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North Dakota Statewide Traffic Safety Survey, 2015: Traffic Safety Performance Measures for State and Federal Agencies

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ABSTRACT

The statewide driver traffic safety survey provides baseline metrics for the Safety Division and others to use in understanding perceptions and self-reported behaviors related to focus issues. A core set of questions addresses nationally agreed upon priorities, including seat belts, impaired driving, and speeding. In addition to the core issues, questions were included to better understand views on specific programs and attitudes pertinent to North Dakota drivers. Results show that more North Dakota drivers have adopted safe driving practices, but it is apparent that additional efforts are needed to improve safety on the state's roads.

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1. INTRODUCTION

The United States trails other developed countries in several transportation safety metrics. For instance, the road traffic death rate is much higher than in other developed countries (World Health Organization 2013) (Figure 1.1). Progress has been made in reducing the number of traffic deaths, but crashes that result in fatalities, injuries, and property damage continue to take place because of preventable factors. These factors include driving under the influence of drugs or alcohol, distracted driving, and operating a vehicle without a safety belt, among others. The metric highlighted in Figure 1.1 suggests that more work is needed to improve driver behavior and overall safety on the roadway in the United States. One critical asset in monitoring and communicating traffic safety priorities is a reliable and comprehensive means to set and measure goals (Government Accounting Office 2010). In a nationwide 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) established a set of performance measures that support traffic safety priorities and reveal progress related to behavioral safety plans and programs (Hedlund 2008).

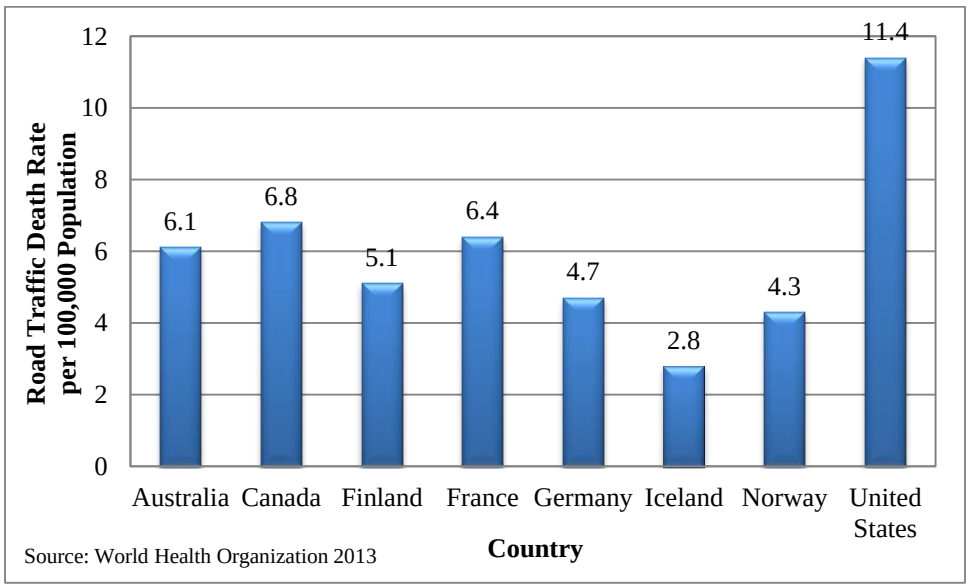


Figure 1.1 Road Traffic Death Rate for Selected Countries, 2010

Within the GHSA-NHTSA safety effort, 14 measures were agreed upon as Minimum Performance Measures (MPM). These include one behavior, three activity, and ten outcome measure-types. The MPM are designed to create a quantitative core for the development and implementation of 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 arise via improvements to organizational focus, feedback processes, and accountability (Herbel et al. 2009). The measures were defined to monitor overall traffic safety performance in addition to progress related to prioritized behavioral issues. These prioritized behavioral issues include occupant protection, alcohol use, and speeding. In addition, the measures target high-risk population target groups. The 10 outcome measures focus on the following:

- 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 Fatality Analysis Reporting System (FARS) to generate performance measures in areas common to state safety strategies and data systems. Activity measures emphasize actions such as citations or arrests under grant-funded enforcement initiatives. Seat belt observation was chosen as the single initial core behavior measure (Hedlund 2008). The measures utilized in the outcome highlights are generally calculated as:

- Core outcome measures
    - C-1) Number of traffic fatalities (FARS). States are encouraged to report 3-year or 5-year moving averages as appropriate. (One example is when annual counts are small enough that random fluctuations may inaccurately reflect true trends. This applies to all fatality measures.)
    - C-2) Number of serious injuries in traffic crashes (state crash data files).
    - C-3) Fatalities per VMT (FARS, FHWA). States should set a goal for total fatalities per VMT; states should report both urban and rural fatalities per VMT in addition to total fatalities per 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 blood alcohol content (BAC) of at least 0.08 g/dL (FARS).
    - C-6) Number of speeding-related fatalities (FARS).
    - C-7) Number of motorcyclist fatalities (FARS).
    - C-8) Number of motorcyclist fatalities not wearing a helmet (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 referenced four additional areas for measuring improvement and implementation. These focused on traffic injury outcome; driver attitudes, awareness, and behavior; traffic speed; and law enforcement activity. The following report fulfills the need for improved measurement of driver attitudes, awareness, and behavior. A core question set was developed by a GHSA-NHTSA working group and presented to state departments of transportation following the preliminary MPM recommendations (Hedlund, Casanova, and Chaudhary 2009).

A set of 10 core questions was created to quantify attitudes, awareness, and self-reported behavioral patterns through periodic statewide traffic safety surveys/questionnaires. This recommended list of core questions was intended to provide a standard for states to track performance as they pursue program goals

and objectives to reduce crashes, injuries, and fatalities related to high-risk driver behaviors. The core questions remain consistent across all entities. Beyond the core questions, an option to supplement the survey with other additional questions provides latitude to address local interests and to obtain other useful information related to topics such as demographics and driving activity.

Currently, federal initiatives relating to driver behavior focus most on impaired driving, seat belt use, and speeding. As such, the core questions emphasize these issues (Hedlund et al. 2009). The core questions of the focus areas are:

- Impaired driving
    - ID-1: In the past 60 days, how many times have you driven a motor vehicle within two 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 pickup?
    - 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 miles per hour, how often do you drive faster than 35 miles per hour?
    - SP-1b: On a road with a speed limit of 65 miles per hour, how often do you driver faster than 70 miles per hour?
    - SP-2: In the past 30 days, have you read, seen or heard anything about speed enforcement by police?
    - 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 "North Dakota Driver Survey" developed in conjunction with the North Dakota Department of Transportation Safety Division (see Appendix A for complete survey). The Safety Division expanded the survey to gain additional information relevant to its goals and responsibilities.

The annual Highway Safety Plan (HSP) provides insight for current priorities and activities (Levi, Nelson, and Mongeon 2014). The most recent HSP outlines goals related to the overall traffic safety mission of the NDDOT, along with specific issues to address in the coming fiscal year. In 2015, these issues will be studied via projects designed to improve the following areas: planning and administration, police traffic services, traffic records, occupant protection, motorcycle safety, speed management, youth/young adult drivers, community traffic safety projects, impaired driving prevention, and distracted driving. Metrics are included to indicate progress of the overall safety mission – in light of traffic fatalities and serious injuries. The single core behavior measure shows observed seat belt use at 77.7%, which is below the five-year moving average of 78.3%. (Levi et al. 2014). Nonetheless, both measures are below the targeted goal of 82.9% of drivers always wearing a seat belt. Results here will enhance the understanding of behavior by providing additional coverage, expanded insight to issues, and an increased number of measures.

2. METHOD

A mail survey was selected as the method for the driver traffic safety survey. A questionnaire was designed by blending the 10 core questions with additional NDDOT-designated questions pertaining to education, policy, and enforcement. The questions were developed based on a review of literature, including previous surveys of this type, and guidance offered by the GHSA-NHTSA working group. The mailing to drivers included a Safety Division cover letter which invited participation and explained survey goals. The survey was mailed to North Dakota drivers on March 2, 2015, and was open to response until April 1, 2015.

NDDOT driver records formed the population used for sampling. Initially, the NDDOT mail list consisted of 10,920 driver addresses. From this preliminary list of addresses, it was discovered that some out-of-state drivers had accidentally been included in the survey sample. After cleaning the sample, a total of 10,671 drivers were verified as having North Dakota residency. Furthermore, the sample had regional, geographic, age, and gender distributions that were a reasonable representation of the general North Dakota driver population.

Unlike mailing lists from earlier years of this study, extensive screening of the address list resulted in zero addresses being identified as duplicates and zero addresses being flagged as "problem addresses." From the 10,671 original addresses, 564 were returned by the postal service as being undeliverable. It is likely that many of these undeliverable addresses were addressed for towns in western North Dakota oil counties, a part of the state in which many individuals live temporarily due to the sporadic nature of the oil extraction industry. Ultimately, 2,244 surveys were completed and returned to the research team. However, 5 were from out-of-state zip codes, 6 were from unverifiable zip codes, and 82 were from individuals who refused to indicate a zip code and thus cannot be verified as legitimate North Dakota responses. Therefore, of the usable survey responses provided, 2,151 were confirmed as valid responses and form the driver response sample used in the analysis.

The sample size was based on a 95% confidence interval, with a 5% confidence level. The expected response was estimated at 20%. Although mail survey response is typically low, with 10% not uncommon, a slightly better response rate was anticipated due to the parameters used in the survey design and administration. These parameters include keeping the survey to a single page, including the state agency cover letter, and using state agency mail envelopes.

A disproportionate stratified random survey sample was used to select drivers. North Dakota drivers were stratified by region (east/west) and geography (urban/rural). County jurisdictional boundaries were used to define both region and geography (Figure 2.1). Additionally, oversampling was conducted for two target driver groups: 18-to-34-year-old male and female drivers. The disproportionate stratified sampling structure was used to elicit sufficient driver participation to allow robust analysis of responses by region, geography, and the target driver groups. Using these simple average responses, however, would provide skewed results in representing the statewide driver population. For example, drivers age 25 to 34 were 43.7% of the survey sample and account for 28.7% of the survey responses. However, this age cohort only accounts for 19.5% of the licensed driver population in the state (Levi et al. 2014). Therefore, a post-stratification weighting process is used to give an appropriate weight to responses for statewide estimates. Results from post-stratification consider North Dakota registered driver age, gender, and location when weighting to reflect the views, perceptions, and behaviors of the statewide driving population. Note that answers with 30 or fewer responses are not considered large enough to extrapolate to the entire North Dakota driver population. These instances are indicated with asterisks throughout the analysis.

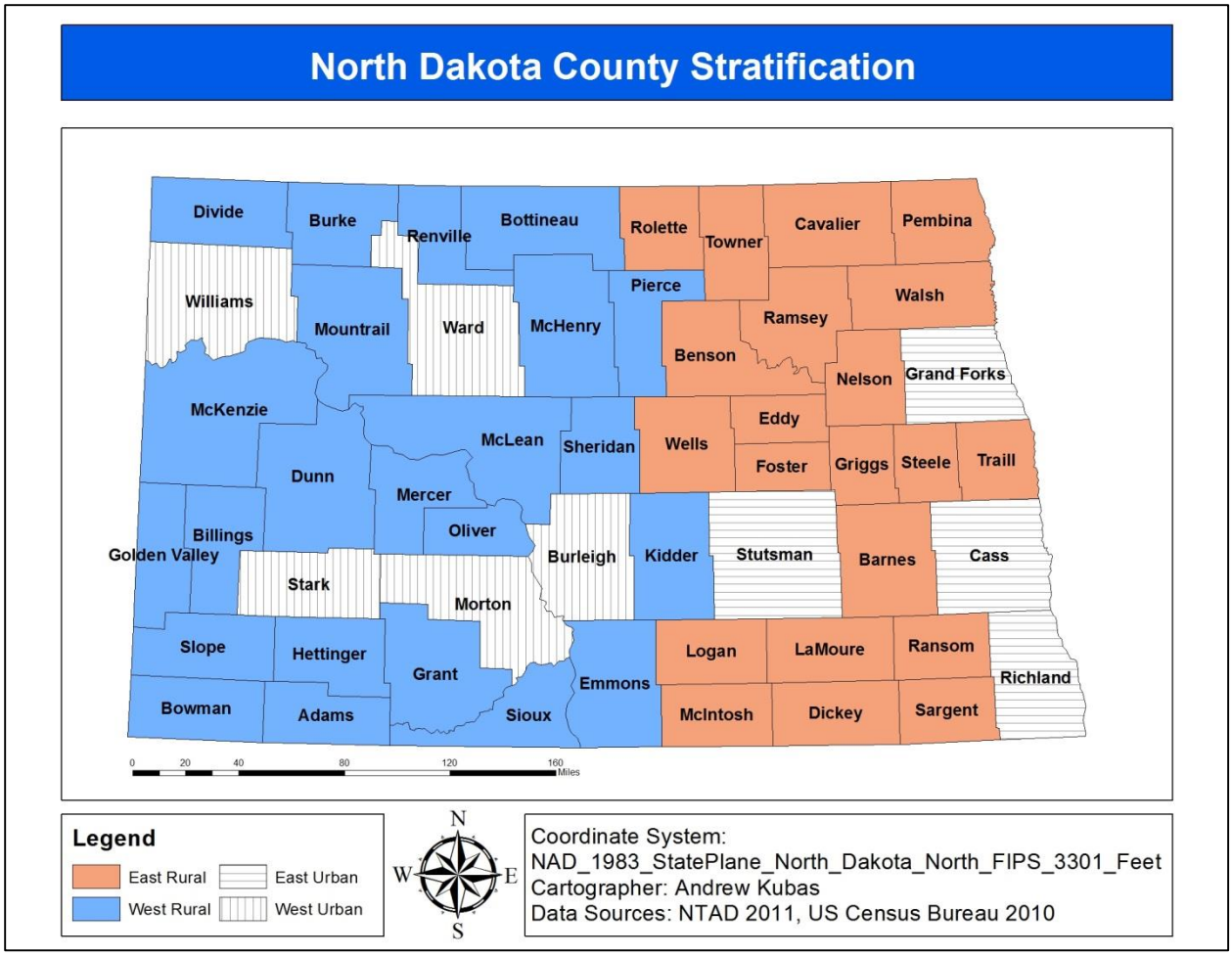


Figure 2.1 County Stratification

The regional geography was defined by aggregating the North Dakota health regions into two regions that most closely represent an east/west division 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 US 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. These nine counties represent nearly 95% of the urban population in the state (US Census Bureau 2010). The sampling probabilities for the survey are shown in Table 2.1.

Table 2.1 Sampling Probabilities

Region	Geography	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

3. RESPONSE

Survey response rate was 21.3% with 2,151 valid responses received from the sample mailing to 10,107 drivers. The response rate was comparable to prior surveys (Vachal, Benson, and Kubas 2010-2014). As expected, oversampling of the 18-34 year-old male and female driver target groups was needed to achieve a sample sufficient for statistical analysis. The target group response rate was 12.5% compared to 34.1% for other drivers. Sampling to elicit response by region and geography was successful as shown in Table 3.1. The responses include an acceptable level of participation with comparable response rates from east, west, urban, and rural demographics.

Table 3.1 Survey Response by Region and Geography

		GEOGRAPHY		
		Urban	Rural	**Total**
REGION	East	577 (26.8%)	514 (23.9%)	**1,091 (50.7%)**
	West	562 (26.1%)	498 (23.2%)	**1,060 (49.3%)**
	Total	**1,139 (53.0%)**	**1,012 (47.0%)**	**2,151**

The sample design did not account for age or gender beyond the target male and female groups. Responses have an acceptable distribution among age cohorts, though the 35-44 year-old age group is moderately underrepresented compared to its actual proportion of the driver population in the state (Table 3.2). The highest share of responses is among drivers age 25-34; this age cohort makes up 28.7% of survey responses. The 35-44 age cohort makes up the lowest proportion of survey responses. Nonetheless, there were well over 30 responses from each age cohort, making statistical extrapolation possible and allowing for inferences to be made with regard to the entire North Dakota driver population. Response rates were slightly skewed by gender: 42.1% of respondents were men and 57.9% were women. This deviates from the North Dakota driver population in which there is an equal distribution of males and females. The number of responses based on gender also provides sufficient data to expand these responses to represent the entire North Dakota driver population.

Table 3.2 Response by Age Group

	Survey		Driver Population	
Age Group	Responses	Share	Drivers	Share
18-24	241	11.2%	63,745	12.3%
25-34	617	28.7%	101,473	19.5%
35-44	130	6.0%	76,986	14.8%
45-54	275	12.8%	86,820	16.7%
55-64	457	21.2%	87,860	16.9%
65-74	247	11.5%	50,324	9.7%
75 and Older	180	8.4%	38,937	7.5%

Frequency Missing: 4
Source: 2013 North Dakota Crash Summary

Information regarding drivers' annual travel provides background for understanding statewide driving activity. The expected trend in driving behavior is that as drivers age, the number of annual miles traveled decreases. This expected trend is evident in the average annual miles traveled summarized in Figure 3.1. With the exception of the 75+ age cohort, a majority of drivers report driving more than 10,000 miles annually. Responses show two-thirds (67.0%) of those over the age of 75 drive less than 10,000 miles yearly. Roughly three-fifths (59.9%) of 35-44 year-olds reported driving more than 15,000 miles annually; this was the largest proportion among age cohorts for driving at least 15,000 miles each year. In contrast, about half (49.0%) of drivers in the 75+ year-old age cohort reported that they drive less than 5,000 miles per year.

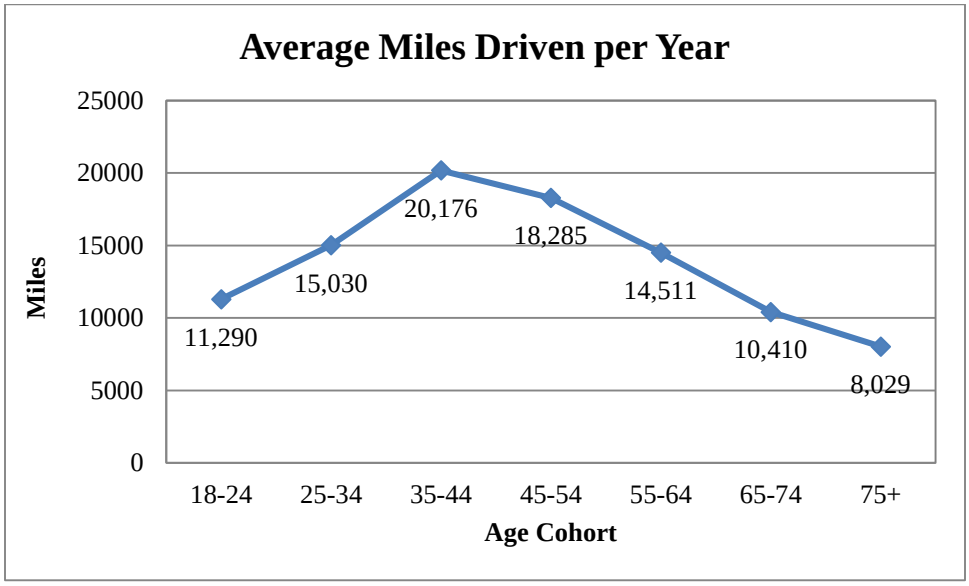


Figure 3.1 Average Miles Driven per Year, by Age

In North Dakota, the western portion of the state is generally associated with more miles driven annually. Similarly, it is assumed that rural residents travel more frequently than their urban counterparts. Thus, one would expect residents from the western region of the state and residents from rural backgrounds to travel further, on average, than their eastern and urban neighbors. When age is broken down by both region and geography, it becomes apparent that drivers from rural areas do indeed drive more, on average, than those from urban portions of the state. Unlike prior iterations of this survey, there were few discrepancies in regional driving habits: North Dakota drivers from the east and west reported driving comparable distances across age cohorts (Table 3.3) (Figure 3.2). There also was consistency when factoring for those who drive the greatest distance annually: the 35-44 year-old age cohort drove the most in each region and geography. Similarly, rural respondents drove the most across all age cohorts.

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

Age	East	West	Urban	Rural
18-24	11,845	10,581	10,385	*13,128*
25-34	14,065	15,951	13,992	*17,313*
35-44	**20,300**	**20,012**	**18,859**	***24,385***
45-54	18,423	18,120	16,565	*22,040*
55-64	14,029	15,051	13,811	*17,531*
65-74	10,376	10,492	9,223	*16,078*
75 and older	8,024	8,046	7,759	*10,373*

Bold: Highest in region or geography
Italic: Highest in age cohort

Drivers from the western half of the state reported traveling an average of 14,629 miles per year, a slightly larger number than their eastern counterparts who traveled 13,169 miles annually. Responses reveal that rural residents, on average, drive farther than urban residents in every age cohort. Rural residents reported annual travel of 16,774 miles compared to just 12,723 miles yearly for urban North Dakotans. Annual travel is important in understanding travel patterns and exposure for traffic safety assessments.

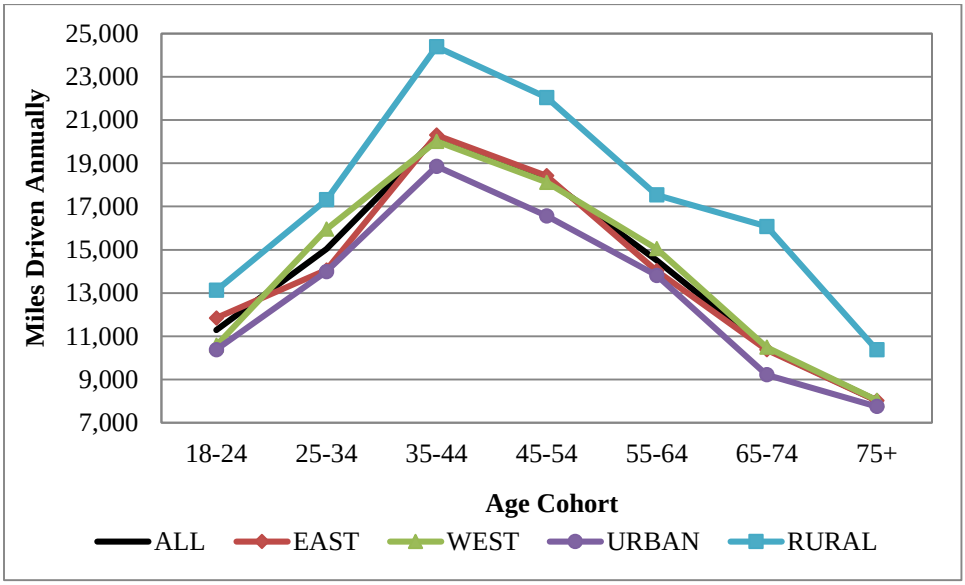


Figure 3.2 Average Annual Driving Activity, by Respondent Group

In rural North Dakota, 35-44 year-olds drive the most, on average, at 24,385 miles annually. This was the largest annual average of any group studied in this project. The largest discrepancy in annual travel is between urban and rural drivers in the 65-74 year-old cohort. Among these drivers, rural residents drive an average of nearly 7,000 more miles yearly. Differences in driving activity may influence views and perceptions of traffic safety. This information is also valuable in understanding and interpreting information regarding crashes, injuries, fatalities, and assessing driver risk. Specific information regarding driver responses is provided in Table 3.4.

Table 3.4 Annual Average Miles Traveled, by Age Group

Driver Age	Less than 5,000	5,000 to 9,999	10,000 to 14,999	More than 15,000
18-24	19.6%	26.9%	28.0%	25.5%
25-34	12.2%	16.5%	35.7%	35.5%
35-44	1.1%	13.1%	25.9%	59.9%
45-54	10.2%	15.7%	29.8%	44.2%
55-64	14.4%	18.8%	30.6%	36.2%
65-74	26.1%	23.3%	27.2%	23.4%
75+	49.0%	18.0%	19.6%	13.3%

Frequency Missing: 139

Table 3.5 indicates that driving activity does vary substantially by geography. Rural residents drive further, on average, than urban residents. The difference between urban and rural annual driving distances is statistically significant at the 1% level ($F=17.191$, $df=1$, $p<0.001$). There were no statistically significant differences in annual driving distance when factoring for one's region ($F=1.380$, $df=1$, $p=0.240$).

Table 3.5 Annual Driving Activity by Geography

Geography	Less than 5,000	5,000 to 9,999	10,000 to 14,999	More than 15,000
Urban	18.4%	21.0%	32.5%	28.1%
Rural	13.8%	14.1%	26.8%	45.3%

Frequency Missing: 135

Travel patterns vary based on the type of vehicle being driven (Figure 3.3). As expected, respondents who drive a semi/large truck travel the furthest annually. A majority (53.4%) of respondents in this survey who drive a semi/large truck were from the western region of the state. Perhaps this directly correlates to the impact of oil extraction and the energy sector in western North Dakota. Among vehicles that were not semi/large trucks, drivers of pickups traveled the greatest average distance annually at 19,407 miles. With regard to regional and geographic strata, residents from rural portions of western North Dakota who drove pickup trucks traveled the most with an average of 22,454 miles per year.

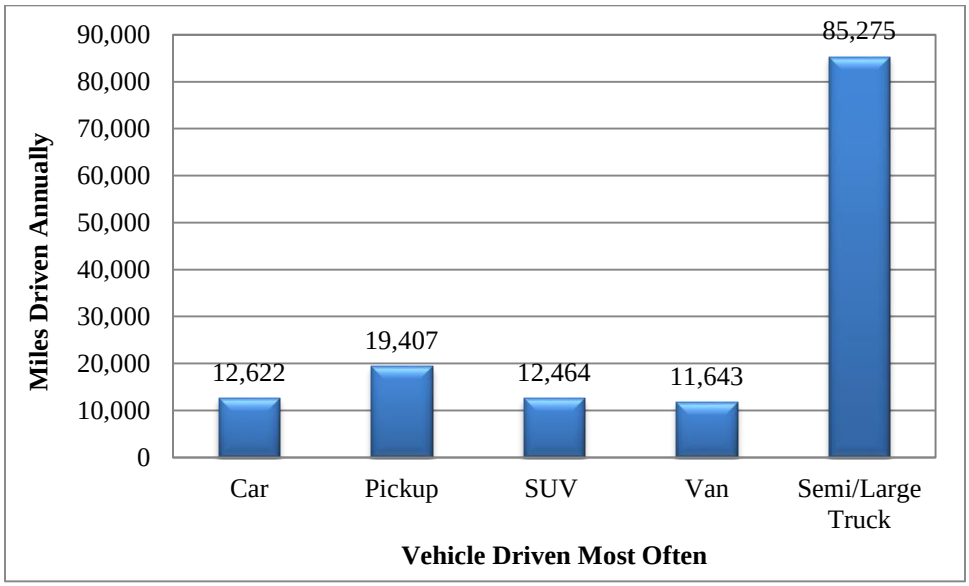


Figure 3.3 Average Annual Vehicle Miles Traveled, by Vehicle Type

More than nine-tenths (93.5%) of the sample have lived in North Dakota for more than three years (Figure 3.4). Length of residency was evenly dispersed across the eastern and western regions of the state; no more than 55.7% of respondents in each residency cohort reported living in one of the two regions. In terms of geographic strata, newer residents report living in urban areas more often than in rural portions of the state. For example, 81.3% of those who have lived in North Dakota for less than one year currently live in an urban county. Similarly, 78.2% of those who have lived in the state between one and three years live in an urban county. Given different push and pull factors affecting human migration patterns, this distribution may be attributable to urban regions having more job opportunities, options for higher education, and quicker access to medical care, among other socioeconomic factors.

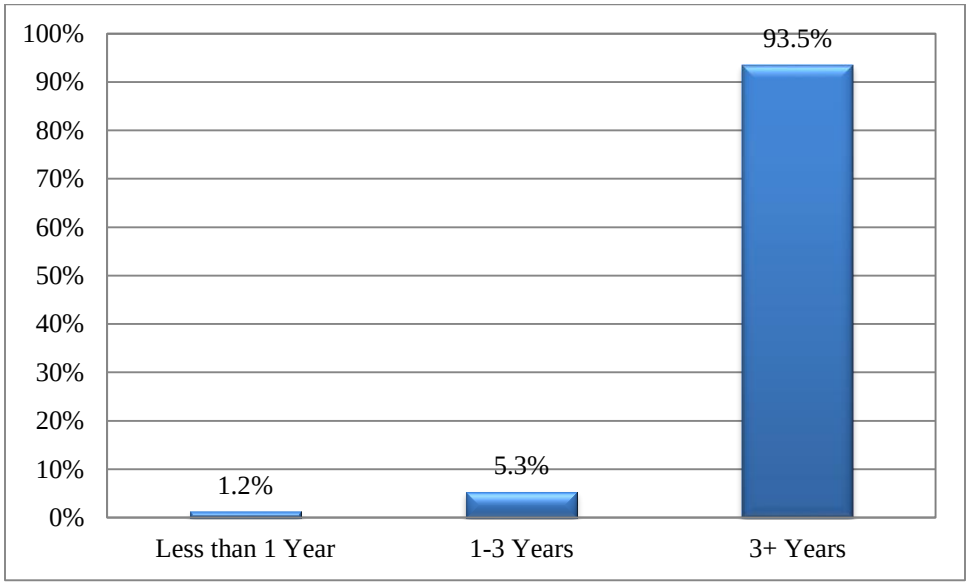


Figure 3.4 Respondent Length of North Dakota Residency

4. RESULTS

Responses to the survey questions provide valuable 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. Additionally, the scale responses can be transformed into ordinal values to help 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 interval 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 aimed at three specific issues: impaired driving, seat belt use, and speeding. Response frequencies for the 10 core questions are included in Table 4.1. The table includes 2010-2014 responses to establish metrics that may be used to identify North Dakota driving trends. Additionally, five-year averages shed further light into patterns during this timeframe. Unlike previous iterations of this survey, 2015 responses show drivers believe law enforcement is more likely to ticket for speeding violations than for impaired driving or seat belt violations. Historically, impaired driving was perceived to be the violation with the greatest likelihood for which one would be ticketed. Frequencies show that 67.3% of drivers believe chances are higher than average that speeding drivers will be ticketed. This is higher than the 66.5% and 47.5% of respondents who believe there is a greater-than-average likelihood that drivers will be arrested for impaired driving or ticketed for seat belt violations, respectively.

Responses show that perceptions of getting a ticket for illegal driving behavior is related to whether one has driven within two hours of consuming alcohol in the last 60 days. For example, compared to drivers who never drove within two hours of consuming alcohol, those that operated a vehicle at least once within two hours of consuming one or two alcoholic beverages were less likely to think that they would be ticketed for not wearing a seat belt ($F=22.437$, $df=1$, $p<0.001$) and were also less likely to think that they would be ticketed for speeding ($F=22.647$, $df=1$, $p<0.001$). A similar pattern occurred among those that chose to operate a vehicle within two hours of consuming three or more alcoholic drinks. In this survey, operating a vehicle after consuming three or more alcoholic beverages appears to lower to one's perceived chances of getting a ticket for speeding ($F=8.142$, $df=1$, $p=0.004$). This suggests that one dangerous activity (impaired driving) may lead to another (speeding, driving without a seat belt) and may exponentially increase danger on the roadway.

In this survey, 32.3% of respondents reported that they had driven a vehicle within two hours of drinking one or two drinks at least once during the past two months. In contrast, just 6.6% of survey participants noted that they had operated a vehicle within two hours of drinking three or more drinks at least once during the past two months. This is not, however, an improvement from the 2014 survey in which 5.5% of survey participants reported operating a vehicle under these exact conditions.

With regard to speeding, 8.6% and 12.6% of drivers report high levels of speeding activity – considering those who answered "always" or "nearly always" to the questions on 30-mile-per-hour and 65-mile-per-hour speed zones, respectively. A higher percentage of drivers in 2015 are speeding on 30- and 65-mile-per-hour roads compared to responses from the 2014 statewide survey. Drivers are more likely to speed on the 30-mile-per-hour road, with only 12.8% of the drivers reporting that they "never" speed on these roads compared to 17.4% of drivers who "never" speed on the 65-mile-per-hour roads. These results follow the same trends from previous iterations of this survey.

Table 4.1 Core Question Responses

Core	Survey Question	Responses				
ID-1	In the past 60 days, how many times have you driven a vehicle within two hours after drinking 1-2 drinks?					
		None	1-5 Times	6-10 Times	More than 10 Times	
	2015[#]	66.7%	30.1%	1.5%	0.7%*	
	2014[#]	71.3%	27.0%	1.3%	0.4%*	
	2013[#]	69.5%	26.8%	3.0%	0.7%*	
	In the past 60 days, how many times have you driven a vehicle within two hours after drinking 3+ drinks?					
		None	1 – 5 Times	6 – 10 Times	More than 10 Times	
	2015[#]	93.4%	6.1%	0.5%*	0.1%*	
	2014[#]	94.5%	5.1%	0.2%*	0.2%*	
	2013[#]	92.4%	6.6%	0.8%*	0.2%*	
ID-2	Have you recently read, seen, or heard anything about drunk driving enforcement?					
		Yes	No			
	2015	89.5%	10.5%			
	2014	85.2%	14.8%			
	2013	88.9%	11.1%			
	2012	89.5%	10.5%			
	2011	87.0%	13.0%			
	2010	85.0%	15.0%			
2011-2015 Five-Year Avg.		**88.0%**	**12.0%**			
2010-2014 Five-Year Avg.		**87.1%**	**12.9%**			
ID-3	Chances of someone getting arrested if they drive after drinking alcohol?					
		Very Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	2015	33.6%	32.9%	21.3%	10.3%	2.1%
	2014	29.7%	31.6%	25.9%	11.1%	1.7%
	2013	25.9%	29.1%	26.5%	16.7%	1.8%
	2012	32.5%	29.7%	25.9%	10.3%	1.6%
	2011	31.3%	26.7%	26.7%	12.6%	2.7%
	2010	25.0%	26.0%	31.0%	15.0%	4.0%
2011-2015 Five-Year Avg.		**30.6%**	**30.0%**	**25.3%**	**12.2%**	**2.0%**
2010-2014 Five-Year Avg.		**28.9%**	**22.7%**	**27.2%**	**13.1%**	**2.4%**
SB-1	How often do you use seat belts when you drive or ride in a vehicle?					
		Always	N. Always	Sometimes	Rarely	Never
	2015	71.9%	20.4%	5.6%	1.6%	0.6%*
	2014	72.2%	19.7%	5.6%	2.1%	0.5%*
	2013	70.5%	21.3%	6.0%	1.8%	0.4%*
	2012	62.8%	26.9%	6.5%	2.9%	0.9%
	2011	67.9%	23.5%	5.3%	2.7%	0.6%*
	2010	58.0%	27.0%	10.0%	3.0%	1.0%
2011-2015 Five-Year Avg.		**69.1%**	**22.4%**	**5.8%**	**2.2%**	**0.6%**
2010-2014 Five-Year Avg.		**66.3%**	**23.7%**	**6.7%**	**2.5%**	**0.7%**
SB-2	Have you recently read, seen, or heard anything about seat belt law enforcement?					
		Yes	No			
	2015	78.2%	21.8%			
	2014	74.5%	25.5%			
	2013	80.6%	19.4%			
	2012	84.7%	15.3%			
	2011	82.8%	17.2%			
	2010	77.0%	23.0%			
2011-2015 Five-Year Avg.		**80.2%**	**19.8%**			
2010-2014 Five-Year Avg.		**79.9%**	**20.1%**			

Note: Please see Appendix A for exact question and response wording
*Estimate uncertain due to limited sample size
[#]Due to wording changes in ID-1, trends from previous years could not be studied

Table 4.1 Core Question Responses (Continued)

Core	Survey Question	Responses				
SB-3	What do you think the chances are of getting a ticket if you don't wear your seat belt?					
		Very Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	2015	16.9%	30.6%	21.6%	26.5%	4.4%
	2014	16.5%	24.9%	26.8%	26.3%	5.6%
	2013	15.5%	28.8%	21.8%	31.3%	2.7%
	2012	17.1%	28.1%	26.6%	23.7%	4.5%
	2011	16.0%	22.6%	25.3%	25.0%	11.2%
	2010	14.0%	26.0%	23.0%	26.0%	10.0%
2011-2015 Five-Year Avg.		**16.4%**	**27.0%**	**24.4%**	**26.6%**	**5.7%**
2010-2014 Five-Year Avg.		**15.8%**	**26.1%**	**24.7%**	**26.5%**	**6.8%**
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
	2015	1.3%*	7.3%	34.0%	44.6%	12.8%
	2014	0.7%*	5.3%	33.6%	48.1%	12.3%
	2013	1.3%*	7.6%	35.5%	42.2%	13.4%
	2012	0.6%*	6.4%	31.6%	46.3%	15.2%
	2011	1.1%*	3.5%	32.9%	47.3%	15.2%
	2010	1.0%	4.0%	31.0%	47.0%	17.0%
2011-2015 Five-Year Avg.		**1.0%**	**6.0%**	**33.5%**	**45.7%**	**13.8%**
2010-2014 Five-Year Avg.		**0.9%**	**5.4%**	**32.9%**	**46.2%**	**14.6%**
SP-1b	On a road with 65 mph speed limit, how often do you drive faster than 70 mph?					
		Always	N. Always	Sometimes	Rarely	Never
	2015	2.0%	10.6%	28.7%	41.3%	17.4%
	2014	1.1%	6.6%	26.3%	45.9%	20.0%
	2013	1.3%*	8.8%	26.0%	45.9%	18.0%
	2012	1.1%*	6.3%	23.5%	45.6%	23.5%
	2011	1.2%*	6.2%	27.3%	44.9%	20.5%
	2010	1.0%	5.0%	22.0%	45.0%	28.0%
2011-2015 Five-Year Avg.		**1.3%**	**7.7%**	**26.4%**	**44.7%**	**19.9%**
2010-2014 Five-Year Avg.		**1.1%**	**6.6%**	**25.0%**	**45.5%**	**22.0%**
SP-2	What do you think the chances are of getting a ticket if you drive over the speed limit?					
		Very Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	2015	24.0%	43.3%	25.7%	6.5%	0.5%*
	2014	23.9%	34.3%	32.7%	8.1%	1.0%*
	2013	24.0%	37.5%	29.3%	8.4%	0.9%*
	2012	28.7%	33.6%	28.8%	7.4%	1.5%*
	2011	28.0%	31.3%	29.1%	9.5%	2.1%
	2010	26.0%	30.0%	28.0%	12.0%	4.0%
2011-2015 Five-Year Avg.		**25.7%**	**36.0%**	**29.1%**	**8.0%**	**1.2%**
2010-2014 Five-Year Avg.		**26.1%**	**33.3%**	**29.6%**	**9.1%**	**1.9%**
SP-3	Have you recently read, seen, or heard anything about speed enforcement?					
		Yes	No			
	2015	41.7%	58.3%			
	2014	38.1%	61.9%			
	2013	36.3%	63.7%			
	2012	34.2%	65.8%			
	2011	35.8%	64.2%			
	2010	57.0%	43.0%			
2011-2015 Five-Year Avg.		**37.2%**	**62.8%**			
2010-2014 Five-Year Avg.		**40.3%**	**59.7%**			

The share of drivers reporting that they always use their seat belts when driving or riding in a vehicle is lower than the information presented by the core behavior metric of 77.7%. Driver self-reported use collected here shows that 71.9% "always" wear a seat belt with another 20.4% indicating usage as "nearly always." The 71.9% of drivers who "always" wear a seat belt represents a slight decrease from 72.2% in 2014. Only 2.2% report that they "rarely" or "never" use a seat belt, an improvement from 2.6% in 2014.

Responses to awareness of public media or other educational messages about traffic safety related to drinking, speeding, and seat belt issues shows speed enforcement is least often read, seen, or heard as a traffic safety topic; just 41.7% of survey participants responded that they had such exposure to this safety message. This is expected as the NDDOT Safety Division does not create safety messages for speeding. This exposure rate did, however, continue a recent trend of improving exposure to this message since 2012 when just 34.2% of drivers were exposed to this safety theme. These low rates of exposure represent a stark contrast to messages about impaired driving and seat belt enforcement. Exposure rates to these two safety topics were 89.5% and 78.2%, respectively. These exposure rates have improved moderately compared to 2014. Considering these trends and drivers' perceptions that there is a relatively high risk for ticketing, it appears enforcement does influence some driving attitudes.

An examination of the relationships between behavior and enforcement along with behavior and education awareness yields some unexpected results. 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 exposure levels and perceived likelihood for ticketing, respectively. As illustrated in Figure 4.1, driver responses are not consistent with this expectation. The ticket drivers least expect to receive is not associated with the highest reported levels of negative behavior.

With seat belts, only 47.5% of drivers have a higher-than-average expectation of receiving a ticket for not wearing a seat belt; this was the smallest percentage of the three target areas. If an inverse relationship were to exist, then the highest level of negative behavior should be associated with seat belt use. Instead, the highest level of negative behavior is associated with speeding. Interestingly, drivers rated speeding as the area in which they are most likely to be ticketed for engaging in a negative behavior, which is once again antithetical to the expected relationship between enforcement and negative behavior.

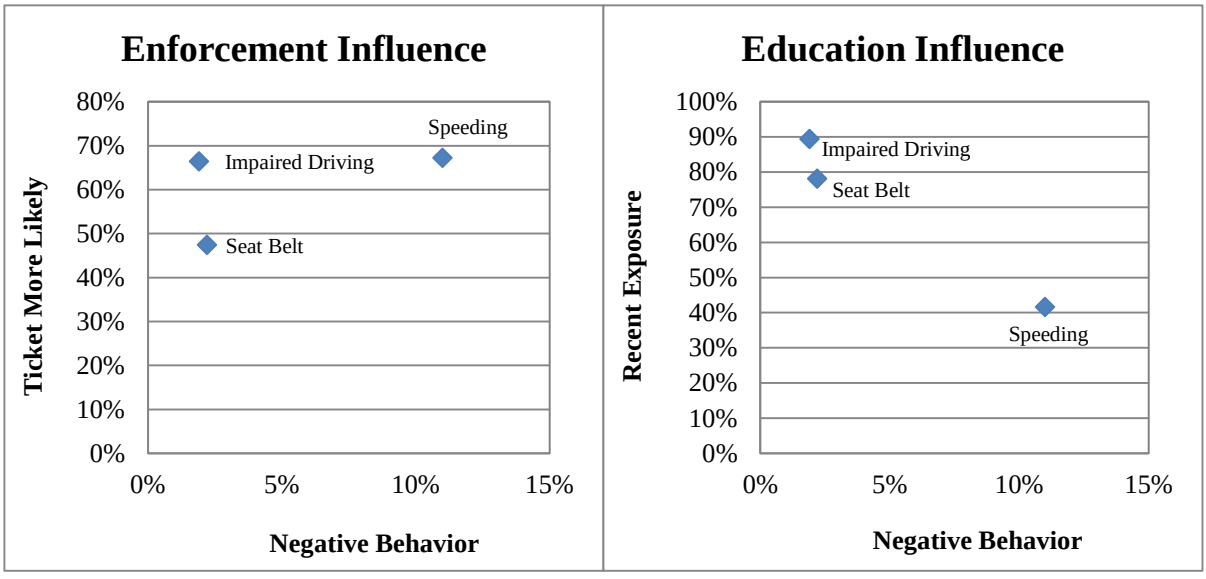


Figure 4.1 Driver Action Related to Enforcement and Education

The education influence follows an expected pattern, considering responses to the read, seen, or heard questions. One would expect that as drivers are more often exposed to traffic safety issues via educational messages, they will subsequently have lower levels of negative behavior. This is precisely what was reported by drivers. Respondents in this survey were most often exposed to traffic safety messages about impaired driving; 89.5% of the sample reported having recent exposure. As expected, this traffic safety issue had the lowest number of drivers reporting that they drove within two hours of consuming alcohol. Similarly, drivers reported that educational exposure to messages about speeding occurred least often. As a result, speeding had the highest rate of self-reported negative behavior among survey participants. This is a logical relationship. One would expect drivers to be more likely to behave negatively if they have not had as much educational exposure to the safety topic. It appears as though in this sample of North Dakota drivers, education has a more recognizable impact than enforcement.

To further investigate relationships among the core questions and issues that may be related, measures of association are calculated for 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 considered strong relationships. Relationships between -0.5 and +0.5 are generally considered weak and inconsequential. For example, the "drive after drinking 1-2 drinks" and "drive after drinking 3+ drinks" variables do have an expected positive relationship at Pearson Corr.=0.485, but the correlation measure shows that less than 24% of their variability is shared. The Pearson correlation values suggest there are no strong relationships between survey items (Table 4.2).

Table 4.2 Correlations in Core Question Responses

	ID1a	ID1b	ID2	ID3	SB1	SB2	SB3	SP1a	SP1b	SP2	SP3
ID1a: Drive After Drinking 1-2 Drinks	1	.485** .000	-.085** .000	-.024 .271	-.097** .000	-.036 .108	-.106** .000	.089** .000	.141** .000	.033 .144	-.118** .000
ID1b: Drive After Drinking 3+ Drinks		1	-.048* .036	-.025 .263	-.151** .000	-.014 .528	-.038 .090	.102** .000	.110** .000	.012 .602	-.065** .004
ID2: Read, Seen, or Heard Drunk Driving			1	-.097** .000	-.029 .185	**.531** **.000**	-.053* .015	-.039 .074	-.070** .001	.277** .000	-.050* .021
ID3: Arrest for Drinking				1	.063** .003	-.107** .000	.392** .000	.005 .826	.039 .073	-.141** .000	.424** .000
SB1: Seat Belt Use					1	.028 .199	.072** .001	-.063** .003	-.039 .068	-.018 .426	-.092** .000
SB2: Read, Seen, or Heard Seat Belt						1	-.079** .000	-.002 .929	-.010 .637	.393** .000	-.055* .013
SB3: Ticket for Seat Belt							1	-.058** .007	-.114** .000	-.183** .000	.444** .000
SP1a: Speed on 30 MPH Road								1	**.525**** **.000**	-.004 .870	-.088** .002
SP1b: Speed on 65 MPH Road									1	.039 .079	-.088** .000
SP2: Read, Seen, or Heard Speed										1	-.139** .000
SP3: Ticket for Speeding											1

**Correlation is significant at the 1% level
*Correlation is significant at the 5% level
Bold: Correlation and p-value indicate a substantive relationship
Note: Correlations between -0.5 and +0.5 indicate a weak relationship and are not addressed in this study

There were two substantive relationships within the core question correlations studied, though these relationships were relatively weak. One substantive relationship was between exposure to messages about impaired driving and exposure to messages about using safety belts while in a vehicle (Pearson Corr.=0.531, p<0.001, n=2,071). These two variables share approximately 28% of their variability. Exposure to these safety messages are related, but the relationship is weak, indicating that the questions address different perceptions of exposure to these educational messages. The other substantive relationship is between speeding on a road with a 30-mile-per-hour limit and speeding on a road with a 65-mile-per-hour limit (Pearson Corr.=0.525, p<0.001, n=2,128). These two variables share roughly 28% of their variability. This relationship reveals that – as one chooses to speed on a road with a posted speed limit of 30 miles per hour – one is more likely to also speed on a road with a posted speed limit of 65 miles per hour. Although several other relationships between variables are found to be statistically significant at the 1% and 5% levels, the relationship measures are between the -0.5 and +0.5 levels and thus are not considered substantive.

Driver responses to other questions are presented in Table 4.3. These responses offer additional insight for decision makers and policymakers 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 taking part in dangerous or risky behaviors. The critical driver risk behaviors here are traffic safety knowledge, driver preferences, distracted driving, and perceptions of other drivers.

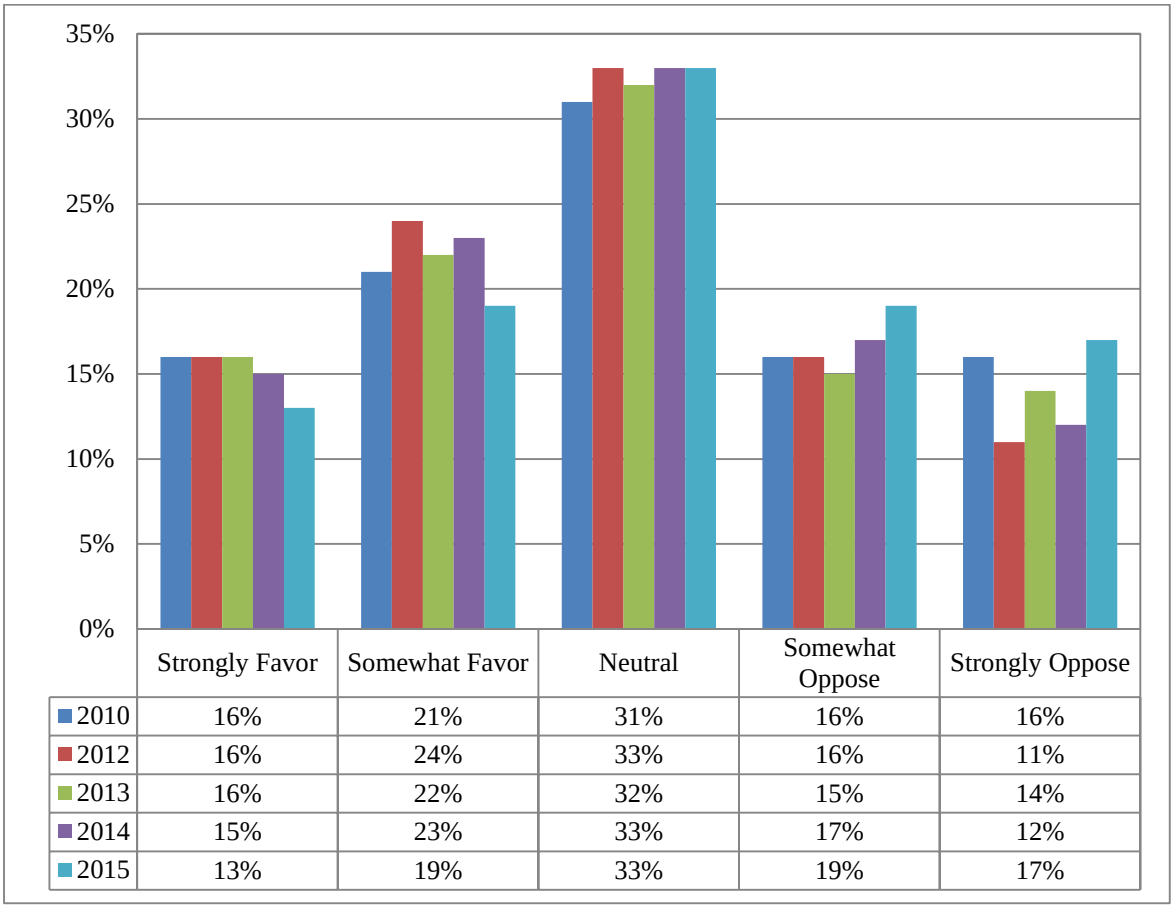
Table 4.3 Other Question Responses

Survey Question	**Responses**				
Traffic Safety Knowledge/Tools					
		YES	NO		
Recently read, seen, or heard ads for *Code for the Road*		45.0%	55.0%		
Recently read, seen, or heard ads for Distracted Driving		61.7%	38.3%		
Driver Preferences					
Do you favor or oppose…	St. Favor	Sw. Favor	Neutral	Sw. Oppose	St. Oppose
Higher fines for speeding?	12.7%	18.6%	32.6%	19.3%	16.8%
Primary seat belt law?	33.1%	22.5%	15.7%	14.5%	14.1%
Driver Distraction					
	Daily	Few/Week	Few/Month	<1/Month	Never
Cell Phone Text While Driving	9.0%	15.3%	21.8%	17.1%	36.8%
Cell Phone Talk While Driving	23.5%	28.2%	24.6%	12.4%	11.3%
Perceptions of Other Drivers					
	Always	Nearly Always	Sometimes	Rarely	Never
How often you think others use seat belts when driving/riding?	6.2%	52.3%	38.8%	2.5%	0.2%
	Daily	Few/Week	Few/Month	<1/Month	Never
How often you think others text on phone while driving?	67.1%	22.7%	7.4%	1.2%	1.7%
How often you think others talk on phone while driving?	73.4%	20.8%	4.4%	0.8%	0.6%

Nearly half (45.0%) of respondents had recent exposure to *Code for the Road* traffic safety messages, a statewide safety campaign rolled out by the North Dakota Department of Transportation. This was a sizeable improvement compared to the 26.6% of respondents who had exposure to the safety messages in 2014. The campaign is designed to target high-risk (18-34 year-old) males via television and radio ads. It also utilizes online advertisements optimized to play more frequently on certain websites when visited by the target demographic (Heidle, Horton, and Lerman 2014). In this sample of North Dakota drivers, 56.5% of high-risk males reported recent exposure to the safety campaign, a higher proportion than the

46.1% of other drivers who had recently read, seen, or heard the advertisements. The difference was statistically significant at the 1% level (Chi-Sq.=11.520, df=1, p<0.001).

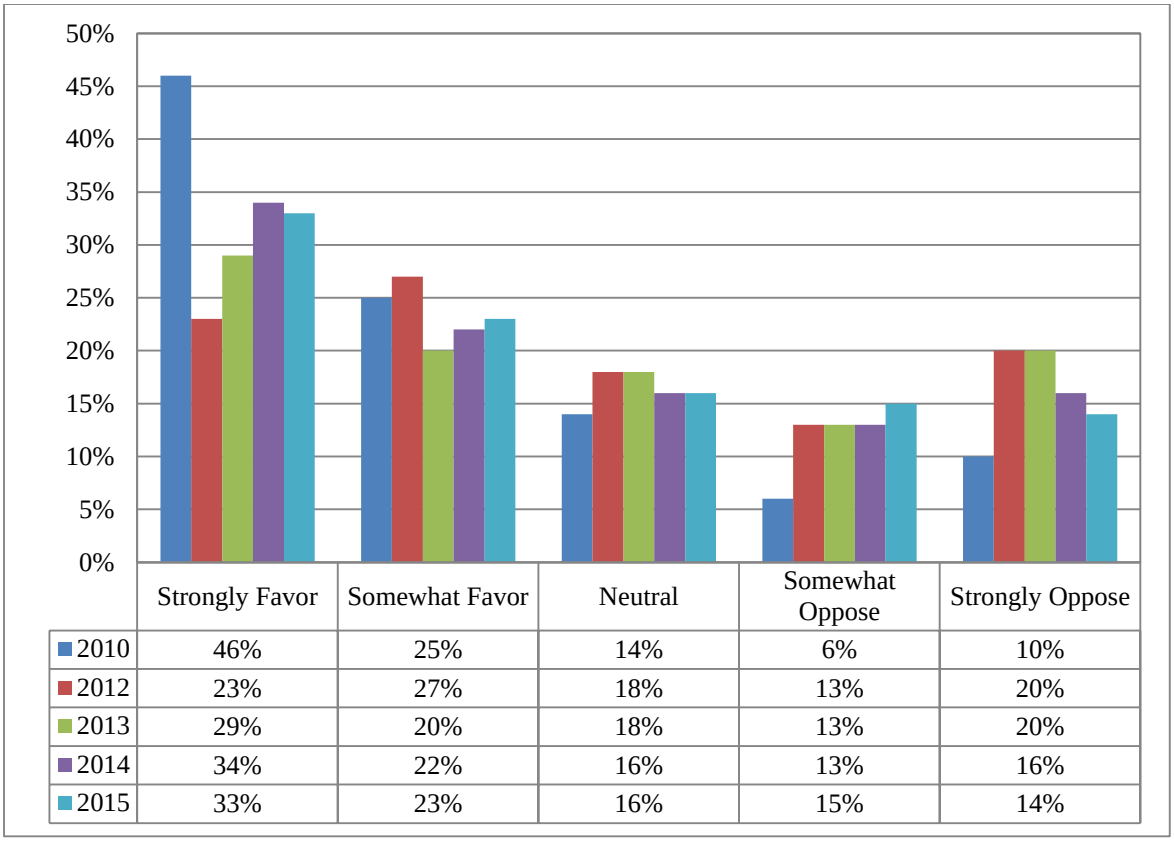
Opinions have remained fairly stable over time regarding higher fines for speeding (Figure 4.2) and support for a primary seat belt law (Figure 4.3). With regard to higher fines for speeding, support decreased slightly between 2014 and 2015: the number of respondents who "somewhat oppose" or "strongly oppose" this prompt grew by about 7%. Nonetheless, responses to this prompt have remained close to 2010 baseline levels. The overall distribution of responses somewhat resembles a bell curve.



	Strongly Favor	Somewhat Favor	Neutral	Somewhat Oppose	Strongly Oppose
2010	16%	21%	31%	16%	16%
2012	16%	24%	33%	16%	11%
2013	16%	22%	32%	15%	14%
2014	15%	23%	33%	17%	12%
2015	13%	19%	33%	19%	17%

Figure 4.2 Driver Preferences for Higher Speeding Fines

The question with the most variability in the dispersion of responses between 2010 and 2015 is in regard to driver preferences towards having a primary seat belt law in North Dakota. In 2010, nearly half (46%) of the North Dakota driver population "strongly favored" a primary seat belt law, but only about one-third (33%) hold the same viewpoint in 2015. Although perceptions have changed noticeably since 2010, attitudes were nearly identical in 2015 compared to the most recent iteration of this survey. Between 2014 and 2015, attitudes either improved or worsened by no more than two percentage points for each of the five ordinal response choices.

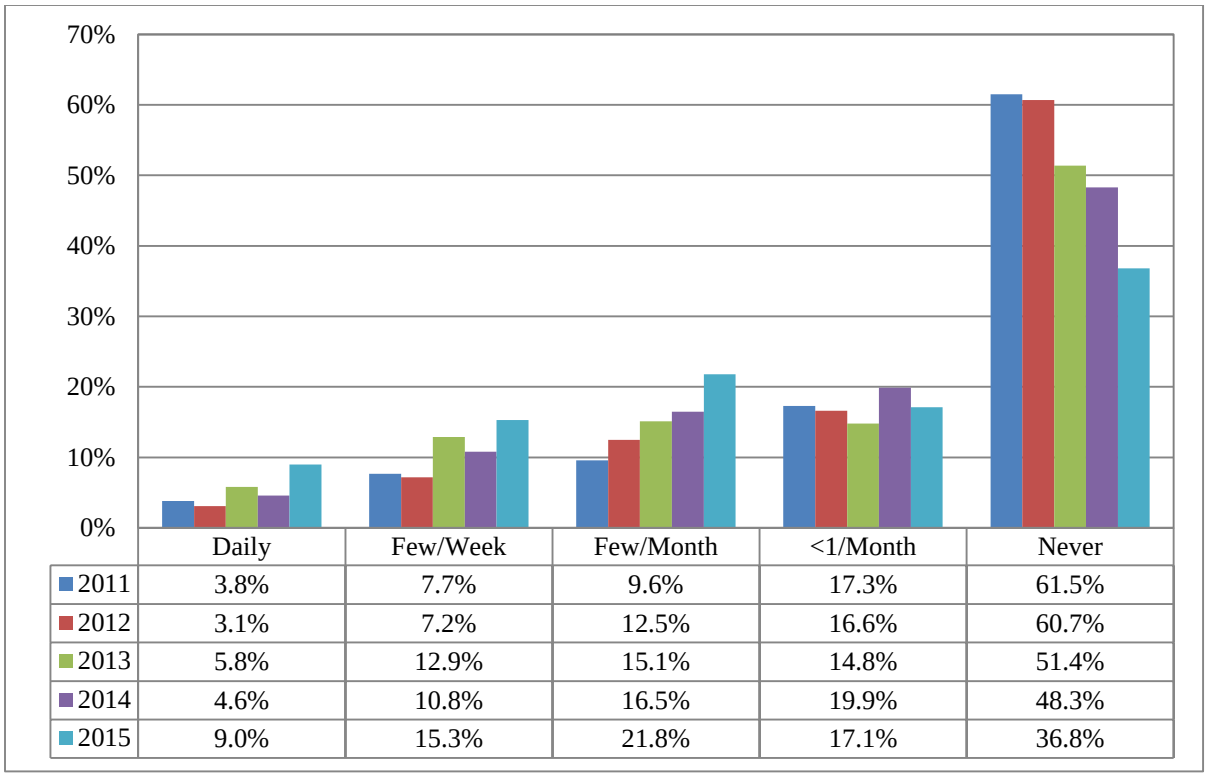


	Strongly Favor	Somewhat Favor	Neutral	Somewhat Oppose	Strongly Oppose
2010	46%	25%	14%	6%	10%
2012	23%	27%	18%	13%	20%
2013	29%	20%	18%	13%	20%
2014	34%	22%	16%	13%	16%
2015	33%	23%	16%	15%	14%

Figure 4.3 Driver Preferences for a Primary Seat Belt Law

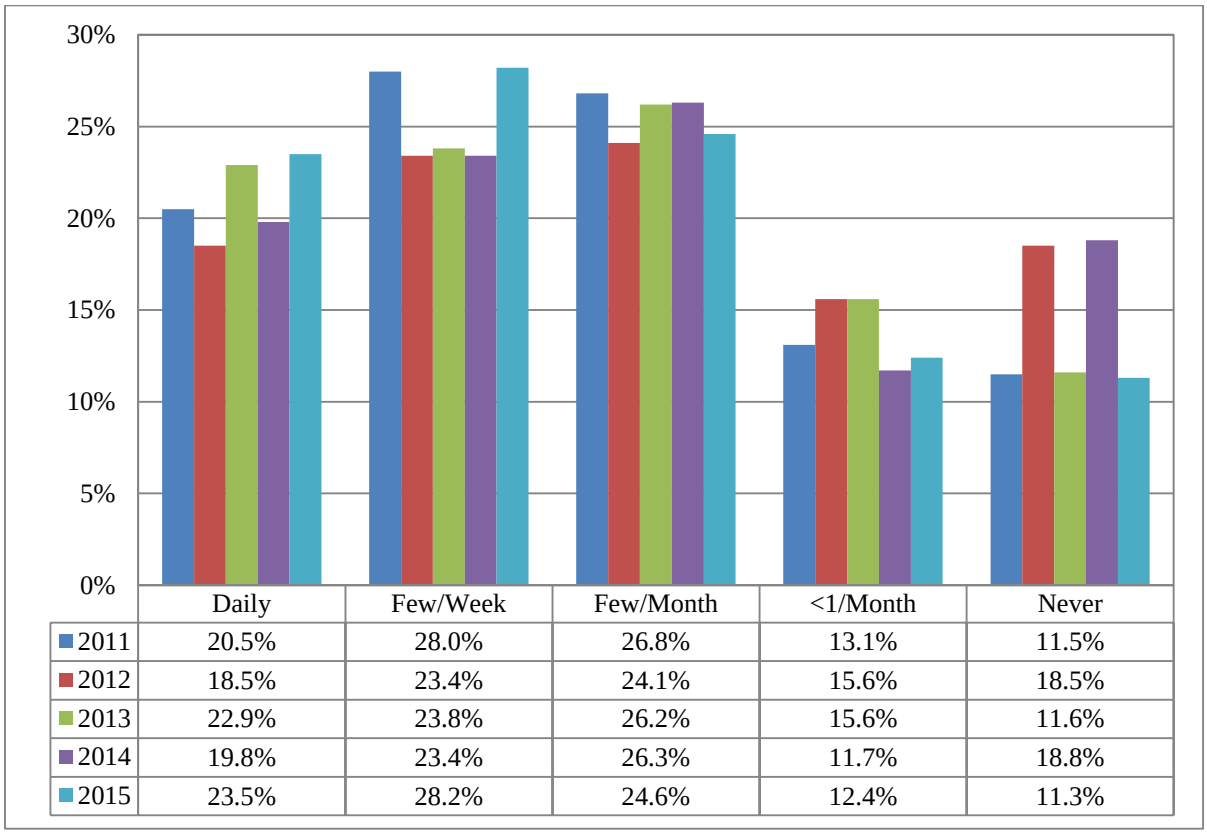
Two questions specific to distracted driving were included in the survey. Although the term distracted driving can refer to a broad range of issues, the focus here is on cell phone use via texting or talking on the phone while driving. In terms of texting while driving, some noticeable trends have emerged over the last five years (Figure 4.4). For example, the proportion of respondents who report "never" texting on the phone while driving has decreased each year. Whereas about 62% of respondents in 2011 claimed to "never" text on the phone when driving, only about 37% of drivers report "never" doing so currently. The number of drivers who text daily nearly doubled between 2014 and 2015 and the number of drivers who reported texting a few times per week or a few times per month grew as well. It is clear that cell phone use for texting while driving is still occurring at dangerous levels within the state.

Drivers are more likely to use their cell phone for talking while driving (Figure 4.5). Nearly one-quarter (23.5%) of drivers in North Dakota use their cell phone for talking while driving on a daily basis. This is not an improvement from 2014, and is the highest percentage ever recorded in the history of this survey's administration. The proportion of respondents that "never" use their cell phone for talking while driving also worsened from 2014 to 2015; an additional 7.5% of North Dakota drivers have shifted from "never" talking on the cell phone while driving to having at least one phone conversation per month while behind the wheel. In the five years in which this survey has been conducted, the 11.3% of drivers reporting that they "never" talk on the phone while driving is the lowest recorded percentage to choose the safest option. The short-term trend in North Dakota indicates that more North Dakotans – both in terms of texting and talking – are choosing to engage in dangerous distractions behind the wheel than ever before.



	Daily	Few/Week	Few/Month	<1/Month	Never
2011	3.8%	7.7%	9.6%	17.3%	61.5%
2012	3.1%	7.2%	12.5%	16.6%	60.7%
2013	5.8%	12.9%	15.1%	14.8%	51.4%
2014	4.6%	10.8%	16.5%	19.9%	48.3%
2015	9.0%	15.3%	21.8%	17.1%	36.8%

Figure 4.4 Cell Phone Texting Distractions, by Year



	Daily	Few/Week	Few/Month	<1/Month	Never
2011	20.5%	28.0%	26.8%	13.1%	11.5%
2012	18.5%	23.4%	24.1%	15.6%	18.5%
2013	22.9%	23.8%	26.2%	15.6%	11.6%
2014	19.8%	23.4%	26.3%	11.7%	18.8%
2015	23.5%	28.2%	24.6%	12.4%	11.3%

Figure 4.5 Cell Phone Talking Distractions, by Year

Two new questions were introduced into the 2015 survey to identify perceptions of distracted driving. The questions asked respondents to rate how often they think other drivers text and talk on cell phones while operating a vehicle. Results show that there is an obvious "self-versus-other" dynamic in North Dakota: individuals perceive themselves to be significantly less distracted than those other drivers with whom they are sharing the road.

Whereas 9.0% of drivers reported that they text on a phone while driving daily, respondents believed that 67.1% of other drivers text daily when operating a vehicle (Figure 4.6). Similarly, whereas 36.8% of respondents in this survey indicated that they never text while driving, just 1.7% of those surveyed believed that other drivers never text when driving. Clearly, there is a sense of otherness on the road: the perceived threat on the road comes from other drivers who are responsible for danger by engaging in distracted driving. A paired samples t-test showed that there was a statistically significant difference in how responses to these two questions were distributed (t=-74.715, df=2,112, p<0.001).

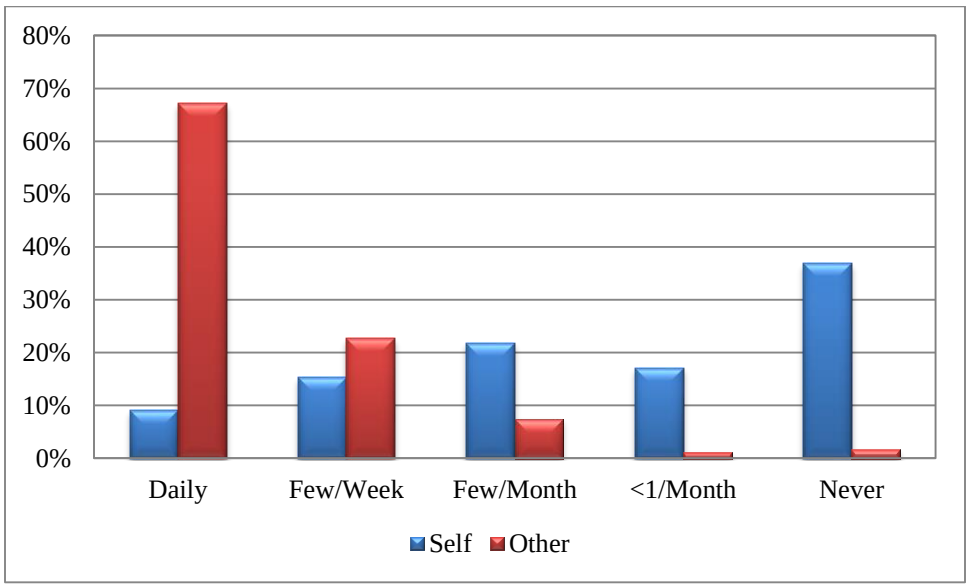


Figure 4.6 Self-versus-Other Reported Levels of Texting while Driving

The same pattern emerged when respondents were asked to rate themselves and others in terms of talking on the phone while operating a vehicle (Figure 4.7). Whereas approximately one-quarter (23.5%) of respondents indicated that they talk on a phone while driving daily, these same individuals believed that about three-quarters (73.4%) of other drivers engaged in this dangerous behavior daily. The self-reported rate at which drivers never talk on the phone while driving (11.3%) was nearly 20 times higher than the rate at which they perceived other drivers (0.6%) to never talk on the phone while driving. Once again, the dispersion of responses to these two questions was statistically significant at the 1% level (t=-50.182, d=2,108, p<0.001).

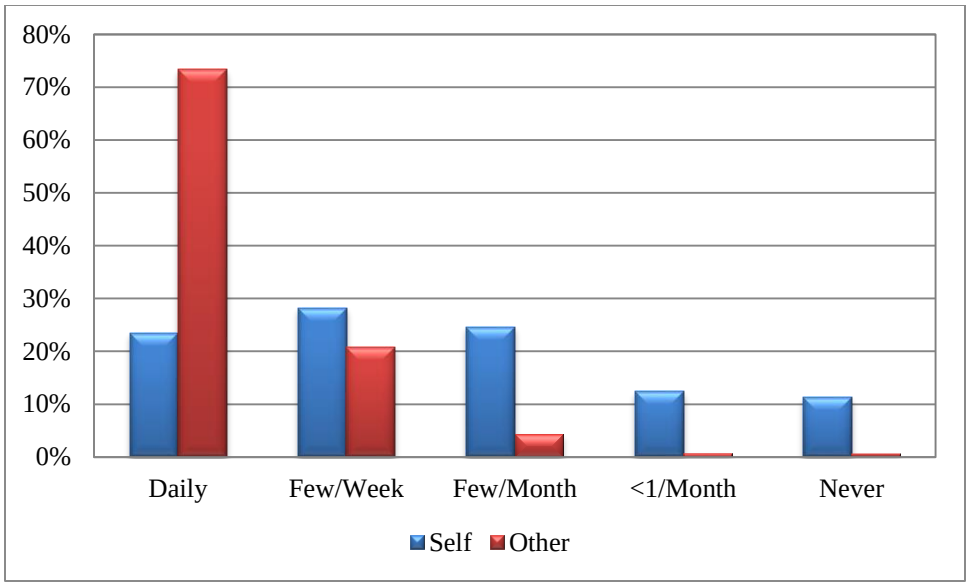


Figure 4.7 Self-versus-Other Reported Levels of Talking while Driving

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 to determine if perceptions can be substantiated. This information may be valuable in more effectively allocating traffic safety resources, conducting program assessments, and focusing programs and strategies beyond 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 quantitative scale definitions are provided in Table 4.4.

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 and female driver groups can be distinguished as a high-risk 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.

Table 4.4 Quantitative Scale Definitions for Responses

Q#	Question	Scale	Conversion Values
1	Seat Belt Use	1-5	1=Never to 5=Always
2	Seat Belt Use, Others	1-5	1=Never to 5=Always
3	Ticket Likely Seat Belt	1-5	1=Very Unlikely to 5=Very Likely
4	Primary Seat Belt Law	1-5	1=Strongly Oppose to 5=Strongly Favor
5	Ticket Likely Speeding	1-5	1=Very Unlikely to 5=Very Likely
6	30 MPH Speed Zone	1-5	1=Never to 5=Always
7	65 MPH Speed Zone	1-5	1=Never to 5=Always
8	Higher Speeding Fines	1-5	1=Strongly Oppose to 5=Strongly Favor
9	Chances of DUI Arrest	1-5	1=Very Unlikely to 5=Very Likely
11	Cell Phone Text	1-5	1=Never to 5=Daily
12	Cell Phone Text, Others	1-5	1=Never to 5=Daily
13	Cell Phone Talk	1-5	1=Never to 5=Daily
14	Cell Phone Talk, Others	1-5	1=Never to 5=Daily
16a	RSH Seat Belt	0-1	0=No, 1=Yes
16b	RSH Speeding	0-1	0=No, 1=Yes
16c	RSH Impaired Driving	0-1	0=No, 1=Yes
16d	RSH *Code for the Road*	0-1	0=No, 1=Yes
16e	RSH Distracted Driving	0-1	0=No, 1=Yes

4.2.1 Regional and Geographic Observations

Table 4.5 shows the mean values 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 a mean of 4.61. This number is below the goal of 5.0 – equivalent to "always" in the driver survey response. Table 4.6 shows the changes in mean values from 2010 to 2015. The primary 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 differences. Driver views and self-reported behaviors showed some regional variation in comparing drivers from the east and west. Similar responses for exposure to policy opinions were found when comparing drivers from opposite sides of the state. In all, three issues were statistically significant by region and nine issues were statistically significant in rural/urban comparisons.

With regard to regional designations, the statistically significant differences were related to seat belt use and speeding. Residents living in the eastern half of the state were more likely to favor a primary seat belt law ($F=5.052$, $df=1$, $p=0.025$) and were also more likely to think that other drivers used a seat belt more often ($F=6.492$, $df=1$, $p=0.011$). Respondents from the western half of the state were more likely to think that drivers would be ticketed for speeding ($F=6.601$, $df=1$, $p=0.010$). These perceptions represent a shift from 2014 in which the only statistically significant differences across regions were for exposure rates to some traffic safety messages.

Table 4.5 Differences in Mean Driver Views and Behaviors, by Region and Geography

		Statewide	Region			Geography		
Question	Scale[1]	All	East	West	Sig.	Urban	Rural	Sig.
Seat Belt Use	1-5	4.61	4.64	4.59		4.68	4.44	##
Seat Belt Use, Others	1-5	3.62	3.68	3.54	#	3.66	3.50	##
Ticket Likely Seat Belt	1-5	3.29	3.38	3.19		3.27	3.35	##
Primary Seat Belt Law	1-5	3.46	3.57	3.32	#	3.52	3.30	#
Ticket Likely Speeding	1-5	3.84	3.82	3.87	#	3.84	3.84	
30 MPH Speed Zone	1-5	2.40	2.41	2.39		2.40	2.39	
65 MPH Speed Zone	1-5	2.39	2.38	2.39		2.37	2.42	##
Higher Speeding Fines	1-5	2.91	2.93	2.88		2.95	2.79	
Chances of DUI Arrest	1-5	3.86	3.90	3.80		3.84	3.89	
Cell Phone Text	1-5	2.43	2.29	2.59		2.35	2.62	
Cell Phone Text, Others	1-5	4.52	4.48	4.58		4.54	4.48	#
Cell Phone Talk	1-5	3.40	3.23	3.61		3.33	3.60	
Cell Phone Talk, Others	1-5	4.66	4.60	4.72		4.65	4.67	
RSH Seat Belt	0-1	0.78	0.79	0.77		0.78	0.79	**
RSH Speeding	0-1	0.42	0.46	0.37		0.41	0.44	**
RSH Impaired Driving	0-1	0.90	0.90	0.89		0.89	0.90	
RSH *Code for the Road*	0-1	0.45	0.47	0.43		0.45	0.46	*
RSH Distracted Driving	0-1	0.62	0.63	0.60		0.62	0.61	

[1]Note: Nominal/Ordinal scales require different tests of significance
*Significant difference at the 5% level for Pearson Chi-Square test
**Significant difference at the 1% level for Pearson Chi-Square test
#Significant difference at 5% level for 1-way ANOVA
##Significant difference at 1% level for 1-way ANOVA

In general, urban residents exhibit safer behaviors behind the wheel than rural residents. For instance, North Dakota drivers living in the nine urban counties are less likely to speed on a road with a 65-mile-per-hour limit ($F=10.109$, $df=1$, $p=0.001$). Residents from urban areas were more likely to wear safety belts while operating a motor vehicle than were respondents from rural communities ($F=58.879$, $df=1$, $p<0.001$). This continues a trend that has been observed each year since 2010.

Interestingly, despite exhibiting more dangerous driving behaviors, rural residents were more likely to think that drivers would be ticketed for engaging in dangerous or illegal driving behavior; rural residents thought tickets were more likely for not using a seat belt ($F=8.279$, $df=0.004$). These same residents were statistically less likely to support a primary seat belt law ($F=6.371$, $df=1$, $p=0.012$). These represent conflicting attitudes because without a primary seat belt law in place, drivers cannot be ticketed solely for operating a vehicle without wearing a seat belt.

Rural residents were more likely to have had recent exposure to some traffic safety messages, yet still were more likely to take part in dangerous driving behaviors. This is counterintuitive as one would expect exposure to traffic safety messages to have a positive influence and improve safety behavior. Rural North Dakotans more frequently recognized messages about wearing a seat belt (Chi-Sq.=7.528, $df=1$, $p=0.006$), speeding (Chi-Sq.=20.051, $df=1$, $p<0.001$), and the *Code for the Road* safety campaign (Chi-Sq.=4.708, $df=1$, $p=0.030$) yet these same individuals chose to wear seat belts less regularly and speed more often than their urban counterparts. This implies that safety messages are in fact reaching specific audiences, but the current messages may not be effective.

Table 4.6 Differences in Driver Views and Behaviors from 2010-2014, by Region and Geography

Question	Year	Scale	Statewide All	Region East	Region West	Region Sig.	Geography Urban	Geography Rural	Geography Sig.	Core Y/N
Seat Belt Use	2015	1-5	4.61	4.64	4.59		4.68	4.44	**	Y
1=Never to 5=Always	2014		4.61	4.63	4.58		4.67	4.40	**	Y
	2013		4.47	4.44	4.50	*	4.54	4.36	**	Y
	2012		4.31	4.37	4.24	*	4.40	4.23	**	Y
	2011		4.42	4.44	4.36	**	4.52	4.21	**	Y
	2010		4.36	4.38	4.36		4.49	4.08	**	Y
2011-2015 Five-Year Average			**4.48**	**4.50**	**4.45**		**4.56**	**4.33**		
2010-2014 Five-Year Average			**4.43**	**4.45**	**4.41**		**4.52**	**4.26**		
Ticket Likely SB	2015	1-5	3.29	3.38	3.19		3.27	3.35	**	Y
1=Very Unlikely to 5=Very	2014		3.20	3.26	3.14		3.19	3.25	*	Y
Likely	2013		3.17	3.18	3.15		3.10	3.17	**	Y
	2012		3.16	3.24	3.06	*	3.10	3.22		Y
	2011		2.98	2.93	3.10		2.94	3.06		Y
	2010		3.06	3.07	3.04		3.03	3.13		Y
2011-2015 Five-Year Average			**3.16**	**3.20**	**3.13**		**3.12**	**3.21**		
2010-2014 Five-Year Average			**3.11**	**3.14**	**1.10**		**3.07**	**3.17**		
Ticket Likely Speed	2015	1-5	3.84	3.82	3.87	*	3.84	3.84		Y
1=Very Unlikely to 5=Very	2014		3.72	3.71	3.73		3.71	3.77	**	Y
Likely	2013		3.67	3.66	3.68	*	3.63	3.67		Y
	2012		3.69	3.71	3.66		3.62	3.76	*	Y
	2011		3.62	3.61	3.66		3.76	3.62	*	Y
	2010		3.59	3.61	3.58		3.60	3.58		Y
2011-2015 Five-Year Average			**3.71**	**3.70**	**3.72**		**3.71**	**3.73**		
2010-2014 Five-Year Average			**3.66**	**3.66**	**3.66**		**3.66**	**3.68**		
Speed 30 MPH Zone	2015	1-5	2.40	2.41	2.39		2.40	2.39		Y
1=Never to 5=Always	2014		2.34	2.27	2.43		2.34	2.34		Y
	2013		2.39	2.38	2.40		2.37	2.39		Y
	2012		2.33	2.30	2.35		2.34	2.32		Y
	2011		2.31	2.35	2.22	**	2.31	2.31		Y
	2010		2.29	2.25	2.32		2.29	2.27		Y
2011-2015 Five-Year Average			**2.35**	**2.34**	**2.36**		**2.35**	**2.35**		
2010-2014 Five-Year Average			**2.33**	**2.31**	**2.34**		**2.33**	**2.33**		
Speed 65 MPH Zone	2015	1-5	2.39	2.38	2.39		2.37	2.42	**	Y
1=Never to 5=Always	2014		2.23	2.14	2.34		2.22	2.24	**	Y
	2013		2.23	2.22	2.24		2.29	2.23	**	Y
	2012		2.19	2.11	2.29	**	2.23	2.15	*	Y
	2011		2.22	2.29	2.04	**	2.16	2.13		Y
	2010		2.19	2.17	2.20		2.20	2.15		Y
2011-2015 Five-Year Average			**2.25**	**2.23**	**2.26**		**2.25**	**2.23**		
2010-2014 Five-Year Average			**2.21**	**2.19**	**2.22**		**2.22**	**2.18**		
Arrest for DUI	2015	1-5	3.86	3.90	3.80		3.84	3.89		Y
1=Very Unlikely to 5=Very	2014		3.76	3.71	3.83		3.79	3.69		Y
Likely	2013		3.53	3.54	3.52		3.51	3.53		Y
	2012		3.64	3.67	3.60		3.68	3.61		Y
	2011		3.62	3.61	3.69		3.63	3.65		Y
	2010		3.53	3.59	3.47		3.55	3.49		Y
2011-2015 Five-Year Average			**3.68**	**3.69**	**3.69**		**3.69**	**3.67**		
2010-2014 Five-Year Average			**3.62**	**3.62**	**3.62**		**3.63**	**3.59**		
RSH Seat Belt	2015	0-1	0.78	0.79	0.77		0.78	0.79	**	Y
0=No, 1=Yes	2014		0.74	0.78	0.70		0.74	0.77	**	Y
	2013		0.83	0.83	0.82		0.80	0.83	**	Y
	2012		0.88	0.89	0.86		0.85	0.90	*	Y
	2011		0.84	0.84	0.84		0.83	0.87		Y
	2010		0.77	0.76	0.77		0.75	0.80		Y
2011-2015 Five-Year Average			**0.81**	**0.83**	**0.80**		**0.80**	**0.83**		
2010-2014 Five-Year Average			**0.81**	**0.82**	**0.80**		**0.79**	**0.83**		

Table 4.6 Continued										
RSH Speeding	2015	0-1	0.42	0.46	0.37		0.41	0.44	**	Y
0=No, 1=Yes	2014		0.38	0.41	0.34		0.37	0.43	**	Y
	2013		0.39	0.40	0.38		0.36	0.39	**	Y
	2012		0.38	0.39	0.36		0.36	0.39		Y
	2011		0.38	0.39	0.36		0.39	0.36		Y
	2010		0.57	0.57	0.56		0.57	0.56		Y
2011-2015 Five-Year Average			**0.39**	**0.41**	**0.36**		**0.38**	**0.40**		
2010-2014 Five-Year Average			**0.42**	**0.43**	**0.40**		**0.41**	**0.43**		
RSH DUI	2015	0-1	0.90	0.90	0.89		0.89	0.90		Y
0=No, 1=Yes	2014		0.85	0.86	0.84	*	0.85	0.85		Y
	2013		0.90	0.91	0.89		0.88	0.90	**	Y
	2012		0.90	0.90	0.90		0.90	0.90		Y
	2011		0.88	0.88	0.88		0.87	0.90		Y
	2010		0.85	0.86	0.84		0.86	0.83		Y
2011-2015 Five-Year Average			**0.89**	**0.89**	**0.88**		**0.88**	**0.89**		
2010-2014 Five-Year Average			**0.88**	**0.88**	**0.87**		**0.87**	**0.88**		

*Statistically significant difference at the 5% level
**Statistically significant difference at the 1% level

The five-year trends presented in Table 4.6 provide insight about patterns that may be emerging from North Dakota driver responses. Although only six years of data are provided, some initial conclusions can be made. For example, self-reported seat belt use is currently at a six-year high with an average rating of 4.61. This means that the average North Dakotan is currently wearing a seat belt "always" or "nearly always" when operating a motor vehicle. Another positive trend is that the perceived likelihood of receiving a ticket for not wearing a seat belt is also at an all-time high. This perception may be leading some residents to wear a safety belt more often when operating a motor vehicle.

A few negative trends become evident when examining results from the previous six years. For example, the mean values for speeding in a 30-mile-per-hour zone and speeding in a 65-mile-per-hour zone are at all-time highs. This means that, on average, North Dakota drivers are speeding more often on local and primary arterial roads. This is occurring despite the fact that exposure to safety messages about speeding has improved since 2011. These trends reveal that there is still room for improvement in North Dakota.

One ongoing trend is the substantial discrepancy in seat belt use between urban and rural drivers. Urban residents are significantly more likely to wear seat belts when driving compared to their rural counterparts. Note, however, that in 2015 rural residents' self-reported seat belt use was the highest it has been since this annual survey has been conducted. Although both subcategories are well under the goal of a mean value of 5.00, rural residents are much farther away from this target number. Perhaps more efforts are needed to increase seat belt use among these individuals. This is especially true because rural residents have a statistically higher exposure rate to traffic safety messages about seat belt use, a trend that has occurred each year since 2012.

4.2.2 Young Male Driver Target Group

As with the previous five surveys, the selected target group of 18-to-34-year-old high-risk males ("HRM") does show significantly different behaviors, exposure levels, and views when compared to other drivers (Table 4.7). (Note that high-risk females were not included in the "other" group. See Section 4.2.3 for results for high-risk females.) 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 30-mile-per-hour zone ($F=13.532$, $df=1$, $p<0.001$), speeding in a 65-mile-per-hour zone ($F=59.718$, $df=1$, $p<0.001$), texting while driving ($F=368.977$, $df=1$, $p<0.001$), and talking on the phone while driving ($F=148.593$, $df=1$, $p<0.001$).

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 behaviors. The high-risk young male drivers surveyed

are substantially less likely to wear safety belts than other drivers (F=48.147, df=1, p<0.001). Only 49.9% of young male drivers "always" wear a seat belt while driving or riding in a vehicle, a number much smaller than the 77.4% of other drivers who "always" do so. The share of young males who report that they "rarely" or "never" use seat belts (4.9%) is more than two times the rate of other drivers (2.1%). Lower reported levels of seat belt use likely goes 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 population (F=36.625, df=1, p<0.001). This implies that these two behaviors from young males are linked: young male drivers do not use seat belts in part because they perceive that there is a low risk of facing consequences from law enforcement for not doing so.

The Safety Division 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. Exposure to traffic safety messages that can be read, seen, or heard vary between the young male drivers and other drivers based on the message at hand. There was no statistically significant difference between young male drivers and others who were exposed to messages about seat belt use (Chi-Sq.=0.173, df=1, p=0.677) and impaired driving (Chi-Sq.=0.000, df=1, p=0.983). Differences between high-risk young male drivers and all other North Dakota drivers were statistically significant for exposure to three other safety materials that can be read, seen, or heard. These drivers were less likely to have had recent exposure to messages about speeding (Chi-Sq.=24.956, df=1, p<0.001) and distracted

Table 4.7 Differences in Driver Views and Behaviors, Young Male Target Group

Question	HRM (n=327)	Other Drivers (n=1,295)	Sig.
Seat Belt Use	4.24	4.68	##
Seat Belt Use, Others	3.51	3.79	##
Ticket Likely Seat Belt	2.83	3.33	##
Primary Seat Belt Law	2.56	3.52	##
Ticket Likely Speeding	3.54	3.79	#
Speed in 30 MPH Zone	2.53	2.29	##
Speed in 65 MPH Zone	2.57	2.09	##
Higher Fines for Speeding	2.47	3.26	##
Drive After Drinking 1-2 Drinks	1.62	1.27	##
Drive After Drinking 3+ Drinks	1.18	1.05	##
How often Use Sober Driver?	4.02	4.76	
Chance Arrest for DUI	3.76	3.67	#
RSH Seat Belt	0.82	0.82	
RSH Speeding	0.36	0.53	**
RSH Drunk Driving	0.90	0.91	
RSH *Code for the Road*	0.57	0.47	**
RSH Distracted Driving	0.57	0.68	**
Cell Phone Text	2.96	1.61	##
Cell Phone Text, Others	4.49	4.39	
Cell Phone Talk	3.87	2.71	##
Cell Phone Talk, Others	4.63	4.58	

*Significant difference at the 5% level for Pearson Chi-Square test
**Significant difference at the 1% level for Pearson Chi-Square test
#Significant difference at the 5% level for 1-way ANOVA
##Significant difference at the 1% level for 1-way ANOVA

driving (Chi- Sq.=11.104, df=1, p=0.001). This group of high-risk young male drivers was statistically more likely to have had exposure to *Code for the Road* safety messages (Chi-Sq.=7.287, df=1, p=0.007) which makes sense considering that the advertisements target this particular demographic.

It is particularly interesting to note the attitudes of young male drivers towards driving under the influence of alcohol. Differences in opinions about the chances of getting arrested for DUI are statistically significant at the 5% level with young male drivers thinking there is a greater likelihood of facing arrest (F=4.001, df=1, p=0.046). It is unknown what factors caused high-risk males to have these perceptions as this target group and all other North Dakota drivers report seeing traffic safety messages related to impaired driving at comparable rates (Chi-Sq.=0.000, df=1, p=0.983). Perhaps messages need to be better focused at targeting this group in an effort to deter these individuals from operating a vehicle while impaired. This is especially important because young male drivers continue to have a higher propensity to drive within two hours of consuming one or two drinks (F=83.214, df=1, p<0.001) and a higher likelihood of driving within two hours of consuming three or more alcoholic beverages (F=25.884, df=1, p<0.001).

This tendency to operate a vehicle after consuming alcohol could perhaps be curtailed by encouraging this target group to designate a sober driver. At present, there is no statistically significant difference in the rate at which young males use sober drivers when compared to all other North Dakota drivers (F=2.132, df=1, p=0.145). This fact, in conjunction with young males' tendencies to drive after consuming alcohol, undoubtedly serves as a major contributing factor to the danger facing North Dakota's roadways.

Young male drivers have views about driving that are explicitly different than other drivers. For example, the target group indicated that they do not support a primary seat belt law as much as the rest of the population does (F=58.057, df=1, p<0.001) (Figure 4.8). Only 31.4% of high-risk young males either "somewhat favor" or "strongly favor" such a law; anywhere from 51.2% to 58.7% of all other groups support having such a law in place. A similar pattern occurred when drivers were asked to rate support for higher fines for drivers who speed. High-risk young male drivers were less likely to support this initiative (F=62.310, df=1, p<0.001) and were least likely to "somewhat" or "strongly" favor increasing fines among all six demographic groups analyzed in this report (Figure 4.9).

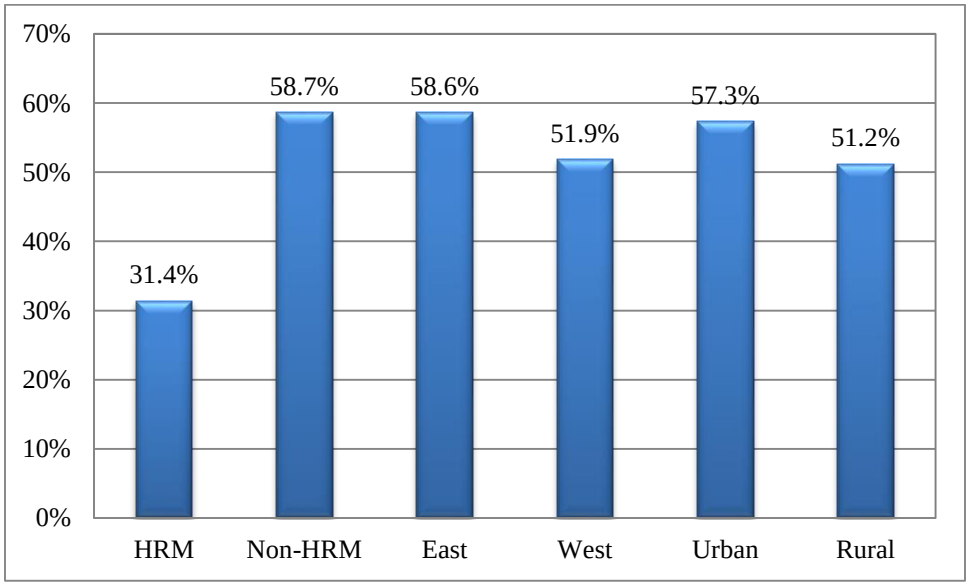


Figure 4.8 Percent that "Strongly" or "Somewhat" Favor a Primary Seat Belt Law

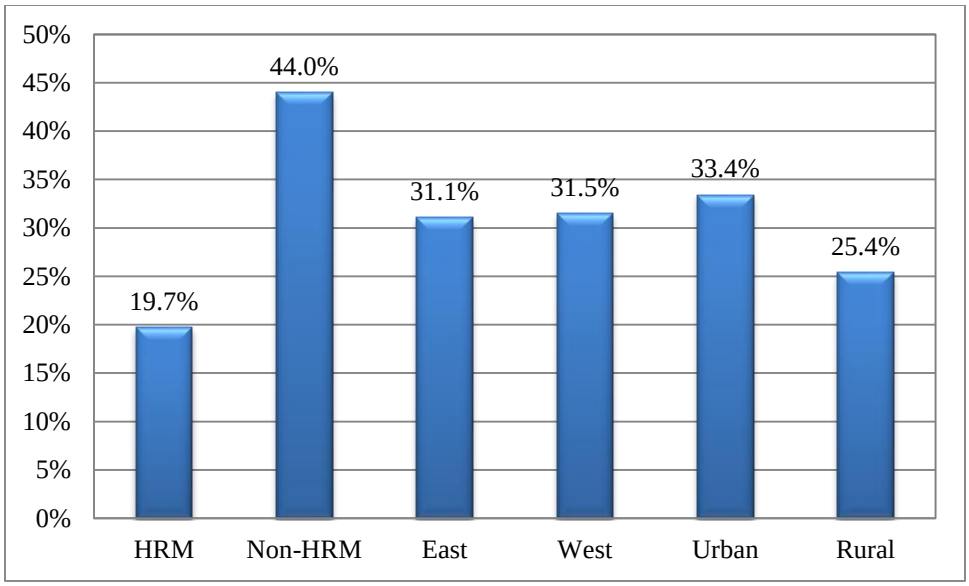


Figure 4.9 Percent that "Strongly" or "Somewhat" Favor Higher Speeding Fines

Table 4.8 compares the responses of high-risk young males to all other driver groups. It is clear that there are differences in views, behaviors, and attitudes towards various transportation safety topics. The complete list of survey questions is provided in Appendix A.

Table 4.8 Responses for High-Risk Male Drivers

Question		**Responses, by Driver Group**				
Seat Belt Use	n=1,618	Always	N. Always	Sometimes	Rarely	Never
	Other	77.4%	16.2%	4.3%	1.5%**	0.6%**
	HRM	49.9%	30.2%	15.1%	3.6%**	1.3%**
Seat Belt Use, Others	n=1,599	Always	N. Always	Sometimes	Rarely	Never
	Other	9.4%	60.5%	29.4%	0.7%**	0.0%**
	HRM	6.6%**	42.5%	47.3%	3.0%**	0.6%**
Seat Belt Ticket	n=1,607	V. Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	Other	19.8%	29.9%	20.7%	23.3%	6.4%
	HRM	11.1%	18.9%	22.6%	37.0%	10.4%
Primary Seat Belt Law	n=1,614	S. Favor	Sw. Favor	Neutral	Sw. Oppose	S. Oppose
	Other	33.9%	24.8%	14.4%	12.8%	14.0%
	HRM	16.9%	14.5%	12.7%	19.2%	36.7%
Chance Speed Ticket	n=1,608	V. Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	Other	26.7%	37.3%	25.8%	9.5%	0.8%**
	HRM	18.3%	34.2%	32.0%	13.9%	1.6%**
Speed in 30 mph	n=1,609	Always	N. Always	Sometimes	Rarely	Never
	Other	1.0%**	5.7%	30.9%	46.3%	16.1%
	HRM	0.9%**	14.6%	31.9%	42.0%	10.6%
Speed in 65 mph	n=1,614	Always	N. Always	Sometimes	Rarely	Never
	Other	1.8%**	5.1%	20.7%	45.6%	26.9%
	HRM	1.4%**	13.3%	33.9%	43.4%	8.0%**
Speed Fines	n=1,605	S. Favor	Sw. Favor	Neutral	Sw. Oppose	S. Oppose
	Other	19.8%	24.2%	29.7%	14.5%	11.8%
	HRM	6.5%**	13.2%	30.1%	20.6%	29.6%
Chance DUI Arrest	n=1,607	V. Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	Other	23.7%	37.1%	24.4%	12.2%	2.6%
	HRM	34.5%	27.6%	21.6%	11.9%	4.4%**
Drive 1-2 Drinks	n=1,580	None	1-5 Times	6-10 Times	10+ Times	
	Other	76.8%	21.0%	1.0%**	1.2%**	
	HRM	46.9%	46.8%	3.2%**	3.0%**	
Drive 3+ Drinks	n=1,464	None	1-5 Times	6-10 Times	10+ Times	
	Other	95.4%	3.9%	0.6%**	0.0%**	
	HRM	84.9%	13.6%	0.4%**	1.1%**	
Sober Driver	n=964	Always	N. Always	Sometimes	Rarely	Never
	Other	46.0%	21.7%	13.0%	7.4%	11.8%
	HRM	41.0%	30.3%	20.1%	6.5%**	2.1%**
Cell Phone Text	n=1,610	Daily	Few/Week	Few/Month	<1/Month	Never
	Other	1.7%**	6.0%	10.9%	13.9%	67.5%
	HRM	15.0%	20.0%	30.9%	13.9%	20.2%
Cell Phone Text, Others	n=1,594	Daily	Few/Week	Few/Month	<1/Month	Never
	Other	61.4%	23.6%	10.6%	1.4%**	3.1%**
	HRM	63.5%	25.8%	8.4%**	0.9%**	1.4%**
Cell Phone Talk	n=1,603	Daily	Few/Week	Few/Month	<1/Month	Never
	Other	12.5%	18.0%	23.7%	19.4%	26.4%
	HRM	34.8%	29.7%	25.4%	7.9%**	2.2%**
Cell Phone Talk, Others	n=1,599	Daily	Few/Week	Few/Month	<1/Month	Never
	Other	71.2%	19.4%	6.9%	0.9%**	1.6%**
	HRM	71.6%	22.1%	4.7%**	1.5%**	0.2%**

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

4.2.3 Young Female Driver Group

Another driver group with noticeable differences in behavior and attitudes is that of 18-to-34-year-old high-risk female ("HRF") drivers. Like their high-risk male counterparts, young female drivers tend to exhibit behaviors that are more dangerous than all other drivers. Similarly, their attitudes towards safe driving habits and exposure to messages promoting safe driving lag behind other driver groups (Table 4.9). When this female driver group was compared to all other drivers, there were statistically significant differences for almost all variables studied in this project. The results from the "other driver" group were likely skewed from the extreme viewpoints held by high-risk male drivers. As such, the young female driver group was compared only to non-high-risk male other drivers.

Table 4.9 Differences in Driver Views and Behaviors, Young Female Target Group

Question	HRF (n=529)	Other Drivers (n=1,295)	Sig.
Seat Belt Use	4.60	4.68	
Seat Belt Use, Others	3.51	3.79	##
Ticket Likely Seat Belt	3.30	3.33	
Primary Seat Belt Law	3.49	3.52	##
Ticket Likely Speeding	3.89	3.79	##
Speed in 30 MPH Zone	2.46	2.29	#
Speed in 65 MPH Zone	2.56	2.09	##
Higher Fines for Speeding	2.72	3.26	##
Drive After Drinking 1-2 Drinks	1.39	1.27	##
Drive After Drinking 3+ Drinks	1.08	1.05	
How often Use Sober Driver?	4.23	3.83	##
Chance Arrest for DUI	3.98	3.67	##
RSH Seat Belt	0.76	0.82	**
RSH Speeding	0.35	0.53	**
RSH Drunk Driving	0.89	0.91	
RSH *Code for the Road*	0.43	0.47	*
RSH Distracted Driving	0.58	0.68	**
Cell Phone Text	2.92	1.61	##
Cell Phone Text, Others	4.61	4.39	##
Cell Phone Talk	3.82	2.71	##
Cell Phone Talk, Others	4.71	4.58	

*Significant difference at the 5% level for Pearson Chi-Square test
**Significant difference at the 1% level for Pearson Chi-Square test
#Significant difference at the 5% level for 1-way ANOVA
##Significant difference at the 1% level for 1-way ANOVA

The 18-34 year-old female cohort is more likely to engage in dangerous driving behaviors. This target group has a higher likelihood of speeding on a 30 mile per hour road ($F=6.452$, $df=1$, $p=0.011$), speeding on a 65 mile per hour road ($F=80.946$, $df=1$, $p<0.001$), texting while driving ($F=504.093$, $df=1$, $p<0.001$), and talking on the phone while driving ($F=189.800$, $d=1$, $p<0.001$). These trends were also evident in the 2014 version of this survey.

Like their high-risk male counterparts, 18-to-34-year-old females also have a lower likelihood of being exposed to safety messages. This target female group was less likely to have had recent exposure to messages about seat belt enforcement (Chi-Sq.=13.579, df=1, p<0.001), speeding (Chi-Sq.=52.475, df=1, p<0.001), the *Code for the Road* safety campaign (Chi-Sq.=5.097, df=1, p=0.024), and distracted driving (Chi-Sq.=16.516, df=1, p<0.001). This also follows the same trend as in 2014.

High-risk females were less likely to support a primary seat belt law (F=9.295, df=1, p=0.002) which represents a shift from last year when these respondents were statistically more likely to support such legislation. Like 2014, this target group was once again less likely to support higher fines for speeding (F=28.447, df=1, p<0.001) which may stem from the group's higher propensity to speed.

With regard to impaired driving, there was one unique difference among young female drivers. This target group of 18-to-34-year-old females thought that the chances of being arrested for driving under the influence of alcohol were more likely than did other North Dakotans (F=35.031, df=1, p<0.001). This group also reported designating a sober driver more often than other drivers (F=18.662, df=1, p<0.001). High-risk females held these viewpoints despite the fact that they were statistically more likely to drive within two hours of consuming one or two alcoholic beverages (F=12.137, df=1, p=0.001). This suggests that messages regarding impaired driving have mixed results for this target group. Whereas some high-risk females are reporting that they believe enforcement is effective and that a sober driver is necessary to avoid punishment for impaired driving, others reveal that they continue to partake in the dangerous activity of operating a vehicle after consuming alcohol.

5. CONCLUSIONS

The initial statewide driver traffic safety survey provides baseline metrics for the Safety Division and others for understanding perceptions and behaviors related to focus issues. A core set of questions was selected to address 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 driving practices, but it is apparent that additional efforts are needed to improve safety on the state's roads.

Two specific recommendations can be made based upon examination of trends that have taken place over the last six years of administering this survey. First, there is a clear dichotomy between how urban and rural residents approach the use of a seat belt while operating a vehicle. Results clearly show that rural residents are substantially less likely to use safety belts than their urban counterparts. Improvement in this area must be made to reduce rates of fatalities and serious injuries during crash events among rural North Dakotans. Second, there is a bifurcation among exposure rates to safety messages contingent upon whether one is a high-risk 18-to-34-year-old driver. Younger drivers have less exposure to key safety campaigns and traffic messages than all other driver groups. They also hold viewpoints that are different than all other drivers and engage in dangerous practices behind-the-wheel more often than their older counterparts. It may be beneficial to make the 18-34 year-old target group more aware of traffic safety tools via focused safety campaigns and optimized advertisement placement. The *Code for the Road* campaign is one such program that appears to be making a positive impact on young drivers. More resources must continue to be allocated to this group to change their perceptions and, ultimately, their behaviors on the roadway.

Further research involving North Dakota driving tendencies can be improved. For instance, future studies involving North Dakota driving habits will be more robust when the response sample more accurately reflects the North Dakota driver population. This particular study would have been more robust by having a higher percentage of 35-to-44-year-old drivers included in the response sample. Nonetheless, the response rate for this survey was satisfactory and most of the desired performance metrics were able to be extrapolated to represent the entire North Dakota driver population.

6. REFERENCES

Government Accounting Office. 2010. "Traffic Safety Data: State Data System Quality Varies and Limited Resources and Coordination Can Inhibit Further Progress." Washington, DC: Government Printing Office, Technical Report to Congressional Committee No. GAO-10-454.

Hedlund, J., T. Casanova, and N. Chaudhary. 2009. "Survey Recommendations for the NHTSA-GHSA Working Group." Trumbull, CT: Preusser Research Group, Inc., on behalf of the Governor's Highway Safety Association. Retrieved August 18, 2011 (http://www.ghsa.org/html/resources/files/pdf/planning/survey_recs.pdf).

Hedlund, James. 2008. "Traffic Safety Performance Measures for States and Federal Agencies." Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration, Technical Report No. DOT-HS-811-025.

Heidle, E., C. Horton, and J. Lerman. 2014. "Behind the Scenes: The Production of North Dakota's Code for the Road Campaign and the Code for the Road Statewide Marketing Plan." Bismarck: ND: Presentation at the 2014 North Dakota Strategic Highway Safety Plan Conference, June 12.

Herbel, S., M.D. Meyer, B. Kleiner, and D. Gaines. 2009. "A Primer on Safety Performance Measures for the Transportation Planning Process." Washington, DC: U.S. Department of Transportation, Federal Highway Administration, Technical Report No. FHWA-HEP-09-043.

Levi, G., M. Nelson, and K. Mongeon. 2014. "2015 North Dakota Highway Safety Plan." Bismarck, ND: North Dakota Department of Transportation, Safety Division.

Levi, G., M. Nelson, K. Mongeon, C. Ihla, and L. Heinert. 2014. "2013 North Dakota Crash Summary." Bismarck, ND: North Dakota Department of Transportation, Safety Division.

North Dakota Department of Transportation 2013.Bismarck, ND: Driver Record Query Requested, Safety Division.

United States Bureau of the Census. 2013. "2010 Census, Urban and Rural Universe: Housing Units 2010 Census Summary File 1" [dataset]. Retrieved July 2, 2014 (http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_H2&prodType=table).

U.S. Department of Transportation. 2011. National Transportation Atlas Databases 2011: A Collection of Spatial Data for use in GIS-based Applications [computer software]. Washington, DC: Bureau of Transportation Statistics: Research and Innovative Technology Administration.

Vachal, Kimberly, Laurel Benson, and Andrew Kubas. 2010-2014. "North Dakota Statewide Traffic Safety Survey – Traffic Safety Performance Measures for State and Federal Agencies." Fargo, ND: Upper Great Plains Transportation Institute, North Dakota State University, document compendium.

World Health Organization. 2013. "Global Health Observatory, Road Safety: Number of road traffic deaths and distribution by type of road user, 2010" [interactive map]. Retrieved June 12, 2015 (http://www.who.int/gho/road_safety/en).

APPENDIX A. SURVEY INSTRUMENT

2015 North Dakota Driver Survey

All Responses Are Confidential

1. **How often do you use seat belts when you drive or ride in a vehicle?**
   □ Never □ Rarely □ Sometimes □ Nearly Always □ Always

2. **How often do you think others use seat belts when they drive or ride in a vehicle?**
   □ Never □ Rarely □ Sometimes □ Nearly Always □ Always

3. **What do you think the chance is of getting a ticket if you do not wear your seat belt?**
   □ Very Unlikely □ Unlikely □ Likely □ Somewhat Likely □ Very Likely

4. **Do you favor or oppose a primary seat belt law where law enforcement can stop a vehicle and issue a citation simply for failure to wear a seat belt?**
   □ Strongly Oppose □ Somewhat Oppose □ Do Not Favor or Oppose □ Somewhat Favor □ Strongly Favor

5. **What do you think the chance is of getting a ticket if you drive over the speed limit?**
   □ Very Unlikely □ Unlikely □ Likely □ Somewhat Likely □ Very Likely

6. **On a local road with a speed limit of 30 mph, how often do you drive faster than 35 mph?**
   □ Never □ Rarely □ Sometimes □ Nearly Always □ Always

7. **On a road with a speed limit of 65 mph, how often do you drive faster than 70 mph?**
   □ Never □ Rarely □ Sometimes □ Nearly Always □ Always

8. **Do you favor or oppose higher fees/fines for speeding violations?**
   □ Strongly Oppose □ Somewhat Oppose □ Do Not Favor or Oppose □ Somewhat Favor □ Strongly Favor

9. **What do you think the chances are of someone getting arrested if they drive after drinking alcohol?**
   □ Very Unlikely □ Unlikely □ Likely □ Somewhat Likely □ Very Likely

10. **In the past 60 days, how many times have you driven a motor vehicle within 2 hours after drinking**
    1 – 2 Alcoholic Drinks? □ none □ 1 – 5 times □ 6 – 10 times □ more than 10 times
    3 or More Alcoholic Drinks? □ none □ 1 – 5 times □ 6 – 10 times □ more than 10 times
    - **If drinking or planning to drink, how often do you designate a sober driver?**
      □ Never □ Rarely □ Sometimes □ Nearly Always □ Always □ Do not drink

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

12. **How often do you think others read/send text messages on a cell phone while driving a vehicle?**
    □ Never □ Less than Once per Month □ Few Times per Month □ Few Times per Week □ Daily

13. **How often do you talk on your cell phone while driving a vehicle? (all phone types including hands-free)**
    □ Never □ Less than Once per Month □ Few Times per Month □ Few Times per Week □ Daily

14. **How often do you think others talk on a cell phone while driving a vehicle? (all phone types including hands-free)**
    □ Never □ Less than Once per Month □ Few Times per Month □ Few Times per Week □ Daily

15. **Have you read, seen, or heard traffic safety messages via the following social media? (select all that apply)**
    □ Facebook □ Twitter □ Hulu □ Pandora □ YouTube

16. **Have you recently read, seen, or heard traffic safety messages relating to:**

Seat Belt Law Enforcement	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Social Media	□ Other _____
Speed Enforcement	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Social Media	□ Other _____
Drunk Driving Enforcement	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Social Media	□ Other _____
Code for the Road. Follow the Rules. Follow the Law.								
	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Social Media	□ Other _____
Distracted Driving Enforcement	□ Yes	□ No	**If yes, where?**	□ TV	□ Radio	□ Print	□ Social Media	□ Other _____

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

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

19. **Approximate Miles Driven Last Year:** _____

20. **Your Gender:** □ Male □ Female

21. **Your Zip Code:** _____

22. **How long have you been a resident of the state of North Dakota?**
    □ Less than 1 year □ 1 – 3 years □ More than 3 years

Thank you for your time and participation.

APPENDIX B. MISSING/REFUSE TO ANSWER RESPONSES

Q#	Question	Total Responses	Missing Responses
	Seat Belt		
Q1	Seat Belt Use	2,147	4
Q2	Seat Belt Use, Others	2,128	23
Q3	Chance Ticket Seat Belt	2,135	16
Q4	Primary Seat Belt Law	2,141	10
	Speeding		
Q5	Chance Ticket Speeding	2,134	17
Q6	Speed, 30 MPH Zone	2,134	17
Q7	Speed, 65 MPH Zone	2,142	9
Q8	Higher Speeding Fines	2,131	20
	Alcohol		
Q9	Chance Arrest Drinking	2,135	16
Q10a	Drive After 1-2 Drinks	2,101	50
Q10b	Drive After 3+ Drinks	1,970	181
Q10c	Designate Sober Driver	2,034	117
	Distracted Driving		
Q11	Cell Phone Text	2,138	13
Q12	Cell Phone Text, Others	2,122	29
Q13	Cell Phone Talk	2,129	22
Q14	Cell Phone Talk, Others	2,125	26
	Awareness/Exposure		
Q15	Social Media	843	1,308
Q16a	RSH Seat Belt	2,086	65
Q16b	RSH Speeding	2,001	150
Q16c	RSH Drunk Driving	2,098	53
Q16d	RSH *Code for the Road*	1,956	195
Q16e	RSH Distracted Driving	1,998	153
Total n=2,151			

APPENDIX C. DRIVER RESPONSES BY REGION AND GEOGRAPHY

Question	Region or Geography, Response					
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	18.6%	14.8%	23.0%	25.3%	33.7%	33.4%
Sw. Likely	33.2%	27.4%	43.8%	42.6%	34.8%	30.5%
Likely	20.2%	23.2%	25.3%	26.3%	21.1%	21.5%
Unlikely	23.1%	30.7%	7.4%	5.3%	8.5%	12.4%
V. Unlikely	4.8%	3.8%	0.4%**	0.5%**	1.9%**	2.3%
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	16.9%	16.9%	24.1%	23.9%	31.9%	38.2%
Sw. Likely	29.8%	32.9%	43.0%	44.2%	34.7%	28.0%
Likely	21.6%	21.6%	26.2%	24.6%	21.6%	20.3%
Unlikely	27.0%	25.1%	6.5%	6.4%	9.6%	11.9%
V. Unlikely	4.7%	3.5%	0.3%**	0.8%**	2.2%	1.6%**
Times driving after drinking 1-2 drinks in the past 60 days…			None	1-5 Times	6-10 Times	10+ Times
East			69.4%	27.9%	1.6%**	1.1%**
West			65.5%	32.9%	1.3%**	0.2%**
Urban			67.5%	30.7%	1.0%**	0.9%**
Rural			68.4%	28.6%	2.7%**	0.3%**
Times driving after drinking 3+ drinks in the past 60 days…			None	1-5 Times	6-10 Times	10+ Times
East			93.4%	5.8%	0.7%**	0.1%**
West			93.3%	6.5%	0.2%**	0.1%**
Urban			94.4%	5.3%	0.3%**	0.1%**
Rural			09.6%	8.4%	1.0%**	0.1%**
Seat Belt Use	Always		N. Always	Sometimes	Rarely	Never
East	73.4%		19.2%	5.5%	1.7%**	0.3%**
West	70.0%		21.9%	5.7%	1.5%**	0.8%**
Urban	77.0%		16.1%	5.1%	1.3%**	0.5%**
Rural	57.9%		32.2%	6.8%	2.3%**	0.8%**
Text messaging while driving	Daily		Few/Week	Few/Month	<1/Month	Never
East	7.6%		14.3%	20.6%	14.6%	42.8%
West	10.8%		16.4%	23.3%	20.1%	29.3%
Urban	8.5%		14.7%	20.5%	16.3%	40.0%
Rural	10.6%		16.8%	25.2%	19.2%	28.2%
Talking on cell phone while driving	Daily		Few/Week	Few/Month	<1/Month	Never
East	19.1%		27.7%	25.6%	12.4%	15.2%
West	28.9%		28.8%	23.4%	12.4%	6.4%
Urban	22.5%		26.7%	24.7%	13.1%	12.9%
Rural	26.1%		32.3%	24.4%	10.6%	6.7%
**Less than 30 responses in this group						

APPENDIX D. EXPOSURE TO MEDIA MESSAGES

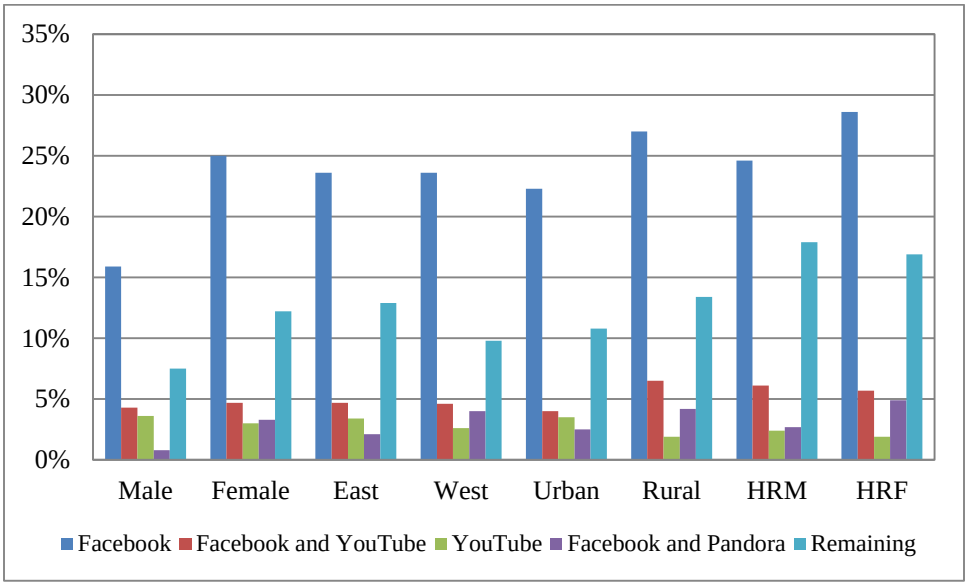


Figure D.1 Exposure to Messages via Social Media

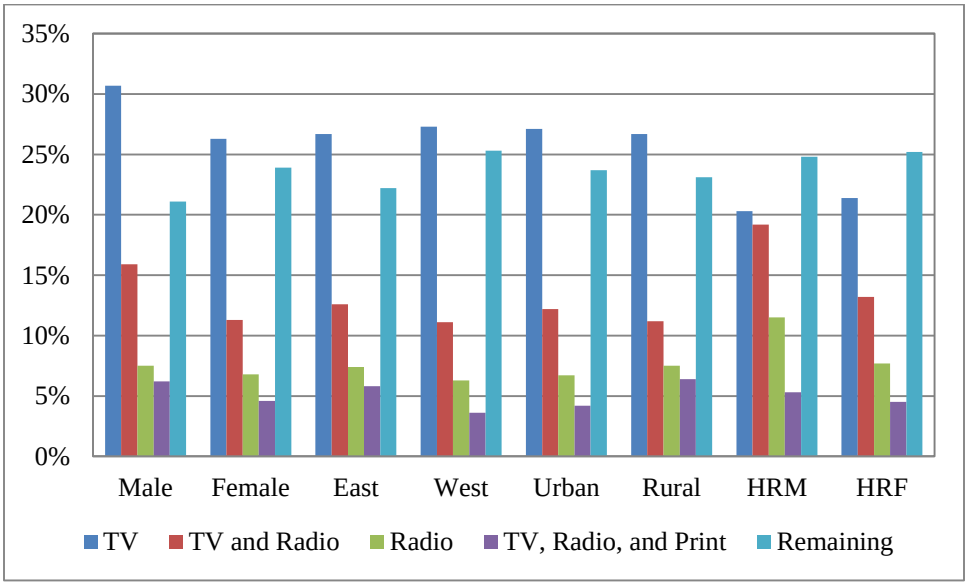


Figure D.2 Exposure to Messages about Seat Belt Use

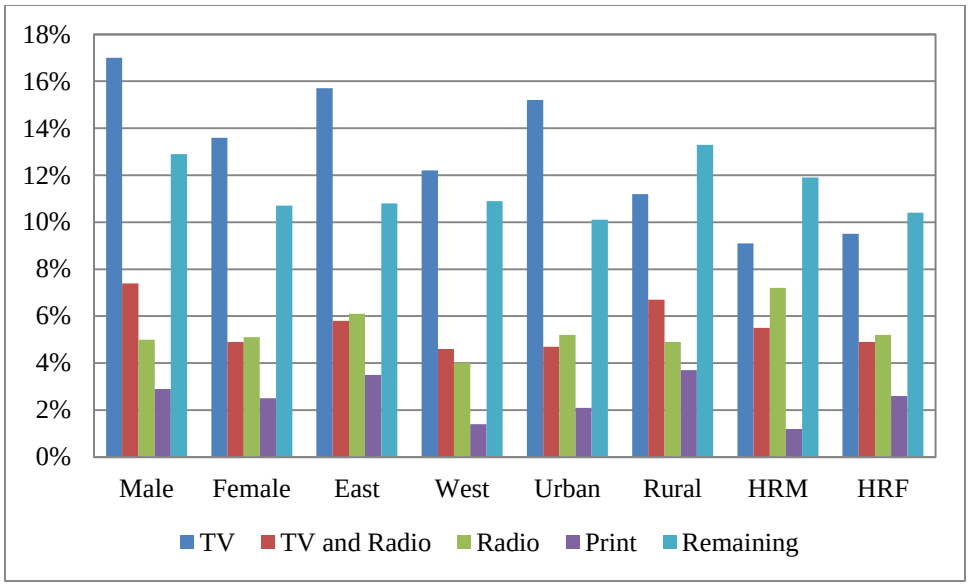


Figure D.3 Exposure to Messages about Speeding

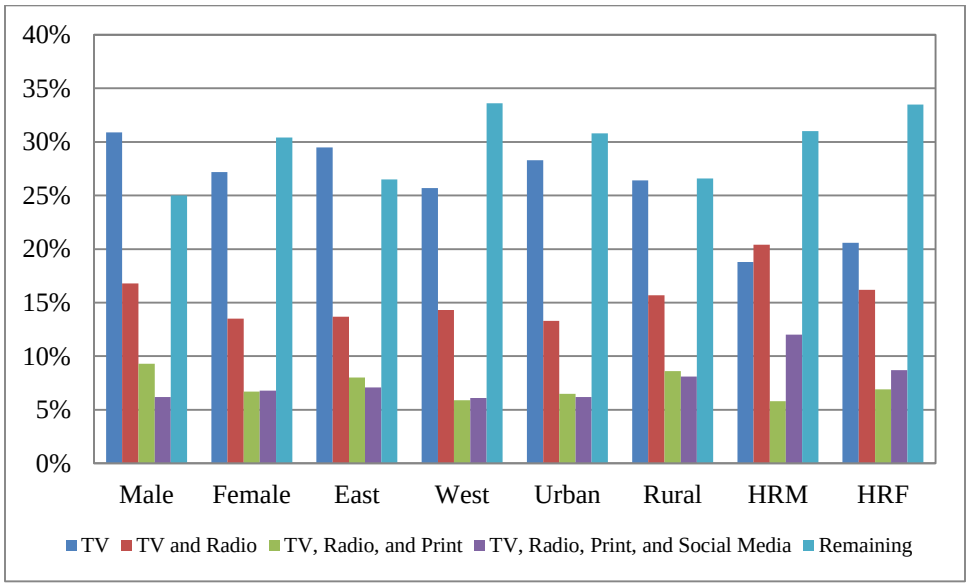


Figure D.4 Exposure to Messages about Impaired Driving

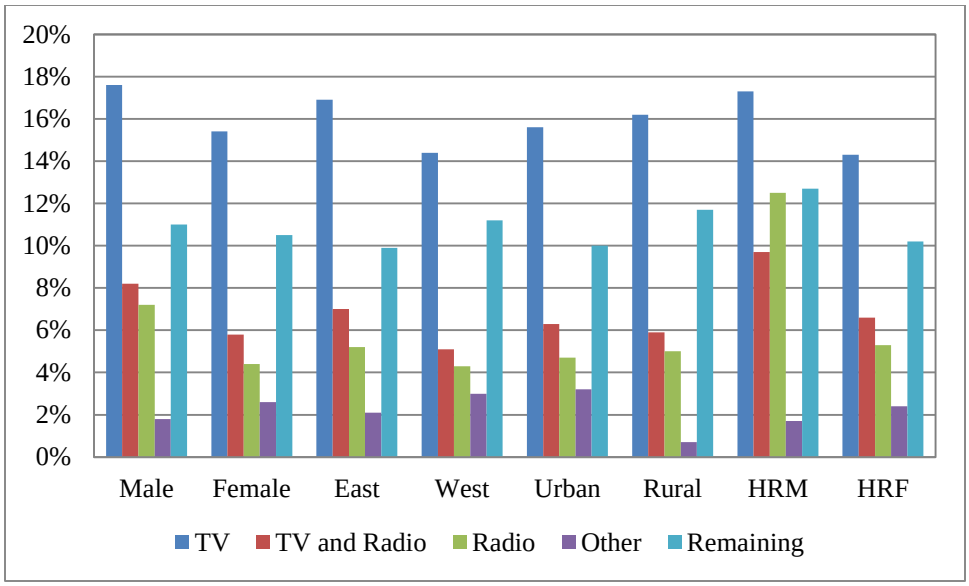


Figure D.5 Exposure to Messages about *Code for the Road*

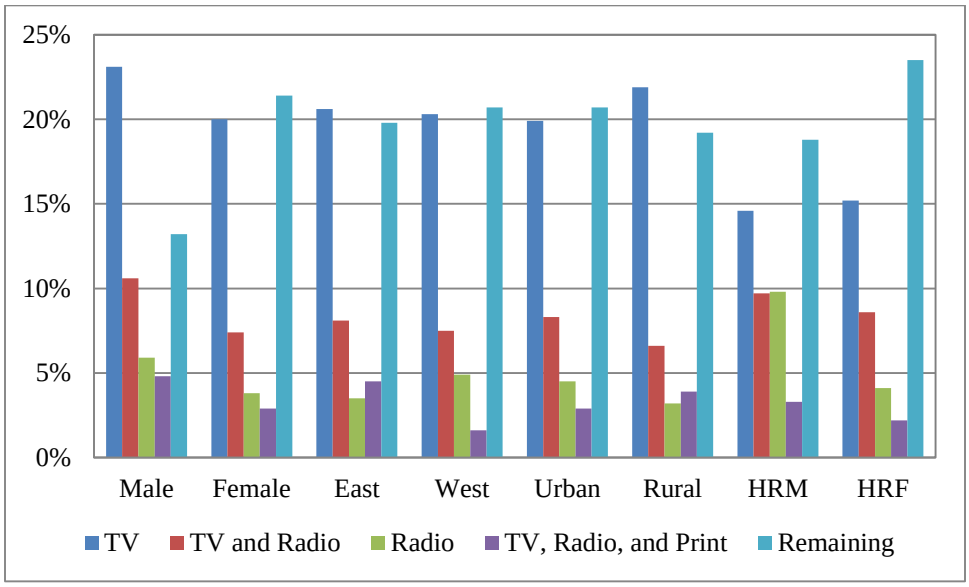


Figure D.6 Exposure to Messages about Distracted Driving