

North Dakota Intercity Transportation Survey

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Abstract

A survey was conducted of North Dakota residents in Fall 2015 that focused on intercity travel. This survey was part of a larger project on rural intercity bus demand. This research summary describes the main findings from the survey. The survey included four sections: a general demographic information section, a section on transportation experience, a section on travel attitudes, and a stated preference section. Most respondents answered that it is easy to make intercity trips in the state. Many indicated a moderate need for highway improvements, and some also indicated a need for bus, rail, and air improvements. Responses to the attitudinal questions showed that North Dakotans place a high value on predictability. Demand for intercity bus appears to be greater for those with lower income, as well as those over age 70 or younger than age 25.

Introduction

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The survey was distributed by mail to a random sample of 4,763 North Dakota residents. Half of the sample received a paper survey by mail, and the other half received a postcard with a link to take the survey online. A total of 541 responses were received, yielding a response rate of 11%. Overall, the survey respondents were fairly representative of the North Dakota population, though older adults over age 80 and those younger than 25 were underrepresented, as were those from low-income households.

Transportation Characteristics of Respondents

Nearly all survey respondents reported being able to operate an automobile, and just a small

percentage reported having a medical condition or disability that makes it difficult to travel (Figure 1). Only 1% of respondents were from households without any automobile, while close to four out of five had two or more automobiles in their

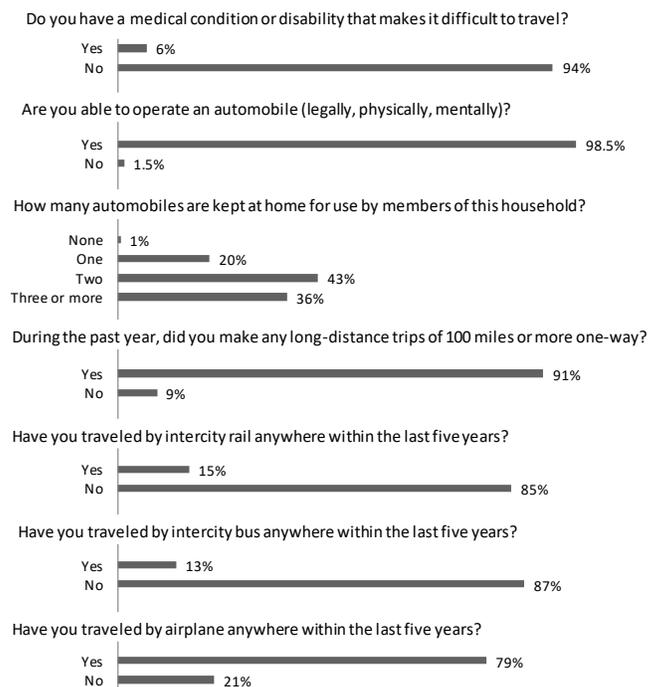


Figure 1. Transportation Characteristics of Survey Respondents

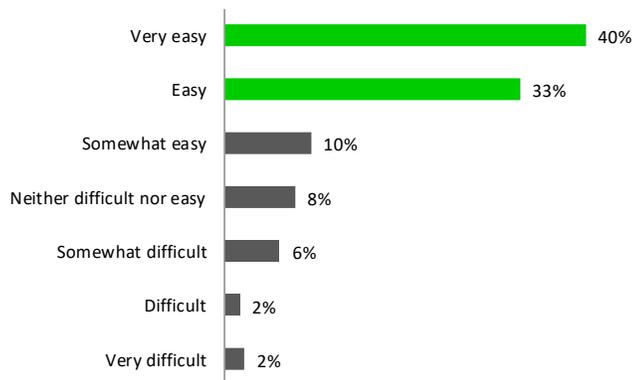


Figure 2. Survey Responses on How Easy it is to Travel to Other Cities in North Dakota

household. Most respondents (91%) had made a long-distance trip of 100 miles or more one-way within the previous year, though nine percent had not taken any such trips. Most respondents were not recent users of intercity bus or rail services, but many had traveled by airplane. Within the previous five years, 15% had traveled by intercity rail, 13% had traveled by intercity bus, and 79% had traveled by airplane.

Opinions on Ease of Travel and Need for Improvements

Most respondents reported that it was easy for them to travel to other cities in North Dakota. Out of 539 responses, 73% answered that it was either easy or very easy (Figure 2). Ten percent reported that it was either somewhat difficult, difficult, or very difficult.

Survey respondents were then asked, regarding travel between towns and cities in North Dakota, how much there is a need for highway improvements, bus service improvements, passenger rail service improvements, and air service improvements (Figure 3). Respondents were most likely to indicate a need for highway improvements, which was not surprising given that the automobile is the predominant mode of travel within the state. Twenty percent indicated a high need for highway improvements, and 55% answered there is a moderate need.

About half of respondents did not know if there is a need for bus or rail service

improvements, which again was not surprising given the lower usage of these modes. Despite the low use of bus and rail services by these respondents, many indicated a need for service improvements. Twenty-nine percent said there was a high or moderate need for bus service improvements, and 34% answered the same for rail service improvements. Very few answered that there was no need for improvements of bus or rail. Regarding air service, 46% answered there was a high or moderate need for improvements.

Travel Attitudes

The survey presented a number of statements about travel, and the respondent was asked to respond on a 1-10 scale the degree to which he or she agreed or disagreed with the statement, with a higher number indicating greater agreement. These statements described a number of attitudes regarding the traveler’s sensitivity to the environment, time, flexibility, safety, stress, comfort, reliability, privacy, convenience, and other elements of the travel experience.

The average responses from these questions are shown in Table 1. The highest rated statement, with an average response of 8.4, was, “If my travel options are delayed, I want to know the cause and length of the delay.” In fact, 42% of respondents answered with a 10 on this statement. The next highest rated statements were regarding timeliness, comfort, predictability, and cleanliness.

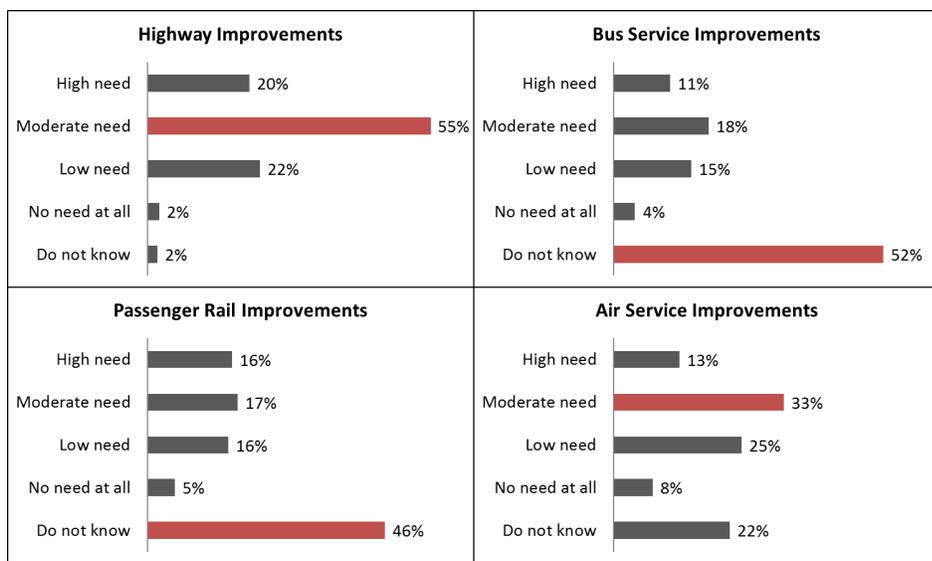


Figure 3. Survey Responses on Need for Intercity Transportation Improvements in North Dakota

Table 1. Average Scores for Travel Attitude Questions

Average Score	Statement
8.4	If my travel options are delayed, I want to know the cause and length of the delay.
8.1	When traveling, I like to keep as close as possible to my departure and arrival schedules.
8.0	It is important to have comfortable seats when I travel.
8.0	I prefer a travel option that has a predictable travel time.
7.8	A clean vehicle is important to me.
7.0	I would like to make productive use of my time when traveling.
6.8	I would change my form of travel if it would save me some time.
6.8	Having a stress-free trip is more important than reaching my destination quickly.
6.2	I would rather do something else with the time that I spend traveling.
5.9	Having privacy is important to me when I travel.
5.7	It's important to be able to change my travel plans at a moment's notice.
5.6	I need to make trips according to a fixed schedule.
5.6	I avoid traveling at certain times because it is too stressful.
5.6	The people who fly are like me.
5.5	I prefer to make trips alone, because I like the time to myself.
5.5	When traveling, I like to talk and visit with other people.
5.4	I'm willing to pay more for a ticket if it allows me to re-book my trip later for free.
5.0	I use the most convenient form of transportation regardless of cost.
5.0	I always take the fastest route to my destination even if I have a cheaper alternative.
4.7	I don't mind traveling with strangers.
4.5	The people who use intercity rail service are like me.
4.5	I would switch to a different form of transportation if it would help the environment.
4.4	I worry about getting into an accident when I travel.
4.4	I don't mind long delays as long as I'm comfortable.
4.1	The people who ride intercity bus are like me.
4.1	I would be willing to pay more when I travel if it would help the environment.
2.7	People who travel alone should pay more to help improve the environment.

Environmental issues were not a primary concern for survey respondents. The lowest-rated statement, with an average score of 2.7, was, "People who travel alone should pay more to help improve the environment." In fact, 45% gave a response of 1 to this statement. Statements regarding the willingness to pay more or to switch to a different form of transportation if it would help improve the environment also received among the lowest scores.

The average response to the statements that people who fly, ride intercity rail, or use intercity bus services are "like me" were 5.6, 4.5, and 4.1, respectively. The lower responses for intercity rail and, especially, bus suggest that people perceive users of these services to be different from them.

Other statements receiving low ratings regarded concerns about getting into an accident (respondents tended to be not too worried) and long delays (although they valued comfortable seats, the statement "I don't mind long delays as long as I'm comfortable" received a low score).

Responses to these attitudinal questions were very similar to those from a previous survey conducted in 2009.

Stated Preference Response

Each respondent was given nine stated preference (SP) questions to answer. Each SP question described a hypothetical intercity trip, and the respondent was asked to identify whether he or she would travel by automobile, airplane, bus, or train for the trip. In each question, the respondent was given the cost, travel time, access distance, egress distance, and frequency for each mode, and the values for these factors varied between questions. The respondent also had to consider trip distance, trip purpose, and if they were traveling alone or in a group.

Respondents chose the automobile 73% of the time, while air, rail, and bus accounted for 13%, 10%, and 4% of responses, respectively. While it was expected that the automobile would be the dominant mode of choice, the results also revealed a clear preference to rail travel over bus travel.

More interesting than the overall mode shares is how mode shares change with changes in demographic, trip, and mode characteristics. Table 2 shows changes in mode choices with changes in demographic characteristics. Men were more likely than women to choose automobile, and a greater percentage of women chose rail travel. Older adults tended to be less likely to choose air travel. Those from lower income households tended to be less likely than others to choose automobile or air travel and more likely to

Table 2. Mode Choice Data from the Stated Preference Survey

	Auto (%)	Air (%)	Bus (%)	Rail (%)
Gender				
Male	75	12	4	8
Female	70	14	4	12
Age				
< 25	71	13	6	10
25-49	70	16	4	10
50-69	77	11	4	9
70+	76	7	6	11
Household Income				
<\$25,000	69	11	6	14
\$25,000—\$49,999	67	14	6	12
\$50,000—\$74,999	78	10	4	8
\$75,000—\$99,999	74	14	3	9
\$100,000+	74	14	3	9

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choose bus or rail travel. For example, bus travel was chosen 6% of the time by those with income below \$50,000 but just 3% of the time by those with income of \$75,000 or more.

Mode choice percentages changed significantly based on the length of the trip. As trip distance increased, the automobile was chosen less often, and air and rail were chosen more often. While air travel was rarely chosen for 50- or 100-mile trips, it was chosen 12% of the time for 250-mile trips and 37% of the time for 400-mile trips. Meanwhile, rail shares increased from 6% for 50-mile trips to 14% for 400-mile trips. Bus shares, on the other hand, were consistently 4-5%, regardless of trip distance.

Mode shares were found to change with changes in the price of gasoline. As the price of gasoline increased from \$2.00 to \$5.00, the auto share decreased from 79% to 65%, while the bus share increased from 3% to 6% and the rail share increased from 6% to 15%. The most significant impacts occurred as the price of gasoline increased from \$3.50 to \$5.00. The impacts on mode shares were much smaller when the gasoline price varied between \$2.00 and \$3.50. As expected, the results also showed that respondents were more likely to choose bus or rail if fares decreased or if travel times improved.

These statistics are based on the raw survey data and are presented to illustrate correlations found in the survey responses. The larger project on rural intercity bus demand involves additional analysis to determine the statistical significance of these relationships.

Also of note, the results from the survey were based on the hypothetical conditions presented in the SP questions and may not

be representative of real-world conditions present to North Dakota travelers. For example, many North Dakotans do not live close to a rail or bus station, so the actual, real-world mode shares for bus and rail travel are expected to be smaller. The results from this survey, though, can be used to develop a mode choice model, and the results from that model can be incorporated into a statewide travel demand model that would estimate the number of trips made by each mode between different origins and destinations within the state. Such a model would take into consideration actual travel times by each mode, as well as access and egress distances and other mode and trip characteristics.

Conclusion

Results from the survey suggest that North Dakota residents are largely satisfied with intercity travel within the state, as most indicated it is easy to make such trips. Many indicated a moderate need for highway improvements in the state, and some also indicated a need for bus, rail, and air improvements. Many respondents, however, were not users of intercity bus or rail and did not know if improvements in these services were needed.

Responses to the attitudinal questions showed that North Dakotans place a high value on predictability, comfort, and cleanliness.

Stated preference survey responses show that intercity rail is preferred to bus, and the automobile is the dominant mode. The mode shares were shown to vary based on individual, mode, and trip characteristics. Demand for intercity bus appears to be greater for those with lower income, as well as those over age 70 or younger than age 25.