 34 is 56.8% female and 43.2% male. While statewide driver population reflects an equal 50.0% share of male and female drivers (NDDOT 2010), the number of responses based on gender provide sufficient data to expand these responses to represent the population. Sufficient data was also collected to represent the driver population under the age of 65, but was insufficient for the over 65 age group.

Table 3.2 Response by Age Group

	Survey		Population*	
Age Group	Responses	Share	Drivers	Share
18 to 34	426	30.8%	145,661	30.3%
35 to 44	357	25.9%	70,117	14.6%
45 to 54	302	21.9%	90,674	18.9%
55 to 64	240	17.4%	76,067	15.8%
65 to 74	54	3.9%	43,359	9.0%
75 and Older	2	0.1%	38,187	8.0%

Frequency Missing = 52
*Source: NDDOT 2009

Information regarding drivers' annual travel provides background for understanding exposure in terms of travel time. The expected declining trend in driving activity as drivers age is evident to an extent in the average annual miles traveled summarized in Figure 3.1. A majority of drivers in the 35-44, 45-54, and 65+ age groups report driving more than 10,000 miles per year. Responses show 57.6% and 61.5% of 18-34 year olds and 55-64 year olds, respectively, report driving less than 10,000 miles per year. About one quarter of drivers age 45-54 travel more than 15,000 miles annually. About one in ten drivers age 55-64 reported driving more than 15,000 miles per year.

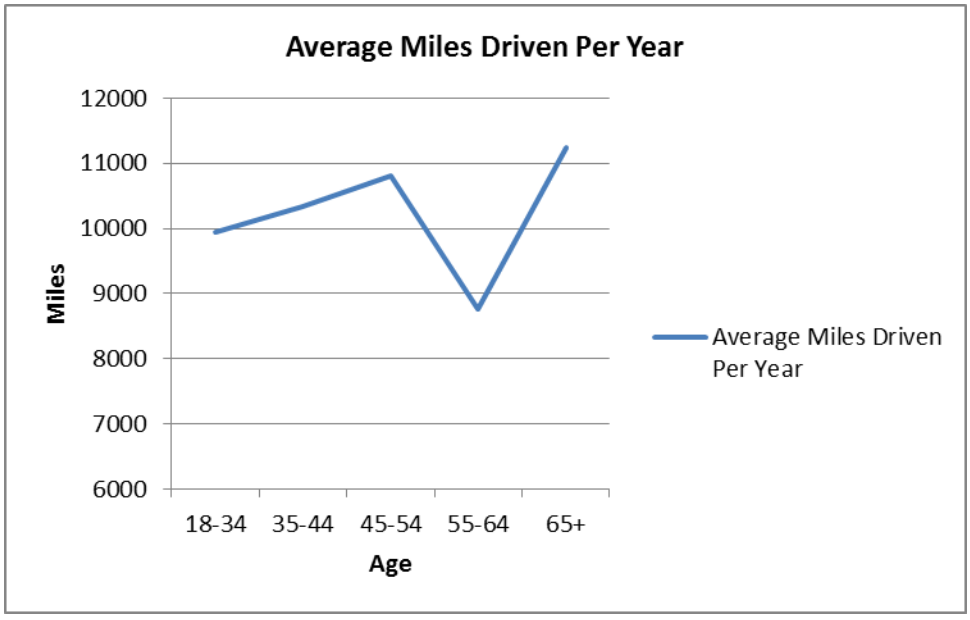

Figure 3.1 Average Miles Driven Per Year by Age

Approximately a third of respondents over the age of 65 reported driving more than 15,000 miles annually. These results could be skewed for two reasons. First, a very small sample (only 56 responses) from this age group was used to extrapolate data. Second, of the 56 respondents over the age of 65, a majority (31) were from the western region of the state, which is generally associated with higher annual driving miles. It was assumed that this larger portion of residents from the western region shifted the data towards a higher number of annual miles traveled. However, when age is broken down by both region and geography, it becomes apparent that drivers over the age of 65 in the west, rural, and urban portions of the state have the highest number of miles traveled annually (Table

3.3). Rural residents over the age of 65 drive the most miles annually, although only 21 responses were elicited from this group; a number so small that extrapolation should not be considered representative of the entire population. These results imply that neither region nor geography skew the data; individuals over the age of 65 in this survey do in fact drive more miles annually than their younger counterparts. Since this age group contained a sample of only 56 respondents, it may be an anomaly given its small size. One can argue that if more individuals over the age of 65 were included in this survey, the average number of miles driven per year may decrease substantially. Because respondents over the age of 65 from both the eastern and rural parts of the state had less than 30 responses, their averages should not be considered representative of the driving population for that age group.

Table 3.3 Annual Miles Driven by Age, Factoring for Region and Geography

Age	East	West	Urban	Rural
18-34	9,839	10,275	9,765	10,894
35-44	10,124	12,026	9,837	11,808
45-54	**11,203**	9,707	10,632	11,718
55-64	8,380	10,185	8,665	10,402
65+	9,630*	**13,020**	**10,982**	**12,293***

Bold: Highest in age category
*Estimate uncertain due to limited sample size

As a whole, drivers over the age of 65 have the largest share of drivers traveling more than 10,000 miles annually at 63.5% although it should again be noted that only 56 responses were obtained from this age group. In comparison, only 38.5% of drivers age 55-64 report driving over 10,000 miles per year. That same age group has the largest share—24.8%—reporting they drive less than 5,000 miles annually. Differences in levels of driving activity may influence views and perceptions about traffic safety. This information is also valuable in interpreting information on crash injuries and fatalities in assessing driver risk. Specific information on driver responses is provided in Table 3.4.

Table 3.4 Annual Driving Activity by Age Group

	Miles			
Driver Age	Less than 5,000	5,000 to 10,000	10,001 to 15,000	More than 15,000
	Share of Respondents			
18 to 34	9.8%	47.8%	26.5%	16.0%
35 to 44	12.9%	36.6%	31.2%	19.2%
45 to 54	12.1%	36.6%	24.3%	27.0%
55 to 64	24.8%	36.7%	26.9%	11.6%
65 and older	19.1%	17.3%	33.3%	30.3%

Table 3.5 and Table 3.6 show driving activity varies significantly by region and geography. Regional summaries show a majority of drivers in the east (55.3%) drive less than 10,000 miles annually and a majority of drivers in the west (50.1%) drive more than 10,000 miles annually. Drivers from the eastern part of the state have a higher percentage of those who drive between 0 and 5,000, 5,000 and 10,000, and 10,000 and 15,000 miles. A greater percentage of drivers from the western half of the state travel more than 15,000 miles per year. In just the rural areas of the state a majority of drivers travel more than 10,000 miles per year. About an 11% larger share of the population in rural areas report traveling more than 10,000 miles per year at 55.4% compared to 44.0% for their urban counterparts.

The regional and geographic summaries of travel activity show that the western region of the state and the rural portion of the state have the highest share of residents traveling more than 15,000 miles per year. The regional and geographic differences in annual driving activity are significant at the 1% level ($F=1222.381$, $p<0.0001$; $F=3527.631$, $p<0.0001$, respectively).

Table 3.5 Annual Driving Activity by Region

	Miles			
Region	Less than 5,000	5,000 to 10,000	10,001 to 15,000	More than 15,000
	Share of Respondents			
East	14.5%	40.8%	28.4%	16.3%
West	13.3%	36.5%	24.9%	25.2%

Table 3.6 Annual Driving Activity by Geography

	Miles			
Geography	Less than 5,000	5,000 to 10,000	10,001 to 15,000	More than 15,000
	Share of Respondents			
Rural	8.1%	36.5%	24.2%	31.2%
Urban	15.4%	40.6%	28.4%	15.6%

4. RESULTS

Survey responses offer important insight into driver perceptions, attitudes, and behaviors regarding traffic safety. Simple frequency analysis of ordinal and dichotomous survey responses provides a general characterization of driver views and behaviors. In addition, the scale responses are transformed to ordinal values to quantify responses between scale extremes to allow for some statistical testing of relationships and means. The higher-than-expected response rate resulted in increased confidence. The 95% confidence level is coupled with smaller margins of error at +/-1% when discussing statewide results, and a +/-2% error margin when addressing the population in regional, geographic, or target driver strata.

4.1 All Drivers

The core questions are designed to focus survey efforts on three issues: impaired driving, seat belt use, and speeding. Response frequencies for the 10 core questions are included in Table 4.1. The table includes 2010 responses to establish a metric that may be used to identify North Dakota driving trends. Responses show drivers believe law enforcement is more likely to ticket for speeding violations than for drunk driving or seat belt violations. Frequencies show that 59.3% of drivers believe chances are higher than average that drivers who speed will be ticketed, compared to 58.0% and 38.6% greater-than-average likelihood that drivers will be ticketed for drinking or seat belt violations, respectively. Differences between perceptions of getting a ticket for speeding and driving after drinking are significant at the 1% level (Chi Sq.=467.849, $p<0.0001$).

Among respondents who do drink alcohol, 40.9% report that they have driven a vehicle within two hours of drinking during the past two months. Responses show 7.9% of drivers who do drink report that they drove after drinking on at least 4 occasions during the past 60 days.

With regard to speeding, 4.6% and 7.4% of drivers report high levels of speeding activity – considering those who answered ”always” or ”nearly always” to the questions on 30 mph and 65 mph speed zones, respectively. Drivers are more likely to speed on the 30 mph road, with only 15.2% of the drivers reporting that they ”never” speed on these roads compared to 20.5% of drivers who ”never” speed on the 65 mph roads.

The share of drivers reporting that they always use their seat belt when driving or riding in a vehicle is substantially lower than the information rate presented by the core behavior metric of 81.5%. Driver self-reported use collected here shows that only 67.9% ”always” wear a seat belt with another 23.5% indicating usage as “nearly always.” Only 3.3% of drivers report rarely or never using their seat belts.

Responses to awareness of public media or other education messages about traffic safety related to drinking, speed, and seat belt issues shows speed enforcement is least often read, seen, or heard as a traffic safety topic. Although messages about speeding were also the least read, seen, or heard as a traffic safety topic in 2010, there was a considerable change in exposure from 2010 to 2011. Whereas 57% of respondents in 2010 had recently read, seen, or heard messages about speeding violations, only 35.8% of respondents in 2011 had recent exposure. Considering this and driver perception of relatively high risk for ticketing, it seems that enforcement rather than education is a leading influence in driver perceptions and actions. Drivers are most likely to have had recent experience with enforcement messages associated with drunk driving, with 87.0% of drivers answering positively. There is also a high likelihood (82.8%) that they have recently been exposed to information on seat belt use.

Table 4.1 Core Question Responses

Core	Survey Question	Responses					
ID-1	In the past 60 days, times driving a vehicle within 2 hours after drinking alcohol?						
		Do Not Drink	Do Drink, by Times Driving (=60.0% of Respondents)				
			0	1	2 to 3	4 to 6	7 or more
	2011	40.0%	59.1%	17.5%	15.5%	5.5%	2.4%
	2010	43%	56%	14%	16%	7%	6%
ID-2	Have you recently read, seen, or heard anything about drunk driving enforcement?						
		Yes	No				
	2011	87.0%	13.0%				
	2010	85%	15%				
ID-3	Chance of someone getting arrested if they drive after drinking alcohol?						
		Very Likely	Sw. Likely	Likely	Unlikely	V. Unlikely	
	2011	31.3%	26.7%	26.7%	12.6%	2.7%	
	2010	25%	26%	31%	15%	4%	
SB-1	How often do you use seat belts when you drive or ride in a vehicle?						
		Always	N. Always	Sometimes	Rarely	Never	
	2011	67.9%	23.5%	5.3%	2.7%	*0.6%	
	2010	58%	27%	10%	3%	1%	
SB-2	Have you recently read, seen, or heard anything about seat belt law enforcement?						
		Yes	No				
	2011	82.8%	17.2%				
	2010	77%	23%				
SB-3	What do you think the chance is of getting a ticket if you don't wear your seat belt?						
		Very Likely	Sw. Likely	Likely	Unlikely	V. Unlikely	
	2011	16.0%	22.6%	25.3%	25.0%	11.2%	
	2010	14%	26%	23%	26%	10%	
SP-1a	On a road with 30 mph speed limit, how often do you drive faster than 35 mph?						
		Always	N. Always	Sometimes	Rarely	Never	
	2011	*1.1%	3.5%	32.9%	47.3%	15.2%	
	2010	1%	4%	31%	47%	17%	
SP-1b	On a road with a 65 mph speed limit, how often do you drive faster than 70 mph?						
		Always	N. Always	Sometimes	Rarely	Never	
	2011	*1.2%	6.2%	27.3%	44.9%	20.5%	
	2010	1%	5%	22%	45%	28%	
SP-2	What do you think the chance is of getting a ticket if you drive over the speed limit?						
		Very Likely	Sw. Likely	Likely	Unlikely	V. Unlikely	
	2011	28.0%	31.3%	29.1%	9.5%	2.1%	
	2010	26%	30%	28%	12%	4%	
SP-3	Have you recently read, seen, or heard anything about speed enforcement?						
		Yes	No				
	2011	35.8%	64.2%				
	2010	57%	43%				

Note: Please see Appendix A for exact question and response wording.
*Estimate uncertain due to limited sample size.

The relationship between behavior and the enforcement expectations and education awareness has an unexpected result. One would presume an inverse relationship between a negative behavior – such as speeding – and a related education or enforcement influence – as measured by read, seen, or heard and perceived likelihood for ticketing, respectively. As illustrated in Figure 4.1, driver responses are not consistent with this expectation as the lowest expectation for a ticket is associated with the lowest reported levels of negative behavior in the seat belt issue. With seat belts, 38.6% of drivers have more than an average expectation of receiving a ticket for not wearing a seat belt. Yet, only 3.3% report greater than average likelihood they will not wear their seat belts. With drinking, 58.0% see a greater than average chance for a ticket. A larger share, 6.9%, reports a more than average likelihood they will drive after drinking. The education influence is mixed, considering responses to the read, seen, or heard questions. The highest levels of reported exposure and negative behavior are reported for driving after drinking. One exception is for seat belt education. Results do show that driver seat belt behavior is positively associated with higher levels of seat belt education.

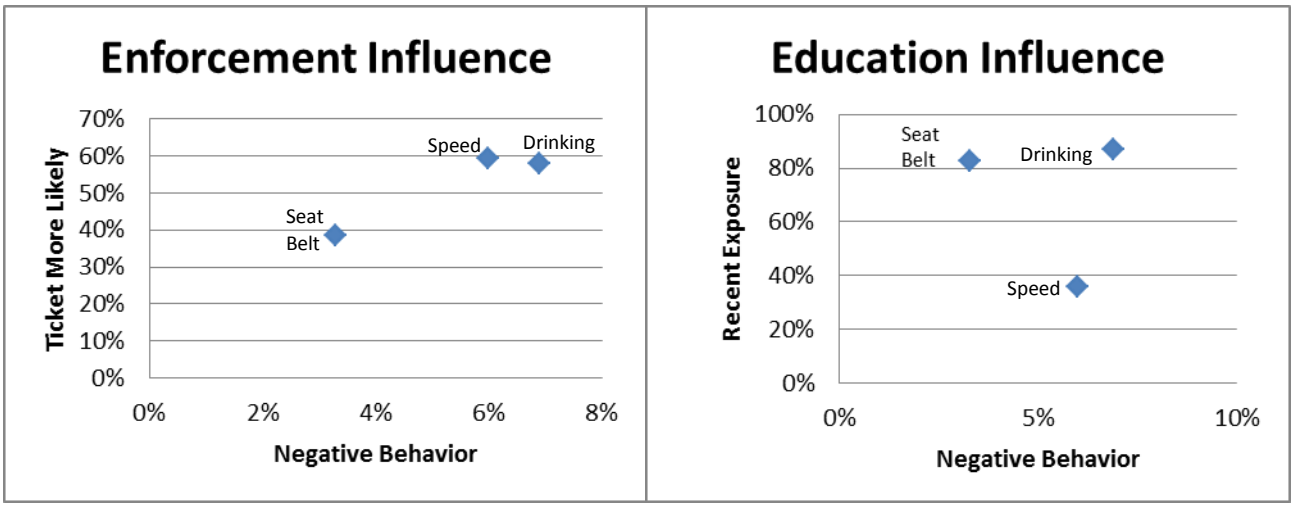

Figure 4.1 Driver Action Related to Enforcement and Education, Core Questions

To further investigate relationships among the core questions and issues that may be related, measures of association are calculated for driver responses. The Pearson coefficient measures the strength of association between two variables – in this case the driver responses. Correlation coefficients range from -1 to +1, with values closer to these extremes indicating stronger relationships. Relationships between -0.5 and +0.5 are generally considered weak and inconsequential. For instance, although the "drive after drinking" and "arrest for drinking" do have the expected negative relationship at Pearson Corr. = -0.17184, the correlation measure shows that less than 3% of their variability is shared.

Although statistically significant relationships are found among many responses, the Pearson correlation calculations indicate no strong relationships among all questions or within issues (Table 4.2).

Two values indicating a substantive relationship, although weak, are for speeding on a 30 mph road and speeding on a 65 mph road (Pearson Corr. =0.52551, $\rho<0.001$, n=1,423). These two variables share 27% of their variability. Questions regarding propensity for speeding on local roads are related for the 30 and 65 mph roads, but the relationship is weak, suggesting the questions address different perceptions of driving behaviors.

Table 4.2 Correlations in Core Question Responses

Correlations in Core Question Responses									
	ID2	ID3	SB1	SB2	SB3	SP1a	SP1b	SP2	SP3: Ticket for Speed
ID1: Drive After Drinking	0.00445 0.9025	**-0.17184** **<.0001**	**-0.20878** **<.0001**	0.00388 0.9149	**-0.16022** **<.0001**	**0.11207** **0.0018**	**0.1394** **0.0001**	-0.00025 0.9946	**-0.09189** **0.0119**
ID2: Read, Seen, or Heard Impaired Driving		**0.0734** **0.0063**	**-0.06265** **0.0186**	**0.47625** **<.0001**	0.00434 0.872	0.04744 0.0751	0.02378 0.3723	**0.23778** **<.0001**	0.0129 0.6345
ID3: Arrest for Drinking			-0.0179 0.5043	**0.06576** **0.0145**	**0.42821** **<.0001**	-0.03212 0.2309	**-0.07435** **0.0055**	**0.10462** **0.0001**	**0.4312** **<.0001**
SB1: Seat Belt Use				**-0.07456** **0.0051**	**0.05974** **0.0258**	**-0.09588** **0.0003**	**-0.12341** **<.0001**	-0.00138 0.9593	-0.00199 0.9412
SB2: Read, Seen, or Heard Seat Belt					**0.0844** **0.0014**	-0.00537 0.8405	-0.04414 0.0976	**0.30151** **<.0001**	**0.06768** **0.0125**
SB3: Ticket for Seat Belt						**-0.08198** **0.0022**	**-0.14213** **<.0001**	**0.1715** **<.0001**	**0.44956** **<.0001**
SP1a: Speed on 30 MPH							**0.52551*** **<.0001**	-0.04624 0.0867	-0.03573 0.1858
SP1b: Speed on 65 MPH								**-0.11312** **<.0001**	-0.05247 0.0519
SP2: Read, Seen, or Heard Speed									**0.09493** **0.0005**

Bold: Significance at the 5% or 1% level.
*Correlation measure indicates weak relationship.
Note: correlations between -0.5 and 0.5 indicate very weak relationnship, so other relationships are not addressed in this study.

Although several other relationships are found to be significant at the 1% and 5% levels, the relationship measures are generally between the -0.5 and +0.5 levels.

Driver responses to other questions are presented in Table 4.4. These responses offer additional insight for decision-makers with queries related to traffic safety enforcement and education programs, policy, and investments. One aspect of traffic safety is deterrence through enforcement. The enforcement aspect combines patrol efforts and penalties to discourage drivers from engaging in risky behaviors. The critical driver risk behaviors studied here are seat belt safety, impaired driving, distracted driving, and motorcycle travel.

In terms of seat belt safety, two-thirds of respondents admitted that a greater police presence increases seat belt use. Aside from police presence, television ad campaigns are a common way to promote messages of driver safety. The North Dakota Department of Transportation recently released a new ad, "Wear It for Them," which depicts a crash in which an unbelted teen driver strikes and kills his belted sister during the force of impact from a collision (the video can be viewed at http://www.youtube.com/watch?v=JAYSt5Ra8rA). According to the driver survey, of those who saw the commercial, 30.4% increased seat belt usage after viewing that public safety ad.

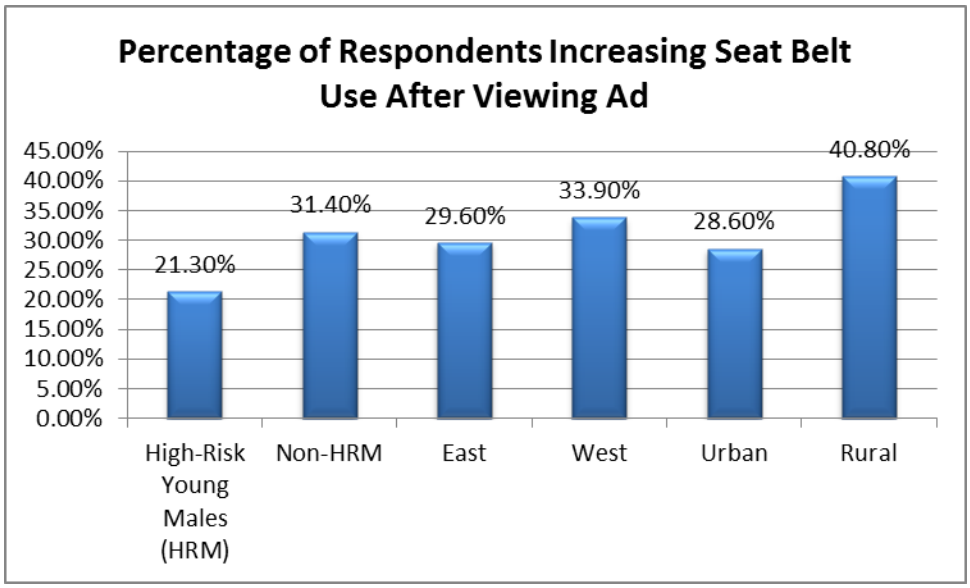

Figure 4.2 "Wear It" Ad Increased Seat Belt Use, by Response Group

Among respondents who saw the public service ad, rural residents had the highest levels of change in seat belt usage behavior. Just over 40% of rural residents reported increasing seat belt use while operating or riding in a vehicle after viewing the ad. Roughly one-third of respondents from both the western region of the state and respondents who are not high-risk males also reported the ad positively changed their use of seat belts. High-risk young males represented the lowest percentage increase, 21.3%.

To expand the scope for understanding success in exposing drivers to traffic safety strategies, two questions specific to impaired driving are included. The questions relate to sobriety checkpoints and saturation patrols – two forms of high-visibility enforcement. The sobriety checkpoints require each vehicle or randomly selected vehicles to move through a temporary law enforcement roadblock site to investigate the possibility that an operator is impaired. During saturation patrols, often conducted subsequent to the check point operations, a relatively large number of law enforcement officers focus efforts to identify impaired drivers in a limited area. The checkpoints and saturation patrols are often combined to raise driver awareness. Law enforcement agencies use local media to alert the public to events. These law enforcement programs are based on studies showing driver perceptions are influenced, and that the use of these activities encourages safe driving (NHTSA, 2002).

Responses indicate that drivers have less exposure to information on specific strategies than to broad drunk driving messages. The sobriety checkpoints were recognized by 56% of drivers as something they had "read, seen, or heard" recently. Saturation patrols were recognized by only 29% of the drivers. This difference may be related to less frequent use of the saturation patrols or that this strategy is a newer addition to the law enforcement activities. Responses show 71% of drivers agree that strategies that increase police presence positively influence safety, as measured by their perceptions for increased seat belt use. This number accurately reflects all groups studied in the survey with the exception of one: high-risk young males (Table 4.3). High-risk young males are much less likely to think that police presence improves driving safety via seat belt usage. A clear majority of all other groups identified police presence as a positive influence on seat belt safety.

Table 4.3 "Greater Police Presence Increases Seat Belt Use" Question, by Group

	Urban	Rural	East	West	High-Risk Young Males	Non-High-Risk Young Males
YES	70.3%	74.2%	70.7%	72.1%	43.1%	73.6%
NO	29.7%	25.8%	29.3%	27.9%	56.9%	26.4%

Two final areas addressed in the survey are distracted driving and motorcycle travel. Although the term distracted driving can refer to a broad range of issues, the focus here is on cell phone use, a currently highlighted issue related to distracted driving. Questions on cell phone use for texting and talking indicate that about 1 in 8 drivers engage in cell phone communication to multitask while driving daily. The share of drivers who admitted to texting daily while driving is 3.8%. Drivers are more likely to use their cell phone for talking while driving, with 20.5% of drivers confirming that they do this daily. The relative impact of limiting these activities varies substantially as 61.5% say that they currently "Never" text while driving, compared to only 11.5% for talking.

Table 4.4 Other Question Responses

Survey Question	**Responses**				
The ND Department of Transportation television ad, "Wear It for Them," depicts a crash where an unbelted teen driver strikes and kills his belted sister during the force of impact. Did you increase seat belt use after viewing this ad?					
Yes	No	Did Not See Ad	Saw Ad	Saw Ad and Increased Seat Belt Use	
17.2%	39.3%	43.5%	56.5%	30.4%	
Traffic Safety Knowledge/Tools					
				YES	NO
I am aware of increased DUI enforcement through Regional DUI Task Forces				60.3%	39.7%
Greater police presence increases seat belt use				71.0%	29.0%
Have you recently read, seen, or heard anything about…					
	Sobriety Checkpoints			56.0%	44.0%
	Saturation Patrols			29.2%	70.8%
Driver Distraction					
	Daily	Few/Week	Few/Month	< 1/Month	Never
Cell Phone Text	3.8%	7.7%	9.6%	17.3%	61.5%
Cell Phone Talk	20.5%	28.0%	26.8%	13.1%	11.5%
Motorcycle Information					
Do you drive a motorcycle?				YES	NO
				14.7%	85.3%
	If yes…				
What protective gear do you wear?		Helmet	Leather	Full Protective Gear	None
		41.3%	11.7%	33.1%	13.9%
				YES	NO
Do you operate your motorcycle within 2 hours of drinking alcohol?				*7.4%	92.6%

*Estimate uncertain due to limited sample size

Motorcyclists have long been identified as a driver group at a relatively high risk for crash injury. Motorcycle safety precautions are vastly different than their automobile counterparts. Approximately 14.7% of the driving population operate a motorcycle. Of these individuals, only 41.3% said they wear a helmet while driving and only one-third regularly wear full protective gear. Responses show 13.9% of motorcyclists wear no protective gear. Although estimates may be uncertain due to limited sample

size, note that the relationship between seat belt use and the amount of protective gear used while operating a motorcycle is expected: as seat belt usage increases, so too does the likelihood of using full protective gear. Similarly, as seat belt usage decreases, the tendency not to wear protective gear whatsoever increases.

4.2 Driver Group Evaluations

It is reasonable to assume that driver perceptions and behaviors are influenced by local norms and the driving environment. Therefore, it may be beneficial to investigate differences within the driver population – are they perceived or substantiated? This information may be valuable in more effective traffic safety resource allocations and program assessment, allowing focus for programs and strategies beyond traditional typical statewide treatment. To more easily quantify and manage the discussion of driver responses in the strata, numeric values are assigned to the descriptive answers to create ordinal scales. These transformations also allow for expanded statistical analysis of responses. The scale definitions are provided in Table 4.5.

Table 4.5 Quantitative Scale Definitions for Responses

Q#	Question	Scale	Conversion Values
Q1	Seat Belt Use	1-5	1=Never to 5=Always
Q2a	Ticket Likely Seat Belt	1-5	1=Very Unlikely to 5=Very Likely
Q2b	Ticket Likely Speed	1-5	1=Very Unlikely to 5=Very Likely
Q3	30 mph zone	1-5	1=Never to 5=Always
Q4	65 mph zone	1-5	1=Never to 5=Always
Q5	Drinking Arrest	1-5	1=Very Unlikely to 5=Very Likely
Q6	Drive After Drinking	0-7	0=0; 1=1; 2 or 3=2.5; 4 to 6=5; 7 or more=7;
Q7a	RSH SB	0-1	0=No, 1=Yes
Q7b	RSH Speed	0-1	0=No, 1=Yes
Q7c	RSH DUI	0-1	0=No, 1=Yes
Q7d	RSH Sobriety Checkpoint	0-1	0=No, 1=Yes
Q7e	RSH Saturation Patrol	0-1	0=No, 1=Yes
Q8	“Wear It” Ad	0-1	0=No, 1=Yes
Q9	DUI Task Force	0-1	0=No, 1=Yes
Q10	Police Presence SB	0-1	0=No, 1=Yes
Q11	Cell Text	1-5	1=Never to 5=Daily
Q12	Cell Talk	1-5	1=Never to 5=Daily
Q13a	Motorcycle	0-1	0=No, 1=Yes
Q13b	Motorcycle Drink	0-1	0=No, 1=Yes

Stratification in sampling the driver population provides an opportunity to look at the drivers based on region and geography – as defined in the methods section. In addition, the young male driver group can be distinguished as a high-risk driver population. Insights regarding impaired driving, seat belts, and speed across these strata may benefit traffic safety advocates by enhancing their ability to focus efforts. The information may also be useful in assessing the value of including these types of stratification in future surveys.

4.2.1 Regional and Geographic Observations

Table 4.6 shows the mean value for drivers surveyed statewide, along with regional and geographic comparisons. Statewide survey averages show that drivers' views and behaviors associated with traffic safety goals have potential for improvement as discussed in the descriptive statistics. For example, seat belt use is at 4.42. This number is below the goal of 5.0 – which is equivalent to "always" in the driver survey response. Table 4.7 shows changes in mean values from 2010 to 2011. The principle reason to include the values here is to establish a statewide baseline for the discussion of respondent groups. The figures may also be useful measures in monitoring statewide progress over time.

The regional and geographic strata were tested for significant difference. Driver views and self-reported behaviors showed some regional variation in comparing drivers from east and west. Similar responses for exposure and policy opinions were found when comparing drivers from opposite sides of the state. There were significant differences, however, in driving behavior between those in the east and west. Drivers in the eastern part of the state have a higher tendency to speed on both 30 mph and 65 mph roads. Figure 4.3 shows the difference in speeding tendencies based on region.

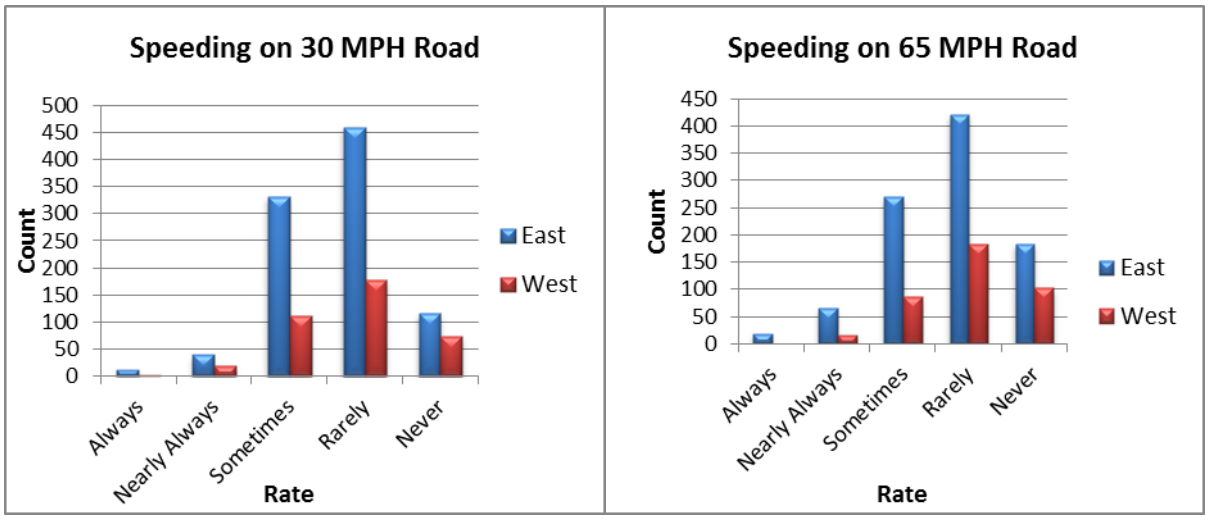

Figure 4.3 Speeding Tendencies on 30 and 65 MPH Roads, by Region

Responses to the questions, "On a local road with a speed limit of 30 mph, how often do you drive faster than 35 mph?" and "On a road with a speed limit of 65 mph, how often do you drive faster than 70 mph?" are significantly different between drivers in the east and west (Chi Sq.=14.2852, p=0.0064; Chi Sq.=21.8725, p=0.0002, respectively). Many more residents in the east admit to "always" or "nearly always" speeding on 30 and 65 mph roads whereas their counterparts in the west have much lower levels of those who "always" or "nearly always" speed.

Aside from speeding, drivers from the east and west regions of the state also have different driving behaviors in terms of cell phone use. Drivers in the east are significantly more likely than their western counterparts to text or talk on cell phones while driving (Chi Sq.=24.556, p<0.0001; Chi Sq.=27.586, p<0.0001, respectively). Figure 4.4 reveals regional tendencies of drivers who "always" or "nearly always" text or talk on a cell phone while driving.

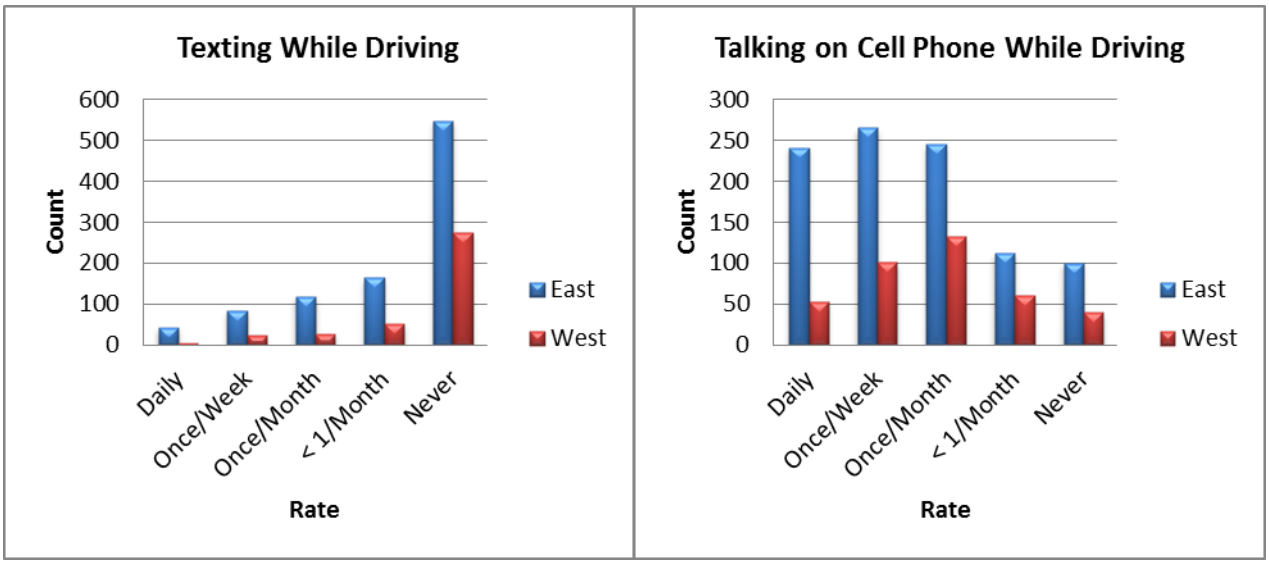

Figure 4.4 Distracted Driving Tendencies, by Region

Table 4.6 Differences in Driver View and Behaviors, by Region and Geography

		Statewide	Region		Sig.	Geography		Sig.
Question	Scale	All	East	West		Rural	Urban	
Seat Belt Use	1-5	4.42	4.44	4.36	**	4.21	4.52	**
Ticket Likely								
Seat Belt	1-5	2.98	2.93	3.10		3.06	2.94	
Speeding	1-5	3.62	3.61	3.66		3.69	3.59	
Speed, 30 mph zone	1-5	2.31	2.35	2.22	**	2.31	2.31	
Speed, 65 mph zone	1-5	2.22	2.29	2.04	**	2.13	2.16	
Drive After Drink[#]	0-7	1.66	1.85	0.96		1.68	1.60	
Arrest for DUI	1-5	3.62	3.61	3.69		3.65	3.63	
RSH Seat Belt	0-1	0.84	0.84	0.84		0.87	0.83	
RSH Speeding	0-1	0.38	0.37	0.40		0.40	0.37	
RSH DUI	0-1	0.88	0.88	0.88		0.90	0.87	
RSH Sob Checkpoint	0-1	0.57	0.59	0.53		0.58	0.57	
RSH Saturation Patrol	0-1	0.31	0.33	0.28		0.30	0.32	
Wear It Ad	0-1	0.30	0.29	0.36		0.40	0.27	**
Regional Task Force	0-1	0.64	0.65	0.62		0.67	0.63	
Police Presence	0-1	0.66	0.66	0.67		0.69	0.65	
Cell Phone Text	1-5	1.83	1.91	1.61	**	1.78	1.85	
Cell Phone Talk	1-5	3.22	3.31	2.98	**	3.19	3.23	
Motorcycle	0-1	0.19	0.19	0.18		0.18	0.18	
Motorcycle Drink	0-1	0.08	0.11	0.03	*	0.03	0.11	*

[#]"Drive after Drinking" frequencies are calculated for drivers who do drink.
*Significant difference at the 5% level for Wald Chi-Square test.
**Significant difference at the 1% level for Wald Chi-Square test.

Drivers from the east and west also exhibit statistically significant differences when it comes to two other behaviors: using a seat belt, and operating a motorcycle within two hours of consuming alcohol. Drivers surveyed from the western portion of the state are significantly less likely to wear a seat belt while driving or riding in a vehicle. This indicates a disparity in behavior from last year. This information is compounded with the fact that—as presented in Table 3.5—drivers in the west travel the greatest number of miles annually. Consequently it seems apparent that drivers from the western part of the state have greater risk exposure for traffic injury or death.

One final significant difference between east and west driving behavior takes place among motorcyclists who drive within two hours of consuming alcohol. Just as with speeding and cell phone behavior, residents surveyed who live in the eastern part of the state are more likely to engage in this driving practice. Unlike the other differences between eastern and western driving behaviors, operating a motorcycle within two hours of consuming alcohol is only statistically significant at the 5% level (Chi Sq.=3.975, p=0.046).

Table 4.7 Differences in Driver View and Behaviors from 2010-2011, by Region and Geography

Question		Scale	Statewide All	Region East	Region West	Sig.	Geography Rural	Geography Urban	Sig.	Core Y/N
Seat Belt Use	2011	1-5	4.42	4.44	4.36	**	4.21	4.52	**	Y
	2010		4.36	4.38	4.36		4.08	4.49	**	Y
Ticket Likely										
Seat Belt	2011	1-5	2.98	2.93	3.10		3.06	2.94		Y
	2010		3.06	3.07	3.04		3.13	3.03		Y
Speeding	2011	1-5	3.62	3.61	3.66		3.69	3.59		Y
	2010		3.59	3.61	3.58		3.58	3.60		Y
Speed, 30 mph zone	2011	1-5	2.31	2.35	2.22	**	2.31	2.31		Y
	2010		2.29	2.25	2.32		2.27	2.29		Y
Speed, 65 mph zone	2011	1-5	2.22	2.29	2.04	**	2.13	2.16		Y
	2010		2.19	2.17	2.20		2.15	2.20		Y
Drive After Drink[#]	2011	0-7	1.66	1.85	0.96		1.68	1.60		Y
	2010		1.36	1.57	1.12	**	1.21	1.43		Y
Arrest for DUI	2011	1-5	3.62	3.61	3.69		3.65	3.63		Y
	2010		3.53	3.59	3.47		3.49	3.55		Y
RSH Seat Belt	2011	0-1	0.84	0.84	0.84		0.87	0.83		Y
	2010		0.77	0.76	0.77		0.80	0.75		Y
RSH Speeding	2011	0-1	0.38	0.37	0.40		0.40	0.37		Y
	2010		0.57	0.57	0.56		0.56	0.57		Y
RSH DUI	2011	0-1	0.88	0.88	0.88		0.90	0.87		Y
	2010		0.85	0.86	0.84		0.83	0.86		Y
RSH Sob Checkpoint	2011	0-1	0.57	0.59	0.53		0.58	0.57		N
	2010		0.68	0.78	0.57	**	0.65	0.70		N
RSH Saturation Patrol	2011	0-1	0.31	0.33	0.28		0.30	0.32		N
	2010		0.37	0.39	0.26	**	0.33	0.34		N
Police Presence	2011	0-1	0.66	0.66	0.67		0.69	0.65		N
	2010		0.74	0.74	0.75		0.74	0.74		N

[#]"Drive after Drinking" frequencies are calculated for drivers who do drink.
*Significant at the 5% level for Wald Chi-Square test.
**Significant at the 1% level for Wald Chi-Square test.
Red: Became statistically significant from 2010 to 2011.
Green: No longer statistically significant in 2011.

Aside from regional differences, a number of different driving tendencies become evident when comparing survey responses by geography. Two such differences revolve around seat belts. Rural residents are significantly less likely to wear a seat belt while operating a vehicle (Chi Sq.=65.788, $p<0.0001$). This is consistent with 2010 results. When this information is coupled with the fact that—as indicated by Table 3.6—rural residents have greater annual driving activity than their urban counterparts, it reveals a dangerous reality about rural North Dakota driving habits.

Although rural residents are less likely to wear a seat belt while operating a vehicle, rural respondents indicated that they have a greater likelihood of increasing their seat belt usage after viewing the "Wear It for Them" ad (Chi Sq.=11.7178, $p=0.0006$). Geographic distinctions in seat belt use due to the "Wear It for Them" ad campaign are highlighted in Figure 4.5. A higher percentage of rural respondents (40.8%) reported they increased seat belt use after viewing the ad. In contrast, a smaller portion (28.6%) of urban residents said the commercial had an impact on their use of seat belts. These results imply the commercial was effective for some drivers. Given the fact that rural seat belt use lags

considerably behind the rest of the state, this ad could be utilized to target rural residents. In addition to possibly aiming this commercial at the rural population, it should be reiterated that roughly 1 in 4 urban residents who saw the commercial also indicated that the ad increased their seat belt use. Considering that statewide seat belt use is at 4.42 out of a goal of 5.0, it can be argued that this commercial can help raise seat belt usage.

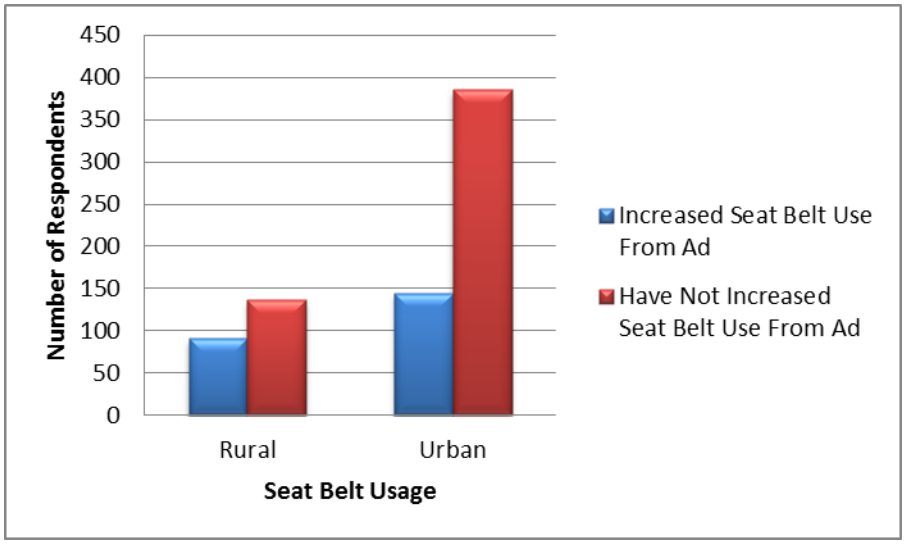

Figure 4.5 Seat Belt Usage from "Wear It for Them" Commercial, by Geography

Note, however, that a significant portion of respondents (43.5%) did not see the commercial. This may play a role in the substantial geographic differences in seat belt usage that stem from the ad. Complete frequency distributions among all responses, by region and geography, are shown in Appendix C.
In addition to issues surrounding seat belt usage, one other response was found to be statistically significant at the 5% level. Urban respondents indicated a higher tendency to operate a motorcycle within two hours of consuming alcohol than their rural counterparts (Chi Sq.=4.5686, p=0.0331). Of those respondents who operate a motorcycle, 8.5% of urban respondents drive within two hours of consuming alcohol compared to just 2.1% of rural residents. The validity of this test, however, is unstable. Of the 1,433 usable surveys received, only 241 indicated that they drove a motorcycle and drank alcohol. Of these 241, only 20 (two rural respondents and eighteen urban respondents) indicated that they operate a motorcycle within two hours of drinking alcohol. Therefore, given the small sample size, extrapolating this data and applying it to the entire state of North Dakota may not be reflective of the larger population behavior.

4.2.2 Young Male Driver Target Group

As with the 2010 survey, the selected target group of male drivers between 18 and 34 years does show significantly different behaviors, exposure levels, and views when compared to other drivers (Table 4.8). In terms of behavior, high-risk male drivers in this survey are more likely to exhibit behavior at-odds with traffic safety goals, such as speeding in a 65 mph zone (Chi Sq.=12.116, p=0.017); driving impaired (Chi Sq.=49.004, p<0.0001); texting while driving (Chi Sq.=81.712, p<0.0001); and talking on the phone while driving (Chi Sq.=60.022, p<0.0001). The responses show that young males are 50.7% more likely to speed on a 65 mph road than all other groups. Among drivers who indicate they drink, the share of young males driving after drinking is 32% higher than for other drivers—at 77.5% compared to 58.5% for other drivers. In regard to distracted driving, young male drivers use cell phones much more frequently while driving. Results show that only 37.9% of young males “never” text while driving. This is a substantially smaller share than for other drivers—where 63.7% “never”

text while driving. A third of young males talk on their cell phones while driving every day. This is a much larger portion considering that just 19.3% of all other respondents indicated that they talk on the cell phone while driving daily. Other drivers are much more likely (12.3%) to "never" talk on a cell phone while driving when compared to their high-risk young male (2.7%) counterparts.

In addition to exhibiting higher levels of risky behavior than the rest of the driver population, young males are also less likely to engage in safe driving behavior. The high-risk young male drivers surveyed are substantially less likely to wear seat belts than other drivers (Chi Sq.=27.207, p<0.0001). Only 48.9% of young male drivers "always" wear a seat belt while driving or riding in a vehicle, compared to 69.6% of other drivers. The share of young males who report that they "rarely" or "never" use seat belts (7.5%) is more than twice as high as it is for other drivers (2.9%). Lower reported levels of seat belt usage likely go hand-in-hand with the fact that young male drivers have a lower expectancy for law enforcement to ticket drivers for seat belt violations when compared to the balance of the driver population (Chi Sq.=16.377, p=0.003). This suggests that these two behaviors from young males are linked: it is possible that young male drivers do not use seat belts in part due to perceptions of a low risk of facing consequences from law enforcement for not doing so.

Table 4.8 Differences in Driver View and Behaviors, Young Male Target Group

	Target Male Drivers, 18-34 yr n=244	Other Drivers n=1189	Sig.
Seat Belt Use	4.18	4.47	**
Ticket Likely			
Seat Belt	2.77	3.03	**
Speeding	3.50	3.65	
Speed in 30 mph zone	2.36	2.30	
Speed in 65 mph zone	2.40	2.19	*
Drive After Drinking	2.58	1.43	**
Arrest for DUI	3.65	3.62	
RSH Seat Belt	0.85	0.83	
RSH Speeding	0.32	0.39	*
RSH DUI	0.94	0.87	**
RSH Sob Checkpoint	0.46	0.60	**
RSH Saturation Patrol	0.23	0.33	**
Wear It Ad	0.23	0.32	*
DUI Task Force	0.68	0.63	
Police Presence	0.43	0.71	**
Cell Phone Text	2.35	1.73	**
Cell Phone Talk	3.78	3.10	**
Motorcycle	0.26	0.17	**
Motorcycle Drink	0.08	0.08	

*Significant difference at the 5% level for Wald Chi-Square test.
**Significant difference at the 1% level for Wald Chi-Square test.

The TSO continues to explore opportunities to increase safe driving behavior overall in this driver group. Young male driver responses to read, seen, or heard education and exposure questions offer some insight. Whereas exposure to messages on seat belts are similar to that of other drivers, young males have less exposure to speeding messages (Chi Sq.=4.375, p=0.036); are less familiar with sobriety checkpoints (Chi Sq.=16.277, p<0.0001); and are less familiar with saturation patrols (Chi Sq.=10.027, p=0.002). Figure 4.6 outlines exposure levels to these three areas.

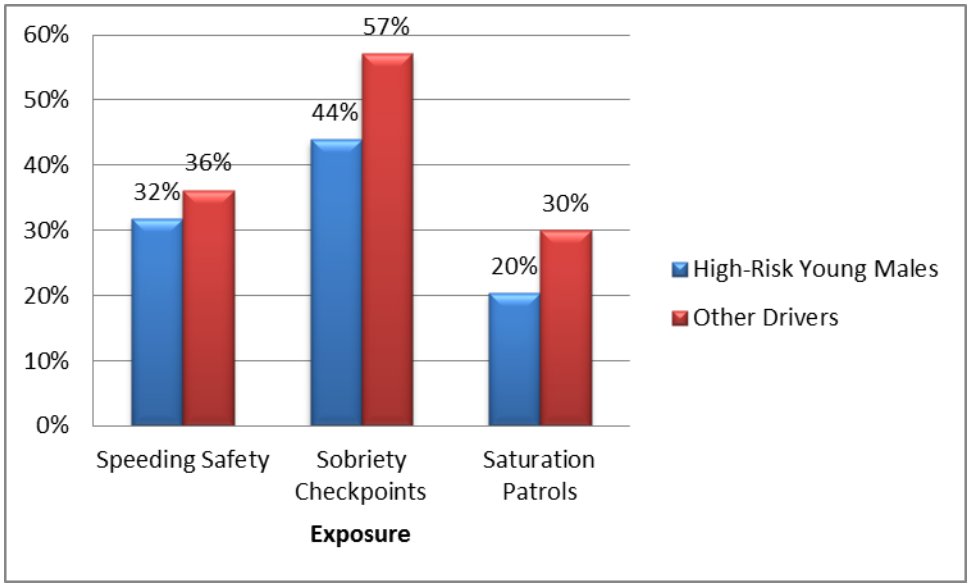

Figure 4.6 Exposure to speeding safety, sobriety checkpoints, and saturation patrols by target groups

One particularly interesting aspect of this survey is the exposure rates of young males to material that can be read, seen, or heard about driving under the influence of alcohol. Whereas young males typically had less exposure to information about speeding, sobriety checkpoints, and saturation patrols, this target group had an exposure rate to driving under the influence of alcohol that was significantly *higher* than all other driver groups (Chi Sq.=9.720, p=0.002). This is a change from the previous survey. This implies that material that can be read, seen, or heard regarding driving under the influence of alcohol has improved effectiveness in successfully reaching high-risk males during the past year. However, despite the fact that this target group has larger exposure rates to information about drunk driving, it is important to understand that young males—when compared to the rest of the driver population—are still far more likely to drive a vehicle within two hours of consuming alcohol (Chi Sq.=49.004, p<0.0001). This suggests that—although material successfully targets and reaches young males—the messages which reach them may not be effective.

Young male drivers have views about driving that are explicitly different than other drivers. For example, the target age group indicated that the "Wear It for Them" ad campaign had less of an impact on their seat belt usage than it did for other drivers. High-risk young male drivers had the lowest propensity to increase seat belt usage after viewing the ad than all other driver categories (Table 4.9). The ad's lack of an impact on seat belt use was statistically significant at the 5% level (Chi Sq.=4.507, p=0.034). This implies one of two scenarios. First, young males may not be as sensitive to images and material about seat belt safety as other drivers. Second, like material concerning the risks of driving under the influence of alcohol, the "Wear It for Them" advertisement may not be an effective deterrent for this specific age group.

Table 4.9 "Wear It for Them" Ad, by Driver Groups

Did you increase seat belt usage after viewing the "Wear It for Them" ad?	YES*	NO*	*DID NOT SEE AD*
High-Risk Males	21.3%	78.7%	*35.4%*
Other	31.4%	68.6%	*44.3%*
Males	25.4%	74.6%	*37.0%*
Females	32.6%	67.4%	*45.9%*
East	29.6%	70.4%	*43.5%*
West	33.9%	66.1%	*43.7%*
Urban	28.6%	71.4%	*40.0%*
Rural	40.8%	59.2%	*42.6%*

*"Yes" and "No" percentages calculated based on those who saw ad

Another viewpoint of young male drivers that must be taken into consideration is their perception of the effectiveness of police presence in increasing seat belt use. Young males are much less likely to think that the presence of law enforcement will increase the use of safety belts (Chi Sq.=62.283, $p<0.0001$). This view by young males could be directly linked to both their low use of seat belts and their beliefs regarding the chances of getting a ticket if one is not wearing a seat belt.

Table 4.10 Responses for High-Risk Male Drivers

Question	Responses, by Driver Group						
Seat Belt Use	n=1428	Always	N. Always	Sometimes	Rarely	Never	
	Other	69.6%	22.7%	4.7%	2.4%	**0.5%	
	HR Males	48.9%	32.2%	**11.4%	**6.2%	**1.3%	
Seat Belt Ticket	n=1398	V. Likely	Sw. Likely	Likely	Unlikely	V. Unlikely	
	Other	16.6%	22.9%	25.6%	23.8%	11.1%	
	HR Males	**9.8%	18.3%	21.8%	37.7%	**12.3%	
Ticket For Speed	n=1378	V. Likely	Sw. Likely	Likely	Unlikely	V. Unlikely	
	Other	29.0%	31.2%	28.6%	9.0%	2.1%	
	HR Males	17.0%	32.0%	34.6%	13.9%	**2.5%	
Speed in 30 mph	n=1427	Always	N. Always	Sometimes	Rarely	Never	
	Other	**1.1%	3.2%	32.8%	47.5%	15.3%	
	HR Males	**0.7%	**6.1%	34.0%	45.6%	13.7%	
Speed in 65 mph	n=1427	Always	N. Always	Sometimes	Rarely	Never	
	Other	**1.1%	5.9%	27.1%	44.8%	21.0%	
	HR Males	**1.8%	**9.0%	29.5%	45.7%	14.1%	
Drive After Drink	n=771	*DND**	0	1	2-3	4-6	7+
	Other	*41.4%*	60.8%	18.3%	14.7%	4.2%	**2.0%
	HR Males	*22.5%*	43.7%	**9.6%	23.0%	**17.4%	**6.3%
Drinking Arrest	n=1399	V. Likely	Sw. Likely	Likely	Unlikely	V. Unlikely	
	Other	31.6%	27.1%	26.1%	12.5%	2.7%	
	HR Males	28.8%	22.4%	33.4%	**12.8%	**2.6%	
"Wear It" Ad	n=796	YES	NO				
	Other	31.4%	68.6%				
	HR Males	21.3%	78.7%				
DUI Task Force	n=1326	YES	NO				
	Other	59.6%	40.4%				
	HR Males	67.0%	33.0%				
Police Presence	n=1223	YES	NO				
	Other	73.6%	26.4%				
	HR Males	43.1%	56.9%				
Cell Text	n=1421	Daily	Few/Week	Few/Month	< 1/Month	Never	
	Other	3.5%	6.9%	8.7%	17.2%	63.7%	
	HR Males	**7.2%	16.4%	19.9%	18.6%	37.9%	
Cell Phone Talk	n=1426	Daily	Few/Week	Few/Month	< 1 Month	Never	
	Other	19.3%	27.4%	27.2%	13.7%	12.3%	
	HR Males	33.5%	34.9%	22.4%	**6.5%	**2.7%	
Motorcycle	n=1421	YES	NO				
	Other	13.7%	86.3%				
	HR Males	25.7%	74.3%				
Motorcycle Drink	n=257	YES	NO				
	Other	**7.1%	92.9%				
	HR Males	**9.6%	90.4%				

Note: Please see Appendix A for exact question and response wording.
*DND: share of drivers who 'Do Not Drink.' 'Drive After Drinking' frequencies are calculated for other drivers.
**Estimate uncertain due to limited sample size

5. CONCLUSION

The initial statewide driver traffic safety survey provides baseline metrics for the TSO and others in understanding perceptions and behaviors related to focus issues. A core set of questions addresses nationally agreed upon priorities, including seat belts, drinking and driving, and speeding. In addition to the core issues, questions were included to better understand views on specific programs and activities. Results show that many North Dakota drivers have adopted safe practices, but it is apparent that additional efforts are needed to improve safety on the state's roads. Within the entire driver population, a target driver group of young male drivers engages in relatively high-risk driving practices and has some disregard for reducing potential for crash injury through consistent seat belt use. A few substantial differences in seat belt use, speeding, and distracted driving were found in comparing drivers by region and geography.

Future research involving North Dakota driving tendencies can be improved. For instance, this study did not have an ideal sample due to changes in the sampling process. Future studies involving North Dakota driving habits will be more robust when the response sample more accurately reflects the North Dakota driving population. The validity of this report would be enhanced if the number of "western" and "rural" respondents was comparable to those from the "east" and "urban" parts of the state. Furthermore, this report would have benefited if responses from residents over the age of 65 accurately reflected their proportion of the driver population. Nonetheless, response rate for this survey was satisfactory and most of the desired performance metrics could be extrapolated to represent the entire North Dakota population.

REFERENCES

Federal Highway Administration. 2009. *A Primer on Safety Performance Measures for the Transportation Planning Process*. U.S. Department of Transportation. FHWA-HEP-09-043. Washington, D.C.

Government Accounting Office. 2010. *Traffic Safety Data: State Data System Quality Varies and Limited Resources and Coordination Can Inhibit Further Progress*. Report to Congressional Committee. GAO-10-454. Washington, D.C.

Hedlund, James, Tara Casanova, and Neil Chaudhary. 2009. Survey Recommendations for the NHTSA-GHSA Working Group. Accessed online October 2, 2009 at http://www.dot.nd.gov/divisions/safety/docs/crash-summary.pdf. Preusser Research Group. Trumbull, CT.

National Highway Safety Administration. 2002. *Saturation Patrols & Sobriety Checkpoints Guide: A How-to Guide for Planning and Publicizing Impaired Driving Enforcement Efforts.* U.S. Department of Transportation. DOT-HS-809-063. Washington, D.C.

National Highway Safety Administration. 2008. *Traffic Safety Performance Measures for States and Federal Agencies*. U.S. Department of Transportation. DOT-HS-811-025. Washington, D.C.

North Dakota Department of Transportation. 2009. *2008 Crash Summary*. Safety Division. Bismarck, N.D.

North Dakota Department of Transportation. 2010. *2011 Highway Safety Plan*. Safety Division. Bismarck, N.D.

North Dakota Department of Transportation. 2010. Driver Record Query Requested. Safety Division. Bismarck, N.D.

World Health Organization. 2009. *Global Status Report on Road Safety: Time for Action*. Department of Violence and Injury Prevention and Disability. Geneva, Switzerland.

APPENDIX A. SURVEY INSTRUMENT

ND Driver Survey

All Responses Are Confidential

1. **How often do you use seat belts when you drive or ride in a vehicle?**
   □ Always □ Nearly Always □ Sometimes □ Rarely □ Never □ Do Not Know/Refuse

2. **What do you think the chance is of getting a ticket if you…**
   Don't wear your seat belt?
   □ Very Likely □ Somewhat Likely □ Likely □ Unlikely □ Very Unlikely □ Do Not Know/Refuse
   Drive over the speed limit?
   □ Very Likely □ Somewhat Likely □ Likely □ Unlikely □ Very Unlikely □ Do Not Know/Refuse

3. **On a local road with a speed limit of 30 mph, how often do you drive faster than 35 mph?**
   □ Always □ Nearly Always □ Sometimes □ Rarely □ Never □ Do Not Know/Refuse

4. **On a road with a speed limit of 65 mph, how often do you drive faster than 70 mph?**
   □ Always □ Nearly Always □ Sometimes □ Rarely □ Never □ Do Not Know/Refuse

5. **What do you think the chances are of someone getting arrested if they drive after drinking alcohol?**
   □ Very Likely □ Somewhat Likely □ Likely □ Unlikely □ Very Unlikely □ Do Not Know/Refuse

6. **In the past 60 days, how many times have you driven a motor vehicle within 2 hours after drinking alcohol?**
   _____(Number of Times) □ I Do Not Drink □ Do Not Know/Refuse

7. **Have you recently read, seen, or heard traffic safety ads relating to:**

Seat Belt Law Enforcement	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Other
Speed Enforcement	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Other
Drunk Driving Enforcement	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Other
Sobriety Checkpoints	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Other
Saturation Patrols	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Other

8. **The ND Dept. of Transportation television ad, "Wear It For Them", depicts a crash where an unbelted teen driver strikes and kills his belted sister during the force of impact. Did you increase seat belt use after viewing this ad?**
   □ Yes □ No □ Did not see TV message □ Do Not Know/Refuse

9. **I am aware of increased DUI enforcement through Regional DUI Task Forces.**
   □ Yes □ No □ Do Not Know/Refuse **If yes, where?** □ TV □ Radio □ Print □ Other

10. **Greater police presence increases seat belt use.**
    □ Yes □ No □ Do Not Know/Refuse

11. **How often do you text message on a cell phone while driving a vehicle?**
    □ Daily □ Few Times per Week □ Few Times per Month □ Less than Once per Month □ Never

12. **How often do you talk on your cell phone while driving a vehicle?**
    □ Daily □ Few Times per Week □ Few Times per Month □ Less than Once per Month □ Never

13. **Do you ride a motorcycle?** □ Yes □ No (If no, skip to question 14) □ Do Not Know/Refuse
    - **If yes, what protective gear do you wear?**
      □ Helmet □ Leathers □ Full Protective Gear □ None □ Do Not Know/Refuse
    - **Do you operate your motorcycle within 2 hours after drinking alcohol?**
      □ Yes □ No □ Do Not Know/Refuse

14. **Your age:** □ 18 – 24 □ 25 – 34 □ 35 – 44 □ 45 – 54 □ 55 – 64 □ 65 – 74 □ 75 or Older

15. **Type of Vehicle You <u>Most Often</u> Drive: (select one)** □ Car □ Pickup □ SUV □ Van □ Motorcycle

16. **Miles Driven Last Year:** □ Less than 5,000 □ 5,000 to 10,000 □ 10,001 to 15,000 □ More than 15,000

17. **Your Gender:** □ Male □ Female

18. **Your Zip Code:** _____

Thank you for your time and participation.

APPENDIX B. DO NOT KNOW/REFUSE TO ANSWER RESPONSES

Q#	Question	Total Responses	DNK/Refuse Responses
	Seat Belt		
Q1	Seat Belt Use	1,429	1
Q2a	Ticket Likely	1,423	25
Q2b	Seat Belt	1,385	7
	Speeding		
Q3	Speed, 30 mph zone	1,431	4
Q4	Speed, 65 mph zone	1,428	1
	Awareness		
Q5	Arrest for DUI	1,420	21
Q6	Drive After Drink	1,400	114
Q7a	RSH Seat Belt	1,415	n.a.
Q7b	RSH Speeding	1,379	n.a.
Q7c	RSH DUI	1,415	n.a.
Q7d	RSH Sob Checkpoint	1,396	n.a.
Q7e	RSH Saturation Patrol	1,378	n.a.
Q8	“Wear It” Ad	1,398	23
Q9	Regional DUI Task Force	1,422	96
Q10	Police Presence	1,223	0
	Distracted Driving		
Q11	Cell Phone Text	1,421	n.a.
Q12	Cell Phone Talk	1,426	n.a.
	Motorcycle		
Q13a	Motorcycle	1,421	0
Q13b	Protective Gear	263	1
Q13c	Motorcycle Drink	262	5

Total n=1,433

APPENDIX C. DRIVER RESPONSES BY REGION AND GEOGRAPHY

Region or Geography, Question	Region or Geography, Response							
Have you recently read, seen, or heard anything about…	EAST		WEST		URBAN		RURAL	
	YES	NO	YES	NO	YES	NO	YES	NO
Sobriety Checkpoints	57.4%	42.6%	50.6%	49.4%	54.9%	45.1%	61.8%	38.2%
Saturation Patrols	30.3%	69.7%	24.8%	75.2%	29.2%	70.8%	29.0%	71.0%

What are the chances of getting a ticket if you…	Don't wear your seat belt		Drive over the speed limit		Drive after drinking alcohol	
	EAST	WEST	EAST	WEST	EAST	WEST
V. Likely	14.4%	22.4%	28.0%	28.1%	29.2%	39.7%
Sw. Likely	22.2%	24.0%	30.2%	35.6%	27.8%	22.6%
Likely	25.8%	23.5%	30.0%	25.7%	27.4%	26.7%
Unlikely	26.1%	20.7%	10.2%	6.6%	12.8%	12.6%
V. Unlikely	11.6%	9.4%	*1.6%	*4.0%	2.8%	*2.7%

What are the chances of getting a ticket if you…	Don't wear your seat belt		Drive over the speed limit		Drive after drinking alcohol	
	URBAN	RURAL	URBAN	RURAL	URBAN	RURAL
V. Likely	16.2%	15.2%	28.6%	25.0%	31.7%	29.6%
Sw. Likely	22.5%	22.7%	30.3%	36.1%	27.1%	24.9%
Likely	25.2%	25.6%	29.2%	28.6%	26.6%	27.1%
Unlikely	24.2%	29.0%	10.0%	6.8%	12.4%	13.1%
V. Unlikely	11.9%	7.5%	*1.9%	*3.4%	*2.2%	*5.2%

Times driving after drinking the past 60 days…	0	1	2-3	4-6	7+
East	58.2%	18.4%	15.0%	5.6%	*2.8%
West	62.7%	*13.3%	*18.1%	*5.0%	*0.9%
Urban	58.2%	17.7%	16.2%	5.5%	*2.4%
Rural	63.7%	*16.2%	*12.3%	*5.1%	*2.7%

Seat belt use	Always	N. Always	Sometimes	Rarely	Never
East	70.4%	21.0%	5.1%	2.8%	*0.6%
West	58.1%	33.5%	5.9%	*2.3%	*0.3%
Urban	72.4%	20.1%	4.2%	2.8%	*0.5%
Rural	44.8%	40.7%	10.9%	*2.6%	*1.0%

Text messaging while driving	Daily	Once/week	Once/month	< 1/month	Never
East	3.9%	8.1%	10.1%	18.4%	59.6%
West	*3.8%	*6.4%	*7.8%	12.9%	69.1%
Urban	3.7%	7.6%	9.2%	16.9%	62.6%
Rural	*4.4%	8.4%	11.7%	19.5%	56.1%

Talking on cell phone while driving	Daily	Once/week	Once/month	< 1/month	Never
East	21.4%	28.9%	24.8%	12.5%	12.4%
West	16.9%	24.5%	35.1%	15.5%	8.1%
Urban	20.9%	27.0%	26.5%	13.3%	12.3%
Rural	18.2%	33.2%	28.5%	12.4%	7.7%

Did you increase seat belt use after viewing the "Wear It for Them" ad?	YES**	NO**	DID NOT SEE AD
East	29.6%	70.4%	43.5%
West	33.9%	66.1%	43.7%
Urban	28.6%	71.4%	42.6%
Rural	40.8%	59.2%	48.3%

*Estimate uncertain due to limited sample size

**"Yes" and "No" percentages calculated based on those who saw ad