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# An Assessment of Road User Needs in a Rural Environment

**Jill Hough**
**Ayman Smadi**
**Gene Griffin**

**March 1996**



Colorado State University
Fort Collins, Colorado

North Dakota State University
Fargo, North Dakota

University of Wyoming
Laramie, Wyoming

Utah State University
Logan, Utah

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Jill Hough
Ayman Smadi
Gene Griffin

Upper Great Plains Transportation Institute
North Dakota State University



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## TABLE OF CONTENTS

## LIST OF TABLES

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## ABSTRACT

There are two major players in the transportation system: users and providers. Traditionally, public agencies (transportation agencies at the federal, state, county, and local level) held most of the decision making powers related to transportation. These decisions pertain to the physical infrastructure and the operating characteristics of roadways. Infrastructure issues include financing and programming of building, improving, and maintaining highway transportation structures. Operational issues include regulations, enforcement, and taxing of users. A multitude of federal and state laws were established to assure the efficient and safe use of the nation's transportation infrastructure. Road users on the other hand, include motorists and motor carriers who utilize the highway transportation system. These users finance some of the costs of the transportation system by paying taxes and user fees. Road users typically expect adequate road services to be provided by governmental agencies. Users of transportation services participate in directing some road decisions through public input mechanisms and input to elected officials. However, in many cases, there will still be differences between perceptions of providers and users. To fill this gap, new federal policy had specifically mandated transportation agencies to adopt active and effective public participation plans. The new transportation plans developed according to ISTEA requirements consider input from extensive public involvement process. However, these efforts are still rudimentary in many states. In addition, user groups targeted for participation are usually located in urban centers where most of the population and economic activities are located. Even in these areas, citizen participation is limited. This paper summarizes the results of a study on direct assessment of rural user needs. The objective of the study was to assess rural road users and providers perception of rural road needs. Different rural road user groups were identified to obtain a representative sample of

perceptions. User groups targeted in the study included: commuters, mail carriers, school bus drivers, and farmers. An attitudinal survey was developed and administered to these groups. The survey yielded a good return rate, suggesting that more road users are becoming aware of road management and finance issues. This paper summarizes the development of the survey and discusses major findings.

# CHAPTER 1

## INTRODUCTION

Transportation Planning in North Dakota is faced with unique challenges. The state's transportation circumstances, geographical, socio-economic, and environmental characteristics differ greatly from states in the east, south, and Pacific coast regions. North Dakota could be characterized by a sparse rural population, large transit-dependent population among the elderly and economically disadvantaged, a vast land-locked transportation system, and an economic base heavily concentrated in agriculture and other natural resources. Nearly 60 percent of the state's population live in non-metropolitan areas, compared to a 22 percent national average. The average population density in the state is about 9.2 capita per mile, compared to 72.9 average U.S. population density (United States Department of Commerce). The low population densities and considerable distances between towns have dictated an extensive infrastructure road system characterized by low traffic densities. North Dakota has 166 road miles for every 1,000 people, more miles of road per capita than any other state in the nation (North Dakota Department of Transportation [NDDOT]1994). The eastern half of the state has more urban centers and a larger population. The western half of the state has a smaller population base and a more rugged terrain. Thus, road requirements and available road resources differ throughout the state. However, several routine road needs are common throughout the state, i.e., snow removal, maintenance, etc.

North Dakota roads have been especially affected by changes in the railroad industry. Since 1980 railroads in North Dakota have abandoned 910 miles of rail line (NDDOT 1994). The land-locked state had no other option but to divert the rail traffic to truck. This modal shift has caused additional damage to the road network, particularly around country elevators no longer served by rail. Rural roads serving those elevators were not designed to carry the increased truck traffic or the heavy truck configurations used to move the shifted rail traffic. Increased truck traffic would likely result in an

increased need for gravel on gravel roads as well as more routine maintenance, (such as filling pot holes) on paved roads. The need for increased maintenance results in additional costs for the counties and townships experiencing this trend. In a time of tight budgets, states, counties, and townships may have to search for supplementary methods to finance road maintenance and improvements.

## BACKGROUND

North Dakota is among the many states plagued by declining revenues for road budgets, increasing road user demands, and a deteriorating infrastructure. Decision makers are faced with tough choices regarding the rural road infrastructure and the allocation of limited resources. These choices are not likely to get easier in the future. Road users pay taxes and expect a safe and reliable infrastructure to move from one point to another. The following paragraphs briefly describe North Dakota's road financing as well as the role of decision makers and road users.

### Road Financing

The lack of road funding is a national problem. According to studies by the Bureau of Transportation Statistics, state and local governments' expenditures are greater than the amount they collect in transportation revenues. In 1992, states generated $39 billion in revenues and spent $46.5 after grant transfers. Likewise, local governments, after grant transfers, spent $54.4 billion but only collected $15.3 billion in revenues (Wooster). As evident from these statistics, additional funds are needed by the federal, state, and local governments just to maintain current roadway conditions. Due to the continuing trend of reduced budgets, there is a growing backlog of highway needs.

North Dakota finances road construction and maintenance through funds received into the Highway Trust Fund. Federal and state fuel taxes are the largest contributor to the Trust Fund. Over the years, North Dakota has been highly dependent on federal revenues for transportation funding. Currently

the state receives about two dollars for every dollar it contributes to the federal gas tax. This is due in part to a funding formula based significantly on road miles. It is uncertain if North Dakota will continue to be a recipient state after current transportation legislation (Intermodal Surface Transportation Efficiency Act) expires in 1997. Some donor states are lobbying to change the funding formula so they get back more of what they contribute. They feel this is more equitable.

The North Dakota Department of Transportation, counties, and cities receive a portion of the Trust Fund. Townships receive one cent of the state motor fuel tax directly rather than allocating the monies through the Highway Distribution Fund. The allocated road funds already are limited and changes in legislation could further reduce funds. A loss of federal highway trust funds may be more severe for counties with little population density and economic activity. All levels of government need to allocate road funds to their best possible use, and search for innovative funding mechanisms. The need for additional funds and the innovative methods to raise these funds are beyond the scope of this study.

Annually, North Dakota counties receive a proportion of state funding based on land area, population, and miles of major arterials within the county, which is deposited into a special account. It is at the discretion of the decision makers within the county how these funds are spent. The funds may accumulate for a couple of years until enough money is available to pursue major projects.

## Decision Makers and Road Users

North Dakota has several categories of transportation decision makers and road users. There are decision makers at the state, county, and local levels that determine the quality and capacity of their respective transportation infrastructure. State road decision makers include legislators, the governor, the commissioner of transportation, and other DOT personnel. County decision makers include county road engineers, road superintendents, and county commissioners. Local decision makers involve township

officers. Most county road decision makers devise a transportation work plan to initiate and maintain the road network within the county. Generally, the work plan has several prioritized projects to be completed over a given number of years. The work plan is open for public scrutiny. Dissatisfied road users can write their county commissioners with recommended changes. Decision makers may face some difficult decisions developing the work plan and taking into consideration the needed road improvements. On one hand they need to consider that taxpayers contribute to the funds designated for roads and the taxpayers have certain needs, and expectations. On the other hand, they need to be realistic and allocate the limited funds to the best possible uses. This results in a creative tension between those that feel they pay for the system and those that are directly responsible for developing and maintaining the system.

There are several user groups of the rural road system that have different needs and requirements. Some of the road system users include agricultural producers, school buses, tourists, and commuters. In the past, agricultural producers were the largest user group. They primarily needed roads that could move their products and farm machinery, and the quality of the road surface was less of a factor. However, the agricultural sector has been in transition. There is a trend toward fewer but larger farms and larger equipment. The larger, heavier equipment places increased demands for wider, stronger rural roads. In addition, several farm families earn off-farm income either seasonally or all year around. As the purpose of rural trips has changed, priorities and needs perceptions also may have changed. For example, pavement surface conditions have probably become more important as farm families travel more regularly and frequently to nearby communities.

In addition to farmers, there is a growing segment of rural residents who enjoy living in a rural environment, but commute to a nearby town or city for employment. They have concerns about the road system to ensure they reach their place of employment. There may be several other needs the rural road users have and these must be identified to assure "customer" satisfaction.

## RESEARCH PROBLEM

The interpretation of providers' perceptions and users' perceptions of road-related needs may be different. The Intermodal Surface and Transportation Efficiency Act requires each state to adopt public participation (public input) while developing state plans and management systems. Even after the state plans and management systems are in place, it will be important for decision makers to have continuous and ongoing public involvement regarding the rural road infrastructure. This participation results in a transportation system that is more consistent with the needs of users and allows the users to become more active stakeholders. Much of the public input has been focused at the state level and the on the metropolitan areas. This project was designed to take into consideration the needs at the county and township level and could serve as a supplement to existing public input avenues.

After the rural road users' perceptions have been identified through interviews and surveys, more user needs can be considered effectively in transportation decisions. Furthermore, as decision makers are aware of the users' needs and perceptions on a continuous basis, it will be easier to detect changes in perceptions and take the appropriate actions to respond to these changes. This will result in a more responsive transportation system overall.

## OBJECTIVES OF STUDY

The overall objective of the study is to gain an understanding of differences in perceptions of rural road needs between the rural road providers and the rural road users. The specific tasks of the study were to:

1. Identify the rural road decision makers.
2. Identify the rural road users.
3. Gather information about the perceptions of the decision makers regarding rural road decisions.

4. Gather information about the perceptions of the rural road users needs regarding the rural road system.

5. Use the information gathered above to compare the perceptions of the rural road decision makers and the rural road users.

## REPORT ORGANIZATION

The remainder of this report is divided into three parts. The questionnaire and methods used to examine the perceptions of decisions makers and rural road users are described in Chapter 2. The results of the questionnaires are presented in Chapter 3. Finally, the summary, conclusions, and need for further study are presented in Chapter 4.

# CHAPTER 2

## RESEARCH METHOD

This report is based on data collected from North Dakota rural road users and providers perceptions of township and county roads. The perceptions were attained through a questionnaire mailed to various user groups and decision makers between December 1994 and March 1995. It could be assumed that users and decision makers agree on the condition of the roads if their perceptions closely match. Furthermore, if providers know what the road users need, it would be easier to make better user-based decisions. In addition, it would be beneficial for decision makers to share relevant information with the road users and ask for their input because this would create more of a partnership or alliance between them. The method used to attain road user and decision makers perceptions about the road system are explained in this chapter.

## DATA COLLECTION

To better understand the perceptions of road users and decision makers, primary data were collected by a mail survey. The survey was sent to select road users and decision makers to gather pertinent attitudinal information. The survey and the methods used in this comparison will be examined more closely in the following pages.

### User Group Identification

The North Dakota Association of County Engineer members were asked to identify possible road user groups, at their annual meeting in January 1994. They identified 16 potential road user groups which include:

- agricultural producers
- country grain elevators
- commercial grain haulers

- local rural businesses
- rural cooperatives
- rural residents/families
- commuters
- rural transit
- school bus operators
- special education buses
- rural tourism and recreation
- leisure time travelers
- energy groups (oil drillers)
- emergency services
- missile sites
- mail carriers.

County engineers and road superintendents helped narrow the user groups further to focus on the groups with the most vehicle miles traveled in the state. The user groups identified are representative of passenger traffic in North Dakota. They include farmers, commuters, school transportation superintendents and bus drivers, and mail carriers.

## Survey Instrument Design

A two-page survey was developed and mailed to selected user groups and decision makers to compare their perceptions. The questionnaire contained only 12 questions to assure as many responses as possible. Specific questions on the survey varied between the user groups to accommodate their differences in objectives and needs. For example, farmers were asked about the percentage of weekly travel related to work, shopping, social events, tourism, or other activities. Whereas, school bus drivers and mail carriers were asked about the number of miles of their daily routes. Questions were divided into sections relating to physical roadway conditions, operational conditions, maintenance, funding, and needed improvements and were kept uniform among the different questionnaires.[1] Most questions asked for a YES or NO answer along with a brief explanation, while other questions had a five-point category

[1] A copy of the questionnaire is in Appendix A.

scale used for rating each roadway factor along with a "not applicable" rating. The rating ranged from 1 = VERY GOOD, 2 = GOOD, 3 = FAIR, 4 = BAD, 5 = VERY BAD, and 6 = NOT APPLICABLE. The final question on the survey asked road users and decision makers to list the 10 improvements they would like to see on the roads they most frequently travel. There was also space for the users and decision makers to write additional comments.

A county road advisory committee pretested the survey for relevance of issues and ease of completion. The survey instruments were modified to incorporate the suggested improvements.

**Mailings**

Mailing lists and labels for the user groups were obtained from both private and public sources. Private sources were used to obtain mailing addresses for farmers and commuters. Farm Bureau and Farmers Union each selected a random sample of their members to represent the farm population. To capture the perceptions of commuters, four manufacturing and processing plants were identified and contacted. Three companies agreed to distribute surveys with their payroll checks to their employees who commuted from rural areas. These three companies were Dakota Pasta in Carrington, Melroe in Gwinner, and American Crystal Sugar in Hillsboro.

The Department of Public Instruction provided mailing labels of all the transportation superintendents in the public school system. In addition to completing the questionnaire, the superintendents supplied school bus driver mailing lists for their school district. The postmaster for the Dakotas District provided mailing labels but required the funding question be eliminated from the questionnaire for mail carriers.

The mailing list for decision makers was obtained from the North Dakota Department of Transportation. The list included county engineers, road superintendents, district engineers, and county commissioners.

In total, 2,533 questionnaires were mailed to the different user groups. Table 2.1 illustrates the groups surveyed and the response rate of each user group. In all, 1,210 questionnaires were returned for a response rate of 48 percent. The response rate indicates users are willing to participate and share their views. It was somewhat surprising that most of the user group response rates were higher than the decision maker response rates as indicated in Table 2.1. The decision maker response rate was 39.6 whereas school bus drivers and mail carrier response rates were 56.2 and 55 percent, respectively.

Road users and decision makers were asked to identify the county in which they lived. Respondents were then categorized within one of North Dakota's eight regions (Figure 2.1). Table 2.2 shows the regional breakdown by user group. The state is represented well by each user group with the possible exception of commuters. Commuter surveys were concentrated in the eastern parts of the state.

Gaining a regional perspective is helpful because there are differences in regional attributes and required services. Readers wishing to gain a regional perspective can view the questionnaire responses on a regional level in Appendix B.

**TABLE 2.1. Response Rate, Survey of North Dakota Rural Road Decision Makers and Users**

| Group Surveyed | Number Sent | Number Returned | Response Rate |
|---|---|---|---|
| Farmers | 763 | 333 | 43.6 |
| Transportation Superintendents | 207 | 107 | 51.7 |
| School Bus Drivers | 347 | 195 | 56.2 |
| Mail Carriers* | 636 | 348 | 55.0 |
| Commuters | 300 | 116 | 31.0 |
| Decision Makers | 280 | 111 | 39.6 |
| TOTAL | 2,533 | 1,210 | 47.8 |

* 318 surveys were sent to community postmasters. We estimated on average there are two mail carriers per community.

**TABLE 2.2. Percentage of North Dakota Rural Road Respondents by User Group and District**

| Region | Total | Farmers | Commuters | School Superintendent & Bus Drivers | Mail Carriers | Decision Makers |
|---|---|---|---|---|---|---|
| | ----------Percent---------- | | | | | |
| **1 - Williston** | 6 | 5 | 0 | 11 | 6 | 6 |
| **2 - Minot** | 13 | 15 | < 1 | 12 | 16 | 10 |
| **3 - Devils Lake** | 9 | 14 | < 1 | 6 | 10 | 9 |
| **4 - Grand Forks** | 8 | 7 | < 1 | 8 | 10 | 10 |
| **5 - Fargo** | 21 | 14 | 80 | 16 | 15 | 14 |
| **6 - Valley City** | 16 | 20 | 17 | 12 | 16 | 16 |
| **7 - Bismarck** | 17 | 16 | 0 | 25 | 16 | 17 |
| **8 - Dickinson** | 10 | 9 | 0 | 10 | 11 | 17 |

NOTE: Region 2, 3, and 4 each had less than one percent of the commuters' response

## DATA ANALYSIS

Responses from the survey were entered into a spreadsheet and then imported into the statistical package SAS. Although school transportation superintendent and school bus drivers were surveyed individually, both data sets were combined to represent the perceptions of public schools. The rating structure was combined for road services and features for the local road system. Before any analysis was performed on responses for road services and features, certain ratings were combined. The ratings were between 1 and 5 (1=very good; 2= good; 3= fair; 4=bad; 5=very bad 6=not applicable). For analysis purposes, ratings 1 and 2 were combined to represent good while 4 and 5 were combined to represent bad. A further expansion of the survey analysis included a breakdown of the suggested road

improvements. Each road user and decision maker listed up to 10 road improvements they would like to see on the roads they most frequently travel. For reporting purpses, the suggested improvements were categorized into physical, operational, and maintenance improvements.

The research methods used to analyze the data were straight-forward. A t-test was used to identify differences in attitudes between the rural road decision makers and the rural road users. The t-test essentially tests if the means of two groups of observations are equal. This test would indicate if the rural road decision makers and the users view the roadway elements and services similarly. In addition, basic means and frequencies were calculated for the variables to compare mean values and percentage responses. A significant difference was found between several of the road and service features. These differences are identified in the next chapter.

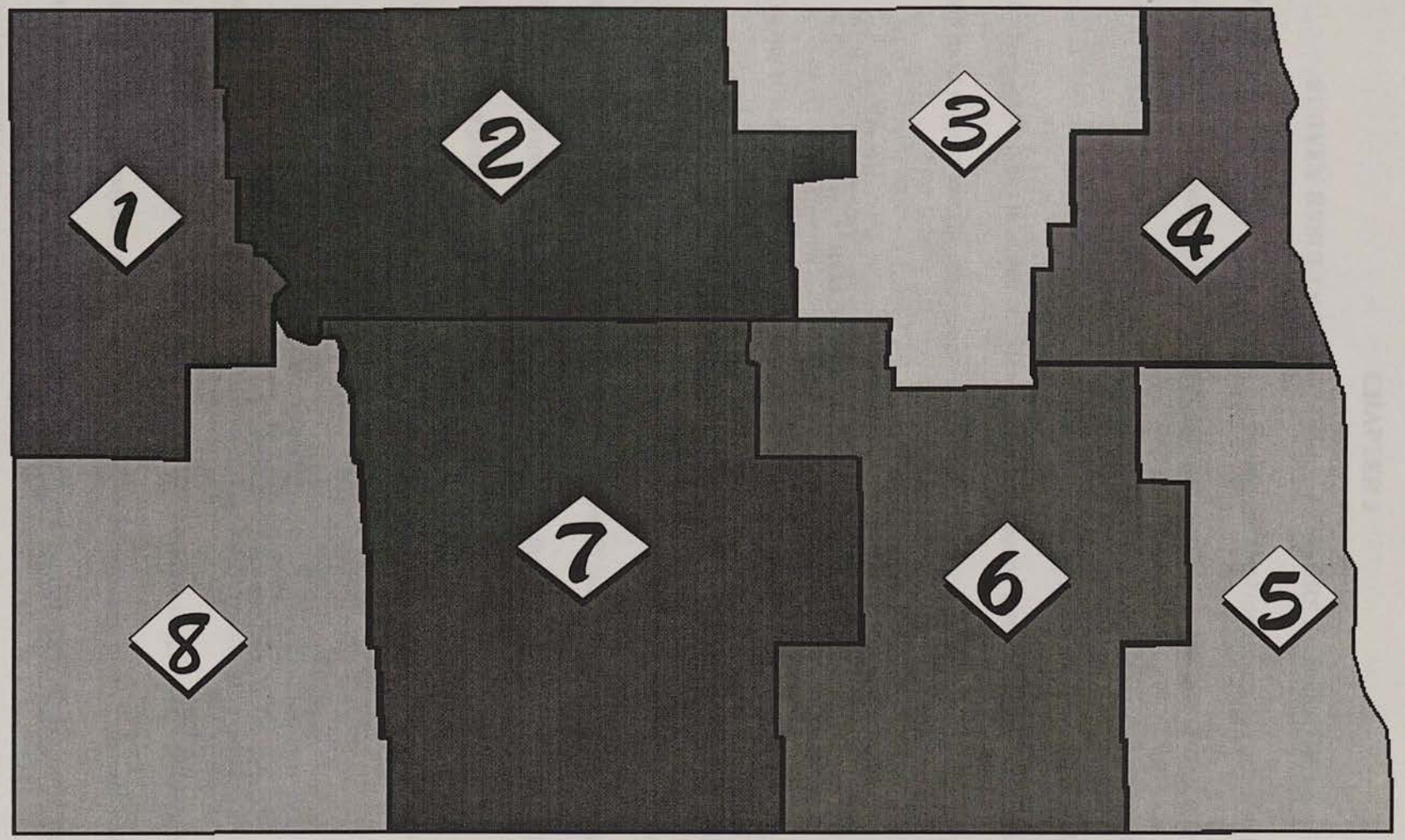


Figure 2.1 North Dakota Eight Region Breakdown

# CHAPTER 3

## SURVEY RESULTS OF ROADWAY FACTORS AND SERVICES

In this chapter, the empirical results of the analysis of rural road users and decision makers responses are presented. This chapter is divided into three sections. In the first section, a brief description of respondents road use characteristics, i.e., number of miles traveled, is presented. The second section summarizes responses on roadway features including the physical and operational roadway features as well as maintenance. Finally, the third section summarizes the type of tax rural road users would most support to raise road improvement funds.

## ROAD USER CHARACTERISTICS

The questionnaires mailed to each road user group contained questions about their general use of the road system, i.e., number of miles traveled in one day. A few questions varied among user groups surveyed because their use and some of their demands for the road system may differ. All of the respondents were asked about the number of miles they travel in one day and the surface type of the roads leading to the nearest community. Commuters reported the number of miles traveled one way to work while farmers reported the number of miles driven in one day. School bus drivers and mail carriers reported their one-day route miles.

### Commuters

Of the 116 commuters responding to the survey, 88 percent reported the majority of roads leading to their place of employment are paved. The average commuter travels 17 miles one-way to work. The commuters surveyed for this study are not indicative of the typical commuter going to an urban center for work. Rather, these commuters represent individuals traveling to a large plant located within a rural community.

## Farmers

There were 333 farmers that responded to the survey. Eighty-four percent reported they live in the country, 14 percent live in town, and 2 percent live in a rural subdivisions. Rural subdivisions are housing developments located outside of town or city limits. On average those farmers travel 42 miles per day and make between one and two trips to their nearest community. Sixty-one percent of the farmers indicated the roads leading to their nearest community are paved. Farmers' weekly travel is characterized by 60 percent related to work, 25 percent related to shopping, 16 percent related to social functions, and 11 percent related to tourism.

## Mail Carriers

There were 348 mail carriers that returned the survey. On average, each mail carrier travels 117 miles per day delivering mail. Only 4 percent of the mail carriers indicated that the majority of rural roads they travel on are paved. Given the high number of miles mail carriers travel on gravel roads, their responses offer an assessment of the condition of the gravel road network and services.

## School Bus

One hundred and seven school transportation superintendents and 195 school bus drivers returned the survey. School transportation superintendents' responses provided an overview of the school district while school bus drivers gave an account for their individual school bus route. School transportation superintendents reported an average of 388 miles traveled a day. Bus drivers reported an average of 88 miles per day. Less than 30 percent of school transportation superintendents and bus drivers indicated the rural roads leading to the school are paved. School bus drivers also gave a good indication of the condition of gravel roads and services.

Mail carriers and school bus drivers travel the most number of miles, particularly on gravel roads. Their responses offered a good indication of the condition of the gravel roads as well as the services provided on these roads.

## Decision Makers

Decision Makers reported an average of 51 miles traveled in one day. More than 60 percent of the decision makers indicated the rural roads leading to their nearest community are paved. Furthermore, nearly 60 percent of their weekly travel was related to work, about 20 percent related to shopping, 13 percent related to social functions, and 11 percent related to tourism. Their percentage breakdown closely resembles the breakdown of farmers.

## Physical Roadway Elements

Physical road characteristics are important to every driver and passenger. Since a large number of crashes involve vehicles that are run off the roadway, a great deal of care should be given to the design of the physical road environment. Road users and decision makers were asked about their perceptions of the road width, ditch steepness, and condition of the rural road shoulders they most frequently travel. Consistently, the decision makers rating indicated they perceived the physical roadway conditions to be better than the rural road users perceived them to be (Table 3.1). This was further validated by a paired t-test on the difference between the mean value for the physical roadway elements as rated by road users and decision makers. The paired t-test revealed perceptions of the road width, ditch steepness, and road shoulder factors are significantly different at the .05 level.

More specifically, school bus drivers and superintendents were most critical of the road width. Twenty-five percent of the school respondents rated road width on their routes as poor. Meanwhile only 35 percent of the school respondents thought the road widths were good. Whereas, farmers and mail

carriers responding to the survey perceived the road width more favorably. Approximately one-half of these user groups viewed road width as good (Table 3.1). Commuters perceptions were closest to decision makers perceptions about the road width. Fifty-four percent of commuters and 62 percent of decision makers viewed the road width as good. One reason for their higher ratings may be the variation in the road surface type on which they travel. The decision makers and the commuters may drive on more rural highways which have different road features than the rural gravel roads or unimproved township roads some road users may use.

**TABLE 3.1. North Dakota Users' Ratings of Physical Roadway Conditions by Percentage Response**

| Groups | ------Road Width------ | | | -----Ditch Steepness----- | | | -----Road Shoulder----- | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Good* | *Fair* | *Poor* | *Good* | *Fair* | *Poor* | *Good* | *Fair* | *Poor* |
| **Decision Makers** | 62 | 34 | 4 | 47 | 48 | 5 | 39 | 51 | 10 |
| **All User Groups** | 47 | 39 | 14 | 37 | 43 | 20 | 30 | 47 | 24 |
| **Farmers** | 49 | 38 | 14 | 40 | 36 | 24 | 32 | 43 | 26 |
| **School** | 35 | 40 | 25 | 27 | 54 | 20 | 20 | 51 | 39 |
| **Mail Carriers** | 47 | 41 | 12 | 33 | 50 | 17 | 30 | 50 | 20 |
| **Commuters** | 54 | 36 | 11 | 47 | 43 | 11 | 32 | 42 | 26 |

NOTE: The rating of 1 and 2 = Good; 3 = Fair; and 4 and 5 = Poor

More than one-half of each user group perceived the ditch steepness as fair to poor (Table 3.1). Likewise, the user groups similarly viewed road shoulder. Road users may have been comparing the rural roads to wider, paved roads they travel in larger metropolitan areas. Less frequently traveled rural roads have different standards than the roads used to serve urban areas, which are built to handle larger traffic volumes at higher levels of service.

All respondents were asked to identify the top road improvements they would like to see on the roads they most frequently travel. The top five responses related to the physical roadway condition include:

1. More and better gravel
2. More paved roads
3. Wider roads / road shoulders
4. Build roads up
5. Replace and widen bridges.

The need for more gravel on the roads was the most suggested road improvement. This may be difficult to accommodate as county engineers have identified that North Dakota has a gravel shortage. Currently the Upper Great Plains Transportation Institute is assessing the severity of the shortage and considering alternatives to solve the problem. The request for more paved roads, which was ranked second in suggested road improvements, may be an economical alternative for some of the high traffic volume gravel roads.

**Operational Conditions**

Several questions were asked to determine users and decision makers perceptions toward operational conditions. Operational conditions included signs and road elements that affect the speed vehicles can travel on the road network.

Traffic signs are imperative to control the movement of vehicles and to reduce the hazard of traffic operation. Users were asked if they felt there was adequate signing to warn motorists of potential hazards on the roads they most frequently travel. Ninety-six percent of the decision makers said that there were adequate signs to warn motorists. In total, 87 percent of the road users agreed that there were adequate signs to warn motorists of the road hazards. It should be noted that most of the activities related to road signing are done according to established road standards. Decision makers follow the standards to give them guidance when and where to place the signs and what the standard sign design

should entail. Road users did have some recommendations regarding signing. First, they would like to see more railroad crossing signs. Second, school bus drivers reported a need for more signs indicating curves in the road. Road curve warning signs are a safety concern for everyone, but especially for school bus drivers and their substitutes. Substitute bus drivers are less familiar with the road and are at great risk of being involved in an accident. There does appear to be a need for specific signing on the rural roads.

Users of the road also were asked if they perceived any road elements that limited the speed they could travel within the speed limit. More than half reported yes, that there were elements which limited the speed they could travel. The elements most frequently reported were potholes, washboard roads, snow, and loose gravel.

As road users identified improvements they would like to see on the road network, some responses were categorized as operational improvements. These suggested operational improvements include:

1. More signs (railroad crossings and curves)
2. Better road drainage
3. Guard rails on bridges
4. Reflectors along ditch for night travel.

The last three suggestions above were not addressed on the survey instrument. However, the users viewed them as important enough to make mention of them frequently and therefore, they should not be overlooked. The suggestion for reflectors along the ditch for night travel may be an indication of a new trend in society. As a result of more activities, family members living further apart, and other events, residents probably drive more often at night than they did 20 years ago.

**Maintenance**

Road users were asked about their perceptions regarding road, bridge, and winter maintenance. Between 20 to 30 percent of the road users rated road maintenance as poor whereas only 8 percent of the decision makers viewed road maintenance as poor (Table 3.2). This is a significant difference in perceptions. Actually, this is not surprising because if decision makers thought they were doing a poor job maintaining the road, one would expect they would work to improve their maintenance strategy. Of all the user groups, commuters were the most critical of road maintenance. Thirty-four percent viewed it as poor. Road users and decision makers perceived bridge maintenance about the same. One-half viewed bridge maintenance as good, while 10 to 15 percent rated it as poor. The question regarding bridge maintenance only rated the ability to drive over the bridge and the surface, not necessarily the structural condition, which is a separate matter.

Road users also were asked to rate the winter maintenance on their local roads. Less than one-half of the user groups viewed winter maintenance as good. There is a significant difference in the perception of road users and decision makers regarding winter maintenance. Of all the user groups, farmers were the least critical of winter maintenance, (farmers were most tolerant of winter driving condition). Their higher level of tolerance may be related to the seasonal movement of agricultural goods or it may be that their expectations are not as great overall regarding rural roads, i.e., they are used to it. Commuters were particularly critical of snow removal, nearly 30 percent viewed winter maintenance as poor. On the other side, 90 percent of decision makers viewed winter maintenance as good (Table 3.2). Decision makers typically do their best to remove the snow from the roads as quickly as possible, however, winter weather and budgets sometimes limit the efficiency in which winter maintenance is performed.

Road users suggested several maintenance improvements for the roads they most frequently travel. These improvements include:

1. Better snow removal
2. More blading
3. Better overall maintenance
4. Cut grass from ditches
5. Fill pot holes.

It was not surprising to see better snow removal at the top of the list given the rating winter maintenance received on the questionnaire. More blading and better overall maintenance will improve the ride on the road. Similarly, filling pot holes also will improve the rideability and decrease maintenance on vehicles. Cutting the grass from the ditches will improve the view of drivers as well as of the scenery. But given the road funding budget constraints, improving the scenery would more than likely be a low priority.

Road users were asked if they noticed any unusual wear and tear on their vehicles as a result of the condition of the roads they most frequently travel. Just over one-half of the respondents noticed additional wear and tear. However, only 31 percent of the decision makers perceived there was additional wear and tear on the vehicles as a result of the road condition.

**TABLE 3.2 North Dakota Users' Rating of Roadway Maintenance by Percentage Response**

| | --Road Maintenance-- | | | ---Bridge Maintenance--- | | | --Winter Maintenance-- | | |
|---|---|---|---|---|---|---|---|---|---|
| **Groups** | ***Good*** | ***Fair*** | ***Poor*** | ***Good*** | ***Fair*** | ***Poor*** | ***Good*** | ***Fair*** | ***Poor*** |
| **Decision** | 73 | 19 | 8 | 69 | 26 | 5 | 90 | 8 | 2 |
| **Makers** | | | | | | | | | |
| **All User Groups** | 38 | 39 | 23 | 61 | 28 | 11 | 50 | 34 | 17 |
| **Farmers** | 41 | 37 | 22 | 56 | 32 | 13 | 59 | 30 | 11 |
| **School** | 33 | 45 | 23 | 55 | 30 | 16 | 41 | 43 | 16 |
| **Mail** | 39 | 42 | 19 | 64 | 26 | 10 | 45 | 37 | 18 |
| **Carriers** | | | | | | | | | |
| **Commuters** | 30 | 36 | 34 | 54 | 34 | 12 | 37 | 36 | 27 |

## Emergency Response

All road users and decision makers were asked if they thought the emergency services, e.g., 911, ambulance, etc. within their area was effective. Not all counties within North Dakota had 911 emergency service available at the time the survey was conducted. There were 134 road users and decision makers (11 percent) who chose not to respond to this question. It is unclear if these respondents had 911 or other emergency services. Nearly 90 percent of all the user groups indicated that the emergency services were effective in their area. In this case, the user groups perceptions matches the perceptions of the decision makers.

## Problem Reporting Procedure

Survey results indicated road users are dissatisfied with certain road elements. However, road users do not always report problems so decision makers can work to correct the problems. Only 55 percent of the road users indicated they report problems to county road officials. Nearly 90 percent of the decision makers responding to the survey indicated they report road problems. This number was expected to be high since they deal with road problems as part of their job. Results indicate school bus drivers and transportation superintendents are the most likely user group to report problems. Seventy-five percent of the school respondents indicated they report road related problems to road officials. Fifty-three percent of farmers and 52 percent of mail carriers responding to the survey report problems to road officials. Only 17 percent of rural commuters responding to the survey report problems to road officials. Perhaps fewer commuters report problems because there is no road reporting mechanism in place. School bus drivers and mail carriers are more likely to report problems because they report to supervisors about their daily routes.

## Funding Road Improvements

Each user group and the decision makers were asked about their willingness to pay for road improvements. Road users identified several road improvements they would like to see on the rural road they most frequently travel. Traditionally, an increase in taxes is a topic rejected by the majority of people. Road users and decision makers were asked which tax increases they would support to improve the conditions of their local road area. Respondents could select "sales tax," "fuel tax," "property tax," or "other." Mail carriers did not respond to the revenue question.

Surprisingly, two-thirds of the users did report they would support increased taxes to make suggested road improvements. Approximately one-third of the respondents supported an increase in the sales tax and one-third supported an increase in the fuel tax (Table 3.3). Very few road users supported an increase in property taxes. The survey allowed road users and decision makers to select "other" as a funding option. About 15 percent of the users checked 'other' and wrote that they would not support any type of additional funding to improve the roads. Users suggested the following methods to increase road fund revenues:

1. Increases in income taxes
2. Use current funds more economically
3. Have a state lottery where funds go to roads
4. Higher motor vehicle taxes
5. Higher vehicle license fee.

More than one-half of the decision makers selected fuel tax as the method to support road improvements. Fuel taxes are one of the most acceptable user-based methods to support road improvements. However, some user groups are exempt from fuel taxes and therefore do not participate n the cost of the improvements. Developing an equitable tax is a difficult and controversial task.

**TABLE 3.3. Funding Options Road Users Would Support to Make Local Road Improvements, by Percentage Response**

| Group | Sales Tax | Fuel Tax | Property Tax | --------Other-------- | |
|---|---|---|---|---|---|
| | | | | None | Check |
| **Farmers** | 33 | 32 | 4 | 15 | 7 |
| **School** | 34 | 36 | 8 | 15 | 5 |
| **Mail Carriers** | - | - | - | - | |
| **Commuters** | 26 | 30 | 8 | 16 | 2 |
| **Decision Makers** | 38 | 52 | 7 | 11 | 7 |

# CHAPTER 4

## SUMMARY & CONCLUSIONS

In this chapter, a summary of the study is presented. In addition, conclusions drawn from the empirical findings are presented. Finally, study limitations and the need for further research also are addressed.

## SUMMARY

North Dakota is characterized by an extensive transportation network and a sparse rural population base. In fact, North Dakota has the largest number of miles of road per capita of any state in the nation. The state is heavily dependent upon agriculture for its economic vitality. The extensive road network developed over the past 100 years was initially designed to move goods from farm to market. Over time, there have been shifts in the agricultural sector toward larger farms and larger equipment, placing different demands on the road system. Furthermore, several farm families are supplementing their farm income with off-farm income generated from a job in a nearby community. In addition, some families are choosing to live in a rural setting and commute to jobs in a nearby community. Commuters add another dimension of service demands and requirements to the road network.

Changes in the rail industry over the past 15 years have placed an additional burden on some of the rural roads. Since 1980, North Dakota has abandoned 910 miles of rail line (ND DOT 1994). Many of these rail lines are located near country elevators. The land-locked state has had to divert the rail traffic to truck. Many roads were not designed to carry the density and truck configuration of the large trucks used to haul equivalent rail car loads of grain.

The future of road funding is uncertain. Historically, North Dakota has been a recipient state of federal highway trust fund dollars. Typically North Dakota has received two dollars back for every one dollar paid into the fund. The current transportation legislation expires in 1997 and it is uncertain if the recipient status will be renewed.

The focus of this study was to gain insight into the road users perceptions of their needs of the road system. In addition, their perceptions were compared to the perceptions of rural road decision makers to determine if there are differences in the perceived needs. A two-page questionnaire was used to survey road users and decision makers between December 1994 and March 1995.

The road users surveyed included farmers, commuters, mail carriers, and school bus drivers/superintendents. The decision makers which were surveyed included county commissioners, county engineers, road superintendents, and DOT district engineers. The response rate was 48 percent. The questionnaire addressed road issues relating to physical characteristics, operational characteristics, maintenance, and funding. Survey results indicated differences do exist in perceptions among road users and decision makers on several issues. Decision makers consistently viewed road conditions more positively or favorably than road users.

The questions relating to the physical characteristics of the road system included ratings of road width, ditch steepness, and road shoulder. Overall, less than one-half of the user groups thought that the physical road attributes (road width, ditch steepness, and road shoulder) were good, meaning more than one-half viewed them as fair to poor. Whereas, more than one-half of the decision makers viewed the physical attributes as good.

Operational characteristics were viewed favorably by road users. In particular, road users felt the decision makers were doing a good job with road signing. Some road users did indicate they would like to see more railroad crossing signs and curve warning signs.

Maintenance activities were not viewed favorably by road users. In fact, road users were quite critical of current road maintenance. The major complaints were the need for better snow removal and blading, as well as better over all maintenance.

About 55 percent of road users indicated they report road problems to road officials. Results indicate it is more likely for organized user groups, such as school bus drivers and mail carriers to report

problems. Commuters and farmers are less likely to report road problems, most likely because they do not have some type of road reporting mechanism easily available.

Finally, survey results indicated road users are willing to pay for their suggested road improvements through increased fuel taxes and sales taxes. Some road users indicated a willingness to raise income taxes to contribute funds for road improvements.

## CONCLUSIONS

In conclusion, differences in perceptions about the road system do exist between rural road users and decision makers. Road maintenance and winter maintenance were the issues with the greatest difference in perceptions between the users and decision makers. The road users thought maintenance needed improvement whereas the decision makers thought road and winter maintenance were good. Commuters, mail carriers, and school bus drivers were the most critical of these services. The differences in perceptions could be a result of the roads traveled by these groups as well as the vehicles driven by the groups. More frequently, commuters may drive smaller cars which would tend to accentuate bumps in the road.

Differences in perceptions between the user groups and decision makers clearly indicate a need for better communication between the groups. A good public input process would allow users to explain what they want in a road system. Furthermore, the process would allow decision makers to educate the road users about the road funding, planning, and programming.

In addition, the public input process would enable those user groups with no "organized" means of reporting road problems an opportunity to state their preferences and views. Likewise, they would learn more about the road system and the funding limitations and have a vested interest in the decision making process.

There also was an overwhelming response that road users would like to see more gravel on the roads. It was expected that road users would want more paved roads but survey results revealed that road users listed the need for more gravel above the need for more paved roads. North Dakota, among other states, is experiencing a gravel shortage. Some counties have a deficit of gravel and must import the gravel from other counties or states. Transporting gravel by trucks is causing additional wear and tear on the already deteriorating roads. In the future, gravel roads with high traffic volumes should be considered for paving.

Only about one-half of the road users report problems on the roadway. It would be beneficial for some type of road problem reporting mechanism to be developed and implemented. Perhaps employers could have a complaint form and completed forms could be mailed directly to county commissioners.

Survey results indicated road users are willing to pay for road improvements. The method used to cultivate these funds is still up for consideration. Road users indicated they are willing to pay more in fuel taxes and sales taxes to finance additional road improvements. However, they were not willing to pay additional property taxes. Agricultural producers and school districts are exempt from fuel taxes, which could be one reason why they supported the increase. Although farmers are exempt from the state 20 cent fuel tax, they do pay a 2 percent tax on fuel purchased for agricultural work. Sales taxes may have been supported because individuals can avoid purchasing items with sales tax. Some users did indicate they were willing to pay additional income taxes to improve the road system they most frequently travel. Additional innovative methods to finance the roads should be identified and presented to the public to determine their willingness to select and pay road financing alternatives.

## LIMITATIONS

Three limitations exist for this study. First, the conclusions were based on an attitudinal survey. Thus, if either the road users or decision makers did not reveal their true perceptions toward the road system, results may be biased. Second, perceptions were based on a specific number of user groups within the state. Other user groups such as tourists and rural delivery truckers (milk haulers) may have different perceptions and needs regarding the rural road system. Finally, only three tax methods were presented in the survey as potential road funding mechanisms. There are other alternative financing strategies which may also raise significant funds for maintaining and improving North Dakota's road system.

## NEED FOR FURTHER STUDY

This study revealed there are differences in the perceptions of road users and decision makers, regarding user's needs of the road network. Currently, no method is in place for road users to report their needs to the decision makers. It may be beneficial to investigate a more scientific method for users to report their road needs to the rural road decision makers on a regular basis. Furthermore, there is a need for the road users to be educated about the road system. As the users better understand the funding limitations and costs involved in road system alternatives they may be more understanding of the tough choices decision makers address.

This study revealed large discrepancies between the perceptions of road users and decision makers, particularly for road maintenance and snow removal. It may be advantageous to investigate methods by which decision makers can better provide these services to accommodate the road users expectations. Road funding is a critical issue and also warrants attention. It is necessary for North Dakota to investigate innovative financing mechanisms which can be used to generate more dollars to maintain and improve the current road network. In addition, because the road network is so extensive

and the funds are limited, it may be advantageous to investigate scaling back the road system by eliminating duplicate routes and seldom used roadways.

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# APPENDIX A
## User Group and Decision Maker Surveys
**Decision Makers**
**Agricultural Producers**
**Commuters**
**School Bus Drivers**
**Mail Carriers**

## RURAL ROAD QUESTIONNAIRE - DECISION MAKERS

1. In which **county** do you live? _____
   Do you live in the **country** _____ **town** _____ **rural subdivision** _____

2. How long have you lived in a rural setting/on a farm? _____years

3. How many miles, on average, do you travel in one day? _____
   a. How many daily trips do you make to your nearest community? _____
   b. How many miles do you live from your nearest community? _____

4. What percentage of your weekly travel is related to the following i.e., 50 to work, 20 shopping, etc:
   work_____ shopping____ social events_____ tourism _____ other _____

5. Are the majority of the roads leading to the nearest community paved? YES___ NO___

6. Do you feel there is adequate signing on the road you travel most frequently to warn motorists of potential hazards e.g., curves, bridges, etc. YES___ NO___

   Please explain what information may be missing. _____
   _____
   _____

7. Do you report problems you encounter (e.g., sign defects, etc.,) along your roadway to your county road office or some other official? YES___ NO___ If YES, please explain.
   _____
   _____

8. Do you feel the emergency services, e.g., 911, ambulance, etc. in your area are effective? YES___ NO___

9. Do certain elements of the road limit/reduce normal operating speed of your vehicle? YES___ NO___
   If YES, please list the elements. _____
   _____

10. Have you noticed unusual wear and tear on your vehicle as a result of the condition of the roads you most frequently travel? YES___ NO___
    What do you think is causing the additional wear and tear? _____
    _____

11. On a scale of 1 to 6 please rate the following road services and features for the local roads you most frequently travel.

| | Very Good | Good | Fair | Bad | Very Bad | Not Applicable |
|---|---|---|---|---|---|---|
| Snow removal during the winter months | 1 | 2 | 3 | 4 | 5 | 6 |
| Adequate roadway signing | 1 | 2 | 3 | 4 | 5 | 6 |
| Road maintenance (patching, blading of gravel, etc.) | 1 | 2 | 3 | 4 | 5 | 6 |
| Bridge maintenance | 1 | 2 | 3 | 4 | 5 | 6 |
| Road width | 1 | 2 | 3 | 4 | 5 | 6 |
| Ditch steepness (slopes) | 1 | 2 | 3 | 4 | 5 | 6 |
| Road shoulder - availability, width, surface | 1 | 2 | 3 | 4 | 5 | 6 |

**PLEASE CONTINUE ON THE BACK OF THE PAGE**

12. Please check which tax increases you would support to improve road conditions in your **local** area?
    Sales Tax ___ Fuel Tax ___ Property Tax ___ OTHER _____

13. Please list what improvements you would like to see on the roads on which you most frequently travel in order of priority.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

OTHER COMMENTS:

**THANK YOU FOR YOUR ASSISTANCE**

# RURAL ROAD NEEDS OF AGRICULTURAL PRODUCERS

1. In which **county** do you live? _____
   Do you live in the **country** _____ **town** _____ **rural subdivision** _____

2. How long have you lived in a rural setting/on a farm? _____years

3. How many miles, on average, do you travel in one day? _____
   a. How many daily trips do you make to your nearest community? _____
   b. How many miles do you live from your nearest community? _____

4. What percentage of your weekly travel is related to the following i.e., 50 to work, 20 shopping, etc:
   work_____ shopping____ social events_____ tourism _____ other _____

5. Are the majority of the roads leading to the nearest community paved? YES___ NO___

6. Do you feel there is adequate signing on the road you travel most frequently to warn motorists of potential hazards e.g., curves, bridges, etc. YES___ NO___

   Please explain what information may be missing. _____
   _____
   _____

7. Do you report problems you encounter (e.g., sign defects, etc.,) along your roadway to your county road office or some other official? YES___ NO___ If YES, please explain.
   _____
   _____

8. Do you feel the emergency services, e.g., 911, ambulance, etc. in your area are effective? YES___ NO___

9. Do certain elements of the road limit/reduce normal operating speed of your vehicle? YES___ NO___
   If YES, please list the elements. _____
   _____

10. Have you noticed unusual wear and tear on your vehicle as a result of the condition of the roads you most frequently travel? YES___ NO___
    What do you think is causing the additional wear and tear? _____
    _____

11. On a scale of 1 to 6 please rate the following road services and features for the local roads you most frequently travel.

| | Very Good | Good | Fair | Bad | Very Bad | Not Applicable |
|---|---|---|---|---|---|---|
| Snow removal during the winter months | 1 | 2 | 3 | 4 | 5 | 6 |
| Adequate roadway signing | 1 | 2 | 3 | 4 | 5 | 6 |
| Road maintenance (patching, blading of gravel, etc.) | 1 | 2 | 3 | 4 | 5 | 6 |
| Bridge maintenance | 1 | 2 | 3 | 4 | 5 | 6 |
| Road width | 1 | 2 | 3 | 4 | 5 | 6 |
| Ditch steepness (slopes) | 1 | 2 | 3 | 4 | 5 | 6 |
| Road shoulder - availability, width, surface | 1 | 2 | 3 | 4 | 5 | 6 |

**PLEASE CONTINUE ON THE BACK OF THE PAGE**

12. Please check which tax increases you would support to improve road conditions in your **local** area?
    Sales Tax ___ Fuel Tax ___ Property Tax ___ OTHER _____

13. Please list what improvements you would like to see on the roads on which you most frequently travel in order of priority.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

OTHER COMMENTS:

**THANK YOU FOR YOUR ASSISTANCE**

## RURAL ROAD COMMUTER QUESTIONNAIRE

1. In which **county** do you live? _____

2. How many miles, on average, do you commute to work one way?_____

3. Are the majority of the rural roads leading to your place of employment paved? YES___ NO___

4. Do you feel there is adequate signing on the roads you travel to work most frequently to warn motorists of potential hazards e.g., curves, bridges, etc. YES___ NO___

   Please explain what information may be missing? _____

_____

_____

5. Do you report problems you encounter (e.g., sign defects, etc.,) along your roadway to your county road office or some other official? YES___ NO___ If YES, please explain.

_____

_____

6. Do you feel the emergency services, e.g., 911, ambulance, etc. in your area are effective? YES___ NO___

7. Do certain elements of the road limit/reduce normal operating speed of your vehicle? YES___ NO___ If YES, please list the elements. _____

_____

_____

8. Have you noticed unusual wear and tear on your vehicle as a result of the condition of the roads you most frequently travel? YES___ NO___

   What do you think is causing the additional wear and tear? _____

_____

_____

9. On a scale of 1 to 6 please rate the following road services and features for the local roads you most frequently travel to work.

| | Very Good | Good | Fair | Bad | Very Bad | Not Applicable |
|---|---|---|---|---|---|---|
| Snow removal during the winter months | 1 | 2 | 3 | 4 | 5 | 6 |
| Adequate roadway signing | 1 | 2 | 3 | 4 | 5 | 6 |
| Road maintenance (patching, blading of gravel, etc.) | 1 | 2 | 3 | 4 | 5 | 6 |
| Bridge maintenance | 1 | 2 | 3 | 4 | 5 | 6 |
| Road width | 1 | 2 | 3 | 4 | 5 | 6 |
| Ditch steepness (slopes) | 1 | 2 | 3 | 4 | 5 | 6 |
| Road shoulder - availability, width, surface | 1 | 2 | 3 | 4 | 5 | 6 |

**PLEASE CONTINUE ON THE BACK OF THE PAGE**

10. Please check which tax increases you would support to improve road conditions in your **local** area? Sales Tax ___ Fuel Tax ___ Property Tax ___ OTHER _____

11. Please list what improvements you would like to see on the roads on which you most frequently travel in order of priority.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

OTHER COMMENTS:

**THANK YOU FOR YOUR ASSISTANCE**

## SCHOOL BUS DRIVER QUESTIONNAIRE

1. In which **county** is your school district? _____
   In what city is the school you represent located? _____

2. How long have you been involved with school bus transportation _____years

3. How many rural road and highway route miles do you drive in one day? _____

4. Are the majority of the rural roads leading to the school paved? YES___ NO___

5. Do you feel there is adequate signing on the road you travel most frequently to warn motorists of potential hazards e.g., curves, bridges, etc. YES___ NO___

   Please explain what information may be missing? _____
   _____
   _____

6. Do you report problems you encounter (e.g., sign defects, etc.,) along your roadway to your county road office or some other official? YES___ NO___ If YES, please explain.
   _____
   _____

7. Do you feel the emergency services, e.g., 911, ambulance, etc. in your area are effective? YES___ NO___

8. Do certain elements of the road limit/reduce normal operating speed of the buses? YES___ NO___ If YES, please list the elements. _____
   _____

9. Have you noticed unusual wear and tear on the buses as a result of the condition of the roads you most frequently travel? YES___ NO___

   What do you think is causing the additional wear and tear? _____
   _____

10. On a scale of 1 to 6 please rate the following road services and features for the local roads you most frequently travel.

| | Very Good | Good | Fair | Bad | Very Bad | Not Applicable |
|---|---|---|---|---|---|---|
| Snow removal during the winter months | 1 | 2 | 3 | 4 | 5 | 6 |
| Adequate roadway signing | 1 | 2 | 3 | 4 | 5 | 6 |
| Road maintenance (patching, blading of gravel, etc.) | 1 | 2 | 3 | 4 | 5 | 6 |
| Bridge maintenance | 1 | 2 | 3 | 4 | 5 | 6 |
| Road width | 1 | 2 | 3 | 4 | 5 | 6 |
| Ditch steepness (slopes) | 1 | 2 | 3 | 4 | 5 | 6 |
| Road shoulder - availability, width, surface | 1 | 2 | 3 | 4 | 5 | 6 |

**PLEASE CONTINUE ON THE BACK OF THE PAGE**

11. Please check which tax increases you would support to improve road conditions in your **local** area? Sales Tax ___ Fuel Tax ___ Property Tax ___ OTHER _____

12. Please list what improvements you would like to see on the roads on which you most frequently travel in order of priority.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

OTHER COMMENTS:

**THANK YOU FOR YOUR ASSISTANCE**

## RURAL ROAD NEEDS
## QUESTIONNAIRE FOR MAIL CARRIERS

1. For which **county(ies)** do you deliver mail? _____
   In what city is the post office located? _____

2. How many rural road and highway route miles do you drive in one day? _____

3. Are the majority of the rural roads paved? YES___ NO___

4. Do you feel there is adequate signing on the road you travel most frequently to warn motorists of potential hazards e.g., curves, bridges, etc. YES___ NO___

   Please explain what information may be missing? _____
   _____
   _____

5. Do you report problems you encounter (e.g., sign defects, etc.,) along your roadway to your county road office or some other official? YES___ NO___ If YES, please explain.
   _____
   _____

6. Do you feel the emergency services, e.g., 911, ambulance, etc. in your area are effective? YES___ NO___

7. Do certain elements of the road limit/reduce normal operating speed of your vehicle? YES___ NO___ If YES, please list the elements. _____
   _____

8. Have you noticed unusual wear and tear on your vehicle as a result of the condition of the roads you most frequently travel? YES___ NO___

   What do you think is causing the additional wear and tear? _____
   _____

9. On a scale of 1 to 6 please rate the following road services and features for the local roads you most frequently travel.

| | Very Good | Good | Fair | Bad | Very Bad | Not Applicable |
|---|---|---|---|---|---|---|
| Snow removal during the winter months | 1 | 2 | 3 | 4 | 5 | 6 |
| Adequate roadway signing | 1 | 2 | 3 | 4 | 5 | 6 |
| Road maintenance (patching, blading of gravel, etc.) | 1 | 2 | 3 | 4 | 5 | 6 |
| Bridge maintenance | 1 | 2 | 3 | 4 | 5 | 6 |
| Road width | 1 | 2 | 3 | 4 | 5 | 6 |
| Ditch steepness (slopes) | 1 | 2 | 3 | 4 | 5 | 6 |
| Road shoulder - availability, width, surface | 1 | 2 | 3 | 4 | 5 | 6 |

**PLEASE CONTINUE ON THE BACK OF THE PAGE**

10. Please list what improvements you would like to see on the roads on which you most frequently travel in order of priority.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

OTHER COMMENTS:

THANK YOU FOR YOUR CONTRIBUTION

## APPENDIX B

### North Dakota Regional Responses

**TABLE B.1. North Dakota Road Users Regional Perception of Road Width**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ----Decision Makers---- | | | -----Commuters----- | | | --------Farmers-------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 67 | 34 | 0 | 0 | 0 | 0 | 44 | 56 | 0 |
| 2-Minot | 45 | 45 | 10 | 100 | 0 | 0 | 38 | 49 | 13 |
| 3-Devils Lake | 56 | 33 | 11 | 50 | 50 | 0 | 49 | 38 | 13 |
| 4-Grand Forks | 55 | 45 | 0 | 0 | 0 | 100 | 71 | 25 | 4 |
| 5-Fargo | 69 | 31 | 0 | 54 | 39 | 7 | 62 | 28 | 10 |
| 6-Valley City | 68 | 26 | 6 | 67 | 22 | 11 | 51 | 38 | 11 |
| 7-Bismarck | 63 | 26 | 11 | 0 | 0 | 0 | 42 | 36 | 22 |
| 8-Dickinson | 67 | 33 | 0 | 0 | 0 | 0 | 32 | 48 | 19 |

**TABLE B.2. North Dakota Road Users Regional Perception of Road Width**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ----Decision Makers---- | | | ----Mail Carriers---- | | | --------Schools-------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 67 | 33 | 0 | 65 | 20 | 15 | 47 | 29 | 24 |
| 2-Minot | 45 | 45 | 10 | 42 | 42 | 16 | 35 | 41 | 24 |
| 3-Devils Lake | 56 | 33 | 11 | 42 | 39 | 19 | 47 | 24 | 29 |
| 4-Grand Forks | 55 | 45 | 0 | 56 | 41 | 3 | 27 | 46 | 27 |
| 5-Fargo | 69 | 31 | 0 | 64 | 25 | 11 | 57 | 28 | 15 |
| 6-Valley City | 69 | 26 | 5 | 43 | 53 | 4 | 31 | 49 | 20 |
| 7-Bismarck | 63 | 26 | 11 | 46 | 39 | 15 | 49 | 45 | 6 |
| 8-Dickinson | 67 | 33 | 0 | 26 | 58 | 16 | 33 | 43 | 23 |

**TABLE B.3. Do you feel there is adequate signing on the road you travel most frequently to warn motorists of potential hazards e.g., curves, bridges, etc.?**

| Region | Percentage Response | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ---Decision--- Makers | | -Commuters- | | ---Farmers--- | | ---Mail--- Carriers | | ---School--- | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| 1-Williston | 100 | 0 | 0 | 0 | 87 | 13 | 95 | 5 | 85 | 15 |
| 2-Minot | 91 | 9 | 100 | 0 | 80 | 20 | 84 | 16 | 83 | 17 |
| 3-Devils Lake | 80 | 20 | 100 | 0 | 84 | 16 | 83 | 17 | 68 | 32 |
| 4-Grand Forks | 100 | 0 | 0 | 100 | 83 | 17 | 89 | 11 | 89 | 11 |
| 5-Fargo | 100 | 0 | 91 | 9 | 94 | 6 | 89 | 11 | 92 | 8 |
| 6-Valley City | 100 | 0 | 83 | 17 | 89 | 11 | 81 | 19 | 86 | 14 |
| 7-Bismarck | 100 | 0 | 0 | 0 | 84 | 16 | 93 | 7 | 86 | 14 |
| 8-Dickinson | 89 | 11 | 0 | 0 | 90 | 10 | 87 | 13 | 90 | 10 |

**TABLE B.4. Do you report problems you encounter (e.g., sign defects, etc.,) along your roadway to your county road office or some other official?**

| Region | Percentage Response | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ---Decision--- Makers | | -Commuters- | | ---Farmers--- | | ---Mail--- Carriers | | ---School--- | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| 1-Williston | 100 | 0 | 0 | 0 | 54 | 46 | 65 | 35 | 74 | 26 |
| 2-Minot | 91 | 9 | 0 | 100 | 49 | 51 | 41 | 59 | 76 | 24 |
| 3-Devils Lake | 91 | 9 | 0 | 100 | 57 | 43 | 50 | 50 | 90 | 10 |
| 4-Grand Forks | 100 | 0 | 0 | 100 | 52 | 48 | 49 | 51 | 73 | 27 |
| 5-Fargo | 88 | 6 | 16 | 84 | 53 | 47 | 48 | 52 | 56 | 42 |
| 6-Valley City | 68 | 32 | 17 | 83 | 45 | 55 | 59 | 41 | 77 | 23 |
| 7-Bismarck | 100 | 0 | 0 | 0 | 62 | 37 | 65 | 35 | 81 | 17 |
| 8-Dickinson | 81 | 19 | 0 | 0 | 52 | 48 | 43 | 57 | 70 | 30 |

**TABLE B.5. Do you feel the emergency services, e.g., 911, ambulance, etc. in your area are effective?**

| Region | Percentage Response | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ---Decision--- Makers | | -Commuters- | | ---Farmers-- | | ---Mail--- Carriers | | ---School--- | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| 1-Williston | 100 | 0 | 0 | 0 | 85 | 15 | 95 | 5 | 90 | 10 |
| 2-Minot | 100 | 0 | 100 | 0 | 90 | 10 | 80 | 20 | 72 | 28 |
| 3-Devils Lake | 100 | 0 | 50 | 50 | 80 | 20 | 83 | 17 | 81 | 19 |
| 4-Grand Forks | 82 | 18 | 100 | 0 | 94 | 6 | 86 | 14 | 92 | 8 |
| 5-Fargo | 87 | 13 | 91 | 9 | 93 | 7 | 89 | 11 | 96 | 4 |
| 6-Valley City | 84 | 16 | 77 | 23 | 89 | 11 | 96 | 4 | 97 | 3 |
| 7-Bismarck | 83 | 17 | 0 | 0 | 80 | 20 | 79 | 21 | 85 | 15 |
| 8-Dickinson | 94 | 6 | 0 | 0 | 89 | 11 | 86 | 14 | 96 | 4 |

**TABLE B.6. Do certain elements of the road limit/reduce normal operating speed of your vehicle?**

| Region | Percentage Response | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ---Decision--- Makers | | -Commuters- | | ---Farmers-- | | ---Mail--- Carriers | | ---School--- | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| 1-Williston | 33 | 67 | 0 | 0 | 31 | 69 | 50 | 50 | 67 | 33 |
| 2-Minot | 45 | 55 | 100 | 0 | 58 | 40 | 76 | 24 | 67 | 33 |
| 3-Devils Lake | 20 | 80 | 0 | 100 | 52 | 48 | 68 | 32 | 74 | 26 |
| 4-Grand Forks | 36 | 64 | 0 | 100 | 48 | 52 | 67 | 33 | 76 | 24 |
| 5-Fargo | 44 | 56 | 50 | 50 | 43 | 57 | 59 | 41 | 60 | 40 |
| 6-Valley City | 28 | 72 | 67 | 33 | 52 | 48 | 58 | 42 | 82 | 18 |
| 7-Bismarck | 44 | 56 | 0 | 0 | 72 | 28 | 65 | 35 | 58 | 40 |
| 8-Dickinson | 61 | 39 | 0 | 0 | 45 | 55 | 70 | 30 | 63 | 37 |

**TABLE B.7. Have you noticed unusual wear and tear on your vehicle as a result of the condition of the roads you most frequently travel?**

| Region | Percentage Response | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ---Decision--- Makers | | -Commuters- | | ---Farmers-- | | ---Mail--- Carriers | | ---School--- | |
| | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| 1-Williston | 33 | 67 | 0 | 0 | 44 | 56 | 40 | 60 | 52 | 48 |
| 2-Minot | 27 | 73 | 100 | 0 | 46 | 54 | 60 | 40 | 66 | 34 |
| 3-Devils Lake | 40 | 60 | 0 | 100 | 52 | 48 | 78 | 22 | 37 | 63 |
| 4-Grand Forks | 27 | 73 | 0 | 100 | 17 | 83 | 57 | 43 | 62 | 38 |
| 5-Fargo | 12 | 88 | 42 | 58 | 34 | 66 | 45 | 55 | 38 | 60 |
| 6-Valley City | 21 | 79 | 61 | 39 | 30 | 70 | 57 | 43 | 33 | 64 |
| 7-Bismarck | 32 | 68 | 0 | 0 | 67 | 33 | 69 | 31 | 47 | 53 |
| 8-Dickinson | 50 | 50 | 0 | 0 | 57 | 43 | 77 | 23 | 48 | 52 |

**TABLE B.8. North Dakota Road Users Regional Perception of Snow Removal**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ----Decision Makers---- | | | -----Commuters----- | | | --------Farmers-------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 83 | 17 | 0 | 0 | 0 | 0 | 75 | 25 | 0 |
| 2-Minot | 100 | 0 | 0 | 0 | 100 | 0 | 49 | 27 | 24 |
| 3-Devils Lake | 90 | 0 | 10 | 0 | 100 | 0 | 64 | 34 | 2 |
| 4-Grand Forks | 100 | 0 | 0 | 0 | 100 | 0 | 71 | 29 | 0 |
| 5-Fargo | 94 | 6 | 0 | 44 | 31 | 25 | 68 | 23 | 9 |
| 6-Valley City | 100 | 0 | 0 | 22 | 33 | 45 | 55 | 28 | 17 |
| 7-Bismarck | 84 | 11 | 5 | 0 | 0 | 0 | 55 | 31 | 14 |
| 8-Dickinson | 72 | 28 | 0 | 0 | 0 | 0 | 48 | 45 | 7 |

**TABLE B.9. North Dakota Road Users Regional Perception of Snow Removal**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Mail Carriers----- | | | -------Schools------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 83 | 17 | 0 | 60 | 25 | 15 | 65 | 20 | 15 |
| 2-Minot | 100 | 0 | 0 | 48 | 33 | 19 | 35 | 47 | 18 |
| 3-Devils Lake | 90 | 0 | 10 | 40 | 43 | 17 | 68 | 21 | 11 |
| 4-Grand Forks | 100 | 0 | 0 | 47 | 47 | 6 | 46 | 39 | 15 |
| 5-Fargo | 94 | 6 | 0 | 43 | 38 | 19 | 48 | 35 | 17 |
| 6-Valley City | 100 | 0 | 0 | 33 | 48 | 19 | 49 | 34 | 17 |
| 7-Bismarck | 84 | 11 | 5 | 57 | 26 | 17 | 53 | 33 | 14 |
| 8-Dickinson | 72 | 28 | 0 | 40 | 34 | 26 | 43 | 33 | 23 |

**TABLE B.10. North Dakota Road Users Regional Perception of Adequate Signing**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Commuters----- | | | -------Farmers------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 100 | 0 | 0 | 0 | 0 | 0 | 88 | 6 | 6 |
| 2-Minot | 82 | 18 | 0 | 100 | 0 | 0 | 74 | 22 | 4 |
| 3-Devils Lake | 70 | 20 | 10 | 50 | 50 | 0 | 79 | 19 | 2 |
| 4-Grand Forks | 82 | 18 | 0 | 100 | 0 | 0 | 78 | 13 | 9 |
| 5-Fargo | 100 | 0 | 0 | 77 | 19 | 4 | 79 | 19 | 2 |
| 6-Valley City | 90 | 10 | 0 | 61 | 33 | 6 | 73 | 21 | 6 |
| 7-Bismarck | 84 | 16 | 0 | 0 | 0 | 0 | 74 | 22 | 4 |
| 8-Dickinson | 78 | 17 | 5 | 0 | 0 | 0 | 81 | 19 | 0 |

**TABLE B.11. North Dakota Road Users Regional Perception of Adequate Signing**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Mail Carriers----- | | | -------Schools------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 100 | 0 | 0 | 85 | 10 | 5 | 76 | 18 | 6 |
| 2-Minot | 82 | 18 | 0 | 73 | 27 | 0 | 71 | 23 | 6 |
| 3-Devils Lake | 70 | 20 | 10 | 72 | 25 | 3 | 53 | 37 | 10 |
| 4-Grand Forks | 82 | 18 | 0 | 83 | 11 | 6 | 69 | 27 | 4 |
| 5-Fargo | 100 | 0 | 0 | 83 | 13 | 4 | 87 | 13 | 0 |
| 6-Valley City | 90 | 10 | 0 | 67 | 31 | 2 | 69 | 23 | 8 |
| 7-Bismarck | 84 | 16 | 0 | 83 | 13 | 4 | 79 | 18 | 3 |
| 8-Dickinson | 78 | 17 | 5 | 76 | 19 | 5 | 70 | 27 | 3 |

**TABLE B.12. North Dakota Road Users Regional Perception of Road Maintenance**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Commuters----- | | | -------Farmers------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 67 | 33 | 0 | 0 | 0 | 0 | 62 | 25 | 13 |
| 2-Minot | 73 | 18 | 9 | 0 | 0 | 100 | 37 | 38 | 25 |
| 3-Devils Lake | 78 | 11 | 11 | 100 | 0 | 0 | 51 | 36 | 13 |
| 4-Grand Forks | 82 | 18 | 0 | 0 | 0 | 0 | 67 | 29 | 4 |
| 5-Fargo | 87 | 13 | 0 | 33 | 38 | 29 | 47 | 28 | 25 |
| 6-Valley City | 74 | 16 | 10 | 18 | 29 | 53 | 44 | 33 | 23 |
| 7-Bismarck | 79 | 16 | 5 | 0 | 0 | 0 | 22 | 48 | 30 |
| 8-Dickinson | 56 | 28 | 16 | 0 | 0 | 0 | 29 | 42 | 29 |

**TABLE B.13. North Dakota Road Users Regional Perception of Road Maintenance**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Mail Carriers----- | | | -------Schools------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 67 | 33 | 0 | 55 | 35 | 10 | 35 | 44 | 21 |
| 2-Minot | 73 | 18 | 9 | 38 | 44 | 18 | 30 | 30 | 40 |
| 3-Devils Lake | 78 | 11 | 11 | 32 | 53 | 15 | 42 | 42 | 16 |
| 4-Grand Forks | 82 | 18 | 0 | 56 | 36 | 8 | 35 | 42 | 23 |
| 5-Fargo | 87 | 13 | 0 | 41 | 41 | 18 | 29 | 46 | 25 |
| 6-Valley City | 74 | 16 | 10 | 34 | 47 | 19 | 39 | 39 | 22 |
| 7-Bismarck | 79 | 16 | 5 | 41 | 38 | 21 | 39 | 35 | 26 |
| 8-Dickinson | 56 | 28 | 16 | 25 | 39 | 36 | 30 | 37 | 33 |

**TABLE B.14. North Dakota Road Users Regional Perception of Bridge Maintenance**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Commuters----- | | | -------Farmers------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 83 | 17 | 0 | 0 | 0 | 0 | 75 | 17 | 8 |
| 2-Minot | 64 | 27 | 9 | 100 | 0 | 0 | 51 | 40 | 9 |
| 3-Devils Lake | 44 | 56 | 0 | 100 | 0 | 0 | 50 | 42 | 8 |
| 4-Grand Forks | 82 | 18 | 0 | 100 | 0 | 0 | 71 | 29 | 0 |
| 5-Fargo | 73 | 27 | 0 | 59 | 29 | 12 | 51 | 28 | 21 |
| 6-Valley City | 83 | 11 | 6 | 33 | 60 | 7 | 58 | 33 | 9 |
| 7-Bismarck | 78 | 11 | 11 | 0 | 0 | 0 | 60 | 24 | 16 |
| 8-Dickinson | 44 | 44 | 12 | 0 | 0 | 0 | 52 | 31 | 17 |

**TABLE B.15. North Dakota Road Users Regional Perception of Bridge Maintenance**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Mail Carriers----- | | | -------Schools------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 83 | 17 | 0 | 94 | 6 | 0 | 77 | 16 | 7 |
| 2-Minot | 64 | 27 | 9 | 66 | 25 | 9 | 62 | 22 | 16 |
| 3-Devils Lake | 44 | 56 | 0 | 56 | 38 | 6 | 73 | 20 | 7 |
| 4-Grand Forks | 82 | 18 | 0 | 81 | 16 | 3 | 52 | 36 | 12 |
| 5-Fargo | 73 | 27 | 0 | 55 | 25 | 20 | 49 | 31 | 20 |
| 6-Valley City | 83 | 11 | 6 | 62 | 33 | 5 | 69 | 17 | 14 |
| 7-Bismarck | 78 | 11 | 11 | 70 | 23 | 7 | 71 | 19 | 10 |
| 8-Dickinson | 44 | 44 | 12 | 53 | 29 | 18 | 46 | 43 | 11 |

**TABLE B.16. North Dakota Road Users Regional Perception of Ditch Steepness**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Commuters----- | | | -------Schools------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 67 | 33 | 0 | 0 | 0 | 0 | 38 | 56 | 6 |
| 2-Minot | 18 | 73 | 9 | 100 | 0 | 0 | 33 | 29 | 28 |
| 3-Devils Lake | 25 | 62 | 13 | 50 | 50 | 0 | 38 | 41 | 21 |
| 4-Grand Forks | 55 | 45 | 0 | 0 | 100 | 0 | 50 | 29 | 21 |
| 5-Fargo | 63 | 37 | 0 | 50 | 43 | 7 | 47 | 34 | 19 |
| 6-Valley City | 63 | 26 | 11 | 44 | 39 | 17 | 44 | 27 | 29 |
| 7-Bismarck | 37 | 58 | 5 | 0 | 0 | 0 | 33 | 39 | 28 |
| 8-Dickinson | 50 | 44 | 6 | 0 | 0 | 0 | 35 | 39 | 26 |

**TABLE B.17. North Dakota Road Users Regional Perception of Ditch Steepness**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Mail Carriers----- | | | -------Schools------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 67 | 33 | 0 | 45 | 35 | 20 | 50 | 29 | 21 |
| 2-Minot | 18 | 73 | 9 | 20 | 61 | 19 | 35 | 32 | 33 |
| 3-Devils Lake | 25 | 62 | 13 | 23 | 46 | 31 | 26 | 37 | 37 |
| 4-Grand Forks | 55 | 45 | 0 | 29 | 62 | 9 | 25 | 46 | 29 |
| 5-Fargo | 63 | 37 | 0 | 39 | 44 | 17 | 36 | 40 | 24 |
| 6-Valley City | 63 | 26 | 11 | 38 | 47 | 15 | 25 | 56 | 19 |
| 7-Bismarck | 37 | 58 | 5 | 42 | 41 | 17 | 37 | 50 | 13 |
| 8-Dickinson | 50 | 44 | 6 | 27 | 62 | 11 | 40 | 47 | 13 |

**TABLE B.18. North Dakota Road Users Regional Perception of Road Shoulder**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Commuters----- | | | -------Schools------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 66 | 16 | 16 | 0 | 0 | 0 | 37 | 44 | 19 |
| 2-Minot | 18 | 64 | 18 | 100 | 0 | 0 | 20 | 52 | 28 |
| 3-Devils Lake | 33 | 67 | 0 | 50 | 0 | 50 | 30 | 51 | 19 |
| 4-Grand Forks | 36 | 55 | 9 | 0 | 100 | 0 | 50 | 33 | 17 |
| 5-Fargo | 50 | 50 | 0 | 34 | 42 | 24 | 43 | 38 | 19 |
| 6-Valley City | 53 | 37 | 10 | 24 | 47 | 29 | 35 | 37 | 28 |
| 7-Bismarck | 32 | 53 | 15 | 0 | 0 | 0 | 30 | 40 | 30 |
| 8-Dickinson | 39 | 50 | 11 | 0 | 0 | 0 | 16 | 45 | 39 |

**TABLE B.19. North Dakota Road Users Regional Perception of Road Shoulder**

| Region | Percentage Response | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -----Decision Makers---- | | | -----Mail Carriers----- | | | -------Schools------- | | |
| | Good | Fair | Poor | Good | Fair | Poor | Good | Fair | Poor |
| 1-Williston | 66 | 16 | 16 | 0 | 100 | 0 | 33 | 40 | 27 |
| 2-Minot | 18 | 64 | 18 | 45 | 45 | 10 | 21 | 44 | 35 |
| 3-Devils Lake | 33 | 67 | 0 | 23 | 43 | 34 | 28 | 39 | 33 |
| 4-Grand Forks | 36 | 55 | 9 | 28 | 56 | 16 | 20 | 48 | 32 |
| 5-Fargo | 50 | 50 | 0 | 41 | 44 | 15 | 32 | 47 | 21 |
| 6-Valley City | 53 | 37 | 10 | 32 | 44 | 24 | 17 | 57 | 26 |
| 7-Bismarck | 32 | 53 | 15 | 37 | 50 | 13 | 32 | 51 | 17 |
| 8-Dickinson | 39 | 50 | 11 | 16 | 54 | 30 | 23 | 50 | 27 |

**TABLE B.20. Funding Options Decision Makers Would Support to Make Local Road Improvements**

| Response | Number of Respondents | Percentage Response | | | | |
|---|---|---|---|---|---|---|
| | | Sales | Fuel | Property | Other | None |
| 1-Williston | 6 | 33 | 33 | 0 | 0 | 17 |
| 2-Minot | 11 | 27 | 9 | 18 | 18 | 18 |
| 3-Devils Lake | 11 | 73 | 55 | 0 | 27 | 0 |
| 4-Grand Forks | 11 | 36 | 64 | 9 | 9 | 0 |
| 5-Fargo | 16 | 50 | 69 | 6 | 19 | 0 |
| 6-Valley City | 19 | 32 | 42 | 0 | 0 | 16 |
| 7-Bismarck | 19 | 32 | 68 | 0 | 0 | 11 |
| 8-Dickinson | 18 | 22 | 50 | 22 | 0 | 17 |

*NOTE: Regional responses may not total 100% because respondents could support more than one funding option.*

**TABLE B.21. Funding Options Schools Would Support to Make Local Road Improvements**

| Response | Number of Respondents | Percentage Response | | | | |
|---|---|---|---|---|---|---|
| | | Sales | Fuel | Property | Other | None |
| 1-Williston | 34 | 35 | 47 | 3 | 0 | 9 |
| 2-Minot | 35 | 27 | 37 | 20 | 14 | 11 |
| 3-Devils Lake | 19 | 42 | 21 | 11 | 11 | 11 |
| 4-Grand Forks | 26 | 38 | 35 | 8 | 8 | 12 |
| 5-Fargo | 48 | 37 | 44 | 2 | 0 | 10 |
| 6-Valley City | 36 | 31 | 47 | 6 | 3 | 14 |
| 7-Bismarck | 74 | 36 | 31 | 7 | 1 | 19 |
| 8-Dickinson | 30 | 33 | 17 | 10 | 13 | 23 |

*NOTE: Regional responses may not total 100% because respondents could support more than one funding option.*

**TABLE B.22. Funding Options Farmers Would Support to Make Local Road Improvements**

| Response | Number of Respondents | Percentage Response | | | | |
|---|---|---|---|---|---|---|
| | | Sales | Fuel | Property | Other | None |
| 1-Williston | 16 | 25 | 25 | 0 | 0 | 6 |
| 2-Minot | 49 | 36 | 31 | 27 | 4 | 22 |
| 3-Devils Lake | 47 | 36 | 32 | 4 | 19 | 6 |
| 4-Grand Forks | 24 | 29 | 38 | 4 | 0 | 13 |
| 5-Fargo | 47 | 36 | 43 | 4 | 0 | 2 |
| 6-Valley City | 64 | 25 | 33 | 6 | 12 | 17 |
| 7-Bismarck | 55 | 35 | 27 | 4 | 9 | 18 |
| 8-Dickinson | 31 | 35 | 32 | 6 | 25 | 10 |

*NOTE: Regional responses may not total 100% because respondents could support more than one funding option.*

**TABLE B.23. Funding Options Commuters Would Support to Make Local Road Improvements**

| Response | Number of Respondents | Percentage Response | | | | |
|---|---|---|---|---|---|---|
| | | Sales | Fuel | Property | Other | None |
| 1-Williston | 0 | N/A | N/A | N/A | N/A | N/A |
| 2-Minot | 1 | 0 | 0 | 0 | 0 | 0 |
| 3-Devils Lake | 2 | 0 | 0 | 0 | 0 | 0 |
| 4-Grand Forks | 1 | 0 | 0 | 0 | 0 | 0 |
| 5-Fargo | 88 | 28 | 35 | 8 | 0 | 19 |
| 6-Valley City | 19 | 16 | 21 | 5 | 0 | 16 |
| 7-Bismarck | 0 | N/A | N/A | N/A | N/A | N/A |
| 8-Dickinson | 0 | N/A | N/A | N/A | N/A | N/A |

*NOTE: Regional responses may not total 100% because respondents could support more than one funding option.*