



North Dakota Department of Transportation 2010 Customer Satisfaction Survey

Final Report

May 2010

Principal Investigator
Cullen F. Goenner, PhD
Associate Professor
Clow Banking Fellow
Department of Economics
University of North Dakota
Grand Forks, ND 58202
cullen.goenner@und.nodak.edu
(701) 777-3353

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Executive Summary

Purpose and Methodology

In the spring of 2010 the Bureau of Governmental Affairs at the University of North Dakota conducted a survey on behalf of the North Dakota Department of Transportation (NDDOT). The purpose of the survey is to provide NDDOT with information regarding how well the department is meeting the needs of North Dakota's motorists, motor carriers, government officials, and businesses. The survey covered topics including ride quality, snow and ice removal, safety, debris removal, rest areas, load capacity, NDDOT communication with the public, and interaction with the motor vehicle and drivers license divisions. The survey was administered by phone to random samples of 1200 motorists, 220 motor carriers, 115 government officials, and 86 businesses in North Dakota.

Overall Satisfaction

In 2010 North Dakota residents remain highly satisfied with the performance of NDDOT. For example, 90% of motorists responded that they were either satisfied or very satisfied with the overall services provided by NDDOT. Table 1 provides a summary of responses. Similarly, motor carriers, government officials, and businesses responded positively with 90%, 96%, and 90% respectively either satisfied or very satisfied. This was an increase for each of the four interest groups since the last survey in 2008.

- None of the areas surveyed showed a statistically significant decline in satisfaction for any of the groups over the period 2008-2010. Instead there was a statistically significant improvement in several areas, most notably among overall satisfaction, which improved among motorists and businesses.
- Also of particular note is the high regard customers continue to give the motor vehicle and drivers license divisions. Customers who interacted with the motor vehicle division reported satisfaction above 89% for each group, while those who interacted with the drivers license division reported satisfaction over 90%.
- With respect to debris removal, snow and ice removal, safety, rest areas, and traveler information, respondents were generally satisfied (more than 70% reporting satisfaction).
- Satisfaction was generally lower in the areas of ride quality, communication with the public, and load carrying capacity. Three of the four stakeholder groups (motorists, motor carriers, and government officials) were least satisfied with the smoothness of the non-interstate. Interestingly a large number of motorists, motor carriers, and businesses do not know whether they are satisfied with communication from the NDDOT. This high lack of response could represent a lack of understanding by customers of what they should know or could be more an indication that they do not really care to know.
- The number of motorists interviewed was increased this year from 600 to 1200 to allow for comparisons across 3 geographic regions in ND. The

results showed that motorists in the west were overall less satisfied than those in the east. Further motorists in the west were less satisfied than those in the east with overall safety, highway signing, rest areas, and the drivers license division. The results also showed that motorists in the central region were less satisfied than those in the east with highway signing and the drivers license division.

Key Factors Influencing Overall Satisfaction

The three most important factors contributing to the overall satisfaction of respondents for the services provided by the NDDOT were:

- Motorists: Drivers license division, timeliness of snow/ice removal, overall safety
- Motor carriers: Overall safety, timeliness of snow/ice removal, debris removal
- Government Officials: Smoothness of non-interstate, public input on activities, overall safety
- Businesses: Overall safety, timeliness of snow/ice removal, debris removal

For each of the four groups overall safety is among the top three factors contributing to perceptions of overall satisfaction. Timeliness of snow/ice removal is also in the top three for three of four groups.

Driver Behaviors and Safety Concerns

New to the 2010 survey were questions asking whether customers had safety concerns with several different driver behaviors. The vast majority (78% and above) of customers responded that driver behaviors were their biggest safety concern on North Dakota's roads. The two greatest concerns for each of the four groups were texting while driving and drinking and driving.

Frequency of Services Used

With respect to the frequency in use of the services provided by NDDOT:

- 78% of motorists responded that they had used North Dakota's rest areas. The other groups' use ranged from 79-92%. Respondents across the four groups reported that they were generally satisfied with their ability to obtain current information on road conditions. While motorists primarily received this information from the television, motor carriers, government officials, and businesses were more likely to get this information from the internet.
- Use of the NDDOT road information system 511 was 31% of motorists, 38% of motor carriers, 34% of government officials and, 27% of businesses.
- Motorists' use of the NDDOT website increased from 27 to 36% in this year's survey. Motorists though continue to use the internet much less frequently than the other three groups. Each of the groups primarily used the website to obtain information on road conditions. Motor carriers reported they use the NDDOT website primarily for "other" purposes.

Overview

The purpose of the North Dakota Department of Transportation (NDDOT) 2010 Customer Satisfaction Survey is to provide NDDOT with information regarding how well the department is meeting the needs of North Dakota's motorists, motor carriers, government officials, and businesses. Identifying and measuring customer satisfaction in key areas will inform NDDOT of areas of excellence and those in need of improvement. The 2010 survey was designed to be nearly identical to a survey administered in 2004, 2006, and 2008 so as to allow customer satisfaction to be also evaluated over time.

The survey was designed to evaluate the satisfaction of North Dakota stakeholders with the NDDOT. Four distinct customer groups were evaluated; motorists, motor carriers, government officials, and businesses. A different survey was designed for each of the four groups, though the questions were largely the same for each group in order to allow consistency in comparisons between groups. Three general areas were addressed to customers on each survey; satisfaction with NDDOT services, frequency of NDDOT service use, and demographic characteristics.

As noted, a few minor changes were made to the survey this year. Stakeholder attitudes concerning driver behaviors and safety were added to the survey as were questions regarding commute times and distance. Removed from the survey were several questions, which asked about satisfaction with various aspects of North Dakota's rest areas.

The surveys were administered by phone between March 15 and May 5, 2010 by the Bureau of Governmental Affairs at the University of North Dakota. Included in the completed surveys were 1200 statewide motorists, 220 motor carriers, 115 government officials, and 86 businesses. The number of motorists surveyed this year doubled from previous surveys so as to allow for a more detailed analysis of satisfaction across three regions of the state.

Areas of measurement

Customer satisfaction with NDDOT services covered several topics on the survey. These included ride quality, debris removal, snow and ice removal, safety, load carrying capacity, rest areas, traveler information, communication with the public, and interaction with the motor vehicle and drivers license divisions. For many of these topics the survey included multiple questions. The questions on each of the four surveys were largely the same with the exception that load carrying capacity was only asked of motor carriers. Appendix 1 contains the questions used in each of the surveys.

This year's survey also asked customers whether five different driver behaviors were a safety concern. The survey asked about: text messaging while driving, not wearing a seatbelt, drinking and driving, talking on a cell phone while driving, and speeding. The survey also asked whether driver behaviors were customers' biggest safety concern on the highway.

With respect to their frequency of use, customers were asked about their use of North Dakota's rest areas, different sources of information including 511, the NDDOT website, and the motor vehicle and drivers license divisions.

Frequencies of use as well as purpose/method of use were also covered in the questions. For instance, respondents who had used the NDDOT website were asked for what purpose. Also those who used the services of the motor vehicle and drivers license were asked in what manner (phone, in person, mail). These questions will allow the NDDOT to evaluate their effectiveness in reaching their customers via alternative means.

Demographic characteristics including gender, age, zip code, purpose of using the highway system, primary vehicle driven, commute time, and commute distance were also collected from each respondent to allow for analysis of whether services are being equally enjoyed by the residents of North Dakota. Commute time and distance were new to the 2010 survey.

Survey Implementation

The four surveys (4 groups) were conducted via telephone by the Bureau of Governmental Affairs at the University of North Dakota. Prior to participating in the survey, participants were given a brief introduction of services provided by the department: *"The department provides services to the public including: maintenance, snow and ice control, and travel information on state highways. It also provides drivers license, traffic safety programs, and motor vehicle registration services."* The complete text of the surveys appears in Appendix 1.

- **Motorists:** The survey of statewide motorists consisted of 1200 respondents that were chosen by random from a list of North Dakota residences generated by the telephone company Qwest. The survey took place between March 15, 2010 and May 5, 2010 during the times of 6-9 PM. Given a population of 645,000 and a sample size of 1200, the survey has a margin of error of +/- 2.85%, with a confidence level of 95%.
- **Motor Carriers:** The survey of motor carriers consisted of 220 respondents selected at random from the 2006 North Dakota Motor Carrier Directory produced by the Upper Great Plains Transportation Institute. The directory contains the contact information for 455 motor carriers in North Dakota. The survey took place between March 15, 2010 and April 15, 2010 during the times of 1-4 PM and 6-9 PM. The survey has a margin of error of +/-4.75% and a confidence level of 95%.

- **Government officials:** The survey of government officials consisted of 115 respondents that were chosen at random from a list of 142 individuals provided by the NDDOT. These individuals included 3 metropolitan planning organization executive directors, thirteen city mayors, 11 city engineers, 2 city auditors, 53 chairs of the county commission, and all county engineers, highway supervisors, road foreman, and road superintendents. The survey took place between March 16, 2010 and April 15, 2010 during the times of 1-4 PM. The survey has a margin of error of +/- 4% and a confidence level of 95%.
- **Businesses:** The survey of businesses consisted of 86 respondents that were chosen by random from a list of North Dakota businesses generated by the telephone company Qwest. The survey took place between April 15, 2010 and May 1, 2010 during the times of 1-4 PM. The survey has a margin of error of +/- 9% and a confidence level of 95%.

Data Processing/Security

Once the surveys were completed on paper they were transferred into electronic form. The paper surveys and electronic format of the data will be retained by the Bureau of Governmental Affairs in a secure location for a period of three years after which they will be destroyed. Electronic copies of the survey data in SPSS, Excel, and STATA formats were provided to the NDDOT by the Principal Investigator. The data were checked for outliers and consistency. The Principal Investigator will retain the data and will not use the data for any purpose other than specified by the North Dakota Department of Transportation.

Customer Satisfaction

Overall, North Dakota residents are highly satisfied with the performance of NDDOT. In response to the question "*In general, how satisfied are you with the services provided by the North Dakota Department of Transportation?*" 90% of motorists responded that they were either satisfied or very satisfied with the services provided by NDDOT. Similarly, motor carriers, government officials, and businesses responded positively with 90%, 96%, and 90% respectively either satisfied or very satisfied. Table 1 summarizes the percentage rates of satisfied and very satisfied respondents across each area surveyed and group. A complete breakdown and summary of responses appears in Appendix 2.

The survey also evaluated customer satisfaction in several key areas which included ride quality, debris removal, snow and ice removal, safety, load carrying capacity, rest areas, traveler information, communication with the public, and interaction with the motor vehicle and drivers license divisions. Review of Table 1 provides insight into which areas customers are more and less satisfied with.

The 2010 survey results indicate that the motor vehicle and drivers license divisions continue to receive excellent marks. Of those respondents who interacted with each division, responses were very positive. Motorists responded with 94% and 93% satisfaction for the motor vehicle and drivers license divisions respectively. The other groups also showed high levels of satisfaction.

Also continuing to receive good marks (above 70% satisfied or very satisfied) were the areas of debris removal, snow and ice removal, safety, rest areas, and traveler information. For many of these categories, satisfaction was in the high 70% to low 90% range. In 2010 we saw for each of the four groups an increase in the mean level of satisfaction with the timeliness of snow and ice removal.

The results of previous surveys indicated the need for improvement in the areas of smoothness of ride, load capacity, and communication with the public. The 2010 survey for the first time asked government officials their level of satisfaction with the smoothness of the interstate and non-interstate highway system. For both questions their satisfaction was higher than for motorists and motor carriers. It was also the two areas that government officials were least satisfied with. This is not a surprise as motorists and motor carriers are also least satisfied by the smoothness of the non-interstate.

The area of NDDOT communication with the public continues to score low marks with respect to customer satisfaction. What is unclear is whether the results indicate dissatisfaction or a lack of understanding of what information the NDDOT should provide. The detailed responses in Table I – Table IV of appendix 2 show that 28% and 24% of motorists do not know whether they are satisfied with notice and input on NDDOT activities respectively. Approximately 30% of motor carriers and businesses also respond they do not know for these questions. This lack of response is more likely an indication that customers do not know what they should know or do not really care to know. There is a need to modify these two questions in the future to make them more meaningful to interpretation.

Table 1. Percentage of respondents either "very satisfied" or "satisfied".

	Motorists	Motor Carriers	Government Officials	Businesses
Overall Satisfaction	90.3	89.6	95.7	89.5
Ride				
Smoothness of Interstate	60.9	49.1	65.2	64.0
Smoothness of Non-Interstate	46.8	42.7	52.2	57.0
Debris removal	74.4	78.2	80.9	79.1
Snow and Ice				
Timeliness of snow/ice removal	85.9	89.6	94.8	95.4
Effectiveness of snow/ice removal	85.5	84.6	91.3	89.5
Safety				
Overall safety	88.3	90.9	85.2	88.4
Pavement striping	78.8	78.6	78.3	86.1
Highway signing	90.1	92.7	93.1	91.9
Construction signing	84.8	89.1	91.3	87.2
Traffic flow through construction	72.1	80.0	86.1	76.7
Rest Areas	90.7	91.9	96.8	92.4
Traveler Information				
Current road condition info.	77.3	86.4	79.8	83.7
General Communication				
Notice of DOT activities	46.9	42.7	76.5	45.3
Public input on activities	54.1	43.6	79.1	53.5
Motor Vehicle Division	93.8	89.0	92.1	96.9
Drivers License Division	93.0	93.8	90.5	91.7
Load Carrying Capacity	NA	49.0	NA	NA
NA = Not asked on survey				

Comparing Customer Satisfaction over Time

The 2010 Customer Satisfaction Survey was designed to be nearly identical to a survey given in 2008 so as to allow for comparisons of satisfaction over time. Satisfaction is measured on a 1-5 scale, where 1 indicates very satisfied and 5 indicates very dissatisfied. Improvement in satisfaction is thus indicated by a decrease in the mean for a particular measure. To evaluate whether the difference is statistically meaningful and not due to chance, one can compare the “effect size” for each of the measures of satisfaction. Effect size measures the standardized difference in mean responses between different time periods. To determine the effect size one calculates Cohen’s (1988) ‘d’:

$$d = (MEAN_{2010} - MEAN_{2008}) / \sigma_{pooled}, \quad \text{where } \sigma_{pooled} = \sqrt{\frac{\sigma_{2010}^2 + \sigma_{2008}^2}{2}}$$

‘d’ measures the difference in mean responses, standardized by the pooled standard deviation. Cohen (1988) categorized effect sizes as small ($d = .2$), medium ($d = .5$) and large ($d = .8$).¹ Using this as a guide, we can evaluate whether satisfaction has significantly changed over time.

The changes in satisfaction that occurred between 2008 and 2010 were small to medium in effect size. Six areas showed a small improvement in satisfaction and four showed a medium sized improvement. Tables 2a-b contains the effect sizes for each of the satisfaction measures and four groups. Most notably, overall satisfaction by motorists and businesses showed a significant improvement.

- For motorists there were no other statistically significant changes from the last survey.
- Motor carriers reported no significant changes with their satisfaction from the last survey.
- Government officials reported a small improvement in their satisfaction with traffic flow through construction.
- Businesses expressed an improvement in their satisfaction with several areas, which included smoothness of the non-interstate, traffic flow through construction, timeliness of snow removal, pavement striping, road information, the motor vehicle, and drivers license divisions. These results reverse the decrease in satisfaction with the smoothness of the non-interstate and traffic flow through construction which was reported in the comparison of the 2008-2006 surveys. It should be noted that the small sample size for businesses contributes to more variation in their responses over time.

¹ Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum.

Table 2a. Comparing Mean Satisfaction Responses Over Time: 2008-2010

	Motorists			Motor Carriers		
	Mean	Effect	Size	Mean	Effect	Size
Overall Satisfaction	2.03	1.86	-0.24*	1.99	1.94	-0.08
Ride						
Smoothness of Interstate	2.40	2.31	-0.10	2.77	2.67	-0.10
Smoothness of Non-Interstate	2.79	2.78	-0.01	2.95	2.92	-0.03
Debris removal	2.30	2.22	-0.08	2.17	2.19	0.03
Snow and Ice						
Timeliness of snow/ice removal	1.98	1.93	-0.06	2.05	1.91	-0.16
Effectiveness of snow/ice removal	1.99	1.93	-0.08	1.99	1.99	0.00
Safety						
Overall safety	1.94	1.85	-0.12	1.86	1.85	-0.02
Pavement striping	2.19	2.12	-0.08	2.18	2.18	0.00
Highway signing	1.89	1.88	-0.01	1.88	1.88	0.00
Construction signing	1.96	1.97	0.02	2.00	1.94	-0.07
Traffic flow through construction	2.26	2.28	0.02	2.19	2.17	-0.03
Rest Areas	NA	1.71	NA	NA	1.72	NA
Traveler Information						
Current road condition info.	1.85	1.85	-0.13	1.87	1.75	-0.18
General Communication						
Notice of DOT activities	2.38	2.41	0.03	2.50	2.50	0.01
Public input on activities	2.38	2.31	-0.08	2.48	2.45	-0.04
Motor Vehicle Division	1.76	1.63	-0.16	1.83	1.80	-0.04
Drivers License Division	1.73	1.60	-0.16	1.66	1.74	0.11
Load Carrying Capacity	NA	NA	NA	3.05	2.84	-.19

* Small effect size; ** Medium effect size; *** Large effect size
 NA = Not asked on survey

Table 2b. Comparing Mean Satisfaction Responses Over Time: 2008-2010

	Government Officials			Businesses		
	Mean		Effect	Mean		Effect
	2008	2010	Size	2008	2010	Size
Overall Satisfaction	1.87	1.73	-0.17	2.16	1.90	-0.36*
Ride						
Smoothness of Interstate	NA	2.33	NA	2.51	2.29	-0.23*
Smoothness of Non-Interstate	NA	2.80	NA	3.26	2.62	-0.67**
Debris removal	2.13	2.05	-0.09	2.15	2.10	-0.05
Snow and Ice						
Timeliness of snow/ice removal	1.66	1.64	-0.03	2.00	1.77	-0.30*
Effectiveness of snow/ice removal	1.66	1.72	0.10	1.92	1.83	-0.12
Safety						
Overall safety	1.90	1.93	0.04	1.79	1.84	0.07
Pavement striping	2.07	2.10	0.04	2.10	1.93	-0.23**
Highway signing	1.75	1.80	0.07	1.91	1.83	-0.13
Construction signing	1.76	1.79	0.04	1.94	1.85	-0.12
Traffic flow through construction	2.17	1.96	-0.27*	2.62	2.12	-0.54**
Rest Areas	NA	1.44	NA	NA	1.65	NA
Traveler Information						
Current road condition info.	1.76	1.82	0.08	1.90	1.71	-0.29**
General Communication						
Notice of DOT activities	2.15	1.99	-0.18	2.60	2.48	-0.12
Public input on activities	2.10	2.11	0.01	2.37	2.23	-0.18
Motor Vehicle Division	1.59	1.55	-0.05	1.83	1.46	-0.51**
Drivers License Division	1.75	1.62	-0.14	2.00	1.54	-0.55**
Load Carrying Capacity	NA	NA	NA	NA	NA	NA

* Small effect size; ** Medium effect size; *** Large effect size
 NA = Not asked on survey

Primary Factors Influencing Overall Satisfaction

These measures of satisfaction not only provide insight into which areas the NDDOT is currently excelling and those which need improvement, but also allow for comparisons over time. The results (Table 2a-b) indicate that overall satisfaction has gone up for each group and the difference is statistically significant for motorists and businesses. Understanding the underlying factors that contribute to high overall satisfaction allow one to target the areas that have the most impact. Towards this end we next identify those areas of service that contribute most to the overall satisfaction of each customer group in 2010.

The relationship between overall satisfaction and each of the other satisfaction measures is evaluated to determine the most important factors contributing to overall satisfaction for each group. To determine this relationship we calculate the correlation between individual responses of overall satisfaction with responses from each of the other areas covered in the survey. The correlation coefficient ranges from -1 to +1. Values close to -1 or +1 indicate a strong linear relationship. The closer the value is to zero the weaker the relationship. Given our data, one would expect the correlation to be positive, i.e. a positive response to satisfaction with overall safety should contribute to a positive response to overall satisfaction. Table 3 contains the correlations between overall satisfaction and other satisfaction responses. Those values indicated with an asterisk * are statistically significant (different than zero) at the 5% level.

Below are the five most important factors for each group (in order of importance):

Motorists:

- Drivers license division, timeliness of snow/ice removal, overall safety, smoothness of the non-interstate, public input on activities.

Motor Carriers:

- Overall safety, timeliness of snow/ice removal, debris removal, effectiveness of snow/ice removal, public input on activities.

Government Officials:

- Smoothness of non-interstate, public input on activities, overall safety, rest areas, construction signing.

Businesses:

- Overall safety, timeliness of snow/ice removal, debris removal, effectiveness of snow/ice removal, construction signing

Maintaining performance and satisfaction in these areas is important to maintaining the already high overall satisfaction with the North Dakota Department of Transportation.

Across all four groups, perceptions of overall safety contribute a great deal to overall satisfaction with the NDDOT. For motor carriers and businesses it is the most important factor and for motorists and government officials it is the third most important. Maintaining the current high level of overall customer satisfaction will require the NDDOT to continue to maintain safe roads.

The data also show that perceptions of snow and ice removal contributed more to overall satisfaction than in previous years. For three of the four groups (motorists, motor carriers, and businesses) the timeliness of snow/ice removal was the second most important factor contributing to their overall satisfaction. This result is likely due to the high levels of snowfall this past year and stakeholders satisfaction with the NDDOT's efforts in this area.

To increase satisfaction further, it will likely require improvement in the areas noted above where satisfaction is generally lower. Among motorists and government officials this would include the smoothness of the non-interstate. For motor carriers, motorists, and government officials this would include notice of and public input on DOT activities.

Across the four groups we can see that improving satisfaction in the smoothness of the non-interstate will likely have a significant impact on overall satisfaction of motorists, motor carriers, and businesses. Increasing satisfaction of public input on activities among motor carriers and government officials will also improve their overall satisfaction.

Table 3. Correlation between Overall Satisfaction and other satisfaction responses

	Motorists	Motor Carriers	Government Officials	Businesses
Ride				
Smoothness of Interstate	0.2182*	0.2609*	0.139	0.1117
Smoothness of Non-Interstate	0.2594*	0.2212*	0.3316*	0.0797
Debris removal	0.1998*	0.3109*	0.1684	0.2602*
Snow and Ice				
Timeliness of snow/ice removal	0.3047*	0.3314*	0.2210*	0.2658*
Effectiveness of snow/ice removal	0.2507*	0.3069*	0.2276*	0.2444*
Safety				
Overall safety	0.2884*	0.3630*	0.3064*	0.2871*
Pavement striping	0.1804*	0.2628*	0.0802	0.1451
Highway signing	0.2523*	0.1524*	0.2026*	0.1573
Construction signing	0.2016*	0.2567*	0.2650*	0.2328*
Traffic flow through construction	0.2352*	0.1733*	0.1554	0.1572
Rest Areas	0.1681*	0.1056	0.2978*	0.1221
Traveler Information				
Current road condition info.	0.1808*	0.1506*	0.1494	0.1784
General Communication				
Notice of DOT activities	0.2025*	0.2485*	0.2222*	-0.0371
Public input on activities	0.2554*	0.2675*	0.3103*	0.0318
Motor Vehicle Division	0.2197*	0.0844	0.2610*	0.0587
Drivers License Division	0.3151*	0.0635	-0.0502	0.121
Load Carrying Capacity	NA	-0.0623	NA	NA

* Indicates significance at 5% level

** Indicates dropped due to small sample size

NA = Not asked on survey

Attitudes about Driver Behavior and Safety

Added to the 2010 survey were several questions which asked customers whether five different driver behaviors were a safety concern. They included text messaging while driving, not wearing a seatbelt, drinking and driving, talking on a cell phone while driving, and speeding. The survey also asked whether driver behaviors were customers' biggest safety concern on the highway. An abbreviated table appears below. Table 4 which follows is more complete.

Approximately 80 percent of the four customer groups surveyed reported that driver behaviors were their biggest safety concern on the highway. This is an important finding when coupled with the fact that customer perception of safety is an important factor contributing to overall satisfaction. Driver behaviors along with the conditions of roads and NDDOT services shape customers' satisfaction with the NDDOT.

Driver Behaviors and Safety Concerns

	Motorists	Motor Carriers	Government Officials	Businesses
Texting While Driving	91.8	94.1	93.9	89.5
Seatbelt use	71.7	60.0	65.2	72.1
Drinking and Driving	94.6	93.6	94.8	94.2
Cell phone use while Driving	82.2	64.6	78.3	68.6
Speeding	79.8	77.3	80.0	74.4

With respect to the particular driver behaviors examined in this survey, we found that each of the four groups is highly concerned with drinking and driving and texting while driving. Ninety percent and more of each group reported these actions were a safety concern. Not surprising, seat belt use was the lowest concern for drivers.

Table 4. Safety Concerns about Driver Behaviors

Are driver behaviors your biggest safety concern on the highway?

	Motorists	Motor Carriers	Government Officials	Businesses
Yes	81.82	82.27	86.09	77.91
No	13.26	15	12.17	20.93
Don't know	4.92	2.73	1.74	1.16

Texting While Driving

	Motorists	Motor Carriers	Government Officials	Businesses
Yes	91.75	94.09	93.91	89.53
No	5	4.55	5.22	8.14
Don't know	3.25	1.36	0.87	2.33

Seatbelt use

Yes	71.67	60	65.22	72.09
No	24.83	35.45	31.3	25.58
Don't know	3.5	4.55	3.48	2.33

Drinking and Driving

Yes	94.58	93.64	94.78	94.2
No	4.33	5.91	3.48	5.81
Don't know	1.08	0.45	1.74	0

Cell phone use while Driving

Yes	82.23	64.55	78.26	68.6
No	13.26	27.27	16.52	25.6
Don't know	4.5	8.18	5.22	5.81

Speeding

Yes	79.82	77.27	80	74.4
No	14.26	18.64	14.78	18.6
Don't know	5.92	4.09	5.22	6.98

Demographic Characteristics

Including the demographic characteristics of respondents in the survey is important because it allows us to determine whether the services that NDDOT provides are equally enjoyed by the residents of North Dakota. For instance one can tell whether women are more satisfied with the NDDOT than men or vice versa, or whether individuals in a particular zip code are more satisfied. Demographic information was collected on respondents' gender, age, zip code, purpose for using the highway system, and vehicle driven. Table 5 provides a summary of the demographic characteristics of the respondents for the four groups.

Two questions were added to the survey this year that collected information on the distance and time spent by motorists, government officials, and businesses during one way of their daily commute. Table 6 summarizes these responses. The 50th percentile, which is the median, represents the value in which 50% of the observations are less than. For example, among motorists one half have drive times less than 15 minutes and drive less than 8 miles.

Cross tabulations were created for respondents' overall satisfaction with each of the demographic characteristics to determine whether there were any significant differences in the responses based on demographic characteristics. These cross tabulations are reported in Appendix 3. A chi-squared test statistic reveals whether there is any significant difference in the response rates. The test reveals that among motorists and government officials, age has a statistically significant effect on overall satisfaction (5% level). Ordered logistic regression was performed to reveal the direction of the relationship. The results indicate that older motorists and government officials tend to be more satisfied and the result is statistically significant. These results appear in Appendix 3. The only other significant difference across groups is for motorists who drove oversized vehicles. They were less satisfied than motorists who drove cars.

One of the concerns with any survey is whether it is representative of the population of interest. Looking at the demographic characteristics allows us to see if there are significant discrepancies between the sample and the population. It is well known in the survey literature that there has been a significant decline in the number of young people who participate in surveys due to their lack of landline telephones. Our telephone based survey is no different. Among motorists surveyed, 12% were in the 18-34 age bracket, relative to 33% for the population based on the most recent census estimates. As seen from the table below, our sample under represents young people and over represents old.

Age	Sample	Population
18-34	11.59%	33%
35-54	31.94%	33%
55+	56.46%	33%

Table 5. Demographic characteristics (%)

	Motorists	Motor Carriers	Government Officials	Businesses
Gender				
Male	40.75	53.64	79.13	48.84
Female	59.25	46.36	20.87	51.16
Age				
18-34	11.59	13.18	2.61	24.42
35-54	31.94	49.55	29.57	46.51
55+	56.46	37.27	67.83	29.07
Zip code				
580	12.17	15.45	9.57	10.47
581	9.0	11.36	1.74	17.44
582	17.0	12.3	14.78	11.63
583	9.67	6.82	15.65	9.3
584	10.25	8.64	8.7	8.14
585	15.25	15.91	15.65	24.42
586	6.25	8.64	15.65	8.14
587	12.25	6.36	11.3	9.3
588	5.25	13.18	6.96	1.16
Other	0.64	1.45	0	0
Use of Highway				
Travel to work	24.46	NA	32.17	30.23
Business travel	9.02	NA	29.57	23.26
Travel to school	1.17	NA	0.87	0
Shopping/Errands	24.71	NA	13.91	11.63
Recreation	17.78	NA	8.7	19.77
Other	22.87	NA	14.78	15.12
Primary Vehicle Driven				
Car	50.08	NA	38.26	36.05
Van	12.46	NA	8.7	13.95
SUV	17.73	NA	17.39	30.23
Truck	17.06	NA	33.04	18.6
Oversized vehicle	1.17	NA	0.87	1.16
Other	1.51	65.45	1.74	0
3 Axles	NA	13.64	NA	NA
5 Axles	NA	20.91	NA	NA

NA = Not asked on survey

Table 6. Distribution of Driver Commutes (one way)

	Motorists	Motor Carriers	Government Officials	Businesses
Drive in Minutes				
10 th Percentile	4	NA	2	3
25 th Percentile	5	NA	5	4.5
50 th percentile	15	NA	15	10
75 th percentile	25	NA	25	15
90 th percentile	45	NA	45	25
Mean	22	NA	21	11.85
Drive in Miles				
10 th Percentile	1	NA	1	0.5
25 th Percentile	3	NA	2.25	2
50 th percentile	8	NA	10	5
75 th percentile	20	NA	21	12
90 th percentile	45	NA	45	19
Mean	19	NA	19	8.22
No Commute	18%	NA	23%	11%

NA = Not asked on survey

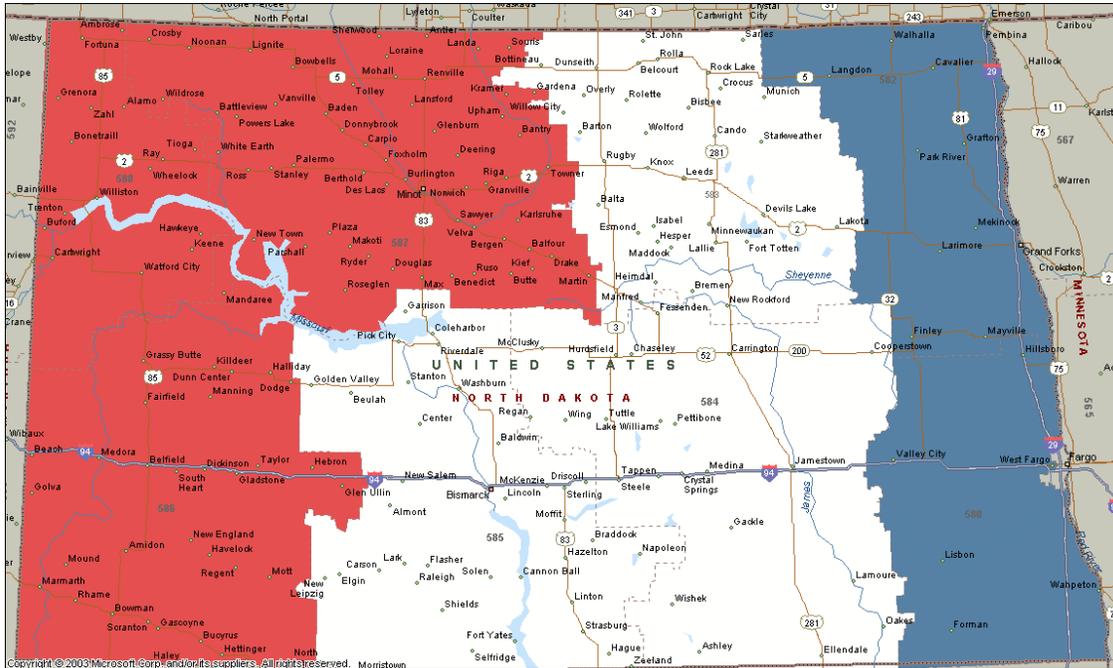
Given we found that older motorists tend to be more satisfied than younger motorists our results for this group could be potentially biased. To determine the impact of this bias we created a weighted sample which allows us to put more weight on the responses of the under- represented group and put less weight on those over-represented. The table below shows the uncorrected and corrected mean values. As one can see the bias is very minimal and is thus not a concern.

Mean Values of Satisfaction

	Age Corrected	
	Mean	Mean
Overall service of NDDOT	1.86	1.90
Smoothness of Interstate	2.31	2.32
Smoothness of Non-Interstate	2.78	2.83
Debris removal	2.22	2.22
Timeliness of snow/ice removal	1.93	1.96
Effectiveness of snow/ice removal	1.93	1.97
Overall safety	1.85	1.83
Pavement striping.	2.12	2.11
Highway signing	1.88	1.89
Construction signing	1.97	1.98
Traffic flow through construction	2.28	2.32
Rest Area	1.71	1.76
Current road condition info.	1.85	1.83
Notice of DOT activities	2.41	2.46
Public input on activities	2.31	2.33
Service during registration	1.63	1.62
Service at renewal	1.60	1.62

Analysis of Motorists Across Geographic Regions

One of the changes made to this year's survey was to increase the sample size of motorists interviewed from 600 to 1200. The main purpose of this was to generate adequate sample sizes to allow for comparisons of satisfaction across three regions of North Dakota. The three regions, west, central, and east, were broken down by zip code and are shown in the graphic below. The east region consists of the 3 digit zip codes 580, 581, and 582. The central region consists of zip codes 583, 584, and 585 and the west is made up of 586, 587, and 588.



The sample size for each region was 473 (East), 427(Central), and 300 (West), which is consistent with the population found in each.

In Table 7 we report the mean level of satisfaction in each area for motorists across the three regions. The results show that there are six areas where there are statistically significant differences across regions.

- Motorists in the west were significantly less satisfied than those in the east with their overall satisfaction, overall safety, highway signing, rest areas, and the drivers license division.
- Motorists in the central region were also significantly less satisfied than those in the east with highway signing and the drivers license division.

Table Va,b in appendix 2 gives a complete breakdown of responses for each of the regions.

Table 7: Motorists' Mean Response by Geographic Region

	East	Central	West
Overall service of NDDOT*	1.83	1.84	1.95
Smoothness of Interstate	2.35	2.24	2.37
Smoothness of Non-Interstate	2.80	2.74	2.83
Debris removal	2.14	2.27	2.29
Timeliness of snow/ice removal*	1.89	1.91	2.02
Effectiveness of snow/ice removal	1.92	1.91	1.98
Overall safety*	1.77	1.85	1.99
Pavement striping.	2.08	2.12	2.17
Highway signing*	1.82	1.91	1.93
Construction signing	1.97	1.97	1.99
Traffic flow through construction	2.32	2.21	2.30
Rest Areas*	1.69	1.69	1.77
Current road condition info.	1.86	1.85	1.82
Notice of DOT activities	2.35	2.45	2.45
Public input on activities	2.29	2.31	2.34
Service during registration	1.61	1.64	1.65
Service at renewal *	1.51	1.60	1.73

*Difference is significant across groups

Frequency of NDDOT Services Used

More than 78% of respondents across the four groups reported using North Dakota's rest areas. Each group's usage along with other summary statistics appears in Table 8. As discussed above, satisfaction with North Dakota's rest areas is high among those who have used them, with satisfaction for each group over 90%

Respondents across the four groups reported that they were generally satisfied with their ability to obtain current information on road conditions. Satisfaction ranged from 77-86% (Table 1). In this year's survey we asked specifically which means of news media were used (television, internet, and radio). While motorists primarily received this information from the television, motor carriers, government officials, and businesses were more likely to get this information from the internet (Table 8). We also see that motorists use the NDDOT website much less frequently than the other three groups. This may be due to two reasons, lack of internet availability and/or lack of awareness of road condition information at the NDDOT website. Most likely the former condition is the primary contributor to these usage patterns. With respect to use of the 511 road information system, 31% of motorists, 38% of motor carriers, 34% of elected officials, and 27% of businesses reported using the system (Table 8).

As noted above, use of the NDDOT website varied among the user groups. In 2010, use of the NDDOT website increased among motorists, government officials, and businesses. Motorists notably increased their use from 27 to 36%. The most popular use by motorists, government officials, and businesses was to obtain road information, whereas for motor carriers it was "other".

The motor vehicle and drivers license divisions both received very high satisfaction marks from the four groups (Table 1). Respondents were much more likely to use the service of the motor vehicle division as they were the drivers license division, which is not surprising given renewal of vehicle registration is more frequent than driver's license. Interestingly, use of the internet to interact with the motor vehicle division continues to increase among all groups.

Table 8. Frequency (%) of services used

	Motorists	Motor Carriers	Government Officials	Businesses
Rest Area Users				
Yes	77.98	78.64	80.87	91.86
No	22.02	21.36	19.13	8.14
Information Sources Used*				
511	30.99	38.18	33.91	26.74
Television	46.95	41.36	40.87	34.88
Internet	43.11	65.91	67.83	67.44
Radio	36.29	38.18	52.17	29.07
All	19.67	27.27	28.7	22.09
None	10.5	5.91	16.7	9.3
Website Users				
Yes	36.14	72.73	75.65	75.58
No	63.86	26.82	24.35	24.42
Website Use*				
Road conditions	49.09	32.92	47.73	44.62
Motor Vehicle Information	10.5	9.94	6.82	7.69
Drivers License Information	19.41	9.94	7.95	20
Employment ads	1.6	0.62	0	1.54
Other	18.26	46.58	37.5	26.15
Motor Vehicle Division Users				
Yes	64.38	81.71	77.39	75.58
No	35.54	17.81	22.61	24.42
Method of Interaction*				
Internet	14.99	41.44	29.21	33.85
In person	69.9	71.27	68.54	70.77
Mail	28.04	32.6	34.83	23.08
Phone	3.36	18.78	7.87	1.54
Drivers License Division Users				
Yes	36.53	36.7	36.52	27.9
No	63.47	63.3	63.48	72.09
Method of Interaction*				
Mail	6.64	5	9.52	4.17
Phone	1.14	1.25	2.38	0
In person	92.34	95	92.86	95.83

*Due to multiple responses, columns may not sum to 100%

Conclusion

The North Dakota Department of Transportation 2010 Customer Satisfaction Survey revealed that residents of North Dakota are highly satisfied overall with the services provided by the department. Overall satisfaction is the highest it has been for each of the four groups since the survey began in 2004. There were no areas which showed a statistically significant decline in satisfaction, with several showing improvements. It appears that the NDDOT's timely efforts to keep North Dakota's roads clear of the abundant snow and ice this past winter were appreciated by their stakeholders. More than 86% of stakeholders reported they were either satisfied or very satisfied with these efforts. For each group this area was a significant factor influencing overall satisfaction.

This year's survey introduced a few minor changes. One of these changes was to interview more motorists to allow for better comparisons across three geographic regions. The results showed that satisfaction among motorists varies by region. Residents in the west are generally less satisfied than those in the east. Another change was the addition of six questions examining customers' opinions about driver behaviors and safety. The results indicated the largest safety concern of customers were other drivers' behaviors. The five behaviors discussed included text messaging while driving, not wearing a seatbelt, drinking and driving, talking on a cell phone while driving, and speeding. More than 60 percent of each customer group reported these behaviors were a safety concern.

Finally, this year more than ever customers when asked about the NDDOT's communication with the public responded they did not know whether they were satisfied or not and a large number reported they were neutral. It appears as if participants, other than government officials, are unclear as to what they should be made aware of. Whether the NDDOT is the cause for this or whether customers do not care to be informed is unclear. Future surveys should reconsider how we evaluate satisfaction in this area.

Appendix 1: Group 1-Motorists survey

Hello I'm _____ and I'm calling from the Bureau of Governmental Affairs at the University of North Dakota. We are conducting a survey about the state's roads and transportation services on behalf of the North Dakota Department of Transportation.

The department provides services to the public including: maintenance, snow and ice control, and travel information on state highways. It also provides drivers license, traffic safety programs, and motor vehicle registration services.

Your opinion is very important to us, would you be willing to take a few minutes to participate in this survey?

Thank you. For most of the following questions please answer on a scale from

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ Don't Know ___

1. In general, how satisfied are you with the services provided by the North Dakota Department of Transportation?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

2. How satisfied are you with the overall smoothness of the pavement on Interstate 29 and 94?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

3. How satisfied are you with the overall smoothness of the pavement on non-interstate highways?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

4. How satisfied are you with the removal of debris from the roadway and litter from ditches and median?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

5. How satisfied are you with the timeliness of highway snow and ice removal?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

6. How satisfied are you with the effectiveness of highway snow and ice removal?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

7. Overall, how satisfied are you with the safety of state highways?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

8. How satisfied are you with highway pavement striping?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

9. How satisfied are you with highway signing?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

10. How satisfied are you with construction work-zone signing?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

11. How satisfied are you with traffic flow through construction work zones?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

12. The next few questions ask whether different driver behaviors are a safety concern to you. You may respond yes, no, or don't know

- a. Text messaging while driving YES _____, NO _____, Don't Know _____
- b. Not wearing a seat belt YES _____, NO _____, Don't Know _____
- c. Drinking and driving YES _____, NO _____, Don't Know _____
- d. Talking on a cell phone while driving. YES _____, NO _____, Don't Know _____
- e. Speeding YES _____, NO _____, Don't Know _____

13. Are driver behaviors your biggest safety concern on the highway?

YES _____, NO _____, Don't Know _____

14. Yes or no, have you used North Dakota's highway rest areas?

No _____ (Move to question 15)

Yes _____

If yes, how satisfied are you with the rest areas?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

15. How satisfied are you with your ability to get current information on state road conditions?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

16. Which of the following information sources do you use most frequently to obtain traveler information?

511 ___ Television ___ Internet ___ Radio ___ All ___ None ___

17. How satisfied are you with the advance information you receive about department activities such as public meetings and notices regarding future construction projects and vehicle auctions?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

18. How satisfied are you that the Department of Transportation actively seeks and encourages public input on appropriate issues?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

19. Yes or no, have you ever visited the North Dakota Department of Transportation web site?

No _____ (move to question 20)

Yes _____

If yes, for what reason:

Road Conditions _____

Motor Vehicle Information _____

Drivers License Information _____

Employment Ads _____

Other? _____

20. Yes or no, within the past 18 months, have you completed a motor vehicle registration or title transfer or received other motor vehicle services?

No _____ (move to question 21)

Yes _____

What method or methods did you use?

Internet _____ In person _____ Mail _____ Phone _____

Overall, how satisfied were you with the registration, title transfer, or other motor vehicle services you received?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

21. Yes or no, within the past 18 months, have you completed a driver's test, license renewal, or driver improvement transaction?

No ____ (move to question 22)

Yes ____

What method or methods did you use?

Mail _____ Phone _____ In person _____

22. Overall, how satisfied were you with the service you received?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

23. Gender? male _____ female _____

24. Is your age? 18-34 _____ 35-54 _____ 55+ _____

25. What is your zip code? _____

26. What is your primary purpose for using the state highway system?

Travel to place of work _____

Business travel _____

Travel to school _____

Going shopping/running errands _____

Recreation _____

Other _____

27. What type of vehicle do you use primarily when traveling on the state highway system?

Car _____

Van _____

Sports Utility Vehicle (SUV) _____

Truck _____

Oversized vehicle _____

Other _____

28. How many minutes does it usually take you to get from home to work or school?

29. How many miles do you drive to get from home to work or school?

Appendix 1: Group 2-Motor Carriers survey

Hello I'm _____ and I'm calling from the Bureau of Governmental Affairs at the University of North Dakota. We are conducting a survey about the state's roads and transportation services on behalf of the North Dakota Department of Transportation.

The department provides services to the public including: maintenance, snow and ice control, and travel information on state highways. It also provides drivers license, traffic safety programs, and motor vehicle registration services.

Your opinion is very important to us, would you be willing to take a few minutes to participate in this survey?

Thank you. For most of the following questions please answer on a scale from

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ Don't Know ___

1. In general, how satisfied are you with the services provided by the North Dakota Department of Transportation?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

2. How satisfied are you with the overall smoothness of the pavement on Interstate 29 and 94?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

3. How satisfied are you with the overall smoothness of the pavement on non-interstate highways?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

4. How satisfied are you with the removal of debris from the roadway and litter from ditches and median?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

5. How satisfied are you with the timeliness of highway snow and ice removal?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

6. How satisfied are you with the effectiveness of highway snow and ice removal?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

7. Overall, how satisfied are you with the safety of state highways?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

8. How satisfied are you with highway pavement striping?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

9. How satisfied are you with highway signing?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

10. How satisfied are you with construction work-zone signing?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

11. How satisfied are you with traffic flow through construction work zones?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

12. The next few questions ask whether different driver behaviors are a safety concern to you. You may respond yes, no, or don't know

- a. Text messaging while driving YES_____, NO_____, Don't Know_____
- b. Not wearing a seat belt YES_____, NO_____, Don't Know_____
- c. Drinking and driving YES_____, NO_____, Don't Know_____
- d. Talking on a cell phone while driving. YES_____, NO_____, Don't Know_____
- e. Speeding YES_____, NO_____, Don't Know_____

13. Are driver behaviors your biggest safety concern on the highway?

YES_____, NO_____, Don't Know_____

14. Do Spring Load Restrictions affect your business?

Yes ____ No ____ (move to question 15)

How satisfied are you with the spring load-carrying capacity of the highway system?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

15. Yes or no, have you used North Dakota's highway rest areas?

No _____ (Move to question 16)

Yes _____

If yes, how satisfied are you with the rest areas?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

16. How satisfied are you with your ability to get current information on state road conditions?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

17. Which of the following information sources do you use most frequently to obtain traveler information?

511 _____ Television _____ Internet _____ Radio _____ All _____ None_____

18. How satisfied are you with the advance information you receive about department activities such as public meetings and notices regarding future construction projects and vehicle auctions?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

19. How satisfied are you that the Department of Transportation actively seeks and encourages public input on appropriate issues?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK_____

20. Yes or no, have you ever visited the North Dakota Department of Transportation web site?

No _____ (move to question 21)

Yes _____

If yes, for what reason:

- Road Conditions** _____
- Motor Vehicle Information** _____
- Drivers License Information** _____
- Employment Ads** _____
- Other?** _____

21. Yes or no, within the past 18 months, have you completed a motor vehicle registration or title transfer or received other motor vehicle services?

No _____ (move to question 22)

Yes _____

What method or methods did you use?

Internet _____ In person _____ Mail _____ Phone _____

Overall, how satisfied were you with the registration, title transfer, or other motor vehicle services you received?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK _____

22. Yes or no, within the past 18 months, have you completed a driver's test, license renewal, or driver improvement transaction?

No _____ (move to question 23)

Yes _____

What method or methods did you use?

Mail _____ Phone _____ In person _____

Overall, how satisfied were you with the service you received?

Very Satisfied _____ Satisfied _____ Neutral _____ Dissatisfied _____ Very Dissatisfied _____ DK _____

23. Gender? male _____ female _____

24. Is your age? 18-34 _____ 35-54 _____ 55+ _____

25. What is your zip code? _____

26. What type of vehicle do you use primarily when traveling on the state highway system in the performance of your job?

3 axles _____ 5 axles _____ other _____

Appendix 1: Group 3-Government Officials survey

Hello I'm _____ and I'm calling from the Bureau of Governmental Affairs at the University of North Dakota. We are conducting a survey about the state's roads and transportation services on behalf of the North Dakota Department of Transportation.

The department provides services to the public including: maintenance, snow and ice control, and travel information on state highways. It also provides drivers license, traffic safety programs, and motor vehicle registration services.

Your opinion is very important to us, would you be willing to take a few minutes to participate in this survey?

Thank you. For most of the following questions please answer on a scale from

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ Don't Know ___

1. In general, how satisfied are you with the services provided by the North Dakota Department of Transportation?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

2. How satisfied are you with the overall smoothness of the pavement on Interstate 29 and 94?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

3. How satisfied are you with the overall smoothness of the pavement on non-interstate highways?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

4. How satisfied are you with the removal of debris from the roadway and litter from ditches and median?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

5. How satisfied are you with the timeliness of highway snow and ice removal?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

6. How satisfied are you with the effectiveness of highway snow and ice removal?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

7. Overall, how satisfied are you with the safety of state highways?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

8. How satisfied are you with highway pavement striping?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

9. How satisfied are you with highway signing?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

10. How satisfied are you with construction work-zone signing?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

11. How satisfied are you with traffic flow through construction work zones?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

12. The next few questions ask whether different driver behaviors are a safety concern to you. You may respond yes, no, or don't know

- a. Text messaging while driving YES _____, NO _____, Don't Know _____
- b. Not wearing a seat belt YES _____, NO _____, Don't Know _____
- c. Drinking and driving YES _____, NO _____, Don't Know _____
- d. Talking on a cell phone while driving. YES _____, NO _____, Don't Know _____
- e. Speeding YES _____, NO _____, Don't Know _____

13. Are driver behaviors your biggest safety concern on the highway?

YES _____, NO _____, Don't Know _____

14. Yes or no, have you used North Dakota's highway rest areas?

No ____ (move to question 15)

Yes _____

If yes, how satisfied are you with the rest areas?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

15. How satisfied are you with your ability to get current information on state road conditions?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

16. Which of the following information sources do you use most frequently to obtain traveler information?

511 ___ Television ___ Internet ___ Radio ___ All ___ None ___

17. How satisfied are you with the advance information you receive about department activities such as public meetings and notices regarding future construction projects and vehicle auctions?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

18. How satisfied are you that the Department of Transportation actively seeks and encourages public input on appropriate issues?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

19. Yes or no, have you ever visited the North Dakota Department of Transportation web site?

No _____ (move to question 20)

Yes _____

If yes, for what reason:

Road Conditions _____

Motor Vehicle Information _____

Drivers License Information _____

Employment Ads _____

Other? _____

20. Yes or no, within the past 18 months, have you completed a motor vehicle registration or title transfer or received other motor vehicle services?

No _____ (move to question 21)

Yes _____

What method or methods did you use?

Internet _____ In person _____ Mail _____ Phone _____

Overall, how satisfied were you with the registration, title transfer, or other motor vehicle services you received?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

21. Yes or no, within the past 18 months, have you completed a driver's test, license renewal, or driver improvement transaction?

No ____ (move to question 22)

Yes ____

What method or methods did you use?

Mail ____ Phone ____ In person ____

22. Overall, how satisfied were you with the service you received?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

23. Gender? male ____ female ____

24. Is your age? 18-34 ____ 35-54 ____ 55+ ____

25. What is your zip code? _____

26. What is your primary purpose for using the state highway system?

Travel to place of work _____

Business travel _____

Travel to school _____

Going shopping/running errands _____

Recreation _____

Other _____

27. What type of vehicle do you use primarily when traveling on the state highway system?

Car _____

Van _____

Sports Utility Vehicle (SUV) _____

Truck _____

Oversized vehicle _____

Other _____

28. How many minutes does it usually take you to get from home to work?

29. How many miles do you drive to get from home to work?

Appendix 1: Group 4-Businesses survey

Hello I'm _____ and I'm calling from the Bureau of Governmental Affairs at the University of North Dakota. We are conducting a survey about the state's roads and transportation services on behalf of the North Dakota Department of Transportation.

The department provides services to the public including: maintenance, snow and ice control, and travel information on state highways. It also provides drivers license, traffic safety programs, and motor vehicle registration services.

Your opinion is very important to us, would you be willing to take a few minutes to participate in this survey?

Thank you. For most of the following questions please answer on a scale from

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ Don't Know ___

1. In general, how satisfied are you with the services provided by the North Dakota Department of Transportation?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

2. How satisfied are you with the overall smoothness of the pavement on Interstate 29 and 94?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

3. How satisfied are you with the overall smoothness of the pavement on non-interstate highways?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

4. How satisfied are you with the removal of debris from the roadway and litter from ditches and median?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

5. How satisfied are you with the timeliness of highway snow and ice removal?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

6. How satisfied are you with the effectiveness of highway snow and ice removal?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

7. Overall, how satisfied are you with the safety of state highways?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

8. How satisfied are you with highway pavement striping?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

9. How satisfied are you with highway signing?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

10. How satisfied are you with construction work-zone signing?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

11. How satisfied are you with traffic flow through construction work zones?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

12. The next few questions ask whether different driver behaviors are a safety concern to you. You may respond yes, no, or don't know

- a. Text messaging while driving YES _____, NO _____, Don't Know _____
- b. Not wearing a seat belt YES _____, NO _____, Don't Know _____
- c. Drinking and driving YES _____, NO _____, Don't Know _____
- d. Talking on a cell phone while driving. YES _____, NO _____, Don't Know _____
- e. Speeding YES _____, NO _____, Don't Know _____

13. Are driver behaviors your biggest safety concern on the highway?

YES _____, NO _____, Don't Know _____

14. Yes or no, have you used North Dakota's highway rest areas?

No _____ (Move to question 15)

Yes _____

If yes, how satisfied are you with the rest areas?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

15. How satisfied are you with your ability to get current information on state road conditions?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

16. Which of the following information sources do you use most frequently to obtain traveler information?

511 ___ Television ___ Internet ___ Radio ___ All ___ None ___

17. How satisfied are you with the advance information you receive about department activities such as public meetings and notices regarding future construction projects and vehicle auctions?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

18. How satisfied are you that the Department of Transportation actively seeks and encourages public input on appropriate issues?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

19. Yes or no, have you ever visited the North Dakota Department of Transportation web site?

No _____ (move to question 20)

Yes _____

If yes, for what reason:

Road Conditions _____

Motor Vehicle Information _____

Drivers License Information _____

Employment Ads _____

Other? _____

20. Yes or no, within the past 18 months, have you completed a motor vehicle registration or title transfer or received other motor vehicle services?

No _____ (move to question 21)

Yes _____

What method or methods did you use?

Internet _____ In person _____ Mail _____ Phone _____

Overall, how satisfied were you with the registration, title transfer, or other motor vehicle services you received?

Very Satisfied ___ Satisfied ___ Neutral ___ Dissatisfied ___ Very Dissatisfied ___ DK___

21. Yes or no, within the past 18 months, have you completed a driver's test, license renewal, or driver improvement transaction?

No ____ (move to question 22)

Yes _____

What method or methods did you use?

Mail _____ Phone _____ In person _____

22. Overall, how satisfied were you with the service you received?

Very Satisfied ____ Satisfied ____ Neutral ____ Dissatisfied ____ Very Dissatisfied ____ DK__

23. Gender? male _____ female _____

24. Is your age? 18-34 _____ 35-54 _____ 55+ _____

25. What is your zip code? _____

26. What is your primary purpose for using the state highway system?

Travel to place of work _____

Business travel _____

Travel to school _____

Going shopping/running errands _____

Recreation _____

Other _____

27. What type of vehicle do you use primarily when traveling on the state highway system?

Car _____

Van _____

Sports Utility Vehicle (SUV) _____

Truck _____

Oversized vehicle _____

Other _____

28. How many minutes does it usually take you to get from home to work?

29. How many miles do you drive to get from home to work?

Appendix 2: Data Summary

Table I. Summary of Motorist Satisfaction

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Don't know	Mean	Std. Dev.	N
Overall service of NDDOT	23.67	66.67	5.58	1.58	0.5	2	1.863095	0.624982	1176
Smoothness of Interstate	9.68	51.25	12.77	10.18	1.09	15	2.314342	0.872056	1018
Smoothness of Non-Interstate	4.76	42.07	17.28	25.13	3.26	7.51	2.784296	1.013659	1108
Debris removal	18.43	55.96	10.09	12.34	1.92	1.25	2.223818	0.956222	1184
Timeliness of snow/ice removal	25.94	59.97	6.01	5.25	0.83	2	1.929362	0.782658	1175
Effectiveness of snow/ice removal	24.02	61.47	6.76	4.67	0.42	2.67	1.931448	0.736523	1167
Overall safety	28.8	59.52	6.01	3.51	0.5	1.67	1.854839	0.722368	1178
Pavement striping.	18.25	60.5	10.25	9.17	0.42	1.33	2.117399	0.827814	1184
Highway signing	24.27	65.8	5.67	3.17	0.08	1	1.878686	0.650937	1187
Construction signing	23.5	61.33	7.92	5.75	0.5	1	1.973906	0.771322	1188
Traffic flow through construction	12.44	59.68	14.69	10.35	1.42	1.42	2.276037	0.865542	1181
Rest Area Use	41.64	49.09	5.43	2.88	0.43	0.53	1.706638	0.736158	934
Current road condition info.	26.25	51.08	6.17	2.92	0.33	13.2	1.847262	0.721053	1041
Notice of DOT activities	6.5	40.42	15.33	7.33	1.92	28.3	2.409091	0.889068	858
Public input on activities	7.93	46.16	14.27	6.76	1.25	23.6	2.30929	0.835136	915
Service during registration	46.64	47.16	3.1	2.2	0.78	0	1.631307	0.721543	773
Service at renewal	49.44	43.57	2.93	2.48	0.68	0.45	1.601367	0.729733	439

Table II. Summary of Motor Carrier Satisfaction

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Don't know	Mean	Std. Dev.	N
Overall service of NDDOT	18.64	70.91	5.45	2.27	0.91	1.82	1.939815	0.647778	216
Smoothness of Interstate	5	44.09	14.55	19.09	3.18	14.1	2.666667	1.005305	189
Smoothness of Non-Interstate	0.45	42.27	21.82	24.55	5.45	5.45	2.918269	0.977057	208
Debris removal	15.45	62.73	9.09	11.36	0.91	0.45	2.191781	0.867204	219
Timeliness of snow/ice removal	24.55	65	3.64	4.09	1.36	1.36	1.912442	0.755647	217
Effectiveness of snow/ice removal	23.64	60.91	6.82	4.55	2.27	1.82	1.990741	0.840768	216
Overall safety	28.64	62.27	5	2.27	1.36	0.45	1.849315	0.729545	219
Pavement striping.	14.09	64.55	9.55	10	0.91	0.91	2.183486	0.83324	218
Highway signing	21.36	71.36	5.91	0.91	0.45	0	1.877273	0.580058	220
Construction signing	22.27	66.82	5.91	3.18	1.36	0.45	1.940639	0.730176	219
Traffic flow through construction	11.36	68.64	11.82	6.82	0.91	0.45	2.16895	0.750379	219
Rest Area Safety	36.42	55.49	5.2	1.73	0	1.16	1.719298	0.644097	171
Current road condition info.	32.27	54.09	4.09	2.27	0	7.27	1.745098	0.653694	204
Notice of DOT activities	2.73	40	16.36	10	0.45	30.5	2.503268	0.812114	153
Public input on activities	4.09	39.55	18.18	7.27	0.91	30	2.448052	0.808793	154
Service during registration	40.88	48.07	4.42	3.87	2.76	0	1.79558	0.905037	181
Service at renewal	33.75	60	1.25	2.5	1.25	0	1.7375	0.74194	80
Load carrying capacity	1.31	47.71	16.34	20.92	7.19	6.54	2.839161	1.03903	143

Table III. Summary of Government Officials Satisfaction

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Don't know	Mean	Std. Dev.	N
Overall service of NDDOT	33.04	62.61	2.61	1.74	0	0	1.73	0.597094	115
Smoothness of Interstate	6.96	58.26	11.3	9.57	1.74	12.2	2.33	0.849811	101
Smoothness of Non-Interstate	4.35	47.83	16.52	24.35	6.09	0.87	2.8	1.057463	114
Debris removal	21.74	59.13	8.7	5.22	2.61	2.61	2.05	0.878567	112
Timeliness of snow/ice removal	45.22	49.57	1.74	2.61	0.87	0	1.64	0.727786	115
Effectiveness of snow/ice removal	38.26	53.04	6.96	1.74	0	0	1.72	0.669483	115
Overall safety	30.43	54.78	6.96	6.96	0.87	0	1.93	0.855547	115
Pavement striping.	25	53.04	9.57	10.43	1.74	0	2.1	0.958562	115
Highway signing	29.57	63.48	4	2.61	0	0	1.8	0.637979	115
Construction signing	33.04	58.26	5.22	3.48	0	0	1.79	0.694536	115
Traffic flow through construction	22.61	63.48	7.83	4.35	0.87	0.87	1.96	0.751751	114
Rest Area Safety	59.57	37.23	3.19	0	0	0	1.44	0.559541	94
Current road condition info.	32.46	47.37	8.77	3.51	0	7.89	1.82	0.756777	105
Notice of DOT activities	26.96	49.57	7.83	7.83	0.87	6.09	1.99	0.895432	107
Public input on activities	19.13	60	6.96	8.7	1.74	3.48	2.11	0.88781	111
Service during registration	56	35.96	5.62	1.12	1.12	0	1.55	0.753948	89
Service at renewal	59.52	31	7.14	2.38	0	0	1.62	0.986553	42

Table IV. Summary of Business Satisfaction

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Don't know	Mean	Std. Dev.	N
Overall service of NDDOT	22.09	67.44	9.3	1.16	0	0	1.9	0.594664	86
Smoothness of Interstate	10.47	53.49	16.28	10.47	0	9.3	2.29	0.823502	78
Smoothness of Non-Interstate	1	55.81	16.28	19.77	1.16	5.81	2.62	0.874184	81
Debris removal	22	56.98	11.63	6.98	2.33	0	2.1	0.907862	86
Timeliness of snow/ice removal	31.4	64	2.33	1.16	1.16	0	1.77	0.662871	86
Effectiveness of snow/ice removal	26.74	62.79	6	2.33	0	2.33	1.83	0.636885	84
Overall safety	33.72	54.65	6.98	3	1.16	0	1.84	0.794991	86
Pavement striping.	25.58	60.47	9.3	4.65	0	0	1.93	0.732292	86
Highway signing	25.58	66.28	8.14	0	0	0	1.83	0.557133	86
Construction signing	34.88	52.33	5.81	6.98	0	0	1.85	0.819145	86
Traffic flow through construction	22.09	54.65	13.95	8.14	1.16	0	2.12	0.886747	86
Rest Area Use	48	44.3	3.8	2.53	1.27	0	1.65	0.785085	79
Current road condition info.	32.56	51	2.33	2.33	0	11.6	1.71	0.649426	76
Notice of DOT activities	5.81	39.53	11.63	10.47	2.33	30.2	2.48	0.965361	60
Public input on activities	8.14	45.35	12.79	2	2.33	29.1	2.23	0.824489	61
Service during registration	56.92	40	3.08	0	0	0	1.46	0.561163	65
Service at renewal	54.17	37.5	8.33	0	0	0	1.54	0.658005	24

Table Va. Summary of Motorist Satisfaction by Region

	Region	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Don't know
Overall service of NDDOT	East	27.06	62.58	6.98	1.48	0.21	1.69
	Central	22.72	70.02	3.51	0.94	0.47	2.34
	West	19.67	68.33	6.33	2.67	1	2
Smoothness of Interstate	East	11.63	53.28	14.16	13.74	1.06	6.13
	Central	10.77	54.8	13.82	7.49	0.94	12.18
	West	5.03	42.95	9.06	8.39	1.34	33.22
Smoothness of Non-Interstate	East	4.87	40.25	18.43	24.36	3.6	8.47
	Central	4.68	44.5	18.27	24.36	2.34	5.85
	West	4.68	41.47	14.05	27.42	4.01	8.36
Debris removal	East	21.78	56.24	8.25	10.99	1.9	0.85
	Central	17.84	53.99	11.74	12.91	2.35	1.17
	West	14	58.33	10.67	13.67	1.33	2
Timeliness of snow/ice removal	East	28.96	56.45	6.98	4.44	0.85	2.33
	Central	27.7	59.15	5.87	5.63	0.47	1.17
	West	18.67	66.67	4.67	6	1.33	2.67
Effectiveness of snow/ice removal	East	25	59.53	6.99	5.3	0	3.18
	Central	25.76	60.42	7.73	3.75	0.47	1.87
	West	20	66	5	5	1	3
Overall safety	East	32.2	59.32	4.45	2.12	0.42	1.48
	Central	28.57	59.95	6.79	2.81	0.47	1.41
	West	23.75	59.2	7.36	6.69	0.67	2.34
Pavement striping.	East	21.14	57.08	11.63	8.46	0.21	1.48
	Central	16.63	63.93	10.3	8.43	0.47	0.23
	West	16	61.33	8	11.33	0.67	2.67

Table Vb. Summary of Motorist Satisfaction by Region

	Region	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Don't know
Highway signing	East	28.18	62.71	5.08	2.54	0	1.48
	Central	23.89	64.64	6.79	3.75	0.23	0.7
	West	18.67	72.33	5	3.33	0	0.67
Construction signing	East	14.38	54.12	15.01	12.68	1.69	2.11
	Central	12.71	63.76	13.41	8.47	1.18	0.47
	West	9	62.67	16	9.33	1.33	1.67
Traffic flow through construction	East	14.38	54.12	15.01	12.68	1.69	2.11
	Central	12.71	63.76	13.41	8.47	1.18	0.47
	West	9	62.67	16	9.33	1.33	1.67
Rest Areas	East	45.83	42.97	6.77	2.86	0.78	0.78
	Central	41.52	50.58	4.09	2.92	0.29	0.58
	West	34.27	57.75	5.16	2.82	0	0
Current road condition info.	East	26.43	48.41	7.82	3.38	0	13.74
	Central	23.89	55.74	5.15	2.11	0.47	12.65
	West	29.33	48.67	5	3.33	0.67	13
Notice of DOT activities	East	7.61	44.82	15.01	7.82	1.27	23.47
	Central	4.47	39.76	14.35	7.29	2.12	32
	West	7.69	34.78	17.39	6.69	2.68	30.77
Public input on activities	East	9.73	43.55	13.53	6.98	1.48	24.74
	Central	6.81	48.36	13.85	6.81	0.94	23.24
	West	6.69	47.16	16.05	6.35	1.34	22.41
Service during registration	East	47.81	47.14	2.02	2.36	0.67	0
	Central	45.49	46.93	4.69	2.17	0.36	0
	West	46.5	47.5	2.5	2	1.5	0
Service at renewal	East	59.63	32.92	3.11	3.11	0.62	0
	Central	46.51	48.26	2.91	1.16	0.58	0.58
	West	39.09	51.82	2.73	3.64	0.91	0.91

Appendix 3: Cross Tabulations

Cross Tabulations of motorists' (Group 1) overall satisfaction with NDDOT service and demographic characteristics.

Gender

Overall Satisfaction	Gender		Total
	male	female	
very satisfied	23.75	24.43	24.15
satisfied	67.50	68.39	68.03
neutral	6.67	5.03	5.70
dissatisfied	1.46	1.72	1.62
very dissatisfied	0.63	0.43	0.51
Total	100.00	100.00	100.00

Pearson chi2(4) = 1.7582 Pr = 0.780

Age

Overall Satisfaction	Age			Total
	18-34	35-54	55+	
very satisfied	13.04	23.14	27.08	24.17
satisfied	76.81	67.82	66.26	68.00
neutral	8.70	6.91	4.39	5.70
dissatisfied	1.45	1.60	1.66	1.62
very dissatisfied	0.00	0.53	0.61	0.51
Total	100.00	100.00	100.00	100.00

Pearson chi2(8) = 17.4212 Pr = 0.026

Zip code

Overall Satisfaction	Zipcode					Total
	580	581	582	583	584	
very satisfied	20.55	31.73	31.34	21.05	25.83	24.32
satisfied	70.55	59.62	60.20	72.81	69.17	67.98
neutral	6.85	6.73	6.97	4.39	3.33	5.51
dissatisfied	2.05	1.92	1.00	1.75	0.00	1.66
very dissatisfied	0.00	0.00	0.50	0.00	1.67	0.52
Total	100.00	100.00	100.00	100.00	100.00	100.00

Overall Satisfaction	Zipcode				Total
	585	586	587	588	
very satisfied	23.03	19.18	22.07	16.13	24.32
satisfied	73.03	73.97	66.90	70.97	67.98
neutral	2.81	4.11	6.21	9.68	5.51
dissatisfied	1.12	2.74	2.76	3.23	1.66
very dissatisfied	0.00	0.00	2.07	0.00	0.52
Total	100.00	100.00	100.00	100.00	100.00

Pearson chi2(32) = 41.5358 Pr = 0.121

Purpose for Driving

Overall Satisfaction	Purpose for driving					Total
	Work	Business	School	Shopping	Recreation	
very satisfied	23.45	25.23	14.29	21.72	26.92	24.09
satisfied	67.59	63.55	78.57	72.76	66.35	68.09
neutral	6.55	9.35	7.14	4.14	3.85	5.70
dissatisfied	1.72	0.93	0.00	1.03	2.88	1.62
very dissatisfied	0.69	0.93	0.00	0.34	0.00	0.51
Total	100.00	100.00	100.00	100.00	100.00	100.00

Overall Satisfaction	Purpose for driving other	Total
very satisfied	25.19	24.09
satisfied	66.17	68.09
neutral	6.39	5.70
dissatisfied	1.50	1.62
very dissatisfied	0.75	0.51
Total	100.00	100.00

Pearson chi2(20) = 14.9279 Pr = 0.781

Vehicle Primarily Driven

Overall Satisfaction	Primary vehicle					Total
	car	van	SUV	truck	oversized	
very satisfied	23.60	23.40	27.01	23.50	14.29	23.98
satisfied	67.74	70.92	66.35	69.00	64.29	68.17
neutral	5.94	4.26	5.69	6.50	7.14	5.72
dissatisfied	2.04	1.42	0.95	1.00	0.00	1.62
very dissatisfied	0.68	0.00	0.00	0.00	14.29	0.51
Total	100.00	100.00	100.00	100.00	100.00	100.00

Overall Satisfaction	Primary vehicle other	Total
very satisfied	17.65	23.98
satisfied	76.47	68.17
neutral	0.00	5.72
dissatisfied	5.88	1.62
very dissatisfied	0.00	0.51
Total	100.00	100.00

Pearson chi2(20) = 63.0092 Pr = 0.000

Cross Tabulations of motor carriers' (Group 2) overall satisfaction with NDDOT service and demographic characteristics.

Gender

Overall Satisfaction	Gender		Total
	male	female	
very satisfied	21.55	16.00	18.98
satisfied	71.55	73.00	72.22
neutral	5.17	6.00	5.56
dissatisfied	0.86	4.00	2.31
very dissatisfied	0.86	1.00	0.93
Total	100.00	100.00	100.00

Pearson chi2(4) = 3.2493 Pr = 0.517

Age

Overall Satisfaction	Age			Total
	18-34	35-54	55+	
very satisfied	10.34	16.98	24.69	18.98
satisfied	86.21	73.58	65.43	72.22
neutral	0.00	6.60	6.17	5.56
dissatisfied	0.00	1.89	3.70	2.31
very dissatisfied	3.45	0.94	0.00	0.93
Total	100.00	100.00	100.00	100.00

Pearson chi2(8) = 10.1335 Pr = 0.256

Zip code

Overall Satisfaction	Zipcode					Total
	580	581	582	583	584	
very satisfied	18.18	12.00	25.93	13.33	16.67	19.25
satisfied	78.79	80.00	70.37	86.67	72.22	72.30
neutral	3.03	4.00	3.70	0.00	5.56	5.63
dissatisfied	0.00	4.00	0.00	0.00	5.56	1.88
very dissatisfied	0.00	0.00	0.00	0.00	0.00	0.94
Total	100.00	100.00	100.00	100.00	100.00	100.00

Overall Satisfaction	Zipcode				Total
	585	586	587	588	
very satisfied	14.29	36.84	15.38	21.43	19.25
satisfied	68.57	57.89	69.23	67.86	72.30
neutral	5.71	5.26	15.38	10.71	5.63
dissatisfied	5.71	0.00	0.00	0.00	1.88
very dissatisfied	5.71	0.00	0.00	0.00	0.94
Total	100.00	100.00	100.00	100.00	100.00

Pearson chi2(32) = 29.2473 Pr = 0.607

Vehicle Primarily Driven

Overall Satisfaction	Primary vehicle			Total
	3 axles	5 axles	other	
very satisfied	31.03	18.18	16.78	18.98
satisfied	65.52	77.27	72.03	72.22
neutral	3.45	4.55	6.29	5.56
dissatisfied	0.00	0.00	3.50	2.31
very dissatisfied	0.00	0.00	1.40	0.93
Total	100.00	100.00	100.00	100.00

Pearson $\chi^2(8) = 6.9613$ Pr = 0.541

Cross Tabulations of government officials' (Group 3) overall satisfaction with NDDOT service and demographic characteristics.

Gender

Satisfaction	male	female	Total
very satisfied	34.07	29.17	33.04
satisfied	62.64	62.50	62.61
neutral	1.10	8.33	2.61
dissatisfied	2.20	0.00	1.74
Total	100.00	100.00	100.00

Pearson chi2(3) = 4.4756 Pr = 0.214

Age

Overall Satisfaction	18-34	Age 35-54	55+	Total
very satisfied	0.00	26.47	37.18	33.04
satisfied	66.67	67.65	60.26	62.61
neutral	33.33	2.94	1.28	2.61
dissatisfied	0.00	2.94	1.28	1.74
Total	100.00	100.00	100.00	100.00

Pearson chi2(6) = 13.8794 Pr = 0.031

Zip code

Overall Satisfaction	580	581	Zipcode 582	583	584	Total
very satisfied	27.27	100.00	52.94	22.22	40.00	33.04
satisfied	63.64	0.00	47.06	77.78	60.00	62.61
neutral	9.09	0.00	0.00	0.00	0.00	2.61
dissatisfied	0.00	0.00	0.00	0.00	0.00	1.74
Total	100.00	100.00	100.00	100.00	100.00	100.00

Overall Satisfaction	585	586	Zipcode 587	588	Total
very satisfied	50.00	11.11	23.08	25.00	33.04
satisfied	44.44	72.22	76.92	75.00	62.61
neutral	5.56	5.56	0.00	0.00	2.61
dissatisfied	0.00	11.11	0.00	0.00	1.74
Total	100.00	100.00	100.00	100.00	100.00

Pearson chi2(24) = 30.3204 Pr = 0.174

Purpose for Driving

Overall Satisfaction	Purpose for driving					Total
	Work	Business	School	Shopping	Recreation	
very satisfied	35.14	29.41	0.00	31.25	70.00	33.04
satisfied	59.46	61.76	100.00	68.75	30.00	62.61
neutral	5.41	2.94	0.00	0.00	0.00	2.61
dissatisfied	0.00	5.88	0.00	0.00	0.00	1.74
Total	100.00	100.00	100.00	100.00	100.00	100.00

Overall Satisfaction	Purpose for driving other	Total
very satisfied	17.65	33.04
satisfied	82.35	62.61
neutral	0.00	2.61
dissatisfied	0.00	1.74
Total	100.00	100.00

Pearson chi2(15) = 16.0589 Pr = 0.378

Vehicle Primarily Driven

Overall Satisfaction	Primary vehicle					Total
	car	van	SUV	truck	oversized	
very satisfied	36.36	40.00	25.00	31.58	100.00	33.04
satisfied	56.82	60.00	70.00	65.79	0.00	62.61
neutral	4.55	0.00	5.00	0.00	0.00	2.61
dissatisfied	2.27	0.00	0.00	2.63	0.00	1.74
Total	100.00	100.00	100.00	100.00	100.00	100.00

Overall Satisfaction	Primary vehicle other	Total
very satisfied	0.00	33.04
satisfied	100.00	62.61
neutral	0.00	2.61
dissatisfied	0.00	1.74
Total	100.00	100.00

Pearson chi2(15) = 7.5037 Pr = 0.942

Cross Tabulations of businesses' (Group 4) overall satisfaction with NDDOT service and demographic characteristics.

Gender

Overall Satisfaction	Gender		Total
	male	female	
very satisfied	14.29	29.55	22.09
satisfied	76.19	59.09	67.44
neutral	9.52	9.09	9.30
dissatisfied	0.00	2.27	1.16
Total	100.00	100.00	100.00

Pearson chi2(3) = 4.1554 Pr = 0.245

Age

Overall Satisfaction	Age			Total
	18-34	35-54	55+	
very satisfied	23.81	17.50	28.00	22.09
satisfied	66.67	70.00	64.00	67.44
neutral	9.52	10.00	8.00	9.30
dissatisfied	0.00	2.50	0.00	1.16
Total	100.00	100.00	100.00	100.00

Pearson chi2(6) = 2.1070 Pr = 0.910

Zip code

Overall Satisfaction	Zipcode					Total
	580	581	582	583	584	
very satisfied	33.33	40.00	30.00	12.50	14.29	22.09
satisfied	66.67	53.33	50.00	87.50	57.14	67.44
neutral	0.00	6.67	10.00	0.00	28.57	9.30
dissatisfied	0.00	0.00	10.00	0.00	0.00	1.16
Total	100.00	100.00	100.00	100.00	100.00	100.00

Overall Satisfaction	Zipcode				Total
	585	586	587	588	
very satisfied	9.52	14.29	25.00	0.00	22.09
satisfied	76.19	85.71	62.50	100.00	67.44
neutral	14.29	0.00	12.50	0.00	9.30
dissatisfied	0.00	0.00	0.00	0.00	1.16
Total	100.00	100.00	100.00	100.00	100.00

Pearson chi2(24) = 21.1859 Pr = 0.628

Purpose for Driving

Overall Satisfaction	Purpose for driving					Total
	Work	Business	Shopping	Recreation	other	
very satisfied	19.23	20.00	40.00	17.65	23.08	22.09
satisfied	76.92	60.00	50.00	70.59	69.23	67.44
neutral	3.85	15.00	10.00	11.76	7.69	9.30
dissatisfied	0.00	5.00	0.00	0.00	0.00	1.16
Total	100.00	100.00	100.00	100.00	100.00	100.00

Pearson chi2(12) = 7.7206 Pr = 0.807

Vehicle Primarily Driven

Overall Satisfaction	Primary vehicle					Total
	car	van	sports ut	truck	oversized	
very satisfied	22.58	50.00	15.38	12.50	0.00	22.09
satisfied	67.74	41.67	73.08	75.00	100.00	67.44
neutral	9.68	8.33	7.69	12.50	0.00	9.30
dissatisfied	0.00	0.00	3.85	0.00	0.00	1.16
Total	100.00	100.00	100.00	100.00	100.00	100.00

Pearson chi2(12) = 9.9139 Pr = 0.624

Appendix 3: Ordered Logistic regression results

Motorists

Age

Ordered logistic regression	Number of obs	=	1175
	LR chi2(2)	=	13.07
	Prob > chi2	=	0.0014
Log likelihood = -1006.8424	Pseudo R2	=	0.0065

services	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
age						
2	-.4598216	.2157369	-2.13	0.033	-.8826581	-.0369851
3	-.7019922	.2034216	-3.45	0.001	-1.100691	-.3032931
/cut1	-1.697217	.1917306			-2.073002	-1.321432
/cut2	1.950456	.1954222			1.567435	2.333476
/cut3	3.315994	.2588498			2.808657	3.82333
/cut4	4.758963	.4401127			3.896358	5.621568

Car Type

Ordered logistic regression	Number of obs	=	1172
	LR chi2(5)	=	4.85
	Prob > chi2	=	0.4344
Log likelihood = -1006.6816	Pseudo R2	=	0.0024

services	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
vehiclet						
2	-.0953133	.1967884	-0.48	0.628	-.4810115	.290385
3	-.2125505	.1684147	-1.26	0.207	-.5426373	.1175363
4	-.0411968	.1734178	-0.24	0.812	-.3810894	.2986959
5	1.027838	.6237283	1.65	0.099	-.1946467	2.250323
6	.1626384	.5250415	0.31	0.757	-.866424	1.191701
/cut1	-1.202083	.0932879			-1.384924	-1.019243
/cut2	2.427023	.1247135			2.182589	2.671457
/cut3	3.791348	.2111819			3.377439	4.205257
/cut4	5.237549	.4138536			4.426411	6.048687

Regional Analysis of Motorists

Overall Service

Ordered logistic regression

Number of obs = 1176

LR chi2(2) = 5.83

Prob > chi2 = 0.0541

Log likelihood = -1010.8484

Pseudo R2 = 0.0029

services	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	

region						
2	.053086	.1414259	0.38	0.707	-.2241038	.3302757
3	.3706915	.1608259	2.30	0.021	.0554785	.6859044

/cut1	-1.038964	.1012739			-1.237458	-.8404711
/cut2	2.58708	.1356383			2.321233	2.852926
/cut3	3.951407	.2178257			3.524476	4.378337
/cut4	5.396055	.4173059			4.57815	6.21396

Timeliness of Snow/Ice removal

Ordered logistic regression

Number of obs = 1175

LR chi2(2) = 6.74

Prob > chi2 = 0.0344

Log likelihood = -1196.2109

Pseudo R2 = 0.0028

snowremo	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	

region						
2	.0484068	.13488	0.36	0.720	-.2159531	.3127668
3	.3691107	.1496789	2.47	0.014	.0757454	.662476

/cut1	-.915442	.0973038			-1.106154	-.7247301
/cut2	2.080176	.117067			1.850729	2.309623
/cut3	2.833847	.1430072			2.553558	3.114136
/cut4	4.878519	.3267629			4.238075	5.518962

Overall Safety

Ordered logistic regression

Number of obs = 1178

LR chi2(2) = 12.93

Prob > chi2 = 0.0016

Log likelihood = -1148.1336

Pseudo R2 = 0.0056

safety	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	

region						
2	.2149754	.1336231	1.61	0.108	-.0469211	.4768719
3	.5432239	.1520491	3.57	0.000	.2452132	.8412346

/cut1	-.6822689	.0935246			-.8655738	-.498964
/cut2	2.402127	.1239081			2.159272	2.644983
/cut3	3.38927	.167308			3.061352	3.717188
/cut4	5.509212	.4170514			4.691806	6.326618

Highway Signing

Ordered logistic regression

Number of obs = 1187
LR chi2(2) = 7.96
Prob > chi2 = 0.0187
Pseudo R2 = 0.0037

Log likelihood = -1059.6874

signing	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	

region						
2	.2831319	.1404794	2.02	0.044	.0077973	.5584665
3	.4081272	.1548543	2.64	0.008	.1046184	.7116361

/cut1	-.9272351	.098153			-1.119612	-.7348588
/cut2	2.528215	.1303528			2.272728	2.783702
/cut3	3.599277	.1825112			3.241562	3.956993
/cut4	7.296163	1.003844			5.328665	9.263662

Traffic Flow through Construction

Ordered logistic regression

Number of obs = 1181
LR chi2(2) = 3.13
Prob > chi2 = 0.2092
Pseudo R2 = 0.0012

Log likelihood = -1352.3126

trafficf	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	

region						
2	-.1996069	.1337723	-1.49	0.136	-.4617958	.062582
3	.0267835	.1458718	0.18	0.854	-.2591198	.3126869

/cut1	-2.004955	.1155541			-2.231437	-1.778473
/cut2	.939174	.0980437			.7470117	1.131336
/cut3	1.936789	.1146588			1.712062	2.161516
/cut4	4.16645	.2541307			3.668363	4.664537

Rest Area

Ordered logistic regression

Number of obs = 934
LR chi2(2) = 4.53
Prob > chi2 = 0.1039
Pseudo R2 = 0.0024

Log likelihood = -929.48934

v21_a	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	

region						
2	.0879263	.1446291	0.61	0.543	-.1955416	.3713942
3	.3463376	.1647788	2.10	0.036	.0233772	.669298

/cut1	-.2161675	.1019566			-.4159988	-.0163362
/cut2	2.462587	.1416882			2.184883	2.740291
/cut3	3.492857	.200013			3.100839	3.884875
/cut4	5.569597	.507635			4.57465	6.564543

Drivers License Division

Ordered logistic regression

Number of obs = 439
LR chi2(2) = 9.73
Prob > chi2 = 0.0077
Pseudo R2 = 0.0118

Log likelihood = -407.30964

dlrsatis	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	

region						
2	.4459033	.2182128	2.04	0.041	.0182142	.8735925
3	.7447203	.2463382	3.02	0.003	.2619063	1.227534

/cut1	.3577929	.1613751			.0415036	.6740822
/cut2	3.123964	.2457751			2.642254	3.605675
/cut3	3.811717	.3077553			3.208528	4.414906
/cut4	5.378128	.5971309			4.207773	6.548483
