North Dakota Statewide Traffic Safety Survey, 2018:
Traffic Safety Performance Measures for State and Federal Agencies

Prepared for:

North Dakota Department of Transportation Safety Division

Prepared by:

Kimberly Vachal, Associate Professor
Laurel Benson, Research Project Specialist
Andrew Kubas, Consulting Faculty

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Upper Great Plains Transportation Institute
North Dakota State University, Fargo

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Disclaimer

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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 additional efforts are needed to improve safety on the state's roads.

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1.   INTRODUCTION

The United States lags behind other developed countries in several transportation safety metrics. One metric, road traffic death rate, is higher than in other developed countries (World Health Organization 2018) (Figure 1.1). Progress has been made to reduce the number of traffic-related fatalities, but crashes resulting in death, injury, and property damage continue to take place due to preventable factors. These factors include driving under the influence of drugs or alcohol, distracted driving, and operating a vehicle without a seat belt, among others. The metric highlighted in Figure 1.1, which presents the most recently-available data from the World Health Organization, suggests that more work is needed to improve driver behavior and overall safety on roadways 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 effort to improve transparency and quantify metrics for behavior-based investments designed to reduce motor vehicle crashes, the Governor's Highway Safety Association (GHSA) and the National Highway Traffic Safety Administration (NHTSA) established a set of performance measures to support traffic safety priorities and demonstrate progress related to behavioral safety plans and programs (Hedlund 2008).
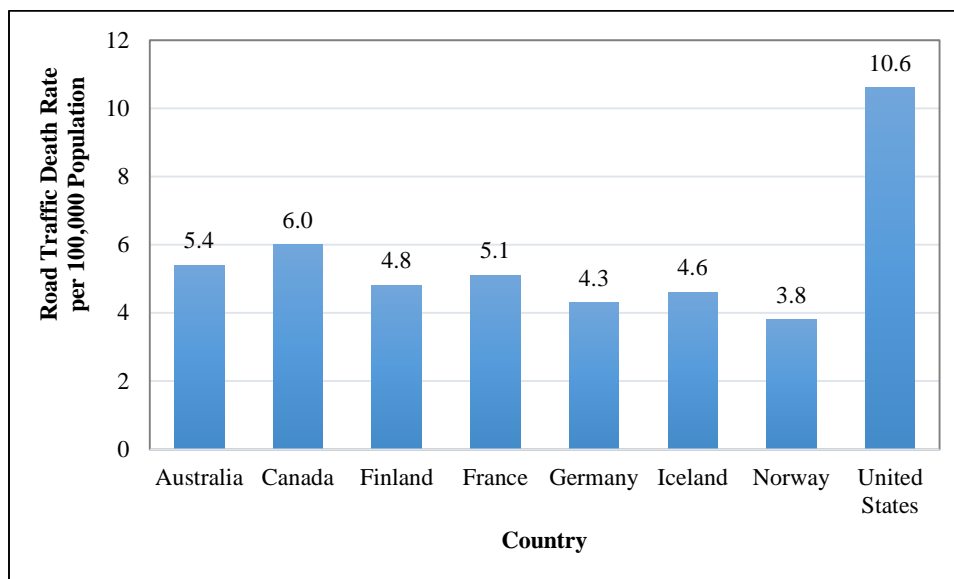
Figure 1.1 Road Traffic Death Rate of Selected Countries, 2013

Within the GHSA-NHTSA safety effort, 14 measures were agreed upon as Minimum Performance Measures. These include 10 outcome measure-types, one behavior measure-type, and three activity measure-types. The Minimum Performance Measures are designed to create a quantitative core for the development and implementation of highway safety plans and programs. Several uses include goal setting, goal-action linkages, resource allocation, program evaluation, and communication. Other benefits occur from improvements to organizational focus, feedback processes, and accountability (Herbel et al. 2009). The measures were defined to monitor overall traffic safety performance and progress related to the prioritized behavioral issues. These issues include occupant protection, alcohol use, and speeding. Additionally, the measures target high-risk population 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 existing national Fatality Analysis Reporting System (FARS) data 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 typically calculated as:
- Core outcome measures
  - C-1) Number of traffic fatalities (FARS). States are encouraged to report three-year or five-year moving averages when 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 grams/deciliter (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 (observational 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 Minimum Performance Measure publication also referenced four additional areas for measuring improvement and implementation: 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 knowledge, attitudes, behaviors, and beliefs. A core question set was developed by a GHSA-NHTSA working group and presented to state departments of transportation following the preliminary recommendations in the Minimum Performance Measures (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. 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.

Commonly, federal initiatives relating to driving behavior focus on impaired driving, seat belt use, and speeding. Thus, the core questions emphasize these issues (Hedlund, Casanova, and Chaudhary 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 "2018 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. Ultimately, the core questions were slightly modified to better fit driving conditions in North Dakota. These core questions read as follows:

- 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) Within the last six months, have you read, seen, or heard anything about alcohol impaired driving (or drunk driving) enforcement by the police?
  - ID-3) What do you think the chances are of someone getting arrested if they drive buzzed/drunk?
- Safety belts
  - SB-1) How often do you use seat belts when you drive or ride in a vehicle?

- o SB-2) Within the last six months, have you read, seen, or heard anything about seat belt law enforcement by police?
- o SB-3) What do you think the chance is of getting a ticket if you do not wear your seat belt?
- Speeding
  - o SP-1) On a road with a speed limit of 75 miles per hour, how often do you drive faster than 80 miles per hour?
  - o SP-2) Within the last six months, have you read, seen, or heard anything about speed enforcement by police?
  - o SP-3) What do you think the chance is of getting a ticket if you drive over the speed limit?

The annual Highway Safety Plan (HSP) provides insight for current priorities and activities (Henke et al. 2017). The most recent HSP outlines goals related to the overall traffic safety mission of the NDDOT, in addition to specific issues to address in the coming fiscal year. In 2018, these issues will be analyzed via projects designed to improve performance in the following areas:

- Enforcement
  - o Crashes, crash fatalities, and injuries in areas of highest risk
  - o Deployment of resources based on data analysis and planned high visibility enforcement strategies to support national mobilizations
  - o Enforcement strategies/guidelines/policies
    - ▪ Impaired driving
    - ▪ Occupant protection
    - ▪ Distracted driving
    - ▪ Underage drinking enforcement
    - ▪ Media plan
  - o Continuous follow-up and adjustment of the enforcement plan
- Performance
  - o Core outcome performance and behavior goals
  - o Core outcome problem identification, state calculations and countermeasures
    - ▪ Traffic fatalities
    - ▪ Serious injuries
    - ▪ Fatalities per VMT
    - ▪ Occupant protection
    - ▪ Fatalities involving an operator with 0.08 BAC or above
    - ▪ Speed-related fatalities
    - ▪ Motorcycle fatalities
    - ▪ Un-helmeted motorcyclist fatalities
    - ▪ Drivers age 20 and younger involved in fatal crashes
    - ▪ Pedestrian fatalities
    - ▪ Bicyclist fatalities

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 2016 observed seat belt use at 82.8% (NDDOT 2017). Results here will enhance the understanding of behavior by providing additional coverage, expanded insights into 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 created by blending the core questions with other NDDOT-designated questions pertaining to education, policy, and enforcement. The questions were developed based on a literature review – which included previous surveys of this type – and guidance offered by the GHSA-NHTSA working group. The mailings to drivers included a Safety Division cover letter which invited participation and explained the survey objectives. The questionnaire was mailed to North Dakota drivers on March 1, 2018 and was open to response until April 1, 2018.

NDDOT adult driver records formed the population used for sampling. Originally, 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 inadvertently been included in the survey sample. After cleaning the sample, a total of 10,659 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 iterations 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 10,659 original addresses, none were returned by the postal service as being undeliverable; this is probably due to "or current resident" being added to the address labels. Ultimately, 1,938 surveys were completed and returned to the research team. However, not all of the surveys were from valid North Dakota counties. A total of 68 respondents did not provide an answer to the "In which county do you live?" question and were removed from the sample. Therefore, of the usable survey responses provided, 1,870 were confirmed as valid 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. Although mail survey response is usually low, with 10% typical, a slightly better response rate was expected 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, using state agency mail envelopes, and providing postage-paid return envelopes.

A disproportionate stratified random 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 necessary 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 18 to 34 were 64.2% of the survey sample and account for 38.1% of the survey responses. However, this age cohort only accounts for 32.4% of the licensed driver population in the state (Levi et al. 2016). Therefore, a post-stratification weighting process is used to give an appropriate weight to responses for statewide estimates. Results from post-stratification consider the age, gender, and location of North Dakota registered drivers when weighting to reflect the views, perceptions, and behaviors of the statewide driving population. Note that answers with fewer than 30 responses are not considered large enough to extrapolate to fit the entire North Dakota driver population. These instances are indicated with asterisks throughout the analysis.
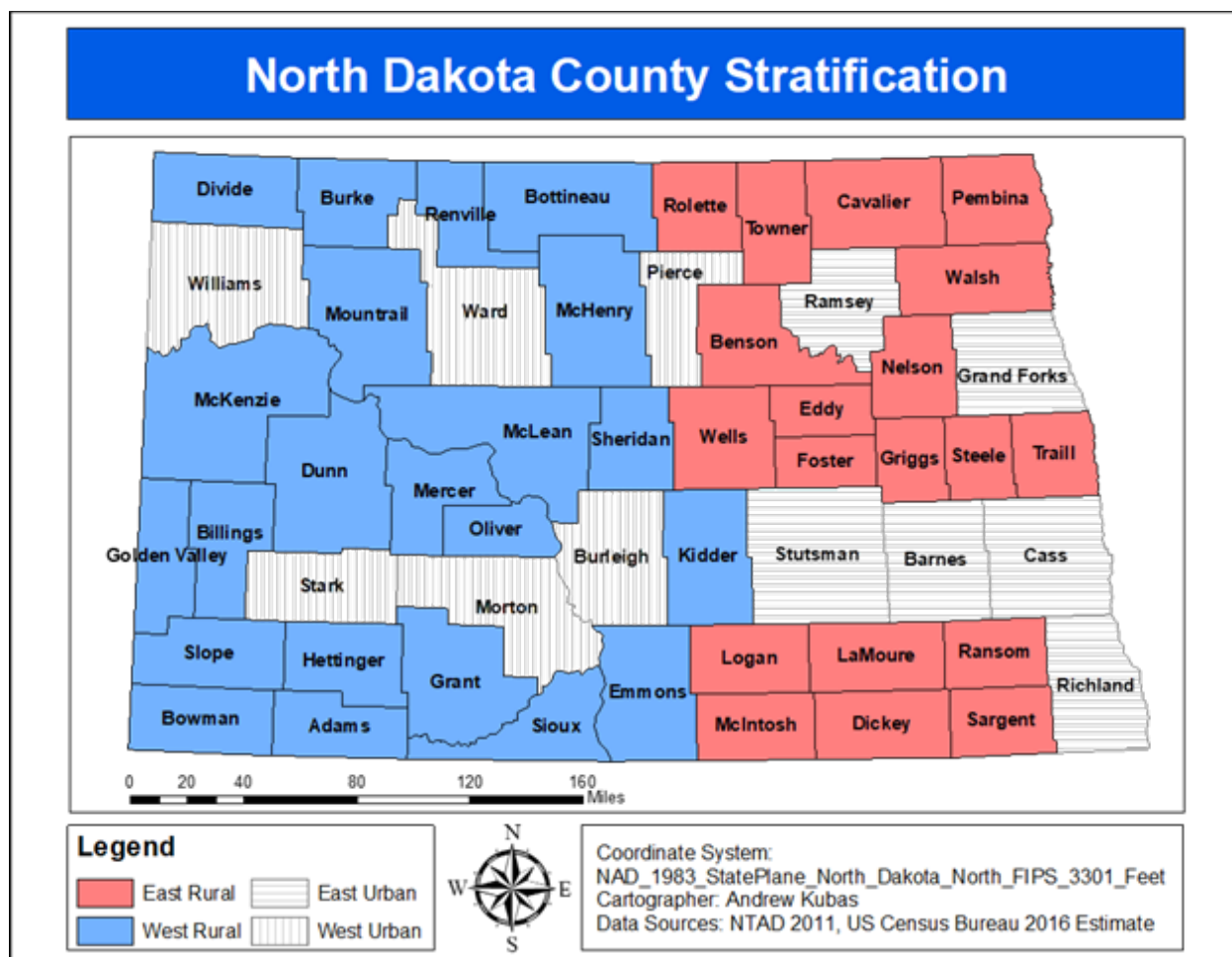
Figure 2.1 County Stratification

The regional definition was created by aggregating North Dakota health regions into two areas closely representing an east/west division of the state. The geography definition includes an urban/rural dichotomy. Urban drivers are those from counties with the largest urban population according to the most recently published data estimates from the US Census Bureau. Six urban counties are located in the east and another six are located in the west as indicated by the population density geographic definitions used in the study. These counties represent the clear majority of the urban population in the state. The sampling probabilities for the survey are displayed in Table 2.1.

Table 2.1 Sampling Probabilities

Region	Geography	Driver Age	Sampling Probability
East	Urban	18-34	0.034
East	Urban	35+	0.006
East	Rural	18-34	0.072
East	Rural	35+	0.012
West	Urban	18-34	0.039
West	Urban	35+	0.007
West	Rural	18-34	0.104
West	Rural	35+	0.018

3. RESPONSE

The survey response rate was 17.5% with 1,870 valid responses obtained from a mailing to 10,659 drivers. The response rate was comparable to prior surveys (Vachal, Benson, and Kubas 2010-2017) but was 2.5% lower than the 2017 mailing (Vachal, Benson, and Kubas 2017). 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 10.1% compared to 29.5% 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**
R E G I O N	East	514 (27.5%)	471 (25.2%)	**985 (52.7%)**
	West	453 (24.2%)	432 (23.1%)	**885 (47.3%)**
	Total	**967 (51.7%)**	**903 (48.3%)**	**1,870**

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-to-44-year-old age group is 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 29.0% of the survey responses and continues the trend from prior iterations of this survey in which this group has the largest number of responses. The 35-to-44-year-old age cohort makes up the lowest proportion of survey responses. Nonetheless, there were well over 30 responses from each age group making statistical extrapolation possible and allowing for inferences to be drawn with regard to the entire North Dakota driver population. Response rates were slightly skewed by gender: 58.0% of the sample identified as female. This deviates from the North Dakota driver population in which there is an approximately equal distribution of males and females. The number of responses based on gender also provides sufficient data to expand the responses to represent the entire statewide driver population. The number of responses from each age group is sufficient for analysis. The comparison to the state population supports the post-weighting for improved driver population representation with the sample.

Table 3.2 Response by Age Group

Age Group	Survey		Driver Population	
	Responses	Share	Drivers	Share[1]
18-24	170	9.1%	65,669	12.3%
25-34	540	29.0%	112,025	20.9%
35-44	129	6.9%	83,582	15.6%
45-54	176	9.5%	85,705	16.0%
55-64	368	19.8%	93,293	17.4%
65-74	288	15.5%	55,520	10.4%
75 and Older	190	10.2%	39,130	7.3%

[1]Represents share of drivers above age 18; percentages do not account for novice (under 18) drivers
Frequency Missing: 9
Source: Levi et al. 2016

A question new to the 2018 North Dakota Driver Survey asked respondents to identify their race/ethnicity. Although roughly 12% of North Dakotans identify as non-white, just 4.5% of the responses are from minority groups (Table 3.3). Only two groups – White/Caucasian and American Indian/Alaska Native – had more than 30 responses and were able to be extrapolated and considered representative of their respective populations. Due to the low number of non-white respondents, only American Indian respondents were studied in greater detail (Appendix B).

Table 3.3 Response by Race

Race	Survey		North Dakota Population
	Responses	Share	Share[1]
White/Caucasian	1,746	95.5%	87.9%
Black/African American	9	0.5%	2.9%
American Indian and Alaska Native	51	2.8%	5.5%
Asian	5	0.3%	1.5%
Two or More Races	2	0.1%	2.1%
Hispanic or Latino	7	0.4%	3.6%

[1]Represents all ages of North Dakotans
Frequency Missing: 50
Source: US Census Bureau Population Estimates 2018

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. The strong 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 emphasize three specific issues: impaired driving, seat belt use, and speeding. Response frequencies for these questions are included in Table 4.1. The table includes 2010-2017 responses to establish metrics that may be used to identify driving trends in North Dakota. In addition, five-year averages shed further light into patterns during this timeframe. Responses show drivers believe law enforcement is more likely to ticket for impaired driving violations than for speeding or seat belt violations. Frequencies indicate that 65.6% of drivers think the chances are higher-than-average that impaired drivers will be arrested (Figure 4.1). This is higher than the 58.5% and 35.9% of respondents who believe there is a greater-than-average likelihood that drivers will be ticketed for speeding or seat belt violations, respectively.
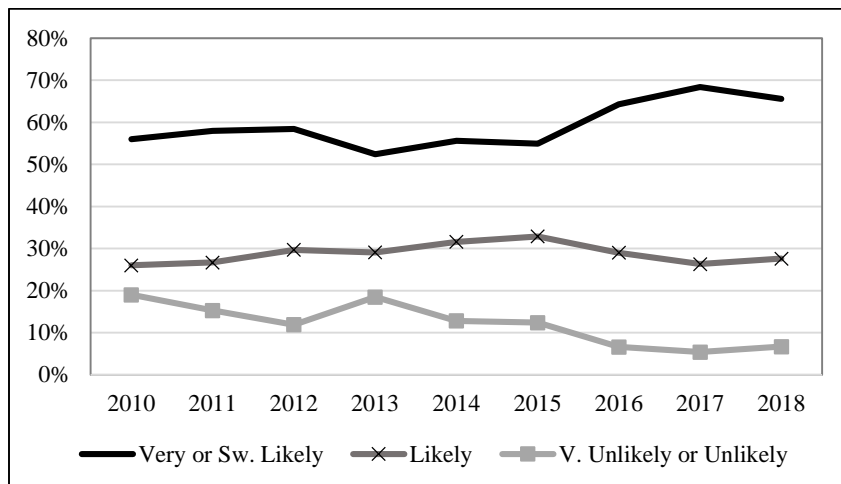
Figure 4.1 Perceived DUI Arrest Likelihood

Responses reveal 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=26.917, df=1, p<0.001) and were also less likely to believe that they would be ticketed for speeding (F=11.594, 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 is associated with a lower perceived chance of getting a ticket for not wearing a seat belt (F=22.031, df=1, p<0.001) and for speeding (F=13.727, df=1, p<0.001). This suggests that a driver engaging in one dangerous activity (driving after consuming alcohol) may also take part in another (driving unbelted, speeding) and therefore may exponentially increase danger on the roadway.

In this survey, 34.5% 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 (Figure 4.2). In contrast, just 7.4% noted that they had operated a vehicle within two hours of drinking three or more drinks at least once during the past two months. These numbers represent worsening trends compared to the 2017 survey in which 31.5% of respondents had one or two alcoholic beverages and 7.0% consumed at least three alcoholic beverages within two hours of operating a motor vehicle.
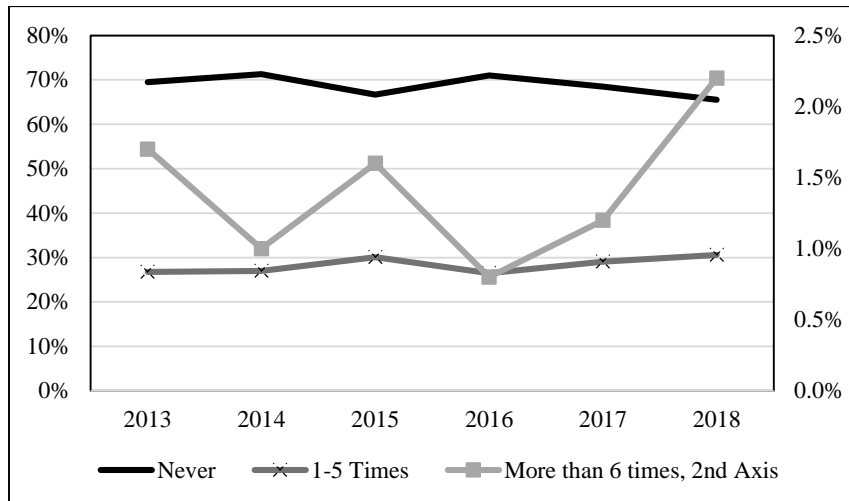
Figure 4.2 Self-Reported Driving-After-Drinking Activity

With regard to speeding, 9.4% of drivers report high levels of speeding activity based on those who answered "always" or "nearly always" to the question about the 75-mile-per-hour speed zone. This is comparable to the 2017 iteration of the questionnaire in which 10.5% of respondents reported the same levels of speeding on 75-mile-per-hour roads.

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
	2018[#]	65.5%	30.6%	2.4%	1.6%
	2017[#]	68.5%	29.1%	1.6%	0.7%*
	2016[#]	71.0%	26.5%	2.0%	0.4%*
	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%*
	2014-2018 Five-Year Avg.	**68.6%**	**28.7%**	**1.8%**	**0.8%**
	2013-2017 Five-Year Avg.	**69.4%**	**27.9%**	**1.9%**	**0.6%**
	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
	2018[#]	92.6%	6.5%	0.7%*	0.2%*
	2017[#]	93.0%	6.7%	0.3%*	0.1%*
	2016[#]	95.3%	4.4%	0.1%*	0.2%*
	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%*
	2014-2018 Five-Year Avg.	**93.8%**	**5.8%**	**0.4%**	**0.2%**
	2013-2017 Five-Year Avg.	**93.7%**	**5.8%**	**0.4%**	**0.2%**
ID-2	Have you recently read, seen, or heard anything about drunk driving enforcement?				
		Yes	No		
	2018	88.4%	11.6%		
	2017	86.4%	13.6%		
	2016	89.2%	10.8%		
	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%		
	2014-2018 Five-Year Avg.	**87.7%**	**12.3%**		
	2013-2017 Five-Year Avg.	**87.8%**	**12.2%**		
	2012-2016 Five-Year Avg.	**88.5%**	**11.5%**		
	2011-2015 Five-Year Avg.	**88.0%**	**12.0%**		
	2010-2014 Five-Year Avg.	**87.1%**	**12.9%**		
ID-3	What are the chances of someone getting arrested if they drive after drinking alcohol?				
		Very Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	2018	31.9%	27.6%	33.7%	5.2%	1.5%*
	2017	32.5%	26.3%	35.9%	4.4%	1.0%
	2016	32.9%	29.0%	31.4%	5.4%	1.2%
	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%
	2014-2018 Five-Year Avg.	**32.1%**	**29.5%**	**29.6%**	**7.3%**	**1.5%**
	2013-2017 Five-Year Avg.	**30.9%**	**31.7%**	**26.3%**	**9.6%**	**1.6%**
	2012-2016 Five-Year Avg.	**30.9%**	**30.5%**	**26.2%**	**10.8%**	**1.7%**
	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%**

Table 4.1 Core Question Responses (Continued)

Core	Survey Question					
SB-1	How often do you use seat belts when you drive or ride in a vehicle?					
		Always	N. Always	Sometimes	Rarely	Never
	2018	77.8%	17.3%	3.9%	0.5%*	0.4%*
	2017	74.4%	19.5%	4.6%	1.2%*	0.3%*
	2016	74.2%	19.7%	4.1%	1.6%	0.4%*
	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%
	2014-2018 Five-Year Avg.	**74.1%**	**19.3%**	**4.8%**	**1.4%**	**0.4%**
	2013-2017 Five-Year Avg.	**72.6%**	**20.1%**	**5.2%**	**1.7%**	**0.4%**
	2012-2016 Five-Year Avg.	**70.3%**	**21.6%**	**5.6%**	**2.0%**	**0.6%**
	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			
	2018	72.4%	27.6%			
	2017	70.7%	29.3%			
	2016	77.1%	22.9%			
	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%			
	2014-2018 Five-Year Avg.	**74.6%**	**25.4%**			
	2013-2017 Five-Year Avg.	**76.2%**	**23.8%**			
	2012-2016 Five-Year Avg.	**79.0%**	**21.0%**			
	2011-2015 Five-Year Avg.	**80.2%**	**19.8%**			
	2010-2014 Five-Year Avg.	**79.9%**	**20.1%**			
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
	2018	13.9%	36.7%	22.0%	22.4%	5.1%
	2017	11.4%	39.5%	23.6%	19.2%	6.3%
	2016	15.1%	39.2%	24.5%	16.7%	4.5%
	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%
	2014-2018 Five-Year Avg.	**14.8%**	**34.2%**	**23.7%**	**22.2%**	**5.2%**
	2013-2017 Five-Year Avg.	**15.1%**	**29.4%**	**26.8%**	**24.0%**	**4.7%**
	2012-2016 Five-Year Avg.	**16.2%**	**30.3%**	**24.3%**	**24.9%**	**4.3%**
	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%**

Table 4.1 Core Question Responses (Continued)

Core	Survey Question	Responses				
SP-1	On a road with a 75 mph speed limit, how often do you drive faster than 80 mph?					
		Always	N. Always	Sometimes	Rarely	Never
	2018##	2.5%	6.9%	22.0%	38.8%	29.8%
	2017##	3.2%	7.3%	20.9%	40.6%	28.0%
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
	2018	17.8%	35.8%	40.7%	4.5%	1.2%*
	2017	15.4%	33.5%	45.3%	4.4%	1.3%
	2016	20.5%	32.8%	42.4%	3.8%	0.5%*
	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%
	2014-2018 Five-Year Avg.	**20.3%**	**35.9%**	**37.4%**	**5.5%**	**0.9%**
	2013-2017 Five-Year Avg.	**21.6%**	**38.6%**	**32.7%**	**6.2%**	**0.8%**
	2012-2016 Five-Year Avg.	**24.2%**	**36.3%**	**31.8%**	**6.8%**	**0.9%**
	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			
	2018	36.9%	63.1%			
	2017	34.9%	65.1%			
	2016	37.3%	62.7%			
	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%			
	2014-2018 Five-Year Avg.	**37.8%**	**62.2%**			
	2013-2017 Five-Year Avg.	**37.7%**	**62.3%**			
	2012-2016 Five-Year Avg.	**37.5%**	**62.5%**			
	2011-2015 Five-Year Avg.	**37.2%**	**62.8%**			
	2010-2014 Five-Year Avg.	**40.3%**	**59.7%**			
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 2010-2012 could not be studied						
##Due to wording changes in SP-1, trends from previous years could not be studied						

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 82.8%. Driver self-reported use collected here shows that 77.8% "always" wear a seat belt with another 17.3% reporting usage as "nearly always" (Figure 4.3). The 77.8% of drivers "always" wearing a seat belt represents an increase from 74.4% in 2017 and is the highest self-reported number in the nine-year history of this questionnaire. Only 0.9% report that they "rarely" or "never" use a seat belt which is the lowest self-reported number in the history of this survey. These metrics indicate that North Dakota drivers are trending in a safer direction with regard to safety belt use.
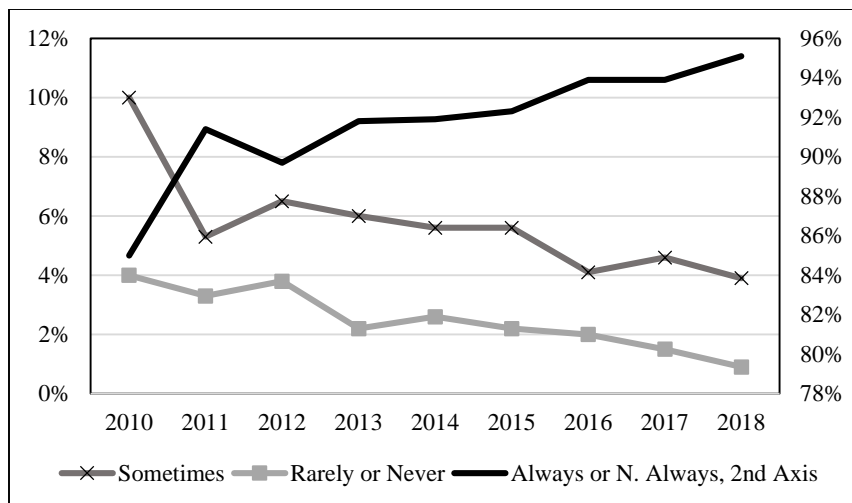
Figure 4.3 Self-Reported Seat Belt Use

Responses to awareness of public media or other educational messages about traffic safety related to drinking, speeding, and seat belt issues reveals speed enforcement is least often read, seen, or heard ("RSH") as a traffic safety topic; just 36.9% of survey participants responded that they had exposure to this safety message. This is expected as the NDDOT Safety Division does not disseminate safety messages for speeding. This low exposure rate represents a stark contrast to messages about impaired driving and seat belt use. Exposure rates to these topics were 88.4% and 72.4%, respectively. These exposure rates increased compared to 2017.

An examination of the relationships between behavior and enforcement along with behavior and education awareness yields mixed 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 4.4, driver responses are inconsistent with this expectation. The ticket North Dakota drivers least expect to receive – a seat belt violation – is associated with the lowest reported levels of negative behavior.
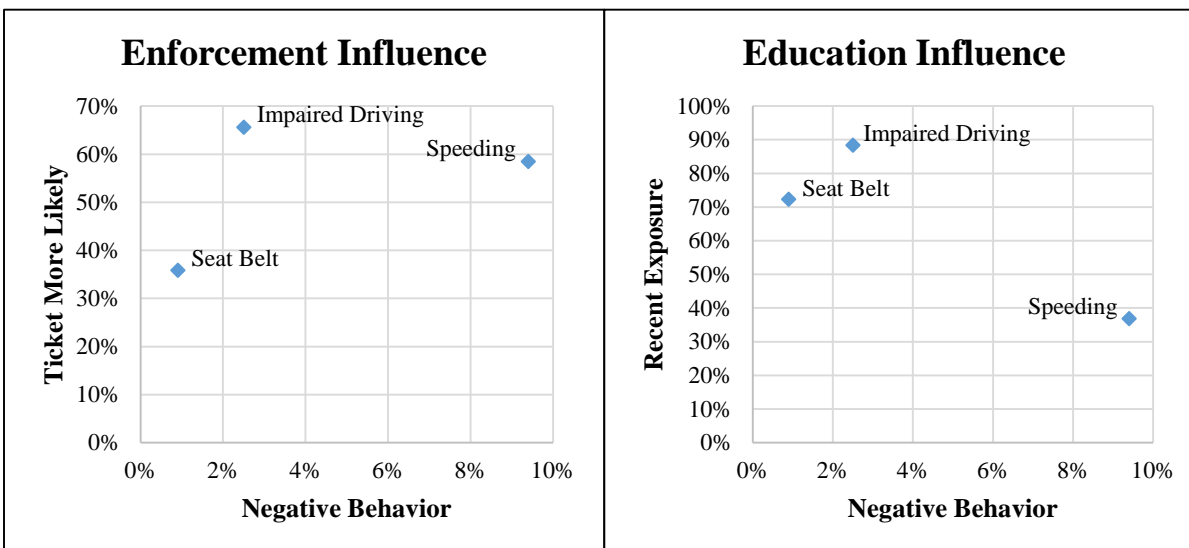
Figure 4.4 Driver Action Related to Enforcement and Education

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The education influence, however, follows an expected pattern factoring for responses to read, seen, or heard questions. One would expect that as drivers have more exposure 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 iteration of the survey were most often exposed to traffic safety messages about impaired driving (88.4%) and seat belt use (72.4%) and these have the lowest levels of self-reported negative behavior at 2.5% and 0.9%, respectively. 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 educational exposure to the safety topic. It appears as though, in this sample of North Dakota drivers, education has positive impacts on drivers. Speeding, however, continues to be an area in which North Dakotans behave dangerously. This negative behavior exists when controlling for both enforcement and education separately.

To further examine 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 driver responses. Correlation coefficients ranges from -1 to +1, and values closer to these extremes are considered stronger relationships. Relationships between -0.5 and +0.5 are generally considered weak and inconsequential. For example, the "arrest for impaired driving" and "ticket for speeding" variables do have an expected positive relationship at Pearson Corr.=0.430, but the correlation measure shows that less than 19% 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	SP1	SP2	SP3
ID1a: Drive After Drinking 1-2 Drinks	1	**.586****	.044	-.026	-.115**	.019	-.148**	.220**	-.079**	-.113**
		.000	.065	.270	.000	.431	.000	.000	.001	.000
ID1b: Drive After Drinking 3+ Drinks		1	.012	-.043	-.148**	-.021	-.108**	.195**	-.045	-.096**
			.644	.090	.000	.417	.000	.000	.088	.000
ID2: Read, Seen, or Heard Drunk Driving			1	.058*	-.052*	.480**	.037	.045	.255**	.037
				.014	.025	.000	.117	.056	.000	.120
ID3: Arrest for Drunk Driving				1	.016	.023	.386**	.076**	.098**	.430**
					.478	.328	.000	.001	.000	.000
SB1: How Often Use Seat Belts					1	-.082**	.094**	-.053*	-.027	.050*
						.001	.000	.023	.258	.032
SB2: Read, Seen, or Heard Seat Belt						1	.054*	-.061**	.364**	.025
							.022	.010	.000	.288
SB3: Ticket for No Seat Belt							1	-.081**	.122**	.461**
								.001	.000	.000
SP1: Speed on 75 MPH Road								1	-.084**	-.032
									.000	.166
SP2: Read, Seen, or Heard Speed									1	.124**
										.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 was one substantive relationship within the core correlations studied, though this relationship was relatively weak. This relationship occurred for the questions concerning driving after having one or two

alcoholic beverages and driving within two hours of consuming three or more alcoholic drinks (Pearson Corr.=0.586, p<0.001, n=1,530). These two variables share roughly 34% of their variability. This relationship demonstrates that – as one chooses to drive after consuming one or two alcoholic beverages – one is more likely to also drive after drinking three or more alcoholic drinks. 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 thresholds and are not considered substantive.

Driver responses to other questions are presented in Table 4.3. These responses offer additional insight for practitioners 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, sober/designated drivers, and drugged driving.

Table 4.3 Other Question Responses

Survey Question			Responses		
Traffic Safety Knowledge/Tools					
			Yes	No	
Recently read, seen, or heard ads for *Vision Zero. Zero Fatalities, Zero Excuses.*			23.4%	76.6%	
Recently read, seen, or heard ads for distracted driving			66.2%	33.8%	
Driver Preferences					
Do you favor or oppose…	St. Favor	Sw. Favor	Neutral	Sw. Oppose	St. Oppose
Higher fines for speeding?	15.6%	20.0%	35.2%	17.6%	11.6%
A primary seat belt law?	39.2%	22.5%	17.1%	11.3%	9.9%
Driver Distraction					
			Never	Handheld	Hands free
Cell phone talk while driving			20.6%	37.8%	41.6%
Cell phone text while driving			56.5%	31.3%	12.2%
		<1/Month	Few/Month	Few/Week	Daily
Cell phone talk while driving, frequency$_1$		12.7%	37.6%	29.2%	20.5%
Cell phone text while driving, frequency$_2$		21.0%	40.1%	25.5%	13.4%
			Never	Use Apps	
Apps while driving			57.0%	43.0%	
		<1/Month	Few/Month	Few/Week	Daily
Apps while driving, frequency$_3$		35.3%	38.8%	15.7%	10.2%
	Never	Rarely	Sometimes	N. Always	Always
Apps while driving, others	2.3%	1.8%	37.5%	40.3%	18.1%
	V. Unlikely	Unlikely	Sw. Likely	Likely	V. Likely
Ticket for texting/using apps	7.8%	27.3%	34.7%	19.0%	11.2%
Designated Driver					
	Never	Rarely	Sometimes	N. Always	Always
Designate a sober driver$_4$	3.5%	3.7%	12.8%	24.8%	55.2%
				Never	Use Rides
Ride services for drunk/buzzed driving$_4$				46.3%	53.7%
			1-5 Times	6-10 Times	10+ Times
Ride services use frequency$_4$			76.0%	11.6%	12.4%
Drugged Driving					
				Yes	No
Driving abilities compromised by drugs				1.8%	98.2%

$_1$Frequency calculated based on those who do talk while driving
$_2$Frequency calculated based on those who do text while driving
$_3$Frequency calculated based on those who do use apps while driving
$_4$Frequency calculated based on those who do drink alcohol

4.1.1 Traffic Safety Knowledge

Around one-quarter (23.4%) of respondents had recent exposure to *Vision Zero. Zero Fatalities, Zero Excuses* traffic safety messages, a statewide safety campaign rolled out by partner agencies such as the North Dakota State Patrol, the North Dakota Department of Transportation, and the North Dakota Department of Health. The safety effort is designed to create a culture of responsibility for drivers where motor vehicle fatalities and serious injuries are recognized as preventable (North Dakota Vision Zero).

4.1.2 Driver Preferences

Opinions have remained fairly stable over time regarding higher fines for speeding (Figure 4.5) and support for a primary seat belt law (Figure 4.6). With regard to higher fines for speeding, support remained virtually unchanged between 2017 and 2018 as none of the response choices differed by more than three percentage points. Responses to this prompt 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%
2016	12%	20%	35%	18%	15%
2017	13%	23%	32%	17%	15%
2018	16%	20%	35%	18%	12%
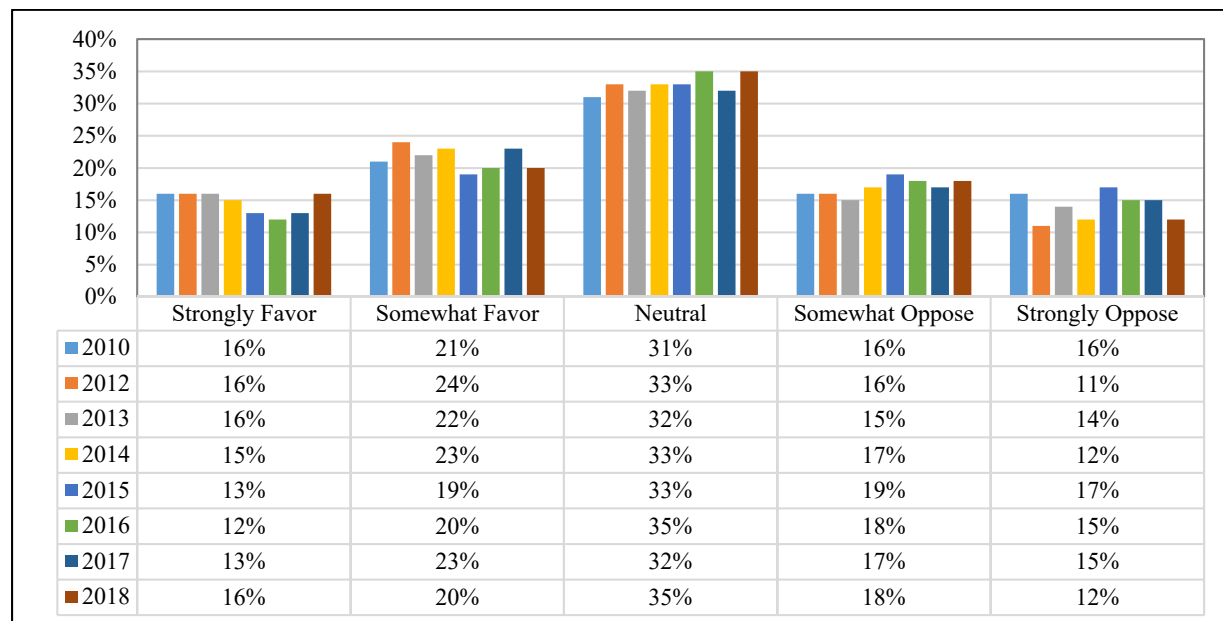
Figure 4.5 Driver Preferences for Higher Speeding Fines

The question concerning driver preferences toward having a primary seat belt law has had more variability in the dispersion of responses between 2010 and 2018. In 2010, nearly half (46%) of the North Dakota driver population "strongly favored" a primary seat belt law, but only about one-third (39%) hold the same viewpoint in 2018. Although perceptions have changed noticeably since 2010, attitudes have remained relatively stable since 2012. One notable improvement between the 2012 and 2018 iterations of the survey concerns opposition to such a law. Whereas approximately 20% of respondents in 2012 "strongly opposed" such legislation, 10% held this view in 2018. Overall, all of the response choices either improved or worsened by no more than four percentage points between the 2017 and 2018 questionnaires.

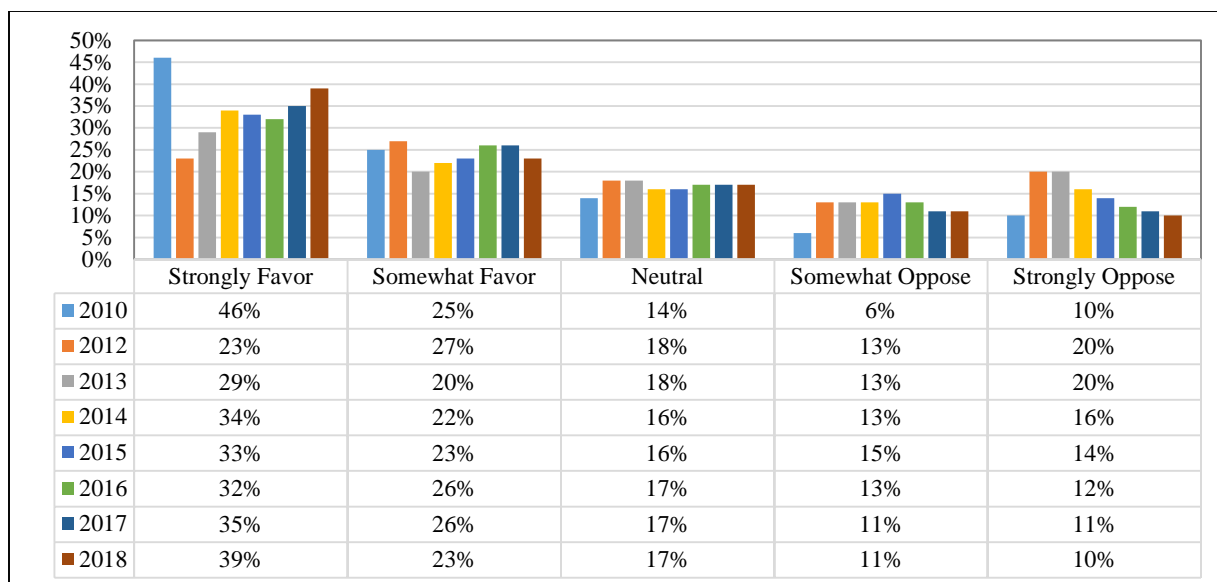|	Strongly Favor	Somewhat Favor	Neutral	Somewhat Oppose	Strongly Oppose
2010	46%	25%	14%	6%	10%
2012	23%	27%	18%	13%	20%
2013	29%	20%	18%	13%	20%
2014	34%	22%	16%	13%	16%
2015	33%	23%	16%	15%	14%
2016	32%	26%	17%	13%	12%
2017	35%	26%	17%	11%	11%
2018	39%	23%	17%	11%	10%

Figure 4.6 Driver Preferences for a Primary Seat Belt Law

4.1.3 Distracted Driving

Eight 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, talking, or using apps on the phone while driving.

The questions about talking on a cell phone while driving and texting while driving were slightly changed from prior versions of the survey. In the 2018 survey, drivers were asked how often they use their cell phones only if they answered "Yes, hand held" or "Yes, hands free" to the questions about cell phone use while driving. These frequencies were then pooled with the drivers who reported "Never" using a cell phone to talk or text while driving. Data from these two pooled sources were then used to continue the longitudinal trends presented in Figure 4.7 and Figure 4.8.

In terms of texting while driving, some noticeable trends have emerged over the last eight years (Figure 4.7). For example, the proportion of respondents who report "never" texting on the phone while driving consistently decreased between 2011 and 2016. For the last two iterations of the survey, the percentage of drivers "never" texting on the phone while driving has grown considerably and is near baseline levels from 2011. Similarly, the percentage of drivers texting daily while driving declined by 2.9% between 2015 and 2018. These improvements may be attributed to the stricter distracted driving law that went into effect on August 1, 2017 (Grueskin 2017). The general trend, however, has shown an increase in daily texting over the last eight years. Overall, the number of drivers who reported texting a few times per week or a few times per month has generally grown as well. It is clear that cell phone use for texting while driving is still occurring at dangerous levels within the state.
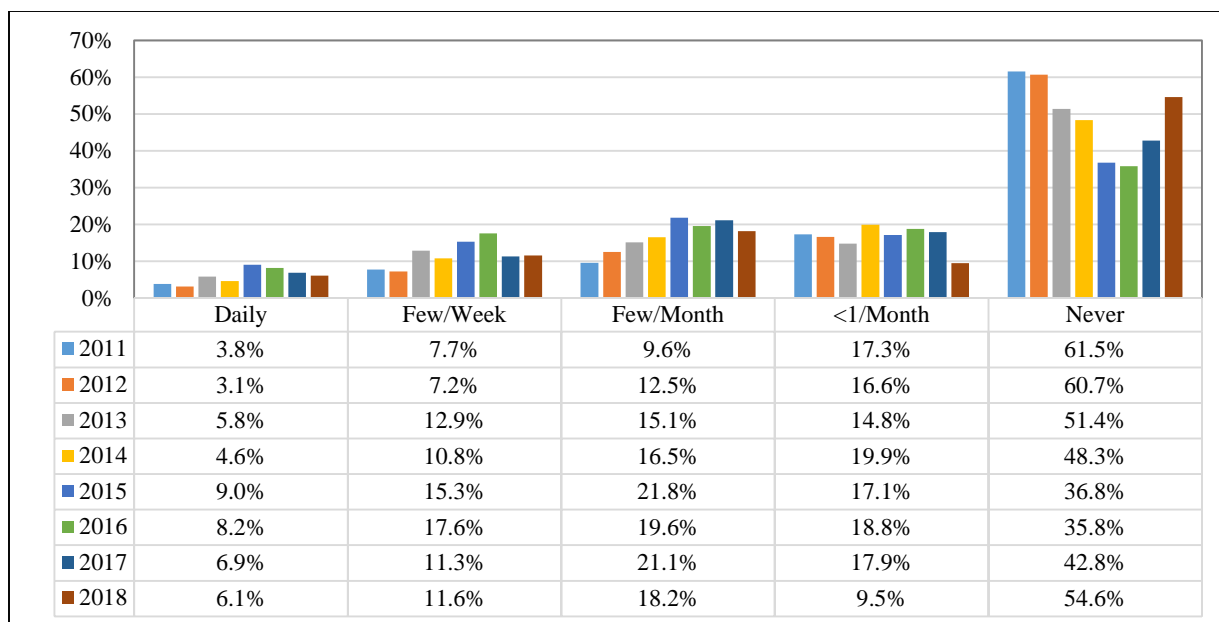
	Daily	Few/Week	Few/Month	<1/Month	Never
2011	3.8%	7.7%	9.6%	17.3%	61.5%
2012	3.1%	7.2%	12.5%	16.6%	60.7%
2013	5.8%	12.9%	15.1%	14.8%	51.4%
2014	4.6%	10.8%	16.5%	19.9%	48.3%
2015	9.0%	15.3%	21.8%	17.1%	36.8%
2016	8.2%	17.6%	19.6%	18.8%	35.8%
2017	6.9%	11.3%	21.1%	17.9%	42.8%
2018	6.1%	11.6%	18.2%	9.5%	54.6%

Figure 4.7 Cell Phone Texting Distractions, by Year

Drivers are more likely to use their cell phone for talking while driving (Figure 4.8). One-sixth (16.6%) of drivers in North Dakota use their cell phone for talking while driving on a daily basis. This is an improvement for a second consecutive year – in 2016 one-quarter (25.2%) reported using their cell phone for talking daily – and is the lowest reported percentage in the history of this survey. The proportion of respondents that "never" use their cell phone for talking while driving increased noticeably from 12.8% to 19.1% between 2017 and 2018. This is the largest reported percentage in the history of this survey and represents the safest option possible.

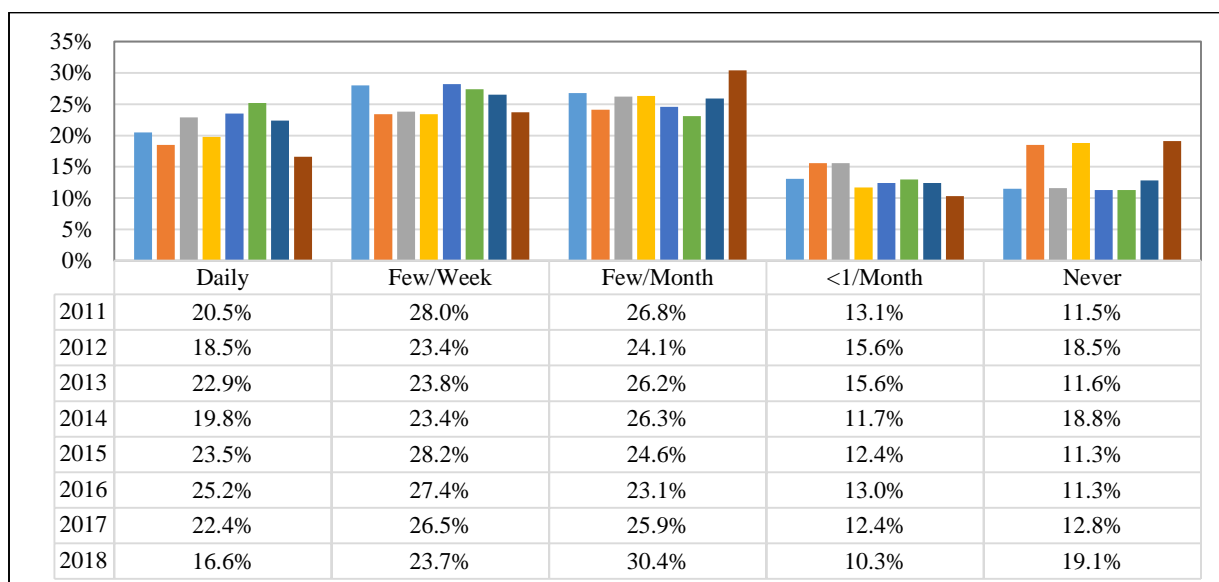|	Daily	Few/Week	Few/Month	<1/Month	Never
2011	20.5%	28.0%	26.8%	13.1%	11.5%
2012	18.5%	23.4%	24.1%	15.6%	18.5%
2013	22.9%	23.8%	26.2%	15.6%	11.6%
2014	19.8%	23.4%	26.3%	11.7%	18.8%
2015	23.5%	28.2%	24.6%	12.4%	11.3%
2016	25.2%	27.4%	23.1%	13.0%	11.3%
2017	22.4%	26.5%	25.9%	12.4%	12.8%
2018	16.6%	23.7%	30.4%	10.3%	19.1%

Figure 4.8 Cell Phone Talking Distractions, by Year

A series of questions new to the 2018 North Dakota Driver Survey emphasize the use of apps while driving. Relative to texting and talking while driving, app use is least likely to occur on a daily basis. Similarly, the largest share of North Dakotans report "never" using apps compared to texting or talking

while driving (Figure 4.9). Using apps while driving is positively correlated with using one's phone to text while driving (Pearson Corr.=0.555, p<0.001, n=424). Most commonly, drivers use a GPS/Navigation app (Figure 4.10).
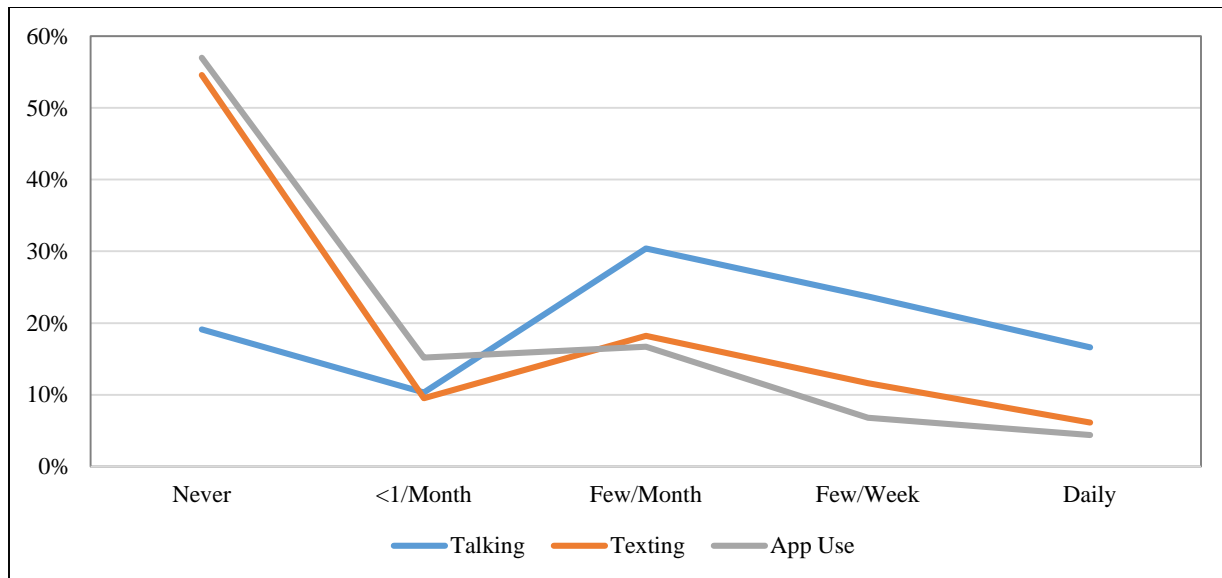
Figure 4.9 Cell Phone Distracted Driving, by Self-Reported Frequency
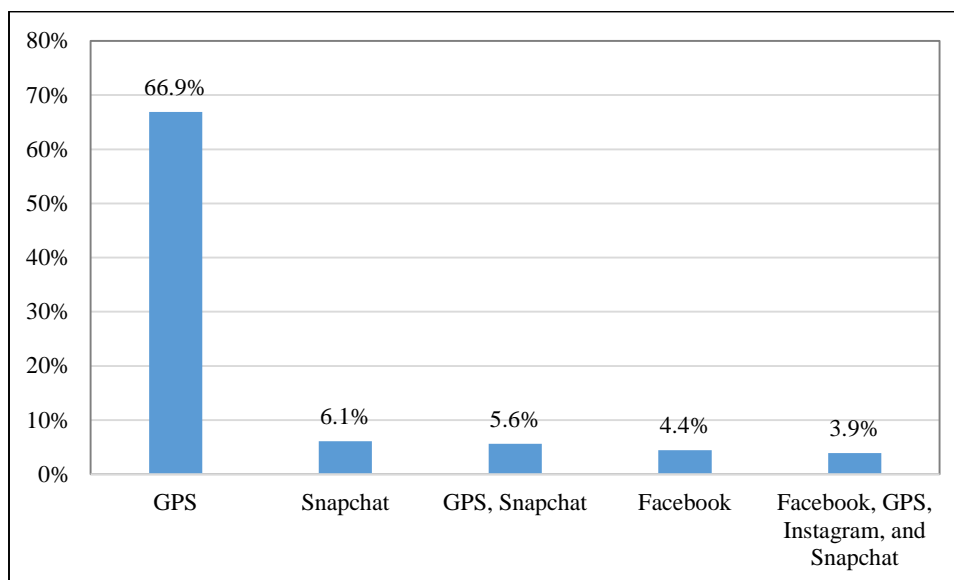
Figure 4.10 App Use by North Dakota Drivers

There is a distinct self-versus-other dynamic at play with regard to the use of cell phone apps while driving. Whereas 57.0% of respondents self-reported that they "never" use cell phone apps while driving, 58.4% of respondents believed that other drivers either "always" or "nearly always" used said apps when driving. Furthermore, the perception among respondents is that drivers have a lower-than-average likelihood of being ticketed for such cell phone use: 35.1% of respondents deemed it "very unlikely" or "unlikely" that one will receive a ticket for texting or using apps while driving.

4.1.4 Sober/Designated Drivers

Among those respondents who do drink alcohol, over half (55.2%) reported that they "always" designate a sober driver when drinking or planning to drink. Only 3.5% of respondents reported "never" doing so. Similarly, over half (53.7%) of respondents used a ride service to avoid drunk driving or buzzed driving. These ride services include ride sharing entities such as Uber, Lyft, taxis, and buses/public transit. In North Dakota, taxis are most commonly used to avoid impaired driving (Figure 4.11). Among those North Dakotans who do drink alcohol and further use ride sharing services, the clear majority (76.0%) only utilized those services one-to-five times within the last year.
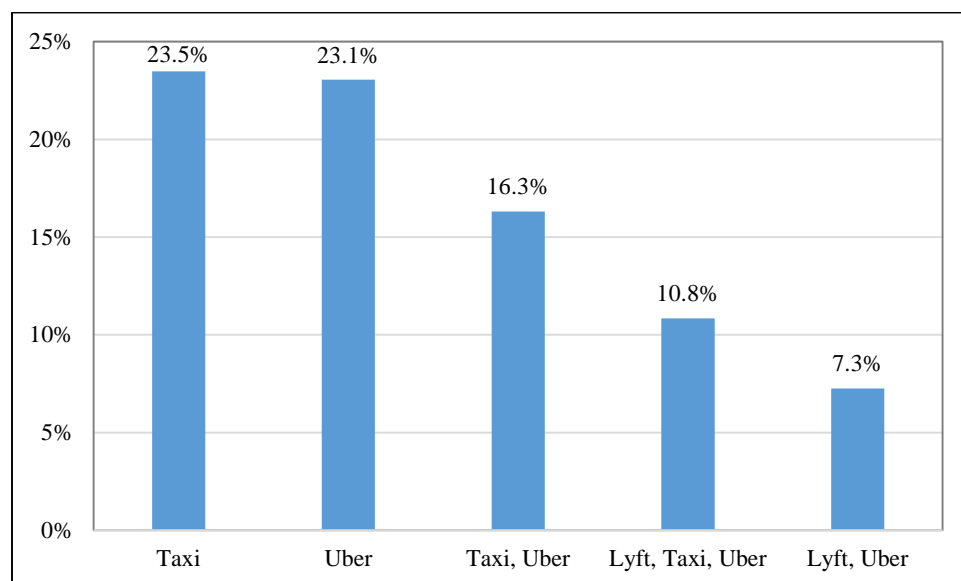
Figure 4.11 Ride Sharing Services Most Commonly Used in North Dakota

4.1.5 Drugged Driving

In this sample, just 1.8% of respondents admitted that they had driven in the past year even though they felt their ability to drive was likely compromised by the effects of drug use. A detailed explanation of drug type(s) is presented in Figure 4.12. There was a direct link between one's decision to drive under the influence of drugs and whether or not one had driven within two hours of consuming three or more alcoholic beverages. Those who had driven under the influence of drugs drove more often within two hours of consuming three or more alcoholic beverages (F=6.044, df=1, p=0.014). This pattern follows other findings of drug and alcohol abuse in North Dakota: a 2012 study in the state determined that repeat DUI offenders were more likely to have used illicit drugs on the same day of their arrest (Huseth and Kubas 2012). Resources should be targeted to drivers who have issues with self-control as drugged driving and alcohol-impaired driving are sometimes linked with one another in North Dakota.

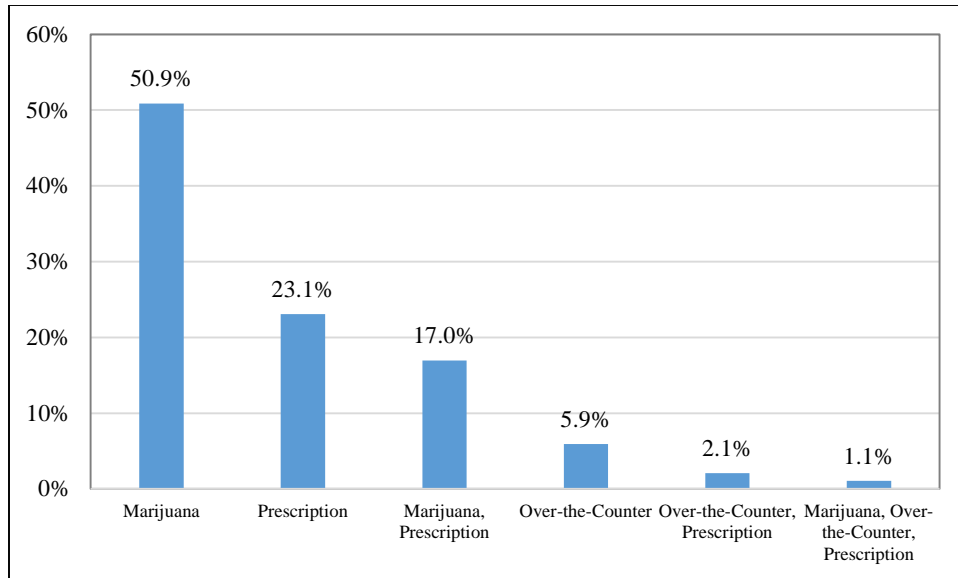**Figure 4.12** Self-Reported Drugged-Driving, by Drug Type

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 is prudent 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 high-risk populations. 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	75 MPH Speed Zone	1-5	1=Never to 5=Always
7	Higher Speeding Fines	1-5	1=Strongly Oppose to 5=Strongly Favor
8	Chances of DUI Arrest	1-5	1=Very Unlikely to 5=Very Likely
9	Drugged Driving	0-1	0=No, 1=Yes
10	Sober Driver	1-5	1=Never to 5=Always
13	Cell Phone Talk	0-1	0=Never, 1=At Least Once/Month
14	Cell Phone Text	0-1	0=Never, 1=At Least Once/Month
15	App Use	0-1	0=Never, 1=At Least Once/Month
16	App Use, Others	1-5	1=Never to 5=Always
17	App Use, Ticket	1-5	1=Very Unlikely to 5=Very Likely
18a	RSH Seat Belt	0-1	0=No, 1=Yes
18b	RSH Speeding	0-1	0=No, 1=Yes
18c	RSH Impaired Driving	0-1	0=No, 1=Yes
18d	RSH Distracted Driving	0-1	0=No, 1=Yes
18e	RSH *Vision Zero*	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 4.72. This number is below the goal of 5.00 – equivalent to "always" in the driver survey response. Table 4.6 shows the changes in mean values from 2010 to 2018. 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 little 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 11 issues were statistically significant in geographic comparisons.

With regard to regional designations, one statistically significant difference occurred based on support for a primary seat belt law (F=4.513, df=1, p=0.034) in which residents from the eastern half of the state were more likely to support such legislation. This represents a shift from 2017 in which this issue had no statistically significant difference across the state. The other two statistically significant topics – one's likelihood of using a sober driver (F=5.887, df=1, p=0.015) and one's exposure to messages about *Vision Zero* (Chi-Sq.=4.037, df=1, p=0.045) – were brand new questions asked in this iteration of the survey. In both instances, drivers from the western half of the state were more likely to use a sober driver and recognize the *Vision Zero* safety messages.

In general, urban residents exhibit safer behaviors behind the wheel than rural North Dakotans. For instance, North Dakota drivers living in the 12 urban counties are more likely to use a seat belt (F=51.943, df=1, p<0.001) and less likely to use apps while driving (Chi-Sq.=14.017, df=1, p<0.001).

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Compared to rural drivers, the higher seat belt use among urban residents continues a trend that has been in place each year since 2010.

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

Question	Scale₁	Statewide All	Region East	West	Sig.	Geography Urban	Rural	Sig.
Seat Belt Use	1-5	4.72	4.72	4.71		4.78	4.52	##
Seat Belt Use, Others	1-5	3.72	3.75	3.67		3.76	3.58	##
Ticket Likely Seat Belt	1-5	3.17	3.14	3.21		3.16	3.21	#
Primary Seat Belt Law	1-5	3.70	3.76	3.62	#	3.78	3.46	##
Ticket Likely Speeding	1-5	3.69	3.64	3.76		3.67	3.76	##
75 MPH Speed Zone	1-5	2.14	2.04	2.26		2.15	2.09	##
Higher Speeding Fines	1-5	3.10	3.19	2.98		3.14	3.00	
Chances of DUI Arrest	1-5	3.89	3.83	3.97		3.90	3.87	
Drugged Driving	0-1	0.02	0.02	0.02		0.01	0.03	
Sober Driver	1-5	4.24	4.13	4.38	#	4.24	4.26	
Cell Phone Talk	0-1	0.79	0.74	0.87		0.77	0.88	
Cell Phone Text	0-1	0.43	0.39	0.50		0.40	0.54	
App Use	0-1	0.43	0.38	0.50		0.43	0.43	**
App Use, Others	1-5	3.70	3.70	3.70		3.72	3.63	##
App Use, Ticket	1-5	2.98	2.94	3.04		2.94	3.11	#
RSH Seat Belt	0-1	0.72	0.71	0.75		0.72	0.73	**
RSH Speeding	0-1	0.37	0.39	0.35		0.38	0.35	**
RSH Impaired Driving	0-1	0.88	0.88	0.89		0.88	0.89	
RSH Distracted Driving	0-1	0.66	0.67	0.65		0.67	0.64	
RSH *Vision Zero*	0-1	0.23	0.20	0.28	*	0.24	0.21	

₁Note: 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

Interestingly, despite exhibiting more dangerous driving behaviors, rural residents were more likely to think that drivers would be ticketed for not wearing a seat belt (F=5.932, df=1, p=0.015), speeding (F=7.465, df=1, p=0.006), and using apps while driving (F=4.141, df=1, p=0.042). These same North Dakota drivers were less likely to support a primary seat belt law (F=11.236, df=1, p=0.001). This represents a conflicting viewpoint because without a primary seat belt law in place, drivers cannot be ticketed solely for operating a vehicle without wearing seat belt.

The five-year trends presented in Table 4.6 provide insight about patterns emerging from North Dakota drivers. With nine years of data available, some conclusions can be made. For instance, the five-year averages of seat belt use (4.65) and perceived likelihood of being arrested for driving impaired (3.87) are at all-time highs.

A few negative trends also become apparent when analyzing results from the previous nine years. Both the five-year average for exposure to safety messages about using a seat belt and the five-year average for exposure to safety messages about speeding are at all-time lows. This means that, compared to other five-year intervals, North Dakota drivers are not being exposed to seat belt and speeding safety message interventions as often as they have been in prior years.

Table 4.6 Differences in Driver Views and Behaviors from 2010-2018, by Region and Geography

Question	Year	Scale	Statewide All	Region East	West	Sig.	Geography Urban	Rural	Sig.	Core Y/N
Seat Belt Use	2018	1-5	4.72	4.72	4.71		4.78	4.52	**	Y
1=Never to 5=Always	2017		4.66	4.69	4.63		4.73	4.46	**	Y
	2016		4.66	4.70	4.61		4.73	4.44	**	Y
	2015		4.61	4.64	4.59		4.68	4.44	**	Y
	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
2014-2018 Five-Year Average			**4.65**	**4.68**	**4.62**		**4.72**	**4.45**		
2013-2017 Five-Year Average			**4.60**	**4.62**	**4.58**		**4.67**	**4.42**		
2012-2016 Five-Year Average			**4.53**	**4.56**	**4.50**		**4.60**	**4.37**		
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 Seat Belt	2018	1-5	3.17	3.14	3.21		3.16	3.21	*	Y
1=Very Unlikely to 5=Very Likely	2017		3.15	3.17	3.12		3.14	3.15	*	Y
	2016		3.29	3.27	3.31		3.26	3.37	**	Y
	2015		3.29	3.38	3.19		3.27	3.35	**	Y
	2014		3.20	3.26	3.14		3.19	3.25	*	Y
	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
2014-2018 Five-Year Average			**3.22**	**3.24**	**3.19**		**3.20**	**3.27**		
2013-2017 Five-Year Average			**3.22**	**3.25**	**3.18**		**3.19**	**3.26**		
2012-2016 Five-Year Average			**3.22**	**3.27**	**3.17**		**3.18**	**3.27**		
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	2018	1-5	3.69	3.64	3.76		3.76	3.67	**	Y
1=Very Unlikely to 5=Very Likely	2017		3.69	3.67	3.72	*	3.67	3.75	**	Y
	2016		3.79	3.76	3.81		3.76	3.87	**	Y
	2015		3.84	3.82	3.87	*	3.84	3.84		Y
	2014		3.72	3.71	3.73		3.71	3.77	**	Y
	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
2014-2018 Five-Year Average			**3.75**	**3.72**	**3.78**		**3.75**	**3.78**		
2013-2017 Five-Year Average			**3.74**	**3.72**	**3.76**		**3.72**	**3.78**		
2012-2016 Five-Year Average			**3.74**	**3.73**	**3.75**		**3.71**	**3.78**		
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 75 MPH Zone	2018	1-5	2.14	2.04	2.26		2.15	2.09	**	Y
1=Never to 5=Always	2017		2.17	2.08	2.28		2.22	2.02	**	Y

Question	Year	Scale	Statewide All	Region East	West	Sig.	Geography Urban	Rural	Sig.	Core Y/N
Arrest for DUI	2018	1-5	3.89	3.83	3.97		3.90	3.87		Y
1=Very Unlikely to 5=Very Likely	2017		3.94	3.90	4.00		3.92	4.02		Y
	2016		3.89	3.86	3.93		3.89	3.90		Y
	2015		3.86	3.90	3.80		3.84	3.89		Y
	2014		3.76	3.71	3.83		3.79	3.69		Y
	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
2014-2018 Five-Year Average			**3.87**	**3.84**	**3.91**		**3.87**	**3.87**		
2013-2017 Five-Year Average			**3.80**	**3.78**	**3.82**		**3.79**	**3.81**		
2012-2016 Five-Year Average			**3.74**	**3.74**	**3.74**		**3.74**	**3.72**		
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**		

Table 4.6 Continued

	Year	Scale								
RSH Seat Belt	2018	0-1	0.72	0.71	0.75		0.72	0.73	**	Y
0=No, 1=Yes	2017		0.71	0.70	0.71		0.69	0.75		Y
	2015		0.78	0.79	0.77		0.78	0.79	**	Y
	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
2014-2018 Five-Year Average			**0.76**	**0.76**	**0.75**		**0.75**	**0.77**		
2013-2017 Five-Year Average			**0.79**	**0.80**	**0.77**		**0.77**	**0.81**		
2012-2016 Five-Year Average			**0.80**	**0.81**	**0.78**		**0.79**	**0.81**		
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**		
RSH Speeding	2018	0-1	0.37	0.39	0.35		0.38	0.35	**	Y
0=No, 1=Yes	2017		0.35	0.38	0.31		0.35	0.34		Y
	2016		0.37	0.41	0.34		0.36	0.40	**	Y
	2015		0.42	0.46	0.37		0.41	0.44	**	Y
	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
2014-2018 Five-Year Average			**0.38**	**0.41**	**0.34**		**0.37**	**0.39**		
2013-2017 Five-Year Average			**0.38**	**0.41**	**0.35**		**0.37**	**0.40**		
2012-2016 Five-Year Average			**0.39**	**0.41**	**0.36**		**0.37**	**0.41**		
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	2018	0-1	0.88	0.88	0.89		0.88	0.89		Y
0=No, 1=Yes	2017		0.86	0.87	0.85		0.86	0.88		Y
	2016		0.89	0.90	0.88		0.89	0.89		Y
	2015		0.90	0.90	0.89		0.89	0.90		Y
	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
2014-2018 Five-Year Average			**0.88**	**0.88**	**0.87**		**0.87**	**0.88**		
2013-2017 Five-Year Average			**0.88**	**0.89**	**0.87**		**0.87**	**0.88**		
2012-2016 Five-Year Average			**0.89**	**0.89**	**0.88**		**0.88**	**0.89**		
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

One ongoing trend is the substantial discrepancy in seat belt use between urban and rural drivers. Urban residents are more likely to wear seat belts compared to their rural counterparts. 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. This is occurring in spite of the fact that rural individuals have a higher-than-average exposure rate to traffic safety messages about seat belt use (Chi-Sq.=12.096, df=1, p=0.001).

4.2.2 Young Male Driver Group

As with the previous eight surveys, the selected target group of 18-to-34-year-old high-risk males ("HRM") shows 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 behaviors at odds with traffic safety goals, such as speeding in a 75-mile-per-hour zone (F=149.192, df=1, p<0.001), talking on the phone while driving (Chi-Sq.=38.260, df=1, p<0.001), texting

while driving (Chi-Sq.=199.238, df=1, p<0.001), and using apps while driving (Chi-Sq.=150.253, df=1, p<0.001).

In addition to having higher levels of risky behavior than the rest of the North Dakota driver population, young males are also less likely to engage in safe driving behaviors. The high-risk young male drivers surveyed are less likely to wear safety belts than other drivers (F=33.773, df=1, p<0.001). Only 55.5% of young male drivers "always" wear a seat belt while driving or riding in a vehicle, a number much smaller than the 81.3% of other drivers who "always" do so. The share of young males who report that they "rarely" or "never" use seat belts (3.9%) is over three times the rate of other drivers (1.1%). Lower levels of seat belt use likely go hand-in-hand with the fact that young male drivers have a lower expectancy for law enforcement to ticket drivers for seat belt violations when compared to the balance of the population (F=7.245, df=1, p=0.007).

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

Question	HRM (n=275)	Other Drivers (n=1,145)	Sig.$_1$
Seat Belt Use	4.31	4.75	##
Seat Belt Use, Others	3.58	3.82	##
Ticket Seat Belt	2.94	3.17	##
Primary Seat Belt Law	2.95	3.72	##
Ticket Likely Speeding	3.48	3.61	
Speed in 75 MPH Zone	2.53	1.72	##
Higher Fines for Speeding	2.46	3.51	##
Chance Arrest for DUI	3.91	3.69	##
Drugged Driving	0.04	0.01	*
Use Sober Driver	4.02	3.95	
Cell Phone Talk	0.87	0.60	**
Cell Phone Text	0.58	0.16	**
App Use	0.61	0.20	**
App Use, Others	3.84	3.60	##
Ticket App Use	2.77	2.82	
RSH Seat Belt	0.79	0.74	
RSH Speeding	0.35	0.44	**
RSH Drunk Driving	0.92	0.84	
RSH Distracted Driving	0.63	0.72	**
RSH *Vision Zero*	0.31	0.24	

$_1$Note: Nominal/Ordinal scales require different tests of significance
**Significant difference at the 1% level for Pearson Chi-Square test
*Significant difference at the 5% level for Pearson Chi-Square test
\#\#Significant difference at the 1% level for 1-way ANOVA

The NDDOT 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 insight into this key demographic. Exposure to traffic safety messages that can be read, seen, or heard is considerably lower for this target group. These drivers were less likely to have had exposure to messages about speeding (Chi-Sq.=7.540, df=1, p=0.006) and distracted driving (Chi-Sq.=11.131, df=1, p=0.001).

It is particularly interesting to note the attitudes of young male drivers toward driving under the influence of alcohol. Differences in opinions about the chances of getting arrested for DUI are statistically significant at the 1% level with young male drivers thinking there is a greater likelihood of facing arrest ($F=12.283$, $df=1$, $p<0.001$). It is unknown what factors cause high-risk males to have these perceptions as this target group and all other North Dakota drivers reported seeing traffic safety messages targeting impaired driving at comparable rates (Chi=Sq.=2.881, $df=1$, $p=0.090$). Perhaps messages need to be better focused at targeting this group in an effort to deter these individuals from operating a motor vehicle while impaired.

Young male drivers hold viewpoints about driving that are notably different than other drivers. For example, the target group indicated that they do not support higher fines for speeding as strongly as the rest of the population ($F=95.064$, $df=1$, $p<0.001$) (Figure 4.13). They were least likely to "somewhat" or "strongly" favor increasing fines among the six demographic groups analyzed in this report.
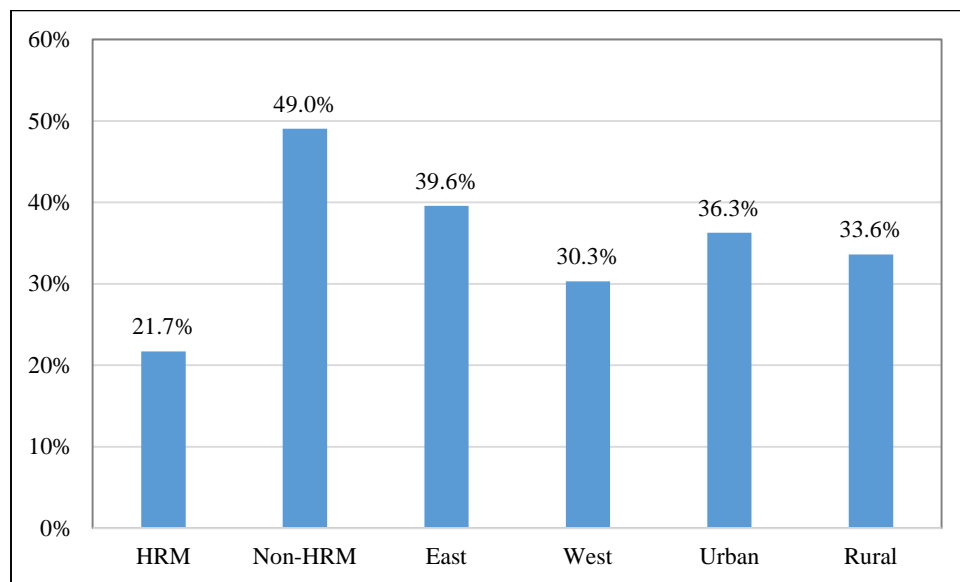
Figure 4.13 Percent "Strongly" or "Somewhat" Favoring Higher Speeding Fines

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 toward 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=1,417	Always	N. Always	Sometimes	Rarely	Never
	Other	81.3%	14.3%	3.3%	0.7%**	0.4%**
	HRM	55.5%	24.8%	15.8%	2.5%**	1.4%**
Seat Belt Ticket	n=1,414	V. Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	Other	14.5%	36.7%	21.3%	21.8%	5.7%
	HRM	9.8%**	33.8%	19.4%	29.2%	7.8%**
Primary Seat Belt Law	n=1,414	St. Favor	Sw. Favor	Neutral	Sw. Oppose	St. Oppose
	Other	41.7%	21.5%	14.8%	10.9%	11.0%
	HRM	19.3%	21.5%	17.9%	17.3%	24.0%
Chance Speed Ticket	n=1,410	V. Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	Other	15.7%	37.9%	38.7%	6.2%	1.5%**
	HRM	10.6%**	36.3%	40.8%	11.3%**	1.1%**
Speed in 75 mph	n=1,420	Always	N. Always	Sometimes	Rarely	Never
	Other	0.7%**	2.1%**	13.2%	36.6%	47.3%
	HRM	6.4%**	12.9%	23.0%	43.4%	14.4%
Speed Fines	n=1,411	St. Favor	Sw. Favor	Neutral	Sw. Oppose	St. Oppose
	Other	25.4%	23.6%	33.4%	11.9%	5.7%
	HRM	9.6%**	12.1%	24.6%	21.9%	31.8%
Chance DUI Arrest	n=1,413	V. Likely	Sw. Likely	Likely	Unlikely	V. Unlikely
	Other	24.0%	35.2%	32.1%	6.8%	1.9%**
	HRM	33.4%	24.2%	33.8%	7.9%**	0.7%**
Drive 1-2 Drinks	n=1,316	None	1-5 Times	6-10 Times	10+ Times	
	Other	75.5%	21.0%	2.0%**	1.5%**	
	HRM	49.2%	40.9%	6.3%**	3.6%**	
Drive 3+ Drinks	n=1,138	None	1-5 Times	6-10 Times	10+ Times	
	Other	96.1%	3.3%	0.2%**	0.5%**	
	HRM	79.6%	15.6%	3.8%**	1.0%**	
Sober Driver[1]	n=854	Always	N. Always	Sometimes	Rarely	Never
	Other	50.0%	19.8%	14.0%	7.5%	8.8%
	HRM	44.0%	29.9%	15.7%	5.0%**	5.4%**
Cell Phone Talk	n=1,291	Never	1+/Month			
	Other	40.0%	60.0%			
	HRM	12.8%**	87.2%			
Cell Phone Text	n=1,362	Never	1+/Month			
	Other	83.8%	16.2%			
	HRM	41.9%	58.1%			
App Use	n=1,378	Never	1+/Month			
	Other	80.4%	19.6%			
	HRM	38.9%	61.1%			
Note: Please see Appendix A for exact question and response wording						
[1]Note: Percentages based only on those North Dakota drivers who report that they consume alcohol						
**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 toward safe driving habits and exposure to messages promoting safe driving lag behind the balance of the driver population (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=431)	Other Drivers (n=1,145)	Sig.[1]
Seat Belt Use	4.72	4.75	##
Seat Belt Use, Others	3.66	3.82	##
Ticket Seat Belt	3.19	3.17	
Primary Seat Belt Law	3.74	3.72	##
Ticket Likely Speeding	3.78	3.61	##
Speed in 75 MPH Zone	2.42	1.72	##
Higher Fines for Speeding	2.84	3.51	##
Chance Arrest for DUI	4.04	3.69	##
Drugged Driving	0.02	0.01	
Use Sober Driver	4.42	3.95	##
Cell Phone Talk	0.94	0.60	**
Cell Phone Text	0.64	0.16	**
App Use	0.60	0.20	**
App Use, Others	3.75	3.60	##
Ticket App Use	3.13	2.82	##
RSH Seat Belt	0.71	0.74	**
RSH Speeding	0.32	0.44	**
RSH Drunk Driving	0.92	0.84	
RSH Distracted Driving	0.62	0.72	**
RSH *Vision Zero*	0.23	0.24	*

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

The 18-to-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 75 mile per hour road (F=167.416, df=1, p<0.001), talking on the phone while driving (Chi-Sq.=97.435, df=1, p<0.001), texting while driving (Chi-Sq.=300.158, df=1, p<0.001), and using apps when driving (Chi-Sq.=180.081, df=1, p<0.001). These cell phone behaviors were also evident in the 2015, 2016, and 2017 iterations 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 about speeding (Chi-Sq.=24.512, df=1, p<0.001) and distracted driving (Chi-Sq.=20.464, df=1, p<0.001). Unlike their high-risk male counterparts, they further have a lower chance of exposure to messages about seat belt use (Chi-Sq.=18.112, df=1, p<0.001) and *Vision Zero* safety advertisements (Chi-Sq.=3.913, df=1, p=0.048).

For the fourth year in a row, this group was less likely to support higher fines for speeding (F=42.196, df=1, p<0.001). It is plausible that this stems from the group's propensity to speed, especially on roads with a posted limit of 75 miles per hour.

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 chance of being arrested for driving under the influence of alcohol was more likely than did other North Dakota drivers (F=40.596, df=1, p<0.001).

Perhaps this is why this group was more likely to use a designated sober driver than other North Dakotans (F=32.879, df=1, p<0.001). This perception of being ticketed may be deterring this driver group.

4.2.4 High-Risk Driver Comparisons

A detailed explanation of how high-risk 18-to-34-year-old drivers compare to all other North Dakota drivers is presented in Appendix C. In general, high-risk drivers exhibit more dangerous behaviors than do drivers over the age of 35. However, with regard to perceived likelihood of ticketing, 18-to-34-year-old females have the lowest perceived likelihood of receiving a ticket. The deterrent effect of ticketing is not as strong for this group of North Dakota drivers.

5.   CONCLUSIONS

The annual statewide driver traffic safety survey provides baseline metrics for the Safety Division and others in understanding perceptions and behaviors related to focus issues. A core set of questions was selected to address nationally agreed upon priorities. These include emphases on seat belt use, impaired 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 when examining trends that have taken place over the last nine years of administering this survey. First, there is a continued 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 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 by 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 drastically different than their 35+ year-old counterparts and regularly engage in dangerous practices behind-the-wheel. It may be worthwhile to make the 18-to-34-year-old target group more aware of traffic safety tools via focused safety campaigns and optimized advertisement placement. The *Vision Zero* campaign is one such program that could fill this gap in exposure.

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.

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APPENDIX A. SURVEY INSTRUMENT

2018 North Dakota Driver Survey

All Responses Are Confidential

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

2. How often do you think others use seat belts when driving or riding in a motor vehicle?
   □ Never □ Rarely □ Sometimes □ Nearly Always □ Always □ Do Not Know

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

6. On a road with a speed limit of 75 mph, how often do you drive faster than 80 mph?
   □ Never □ Rarely □ Sometimes □ Nearly Always □ Always

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

8. What do you think the chances are of someone getting arrested if they drive buzzed/drunk?
   □ Very Unlikely □ Unlikely □ Somewhat Likely □ Likely □ Very Likely

9. In the past year, have you driven even though you felt your ability to drive may have been compromised by drugs?
   □ Yes □ No **If yes,** select all that apply: □ Marijuana □ Prescription Drugs □ Over-the Counter □ Other _____

10. If drinking or planning to drink, how often do you designate a sober driver?
    □ Never □ Rarely □ Sometimes □ Nearly Always □ Always □ Do Not Drink

11. Have you used a ride service to avoid driving drunk/buzzed?
    □ Never □ Uber □ Lyft □ Taxi □ Bus □ Other _____ □ Do Not Drink
    ➢ If you have used a ride service to avoid driving drunk, how often in the past year?
    □ 1 – 5 times □ 6 – 10 times □ more than 10 times

12. 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

13. How and how often do you talk on your cell phone while driving? □ Never □ Yes, Hand held □ Yes, Hands free
    ➢ **If yes,** how often: □ Less than Once per Month □ Few Times per Month □ Few Times per Week □ Daily

14. How and how often do you text message while driving? □ Never □ Yes, Hand held □ Yes, Hands free
    ➢ **If yes,** how often: □ Less than Once per Month □ Few Times per Month □ Few Times per Week □ Daily

15. Do you use apps while driving? (Select all that apply)
    □ Never Use Apps □ Yes, Facebook □ Yes, Instagram □ Yes, Snapchat □ Yes, GPS/Navigation □ Other_____
    ➢ **If yes,** how often: □ Less than Once per Month □ Few Times per Month □ Few Times per Week □ Daily

16. How often do you think others use apps while driving?
    □ Never □ Rarely □ Sometimes □ Nearly Always □ Always □ Do Not Know

17. What do you think the chance is of getting a ticket for texting or using apps while driving?
    □ Very Unlikely □ Unlikely □ Somewhat Likely □ Likely □ Very Likely

18. Within the last 6 months have you read, seen, or heard traffic safety messages relating to:

Seat Belt Enforcement	□ Yes	□ No	If yes, where?	□ TV	□ Radio	□ Online Ad	□ Social Media	□ Other _____
Speed Enforcement	□ Yes	□ No	If yes, where?	□ TV	□ Radio	□ Online Ad	□ Social Media	□ Other _____
Drunk Driving Enforcement	□ Yes	□ No	If yes, where?	□ TV	□ Radio	□ Online Ad	□ Social Media	□ Other _____
Distracted Driving Enforcement	□ Yes	□ No	If yes, where?	□ TV	□ Radio	□ Online Ad	□ Social Media	□ Other _____
Vision Zero. Zero Fatalities, Zero Excuses	□ Yes	□ No	If yes, where?	□ TV	□ Radio	□ Online Ad	□ Social Media	□ Other _____

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

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

21. Race/ethnicity: □ Caucasian □ Native American □ African American □ Asian □ Other _____

22. Your Gender: □ Female □ Male

23. In which North Dakota county do you live? _____

Thank you for your time and participation.

APPENDIX B. AMERICAN INDIAN DRIVER RESPONSES

Question	Race, 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	
	American Indian	Others	American Indian	Others	American Indian	Others
V. Likely	68.9%**	12.7%	70.0%**	16.7%	67.4%**	31.3%
Sw. Likely	13.5%**	37.4%	10.7%**	36.3%	10.8%**	27.5%
Likely	12.7%**	22.1%	16.7%**	41.3%	21.1%**	34.4%
Unlikely	2.0%**	22.9%	1.3%**	4.5%	0.8%**	5.3%
V. Unlikely	3.0%**	4.9%	1.4%**	1.2%**	0.0%**	1.5%**
Times driving after drinking 1-2 drinks in the past 60 days…			None	1-5 Times	6-10 Times	10+ Times
American Indian			82.0%	18.0%**	0.0%**	0.0%**
Others			64.6%	31.3%	2.4%	1.6%
Times driving after drinking 3+ drinks in the past 60 days…			None	1-5 Times	6-10 Times	10+ Times
American Indian			87.7%	12.3%**	0.0%**	0.0%**
Others			92.5%	6.6%	0.7%**	0.2%**
Seat Belt Use	Always	N. Always	Sometimes	Rarely	Never
American Indian	91.0%	4.3%**	4.7%**	0.0%**	0.0%**
Others	77.6%	17.6%	3.9%	0.5%**	0.3%**
**Fewer than 30 responses in this group						

APPENDIX C. HIGH-RISK 18-TO-34-YEAR-OLD DRIVER BEHAVIORS/PERCEPTIONS
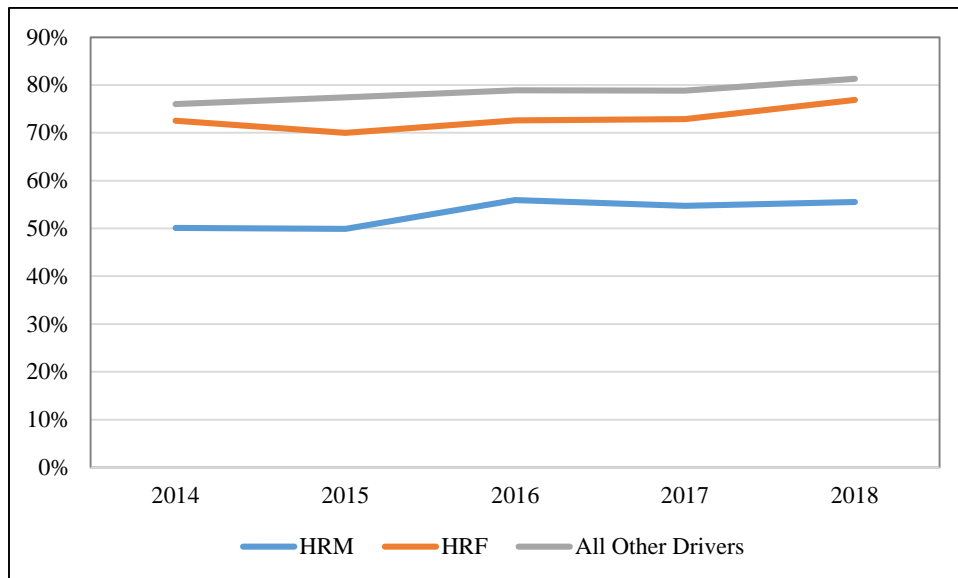

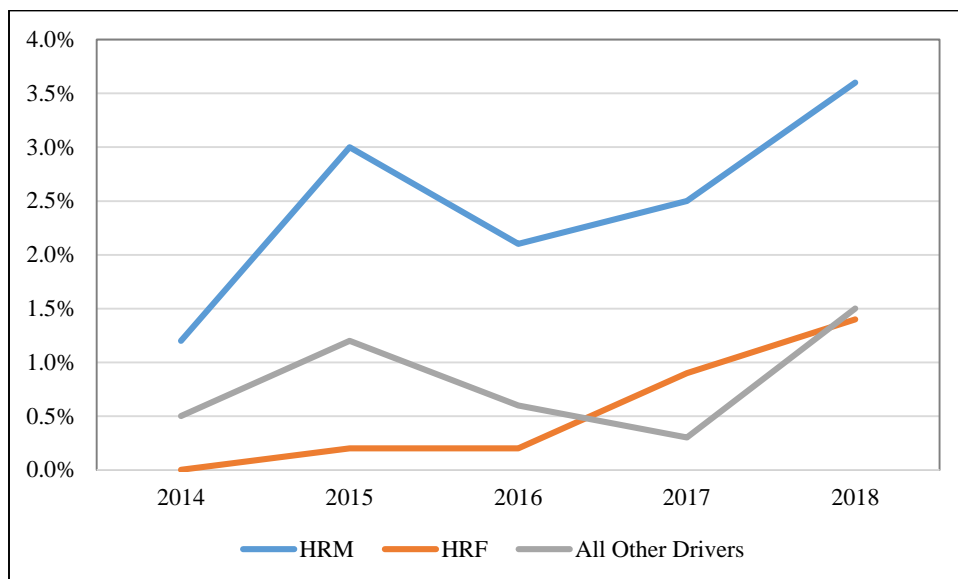**Figure C.1** Drivers Self-Reporting Seat Belt Use as "Always"

Figure C.2 Drivers Self-Reporting Driving Within Two Hours of Consuming One or Two Alcoholic Beverages
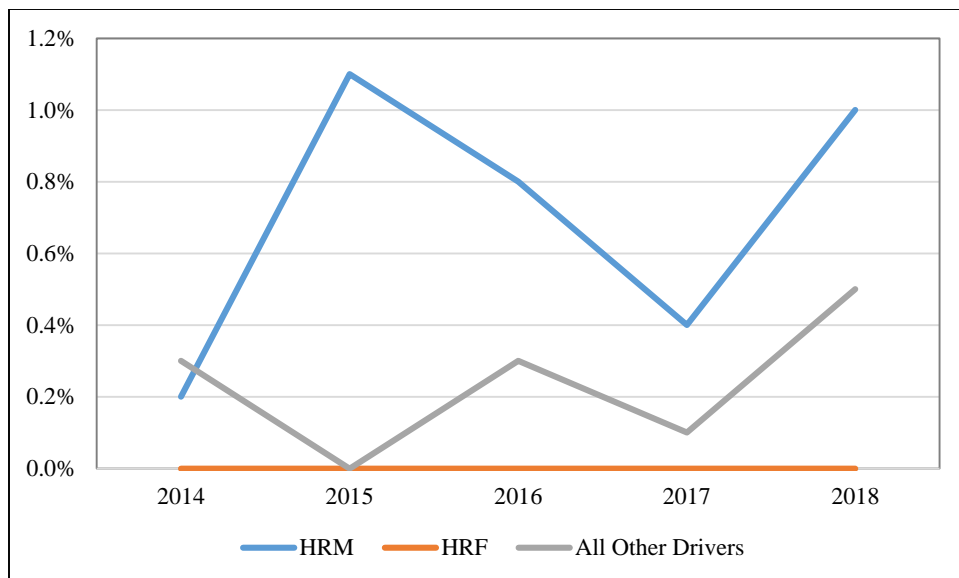
Figure C.3 Drivers Self-Reporting Driving Within Two Hours of Consuming Three or More Alcoholic Beverages
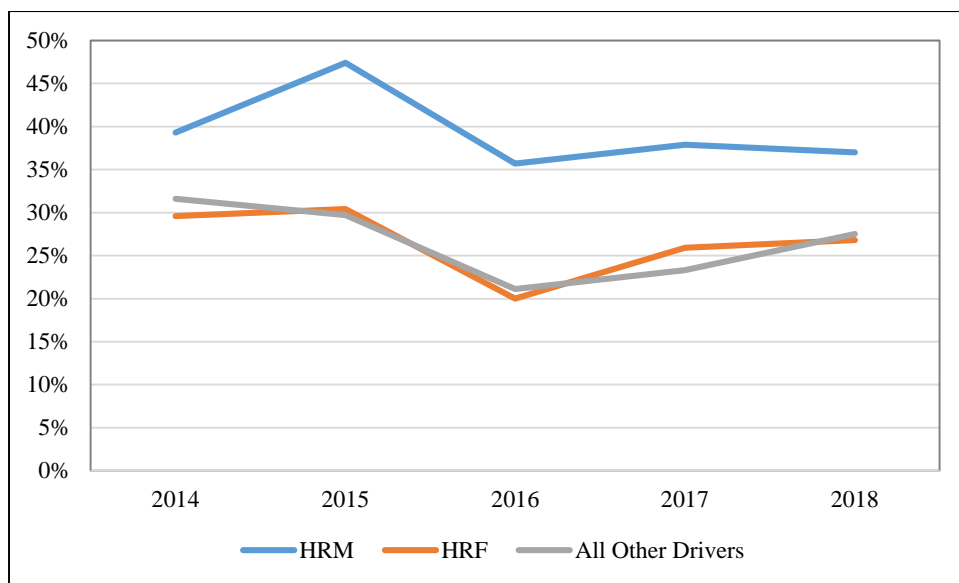

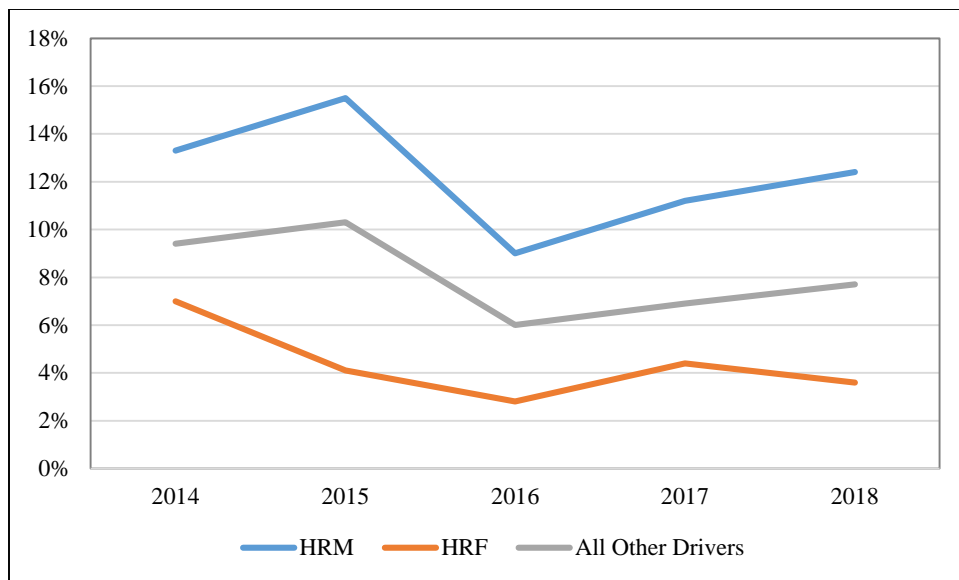**Figure C.4** Drivers Reporting the Perceived Likelihood of Receiving a Ticket for Not Wearing a Seat Belt as "Very Unlikely" or "Unlikely"

Figure C.5 Drivers Reporting the Perceived Likelihood of Receiving a Ticket for Speeding as "Very Unlikely" or "Unlikely"
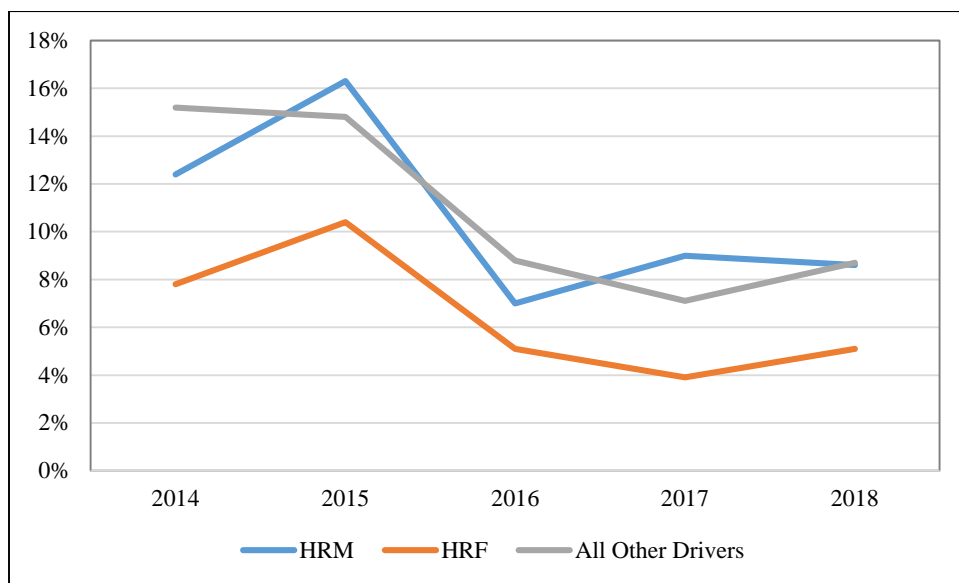

Figure C.6 Drivers Reporting the Perceived Likelihood of Receiving a Ticket for Impaired Driving as "Very Unlikely" or "Unlikely"

APPENDIX D. MISSING/REFUSE TO ANSWER RESPONSES

Q#	Question	Total Responses	Missing Responses
	Seat Belt		
Q1	Seat Belt Use	1,867	3
Q2	Seat Belt Use, Others	1,862	8
Q3	Chance Ticket Seat Belt	1,863	7
Q4	Primary Seat Belt Law	1,864	6
	Speeding		
Q5	Chance Ticket Speeding	1,860	10
Q6	Speed, 75 MPH Zone	1,870	0
Q7	Higher Speeding Fines	1,858	12
	Alcohol/Impairment		
Q8	Chance Arrest Drinking	1,862	8
Q9	Drugged Driving	1,861	9
Q10	Sober Driver	1,853	17
Q12a	Drive 1-2 Drinks	1,757	113
Q12b	Drive 3+ Drinks	1,548	322
	Distracted Driving		
Q13	Cell Phone Talk	1,697	173
Q14	Cell Phone Text	1,786	84
Q15	App Use	1,816	54
Q16	App Use, Others	1,856	14
Q17	App Use, Ticket	1,854	16
	Awareness/Exposure		
Q18a	RSH Seat Belt	1,812	58
Q18b	RSH Speeding	1,743	127
Q18c	RSH Drunk Driving	1,827	43
Q18d	RSH Distracted Driving	1,791	79
Q18e	RSH *Vision Zero*	1,720	150

Total n=1,870

APPENDIX E. 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	13.9%	13.9%	16.9%	19.0%	30.6%	33.7%
Sw. Likely	35.8%	37.8%	39.8%	30.4%	31.4%	22.6%
Likely	21.1%	23.1%	37.6%	44.9%	31.0%	37.4%
Unlikely	24.1%	20.2%	4.4%	4.7%	5.2%	5.2%
V. Unlikely	5.1%	5.0%	1.3%**	1.1%**	1.8%**	1.1%**
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	13.9%	13.8%	17.6%	18.3%	31.8%	32.2%
Sw. Likely	37.3%	34.9%	36.8%	32.8%	26.3%	31.4%
Likely	21.3%	24.0%	39.4%	44.6%	35.0%	29.9%
Unlikely	22.0%	23.9%	4.7%	3.8%	5.1%	5.6%
V. Unlikely	5.6%	3.4%	1.4%**	0.6%**	1.7%**	0.9%**
Times driving after drinking 1-2 drinks in the past 60 days…			None	1-5 Times	6-10 Times	10+ Times
East			67.4%	28.4%	2.1%**	2.0%**
West			62.9%	33.4%	2.7%**	0.9%**
Urban			64.9%	30.8%	2.7%	1.7%**
Rural			67.3%	30.0%	1.5%**	1.2%**
Times driving after drinking 3+ drinks in the past 60 days…			None	1-5 Times	6-10 Times	10+ Times
East			92.4%	6.8%	0.5%**	0.3%**
West			92.9%	6.0%	1.0%**	0.1%**
Urban			93.1%	6.0%	0.8%**	0.2%**
Rural			91.0%	8.1%	0.5%**	0.4%**
Seat Belt Use		Always	N. Always	Sometimes	Rarely	Never
East		77.7%	18.3%	3.0%	0.5%**	0.4%**
West		78.0%	16.0%	5.1%	0.5%**	0.5%**
Urban		83.5%	12.2%	3.8%	0.2%**	0.4%**
Rural		61.0%	32.6%	4.4%	1.4%**	0.6%**
**Fewer than 30 responses in this group						

APPENDIX F. EXPOSURE TO TRAFFIC SAFETY MESSAGES

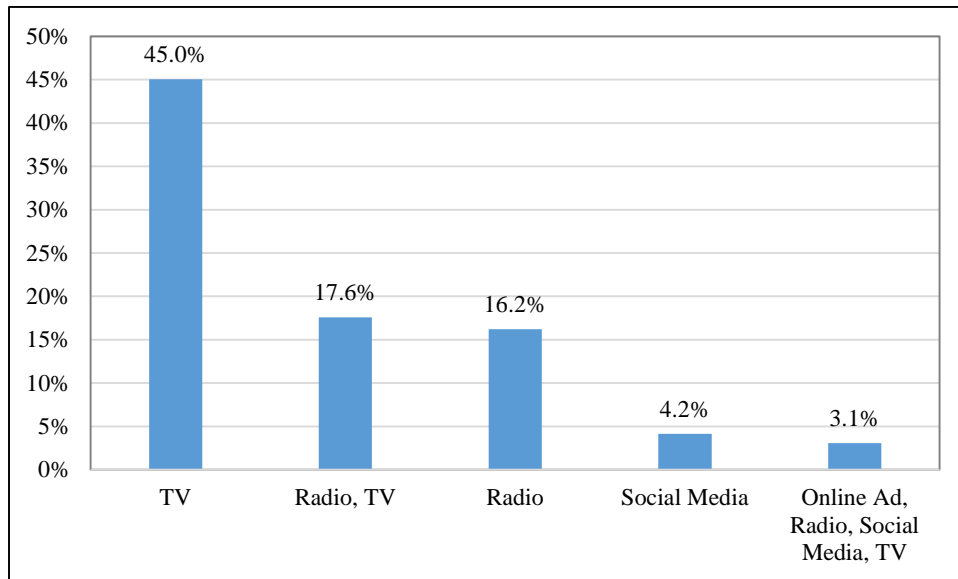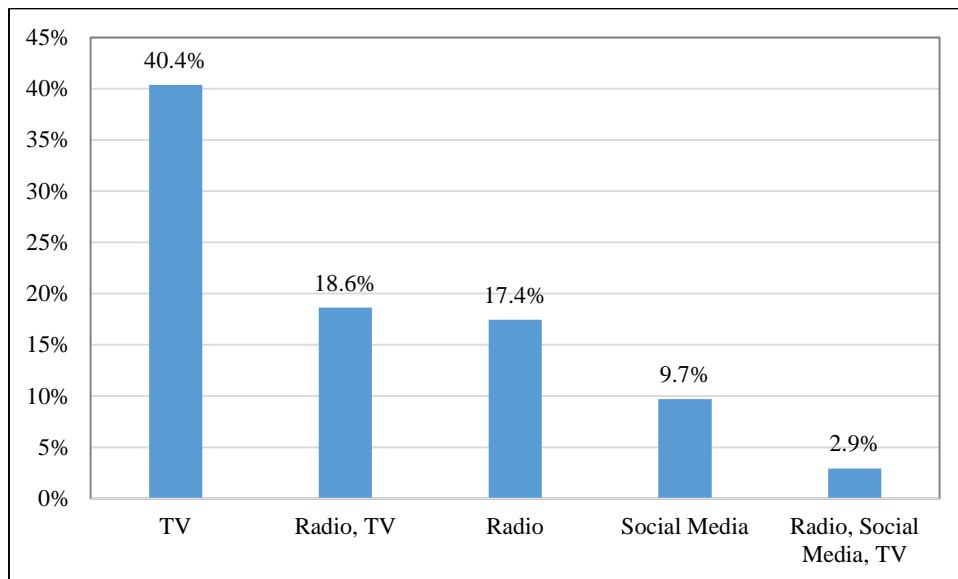**Figure F.1** Exposure to Messages about Seat Belt Use, by Source

Figure F.2 Exposure to Messages about Speeding, by Source
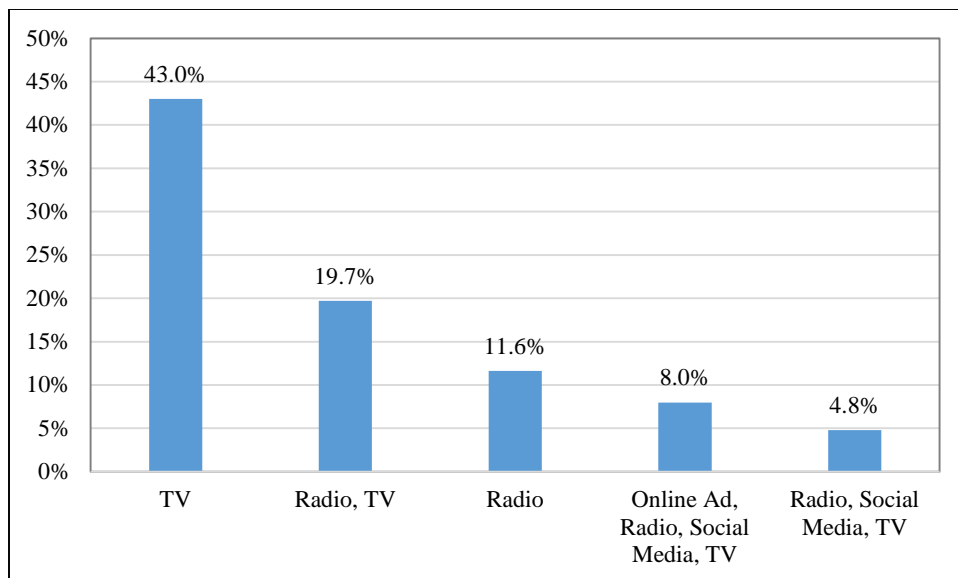
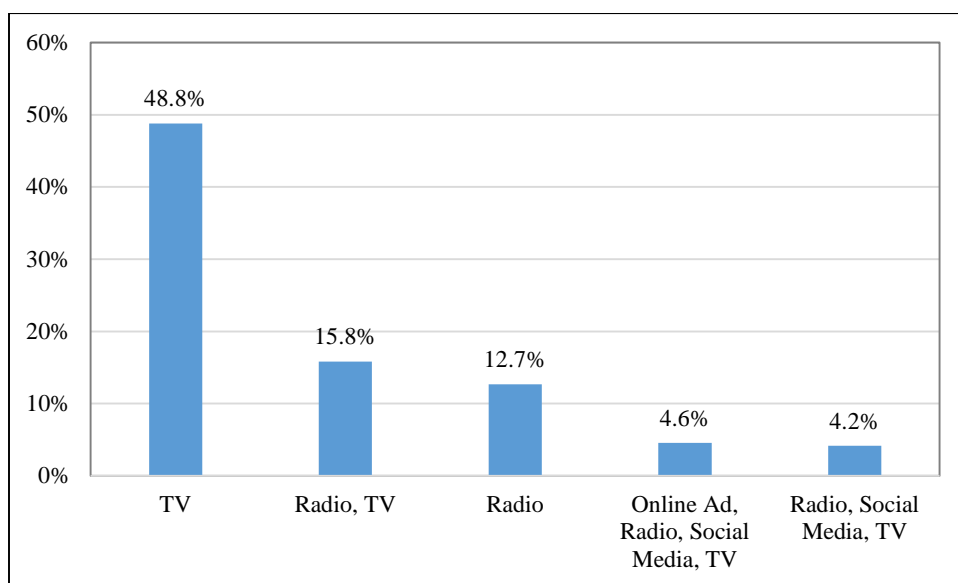**Figure F.3** Exposure to Messages about Impaired Driving, by Source

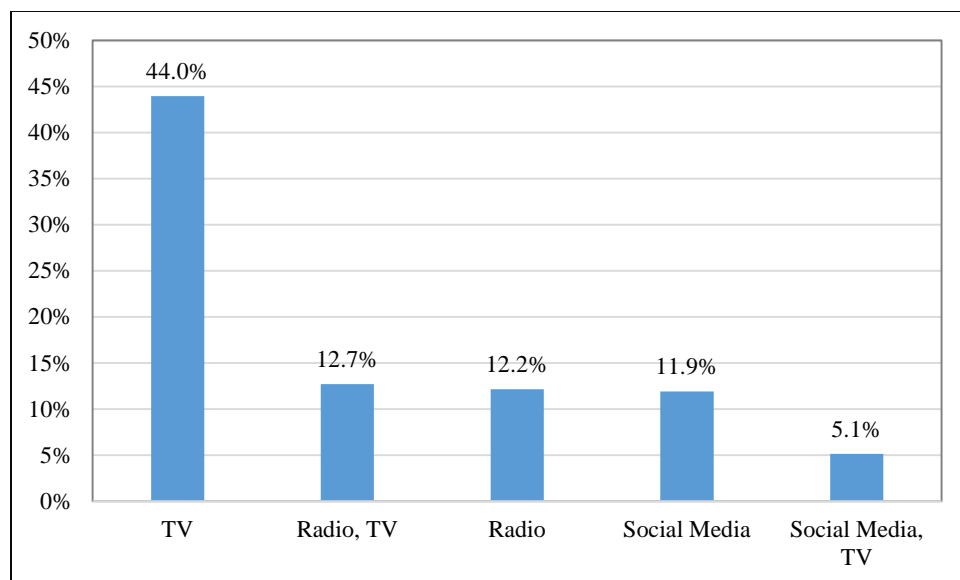**Figure F.4** Exposure to Messages about Distracted Driving, by Source

Figure F.5 Exposure to Messages about *Vision Zero*, by Source