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Attributes and Amenities of
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That Are Important to Tourists



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Final Report

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EXECUTIVE SUMMARY

There has been very little research conducted on travelers using highways with respect to their preferences for how these roads should be designed. The literature available on the subject is primarily based on users of designated scenic highways with a focus on economic impact. From that limited perspective, it appears that users of scenic highways exhibit different behavior, especially with regards to expenditures, than users of non-designated highways. This study attempted to extend existing research to encompass users of both scenic designated and non-designated highways in the state of Minnesota. The focus of inquiry dealt with user preferences for highway features: attributes, amenities, and aesthetics. It also extended the use of benefit-based studies, a staple of recreation research, into the field of highway user studies. To our knowledge this has never been accomplished before.

Initially twelve road segments were chosen for analysis. This number was reduced to eleven when it became clear that acquiring a quota (200 usable responses) for one particular road segment would not be possible. Data collection was accomplished using a two-step procedure. Field researchers were hired and trained to intercept highway users that they found stopped along the roadway. Most contacts were made at official rest stops although some roads contained numerous areas to pull off and contacts were made at those stops as well. Once a field researcher contacted a highway user, a series of qualifying questions was asked, including the location where they entered the highway in question. The highway user was then asked to complete a questionnaire at that time. They could either complete it using a hard copy or answer questions on a POV2000Survey unit, which is a hand held computer that contained the entire questionnaire. Data collection was conducted from June to October 2001; a road segment was considered finished when 200 completed questionnaires were received.

Results reveal that each road segment possessed its own character that users are able to discern and evaluate independently of other road segments. In addition it was found that different user groups using the same roadway seek different benefits from the driving experience. What follows are some of the more revealing results from the study.

Natural scenery consistently shows up as an interesting feature of the road segment regardless of which road segment was examined. When features of the natural scenery were examined, items such as lakes and rivers, or forests showed a high degree of interest to the travelers. Other items such as shopping had high interest levels for users of some road segments, but with almost no appeal to users of other road segments.

The majority of users of seven of the eleven road segments indicated they chose that road because it was the fastest route to their final destination while users of the other four had different reasons, including the scenic aspects of the road, for choosing that road segment as their primary route.

Users had different perceptions as to how they would like to see each roadway designed and managed. In general, highway users desire to see businesses clustered in communities rather than along the roadway. There was also strong support for viewing native vegetation growing close to the road, with wildflower-like vegetation most desired. Certain roadways elicited unique responses such as those expressed by users of segment 2 (TH 38 Edge of the Wilderness Scenic Byway From Grand Rapids to Bigfork), who were concerned about safety issues due to the narrow shoulder provided along the older stretch of this road.

Different benefits were available to users of the various road segments. There appears to be a sizeable group of users found on most road segments that are engaged in the act of driving for pleasure. Activities with low entrance cost that are easy in terms of entry and exit (e.g. bird watching, hiking) appear to appeal to this group of travelers. This group is also attracted to small towns and cultural attractions associated with small town life.

Scenic Byway designation does appear to send a message to users that something different is expected when choosing that particular type of travel route. There are a number of highway users that will choose a route because it carries a Scenic Byway designation.

There is a group found on all road segments (with the exception of segment 1) who is only interested in a highway if it gets them to their final destination quickly and safely. The size of this group is estimated to be between 10-15% of the population of roadway users.

Protection of the natural environment scored highest when roadway users were asked their opinion regarding how highways should be managed. Other management options such as cultural uniqueness, employment and income, recreation, etc. were also favored, but at a lower level than that recorded for protecting the natural environment.

When users of road segment were examined with respect to the types of benefits sought from the traveling experience, getting away from the usual demands of life, to enjoy the scenery of the area, and to be with members of my travel party scored highest in terms of benefits sought and attained.

There were small groups of users of each road segment interested in experiencing local culture or agricultural practices, but they were generally unable to attain these desired benefits. Although the number of users that selected a particular route with the hope of experiencing local culture or agricultural practices was small, the results indicate that some users are interested in cultural, history or agricultural aspects of the experience that are not currently being attained.

Does preference lead to action? This is a question that arose from the study. While this report contains numerous indications of how users would like to see specific road segments designed, there is nothing to indicate that preference leads to overt action. For example many people indicated they chose the route they were on because it would take them, in the most direct way, to their final destination. Yet in the study, people indicated they chose roads because of the features they expected to encounter (e.g., scenic byway should be scenic). Does preference lead to action? The results from this study are mixed when it comes to answering that question definitively.

This study was only conducted during months when tourists were likely to be encountered (i.e. July –October). It is entirely possible that preferences for roadway attributes, amenities, and aesthetics would change in different seasons. It is also possible that the size of the different benefit-based groups would also vary by season.

Finally the null hypotheses that guided this study must be rejected. Instead, we conclude:

Users of the various road segments were able to differentiate between the attributes and amenities found along a particular road and indicate their preference for each one.

There is strong evidence that different user groups using the same roadway seek different benefits from the driving experience.

CHAPTER 1

INTRODUCTION

The major means of tourist travel around the United States are airplanes, automobile, rail, recreational vehicles (RV) and tour buses. Whether or not they arrive by air or by rail, recreational travelers will eventually use state roads to see the countryside or reach a site of historical value, entertainment or scenic beauty [1].

According to a Federal Highway Administration survey, 23% of all vehicle trips and 30% of vehicle miles are driven for purposes such as vacations, visiting friends and relatives, pleasure driving and other forms of recreation. In 1989, U.S. residents took more than 1.3 billion person trips 100 miles or more away from home and spent \$350 billion doing so.

At the same time, a growing number of foreign tourists are coming to America. Many of these international visitors are choosing to travel to America because they view a vacation trip to the United States as a bargain. These visitors increasingly fly inland “gateway” cities where they rent cars and take their own driving tours [2]. A recent report from the Travel Industry Association of America indicates that travel and tourism is a \$ 350 billion a year industry and ranked as either the first, second or third largest employer in 37 of 50 states.

The travel and tourism industry is one of Minnesota’s largest industries and has an economic impact of \$8.7 billion dollars on the state’s economy. Over 85 percent of Minnesota’s pleasure travelers use our roadways as their primary mode of transportation and the other 15 percent use our roads to gain access to attractions or to move from one place to another during their visit [3]. It is important to understand the reasons people choose certain roads as that choice may add or detract from total trip satisfaction and ultimately travel-related expenditures. Within the body of roadway research, there have been many studies about resident road users travel patterns but very little focus on the tourist road user. Since tourism is very important to Minnesota’s economy and especially to many of the state’s rural areas – in a number of northern counties it accounts for 10% + of jobs [4]– the evaluation procedure for road improvements and enhancements

should include a tourism perspective. Currently, much of the valuation of road user benefits is based on travel timesaving, improved safety, and reduction in vehicle costs. While these benefits apply to many tourist road users, they are not the only ones that need to be considered.

The usual assumption that travel is a cost, and time spent in travel is a disutility, does not apply well to tourist travel. Tourists frequently derive pleasure from driving. In fact, driving for pleasure ranks among one of the top recreational activities for adults in the U.S. [5]. Walsh et al, have found that the value attached to the experience of sightseeing is high relative to the disutility of traveling. They also found that many people traveling on scenic roads are prepared to pay for their scenic driving experience with increased travel time. A tourist's willingness to pay is related to a number of variables such as distance traveled, type of trip, opportunity costs of time, income, age, preferences and quality of scenery.

Most road-related research that has a tourism component focuses on scenic byways. Most of the literature on Scenic Byways deals with explaining the national and state scenic byway programs [6] or safety standards for rural roads [7]. Within the studies on scenic byways very little has been done to link tourist preferences to road characteristics and ultimately route decisions. A number of studies using various approaches examine the qualities of view. One in particular, *A Look at the Iowa Scenic Byways Pilot Program* by Davidson-Peterson Associates [8] evaluated the perception that travelers had of the visual characteristics of Iowa's scenic byways and compared those perceptions to those held by local community leaders. They found that visitors valued many scenic qualities and features of the byways far greater than community leaders thought they would. This discrepancy between the perceptions of community leaders and visitors provides evidence that more research on road characteristics from a visitor/user point of view is needed in order to optimize roadway development for tourists.

Other studies on scenic byways attempt to measure the economic impact of the "scenic" designation. Two methods are commonly used. One involves measuring traffic volume before and after the "scenic" designation. The other is to sample users, collect expenditure data, and extrapolate to total traffic volume. There are a number of studies on specific scenic byways that

use one or the other of these methods to measure the economic impact of scenic byway designation.

Finally, there is a small body of research that attempts to measure roadway characteristics that impact user experiences. In most cases this research uses a Likert (or modified Likert) scale to measure a respondents preference to a number of characteristics. This technique has limitations in that there is no way to differentiate characteristics with similar ratings and no way to compare the relative benefits and costs of a policy decision about the characteristics. Tyrell and Devitt [9], in their study, “An Analysis of the Economic Impacts of Scenic Byway Treatments to Vermont: A Pilot Study” use a paired comparison technique on an intercept survey to assess a visitor’s relative preferences between two road way scenarios containing sets of seven roadway characteristics. This is a pilot study and thus is a very limited, but offers insight on the use of a technique that attempts to place a dollar value on a change in roadway characteristics.

One of the best studies completed to date that considered user preferences is *Scenic Byway Development on the Oregon Coast* [10]. The roadway in this study is coastal highway US 101, which is a rather long stretch of road with numerous characteristics ranging from scenic views to urban sections. This study used a focus group technique to determine variables for further investigation and then intercepted actual users to complete surveys onsite. The method they employed is essentially the same as the one utilized in this study. Some of their findings were relevant to this study. Specifically, they identified four user preferences with respect to US 101. Road travelers wanted to see vegetation managed to open up scenic vistas, improved bicycle facilities, more passing lanes, and more protection of scenic areas.

The study presented here was an attempt to link tourist preferences to different sets of road characteristics. In doing so some of the following questions were addressed:

- Do road characteristics such as speed limits, shoulder width; traffic problems have an effect on a potential vacationers selection of a roadway?

- Are some safety, maintenance and/or design characteristics more important to tourists than other intrinsic characteristics of the route?
- Do benefits sought from the driving experience have any affect on route selection?
- Do attributes such as scenic designations, number of pull offs, and vegetative maintenance impact on users selection of a particular route?
- What overriding management philosophy should be followed when designing transportation corridors?
- Are there some road characteristics, and if so which ones, that change the role of the road from that of a transport route to the road, itself, becoming part of the tourist destination experience.

The next section details the methods employed to address the questions posed above.

CHAPTER 2

METHOD

This study began with very little understanding of roadway users preferences for selected road attributes, amenities, and aesthetics. As discussed in the section above, very little information existed in the literature on users preferences for certain roadway features. Therefore, it was decided to begin this investigative study with a series of focus groups in different parts of the state to elicit issues related to road user preferences. The research format for the focus groups and findings from that work was contained in a previous report submitted as part of this study's deliverables. Information gleaned from the focus group effort was instrumental in designing the questionnaire used to collect information for the second phase of the research effort.

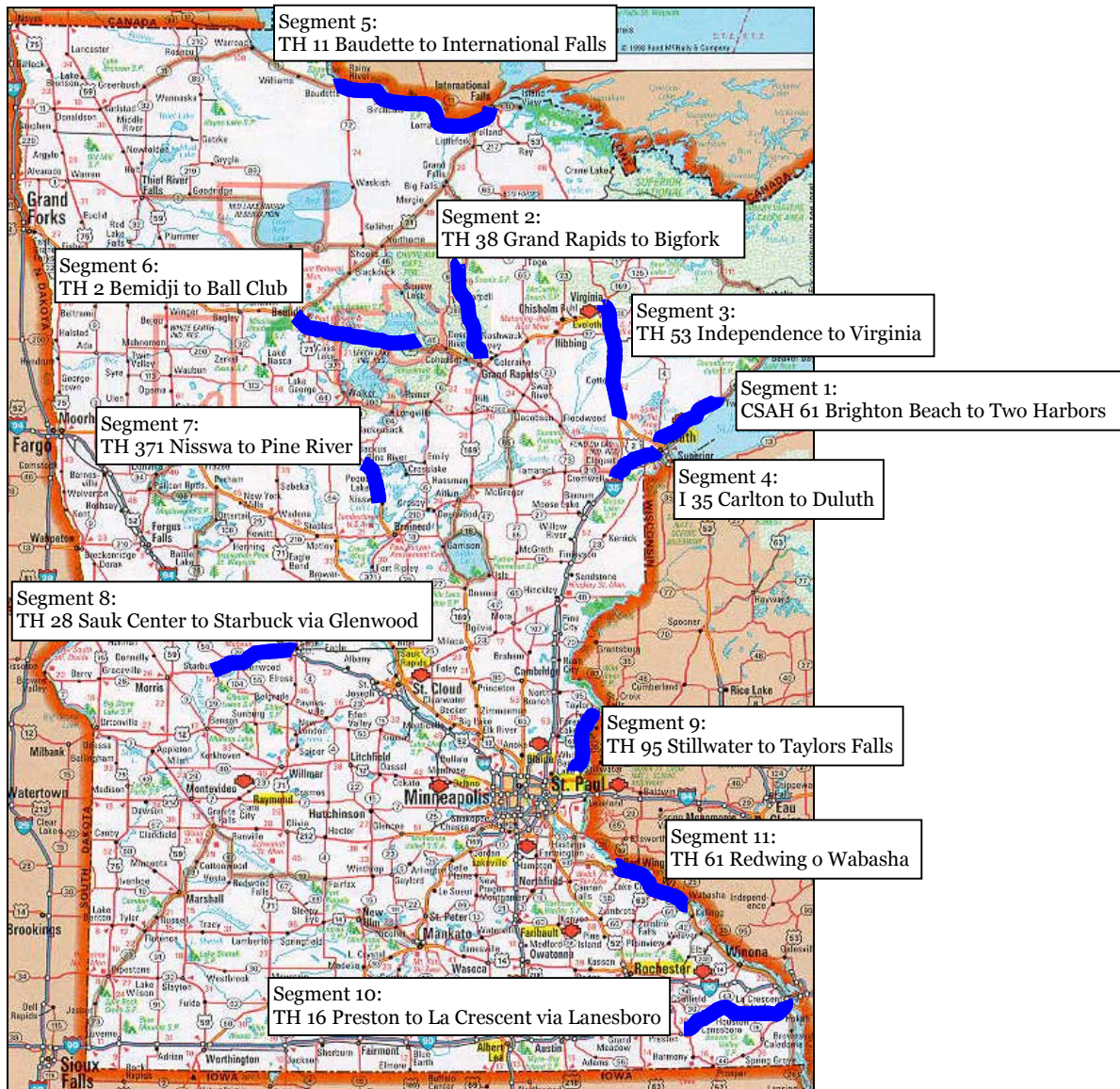
For phase two of this research, the initial step involved the selection of different road segments where questionnaires could be administered to a sample of travelers. It was decided that a wide range of roads, with varying design characteristics, should be selected for intercept survey work. Information gathered from members of the Technical Advisory Panel, assembled to help guide this study, was used for route selection along with suggestions from Mn/DOT maintenance engineers and Tourism Center researchers. Initially, 12 roadways in different parts of the state were selected. Table 2.1 outlines each segment. As this table suggests, the roadways differed on a number of characteristics. Some of the highways are four-lane divided roads, and some are two lanes. Some of the road segments are located in areas of the state frequented by tourists, while others are in close proximity to urban areas or in rural areas. The road segments were also varied in terms of natural elements located along the roadway. Finally, some of the roads selected were included because of their scenic byway designation.

Table 2.1: Description of Road Segments

Segment	Segment Length	Mn/DOT District	Number of lanes	Divided/ Not Divided	Natural Elements
1 St. Louis CSAH 61 Brighton Beach Road to Two Harbors	16 miles	1	2	Not Divided	Lake, cliffs, forests
2 TH 38 Grand Rapids to Bigfork	40 miles	1	2	Not Divided	Lakes, forests, hills
3 TH 53 Independence to Virginia	39 miles	1	4+	Divided	Lakes, forests
4 I 35 Carlton to Duluth	15 miles	1	4+	Divided	Lake, city, harbor
5 TH 11 Baudette to International Falls	60 miles	2	2	Not Divided	Forests, lakes
6 TH 2 Bemidji to Ball Club	45 miles	2	2	Not Divided	Lakes, forests
7 TH 371 Nisswa to Pine River	29 miles	3	2	Not Divided	Lakes, forests
8 TH 28 and TH 29 Sauk Centre to Starbuck via Glenwood	40 miles	4	2	Not Divided	Lakes, woods, farmland
9 TH 95 Taylors Falls to Stillwater	26 miles	Metro	2	Not Divided	River, woods, cliffs
10 TH 16 La Crescent to Preston via Lanesboro	46 miles	6	2	Not Divided	Forests, cliffs, river
11 TH 61 Red Wing to Wabasha	29 miles	6	2	Not Divided	Mississippi River, trees
12 Nicollet CSAH 21 TH15 to Fort Ridgely State Park	16 miles	7	2	Not Divided	River, woods, farms

Data collection was done through the use of a questionnaire (Appendix A). The questionnaire was available as a hard copy (i.e. printed on paper) or in computer format on a POV2000 Survey Unit, provided by Your Perceptions, Inc. Users were asked which form of questionnaire they preferred to complete. Field researchers conducted intercept surveys with visitors stopped at travel information centers, developed rest stops, historic sites or scenic pull-offs located along road segments. Where well-defined pull-offs were not available, field researchers were asked to stop along the roadway when they found users at less-developed pull-offs or, in some cases, encountered users in communities along the route. Data collection was conducted from June to October 2001. The quota of completed questionnaires for each route was 200. For all road segments, the quota of 200 completed responses was reached or exceeded, with the exception of segment 12, where not enough completed surveys were obtained, so the segment was dropped from further analysis. Map 2.1 illustrates the location of the 11 road segments included in this study. See Appendix B for maps detailing each road segment.

Map 2.1: Road Segments Included in the Study



Data were analyzed using SPSS (Statistical Package for the Social Science) to determine user characteristics and preference for the attributes and amenities under investigation. Since the focus of this phase of the research was to examine how different amenities and attributes affected users preference and selection of transportation route, this null hypothesis guided this research effort:

There is no statistically significant difference between how people rate the importance of roadway attributes and amenities present (or absent) along a particular roadway when compared to other road segments in the study.

A companion null hypothesis was also tested:

There is no indication that different user groups using the same roadway seek different benefits.

Before examining what significant differences might exist between users of the different roadways in this study some general discussion about all users in general is presented. That will be followed by a more in depth discussion of users by specific road segment.

CHAPTER 3

FINDINGS

DESCRIPTIVE DETAILS

Most Interesting Aspects of Road Segments

What are the most interesting aspects of this road segment? Respondents were asked to identify up to three items that they found to be most appealing about a given road segment. Overall, the natural scenery was rated as the most interesting aspect of every road segment. The items with the highest and lowest percentages for each segment are underlined in Table 3.1. Other consistently high percents included lakes and rivers (all segments), and forests (segments 2, 3, 5, and 6). Recreational opportunities were particularly interesting to travelers on segment 10, while small towns were interesting to road travelers on segments 6 and 11. The least interesting aspects of most road segments were farms (segments 1, 2, 3, 4, 9, and 11), shopping (segments 5, 6, and 10) and historic or cultural sites (segments 7 and 8).

Table 3.1: Most Interesting Aspects of Road Segments

Segment	Small towns	Lakes and rivers	Farms	Recreational opportunities	Natural scenery	Historic or cultural sites	Shopping	Forests	None of these
1	16.1%	70.0%	<u>3.5%</u>	19.2%	<u>79.4%</u>	16.1%	10.1%	27.3%	1.5%
2	9.8%	68.8%	<u>1.3%</u>	24.8%	<u>83.8%</u>	10.3%	1.7%	46.2%	0.9%
3	26.1%	55.7%	<u>5.3%</u>	17.7%	<u>84.7%</u>	20.6%	7.1%	54.5%	6.6%
4	18.5%	63.0%	<u>16.5%</u>	30.3%	<u>76.6%</u>	23.3%	18.3%	35.7%	11.8%
5	20.4%	77.1%	24.7%	31.4%	<u>78.2%</u>	35.0%	<u>5.9%</u>	40.5%	1.5%
6	47.4%	77.8%	16.5%	35.0%	<u>86.9%</u>	29.1%	<u>8.9%</u>	61.4%	5.2%
7	39.7%	50.5%	5.4%	22.5%	<u>63.7%</u>	<u>4.4%</u>	21.1%	26.5%	4.4%
8	39.2%	46.0%	27.7%	9.4%	<u>60.4%</u>	<u>2.8%</u>	3.3%	5.2%	5.7%
9	43.5%	60.0%	<u>10.6%</u>	18.4%	<u>88.6%</u>	25.0%	12.7%	21.6%	0.0%
10	42.4%	54.0%	10.9%	43.9%	<u>73.1%</u>	8.8%	<u>1.9%</u>	20.3%	5.6%
11	51.8%	77.8%	<u>9.3%</u>	28.0%	<u>79.5%</u>	25.2%	21.3%	22.6%	3.8%

Road Segment Choice

As Table 3.2 indicates, many road travelers chose a given road segment because it was the most direct and/or fastest route to take (segments 2, 3, 4, 6, 7, 8, and 10). Exceptions included segments 1, 5, 9, and 11. Segments 1 and 9 were chosen because each was seen as the most scenic route. Segment 5 was both the more direct route and the only reasonable road to take.

Reasons for choosing segment 11 were split among a number of categories: the most scenic route, the most direct, and the fastest route.

Interestingly almost 20% of visitors identified “other” reasons to travel along segment 10. Those other reasons included the route needed to reach a specific recreational activity (42% of other responses), the route needed to reach people who lived in the area (33% of other responses) and the route chosen by a group leader (25% of other responses).

Table 3.2: Road Segment Choice

Segment	Most scenic route	Didn't specifically decide to take it	Most direct route	Only reasonable road to take	Fastest route	Selected this road among several others	Other
1	65.7%	7.6%	8.6%	6.1%	1.0%	6.1%	5.1%
2	13.2%	2.6%	25.9%	13.6%	26.3%	4.4%	14.0%
3	3.3%	0.8%	49.2%	10.2%	32.8%	1.6%	2.0%
4	7.4%	7.4%	44.6%	8.3%	26.0%	5.4%	1.0%
5	7.4%	5.9%	35.6%	25.5%	15.4%	2.1%	8.0%
6	6.3%	2.4%	48.8%	7.7%	25.6%	5.3%	3.9%
7	2.1%	0.5%	41.8%	11.3%	32.5%	4.1%	7.7%
8	4.0%	2.5%	41.2%	18.1%	27.6%	2.0%	4.5%
9	49.5%	8.1%	11.6%	2.5%	11.1%	7.6%	9.6%
10	7.0%	1.4%	26.8%	18.3%	25.4%	1.4%	19.7%
11	31.5%	3.9%	26.4%	7.9%	21.9%	5.6%	2.8%

Prior Road Segment Experience

More than two-thirds of road travelers had driven the road segment previously, as Figure 3.1 indicates. Segments 7 and 8 had the highest proportion of respondents with prior experience on that road segment (97.0% and 96.6%, respectively). Segments 5 and 10 received the highest percent of new road travelers (31.1% and 32.4% respectively).

If respondents reported having prior experience on a road segment, they were asked to indicate the frequency of trips on that segment in the last 12 months. Figure 3.2 illustrates the proportion of travelers who reported traveling that segment “rarely,” “occasionally,” or “almost daily.”

Travelers on segments 1, 2, 3, 6, 9, 10, 11 most often reported taking that segment “occasionally” in the past 12 months. The majority of travelers on segment 4 reported taking that segment “rarely” in the past 12 months, while most travelers on segments 7 and 8 reported taking

that segment “almost daily” in the past 12 months. Travelers on segment 5 were fairly evenly split across all frequency categories.

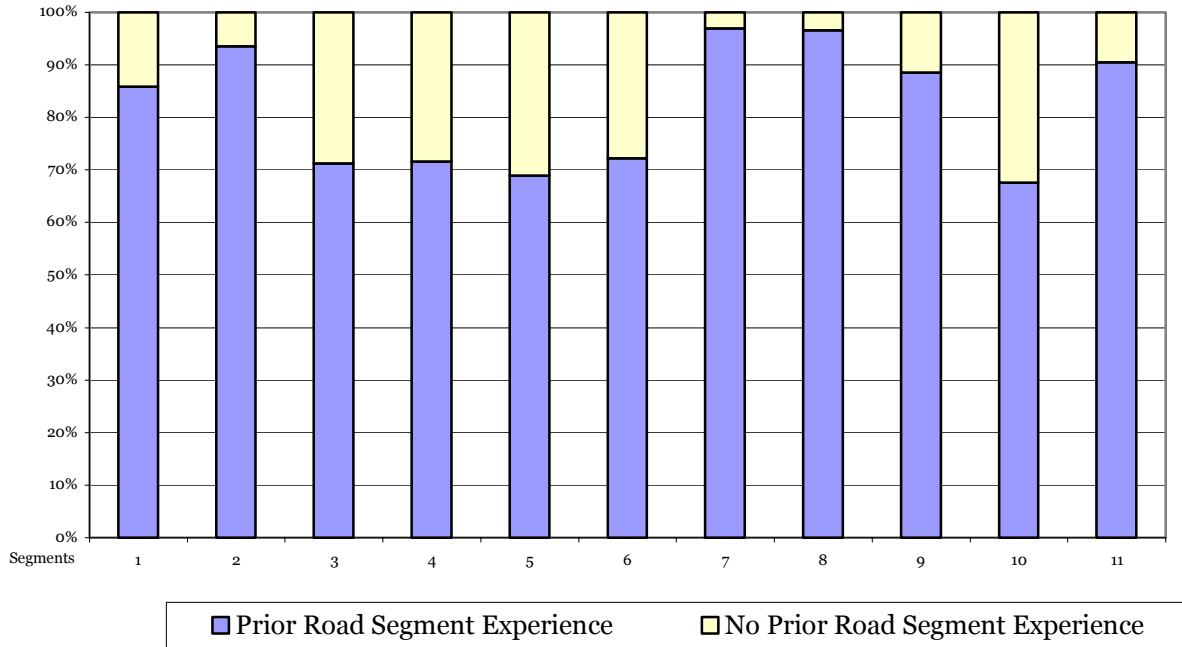


Figure 3.1: Prior Road Segment Experience

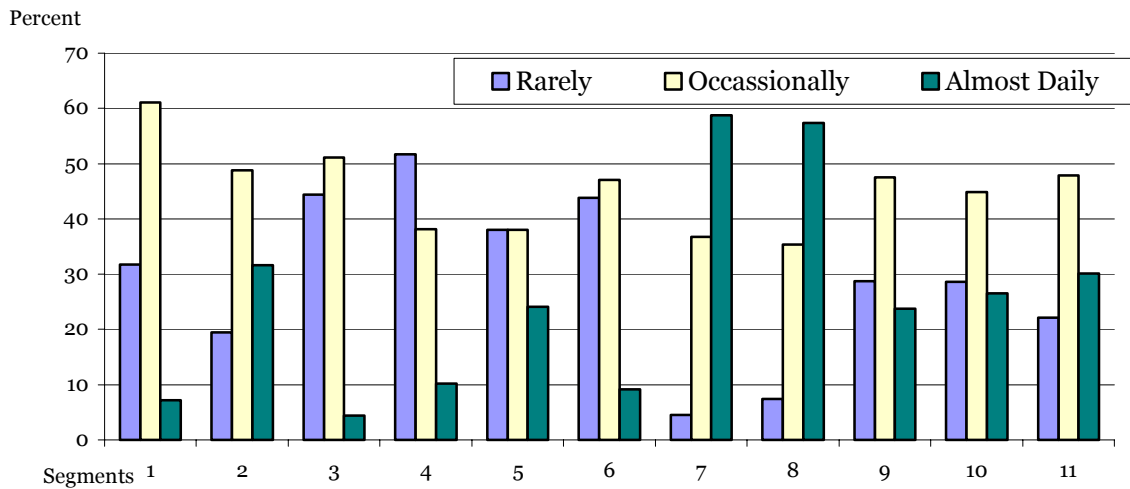


Figure 3.2: Trip Frequency

Travel Party Size

The average travel party size was about 2 people (Figure 3.3). Segments 1, 2, 3, 4, 5, 6, and 10 averaged slightly more and 2 people per travel party, while segments 7, 8, 9, and 11 averaged slightly less than 2 people per travel party. The largest travel party size (mean=3.00) was reported for segment 10, and the smallest travel party size (mean=1.66) was reported in segment 8. Table 3.3 below details the number of people in the travel party by road segment.

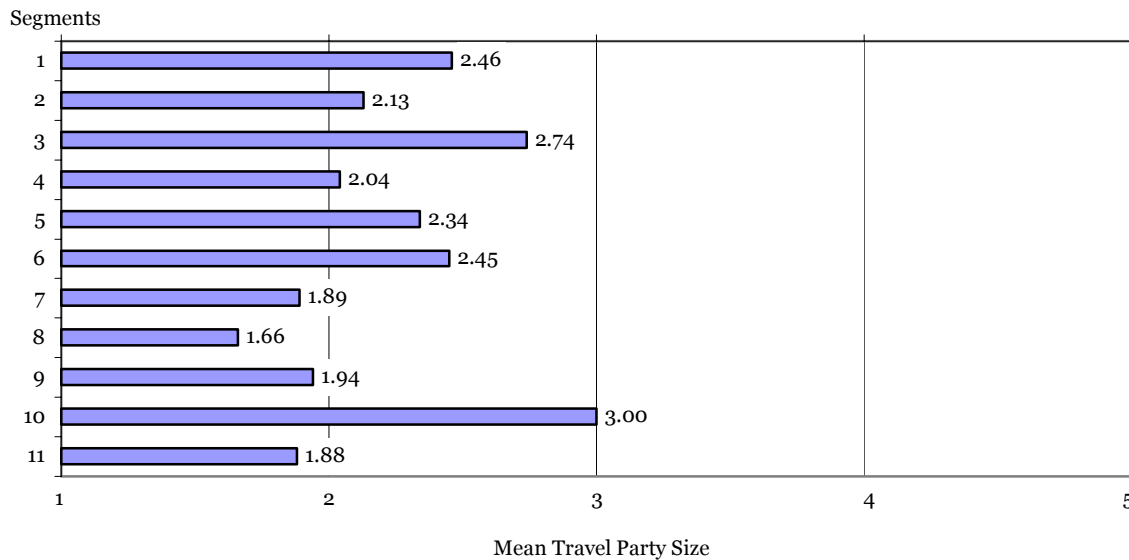


Figure 3.3: Mean Travel Party Size

Table 3.3: Percent of People by Travel Party Group Size

Segment	1 person	2 people	3 people	4 people	5 people	6 people	7 people	8 people	9 or more people
1	18.1%	48.7%	13.6%	14.6%	1.5%	2.0%	1.0%	0.0%	0.5%
2	28.1%	45.0%	15.6%	9.1%	1.7%	0.4%	0.0%	0.0%	0.0%
3	16.5%	45.0%	16.1%	10.7%	4.5%	2.9%	0.4%	0.0%	3.7%
4	17.7%	72.4%	1.5%	4.9%	3.0%	0.5%	0.0%	0.0%	0.0%
5	20.4%	50.3%	12.6%	9.9%	5.8%	1.0%	0.0%	0.0%	0.0%
6	21.2%	43.3%	12.5%	17.8%	4.3%	0.5%	0.0%	0.0%	0.5%
7	47.5%	37.6%	6.9%	5.0%	0.0%	0.0%	0.5%	0.5%	2.0%
8	59.5%	26.8%	7.3%	3.4%	2.0%	0.0%	0.5%	0.0%	0.5%
9	38.8%	43.9%	8.2%	5.6%	1.5%	1.5%	0.0%	0.5%	0.0%
10	33.8%	33.8%	7.0%	4.2%	0.0%	0.0%	0.0%	0.0%	21.1%
11	47.8%	30.3%	14.0%	4.5%	2.8%	0.0%	0.0%	0.0%	0.6%

Trip Purpose

Figure 3.4 illustrates the proportion of travelers who reported traveling that segment for “business,” “leisure,” or “personal” reasons. The majority indicated that the primary purpose of their trip along a given road segment was leisure-related. In fact, more than half of travelers along segments 1, 2, 3, 4, 5, 6, 7, 9, and 10 indicated they were on that segment for leisure purposes. However, other trip purposes were reported in significant proportions for respondents traveling on several of the road segments. Respondents along segments 7, 8, and 11 indicated they were traveling for business, while a notable proportion of respondents reported that they were traveling on segments 2, 6, 7, and 8 for personal reasons.

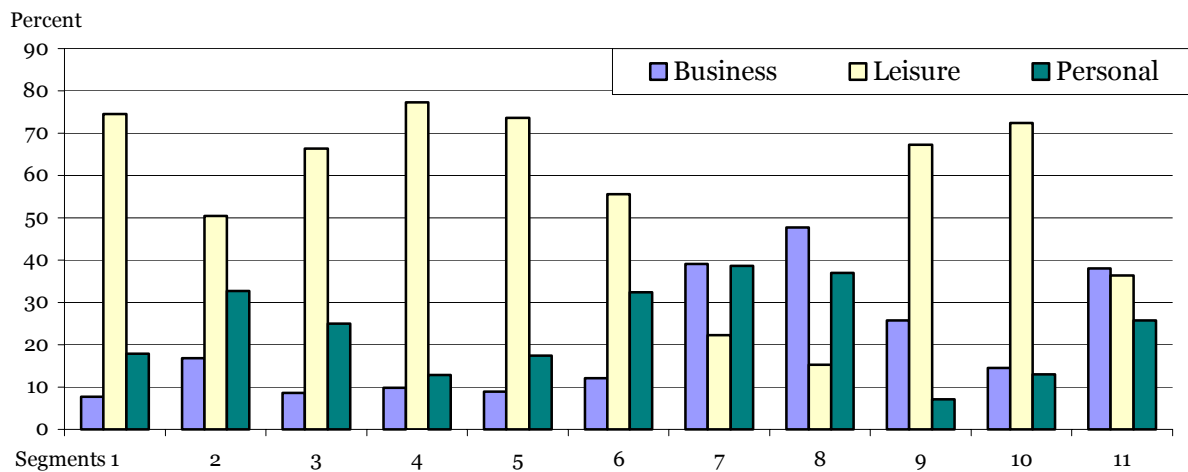


Figure 3.4: Trip Purpose

Business Travel

If respondents indicated that they were traveling on business, they were asked to indicate the type of vehicle in which they were traveling. The vast majority of business travelers were driving a car, pickup, or van without a trailer, although a significant proportion reported were driving a car, pickup, or van with a trailer (Table 3.4).

Segments 7 and 8 were the only two where business travelers reported driving a bus. Business travelers driving on segments 2, 4, 6, 7, 8, 9, and 11 reported using some “other” vehicle, including SUVs, motorcycles, and bicycles.

Business travelers were then asked to skip question #10 and #11 because their responses to road user preference and benefit items were not seen to be consistent with the opinions of tourists, but complete the remainder of the survey.

Table 3.4: Percent of Business Travelers by Vehicle Type

Segment	Car/pickup/van with trailer	Car/pickup/van without trailer	Commercial vehicle	Bus	Other
1	25.0%	66.7%	8.3%	0.0%	0.0%
2	37.0%	53.7%	5.6%	0.0%	3.7%
3	23.3%	63.3%	13.3%	0.0%	0.0%
4	36.4%	40.9%	9.1%	0.0%	13.6%
5	30.3%	66.7%	3.0%	0.0%	0.0%
6	41.2%	41.2%	11.8%	0.0%	5.9%
7	27.8%	51.1%	10.0%	8.9%	2.2%
8	25.0%	70.2%	1.9%	1.0%	1.9%
9	14.5%	72.7%	7.3%	0.0%	5.5%
10	23.1%	61.5%	15.4%	0.0%	0.0%
11	24.3%	67.1%	4.3%	0.0%	4.3%

Leisure or Personal Travel

As above, respondents traveling for leisure or personal reasons were asked to indicate the type of vehicle in which they were traveling. As Table 3.5 details, most were driving a car, pickup, or van without a trailer, although a substantial proportion reported were driving a car, pickup, or van with a trailer – likely pulling recreational equipment. Respondents driving on 9 of the 11 segments (excepting segments 2 and 5) reported driving motorcycles. Even so, they constituted a very small proportion of all vehicle types. Another vehicle type reported by personal and leisure travelers was the RV, although this vehicle type never comprised more than 10% of any segment. As with business travelers, segments 7 and 8 were the only two road segments where leisure and personal travelers reported driving a bus. All segments (except segment 10) recorded leisure and personal business using some “other” vehicle, predominately SUVs and bicycles.

Table 3.5: Percent of Leisure and Personal Travelers by Vehicle Type

Segment	Car/pickup/van with trailer	Car/pickup/van without trailer	Motorcycle	RV	Bus	Other
1	21.1%	67.6%	0.5%	9.7%	0.0%	1.1%
2	33.7%	58.5%	0.0%	4.7%	0.0%	3.1%
3	29.4%	64.2%	0.5%	3.7%	0.0%	2.3%
4	20.7%	71.2%	1.6%	3.8%	0.0%	2.7%
5	38.0%	56.6%	0.0%	4.8%	0.0%	0.6%
6	26.1%	56.7%	4.4%	10.0%	0.0%	2.8%
7	31.0%	60.3%	0.8%	1.6%	3.2%	3.2%
8	19.4%	73.1%	0.9%	0.0%	1.9%	4.6%
9	18.7%	66.7%	8.7%	0.0%	0.0%	6.0%
10	24.6%	70.5%	1.6%	3.3%	0.0%	0.0%
11	33.0%	60.9%	0.9%	2.6%	0.0%	2.6%

Recreational Equipment

Following the previous question, personal and leisure travelers were asked to indicate which, if any, of five specific recreational items were taken on the trip along this road segment. These items included bicycles, jet skis, kayaks/canoes/rafts, boats, and ATVs.

As Table 3.6 indicates, most respondents traveled without recreational equipment. Segment 10 is a prominent exception as more than half of respondents traveled with kayaks/canoes/rafts or bicycles. Boats were also notable on segments 2 and 5.

Drivers and Passengers

Respondents traveling for leisure or personal reasons were also asked to indicate their place in the vehicle. Figure 3.5 suggests that the majority of respondents in this sample were drivers, followed by front-seat passengers. Back-seat passengers were only included in proportions over 10% in segments 6 and 10.

Table 3.6: Percent of Respondents Traveling with Recreational Equipment

Segment	None of these	Bicycle	Jet Ski	Kayak/canoe/raft	Boat	All terrain vehicle (ATV)
1	81.4%	10.7%	0.0%	4.5%	2.8%	0.6%
2	71.0%	2.4%	0.4%	2.4%	21	2.8%
3	80.9%	1.8%	0.0%	9.8%	7.1%	0.4%
4	93.8%	3.9%	0.0%	1.7%	0.0%	0.6%
5	67.0%	0.6%	0.0%	3.4%	26.7%	2.3%
6	88.2%	5.9%	1.1%	1.6%	2.7%	0.5%
7	85.4%	5.1%	0.6%	0.6%	7.0%	1.3%
8	96.3%	1.5%	0.0%	0.7%	1.5%	0.0%
9	94.0%	3.6%	0.0%	1.2%	1.2%	0.0%
10	34.4%	16.4%	1.7%	47.5%	0.0%	0.0%
11	87.4%	6.3%	0.8%	1.6%	3.9%	0.0%

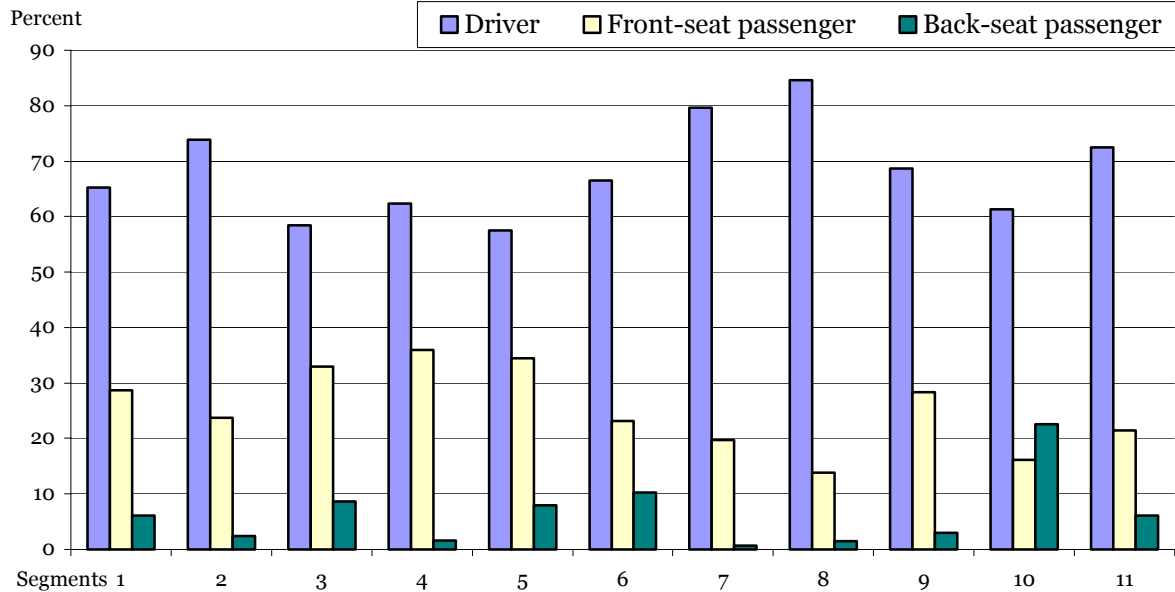


Figure 3.5: Drivers and Passengers

Demographics

Four demographic questions were asked of all road segment travelers, including home zip code, gender, income, and age.

Traveler Origin: Metro, Other Minnesota, and Out-of-state Travelers

Zip codes were used to compare traveler origin by road segment. Figure 3.6 shows that more than half of travelers on segments 9 and 11 were from the Twin Cities metro area, while the majority of travelers on segments 1, 2, 5, 7, 8, and 10 were from other areas of the state. Over 30% of travelers on segments 3, 4, 6, and 10 resided outside Minnesota.

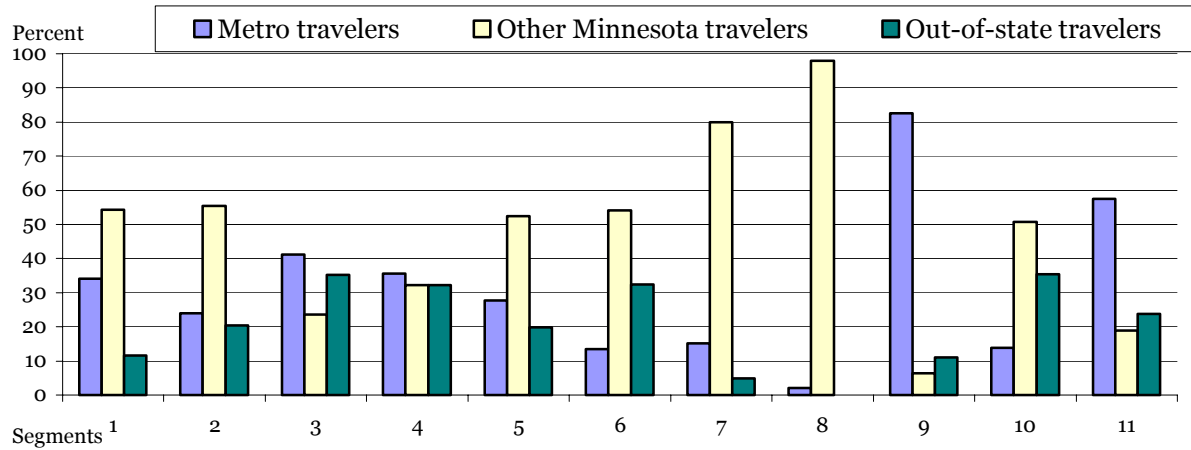


Figure 3.6: Traveler Origin

Traveler Origin: Zip Code Analysis by Road Segment

For a more detailed examination of traveler origin zip code maps were generated for each road segment using MapInfo Professional (Maps 3.1-3.11). As the maps and corresponding figures illustrate (Figures 3.7-3.17), some road segment attract more long distance travelers, while others serve a more local traveler base.

Map 3.1: Zip Code Analysis Map for Segment 1: CSAH 61 Brighton Beach to Two Harbors

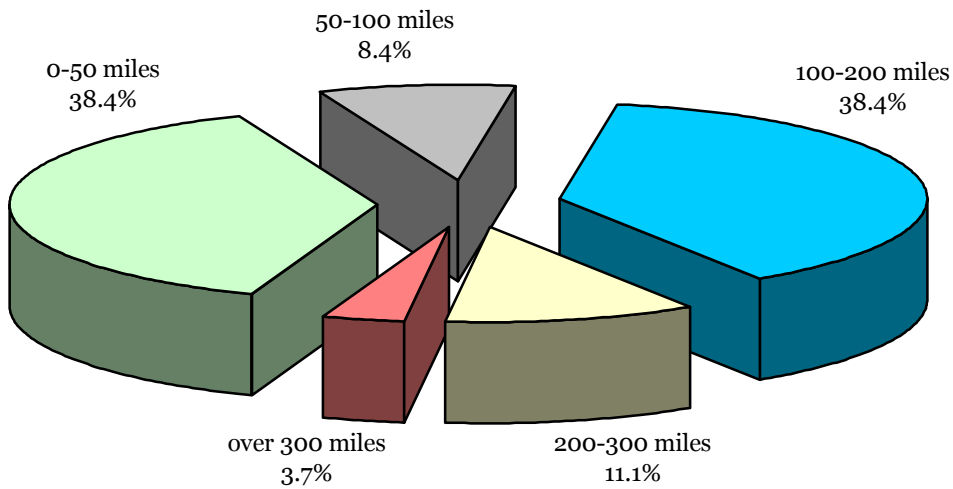
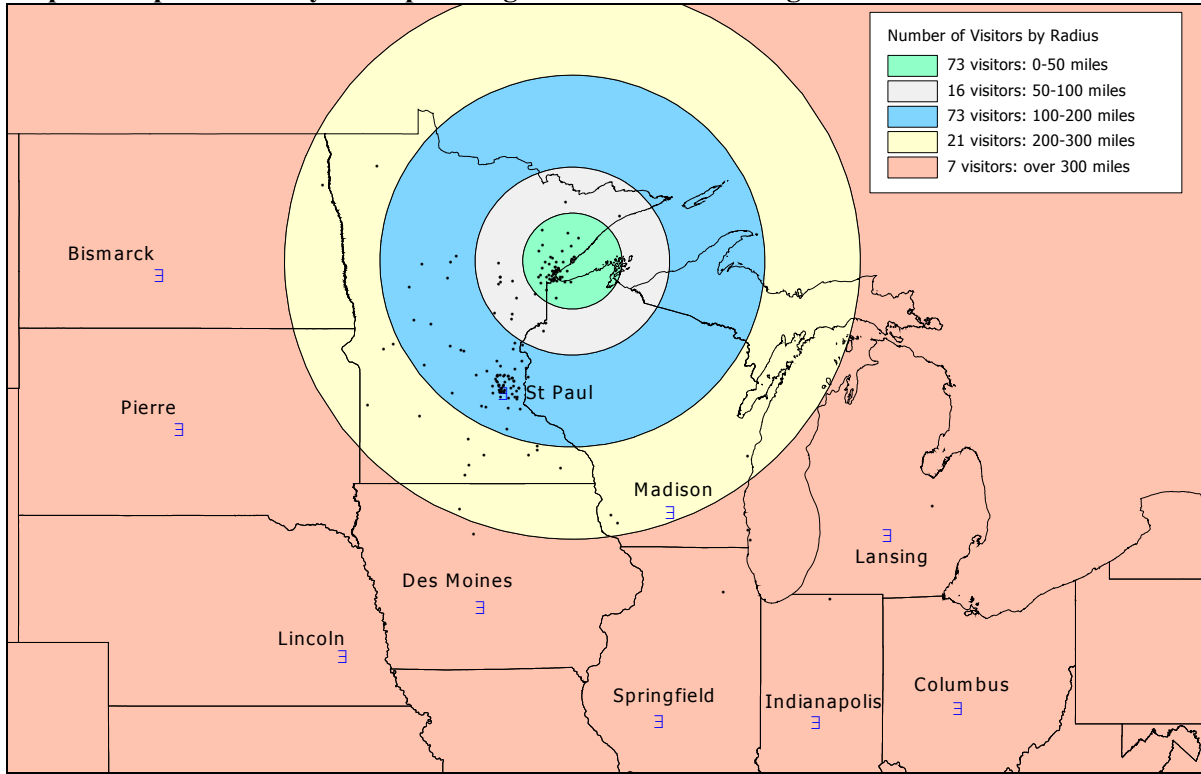


Figure 3.7: Distance Traveled for Segment 1

Map 3.2: Zip Code Analysis Map for Segment 2: TH 38 Grand Rapids to Bigfork

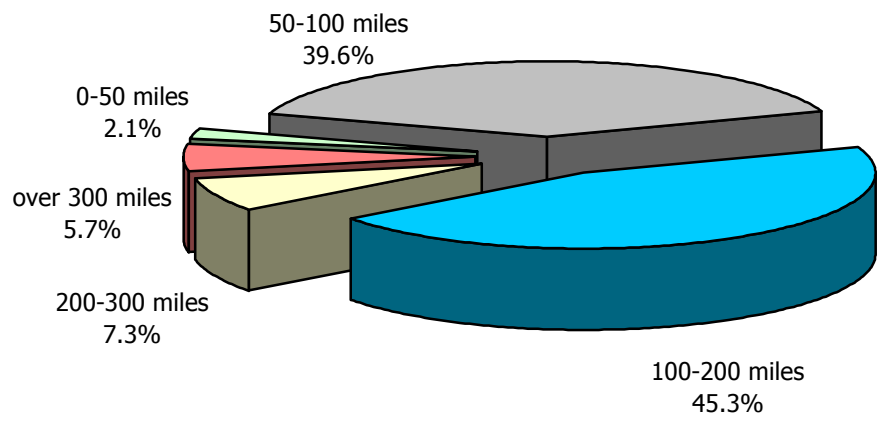
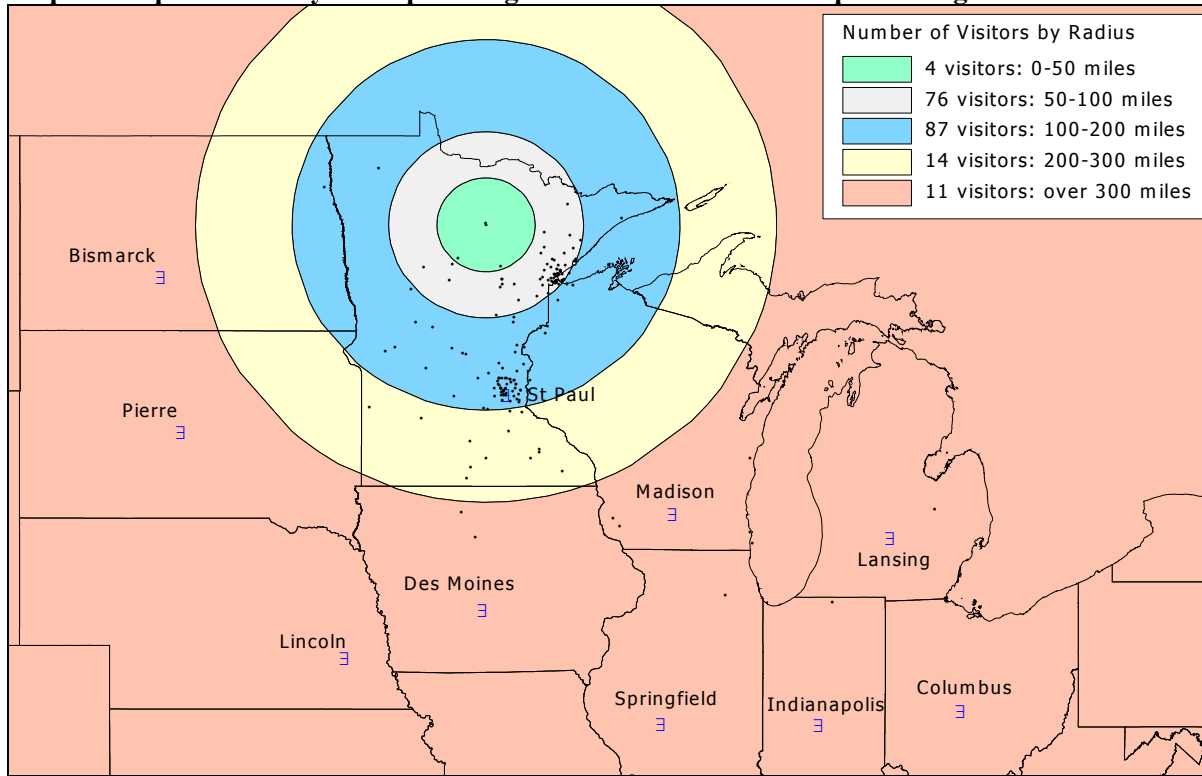


Figure 3.8: Distance Traveled for Segment 2

Map 3.3: Zip Code Analysis Map for Segment 3: TH 53 Independence to Virginia

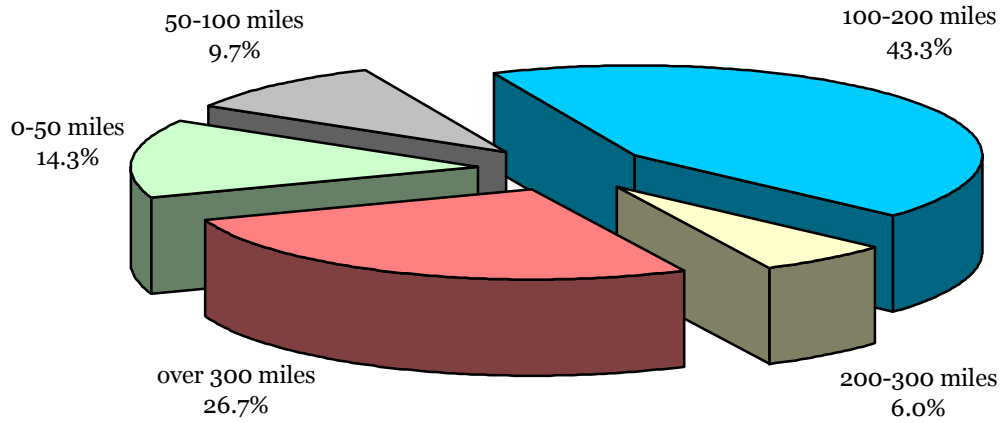
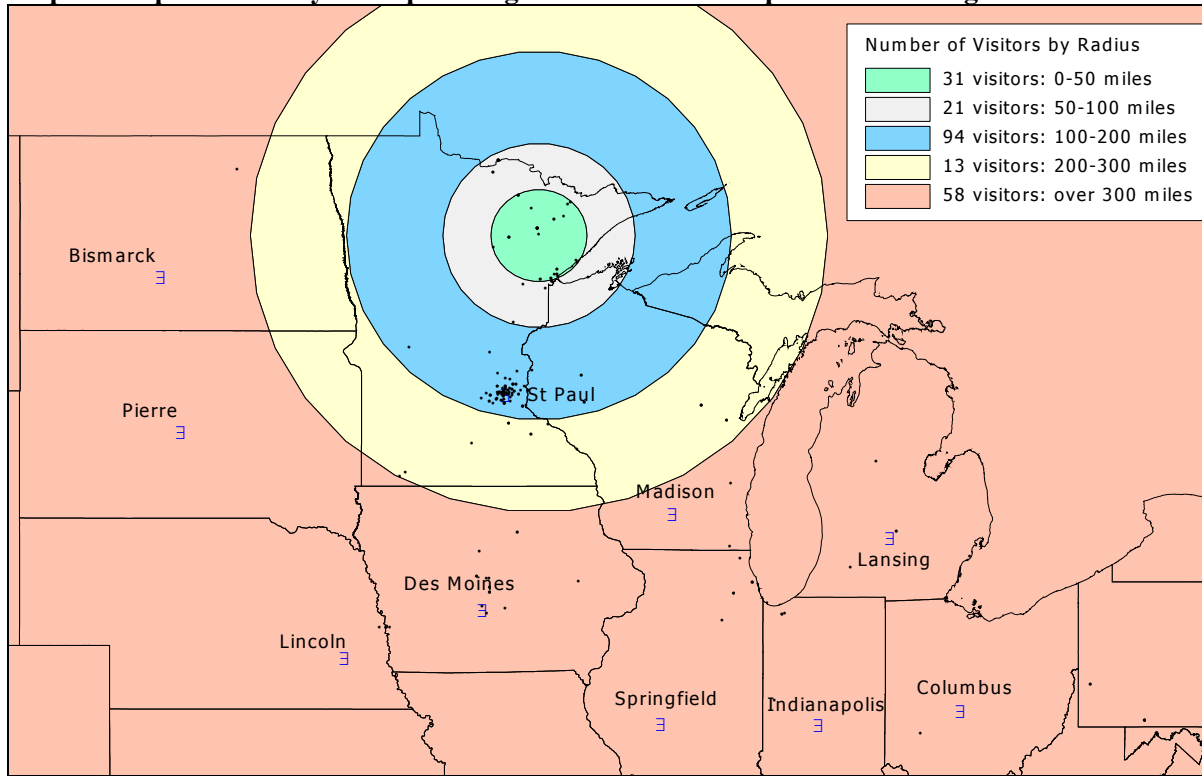


Figure 3.9: Distance Traveled for Segment 3

Map 3.4: Zip Code Analysis Map for Segment 4: I 35 Carlton to Duluth

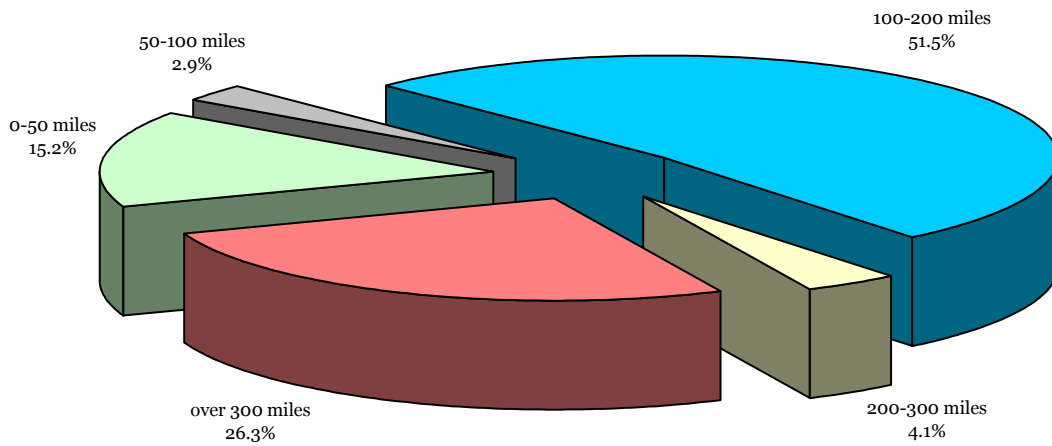
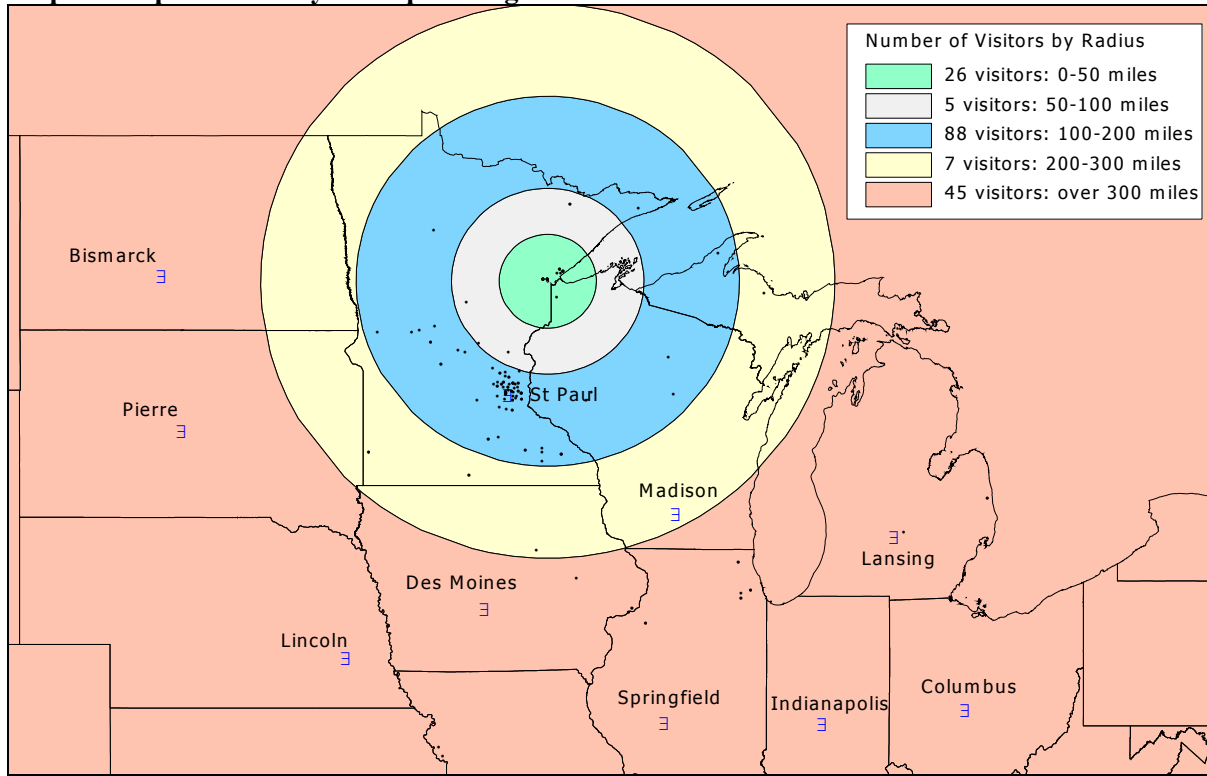


Figure 3.10: Distance Traveled for Segment 4

Map 3.5: Zip Code Analysis Map for Segment 5: TH 11 Baudette to International Falls

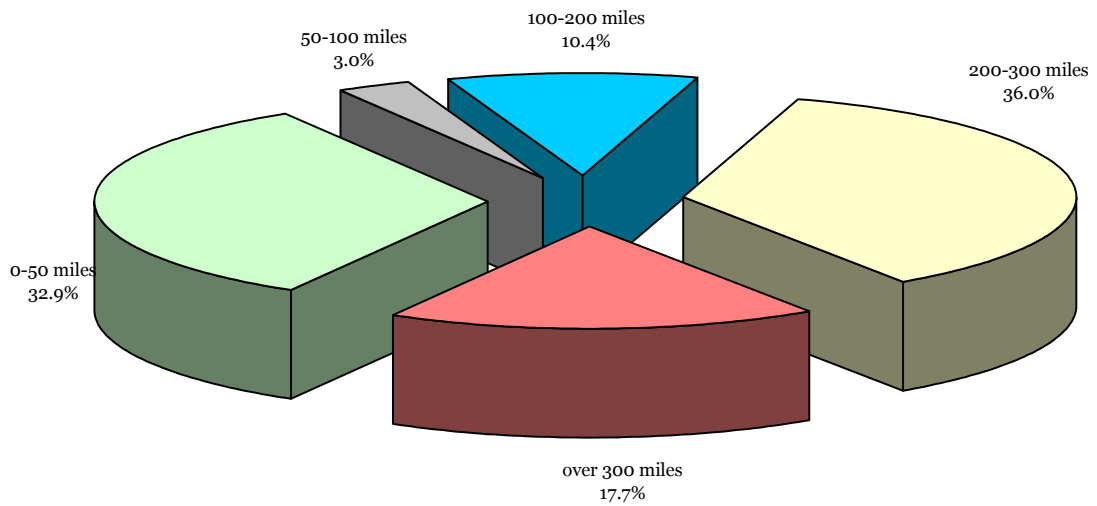
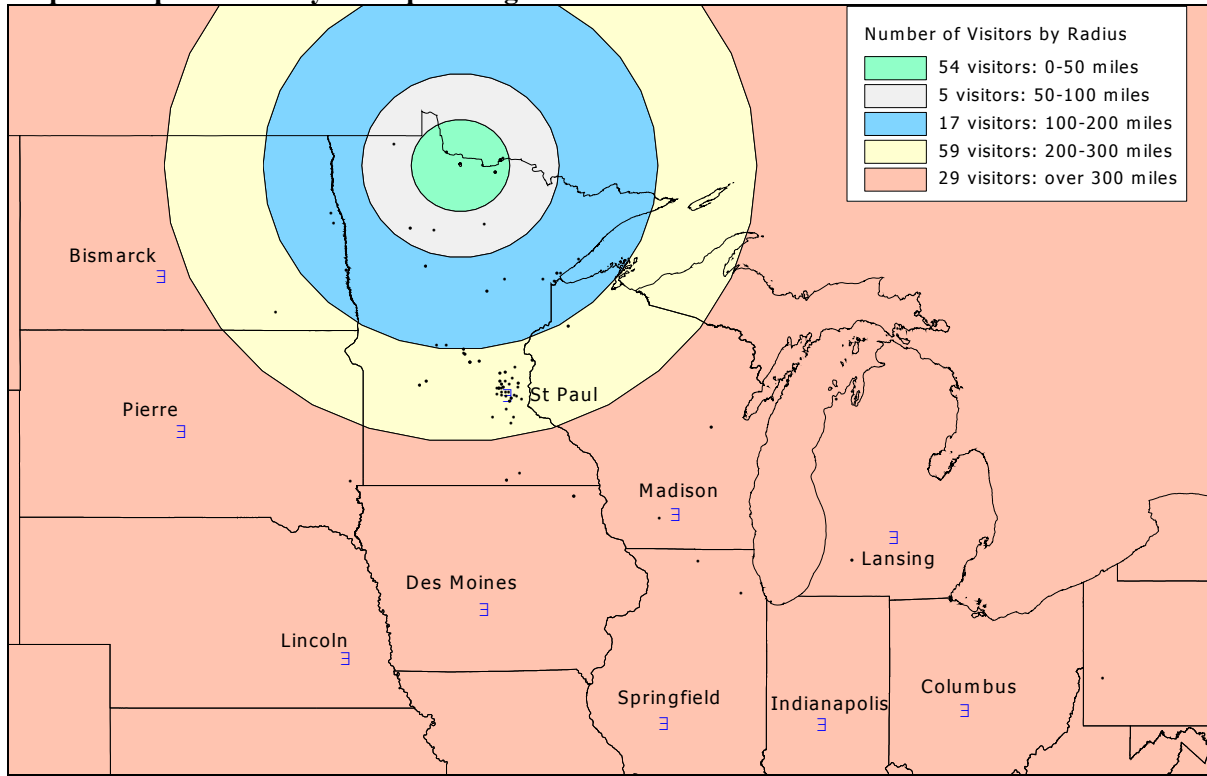


Figure 3.11: Distance Traveled for Segment 5

Map 3.6: Zip Code Analysis Map for Segment 6: TH 2 Bemidji to Ball Club

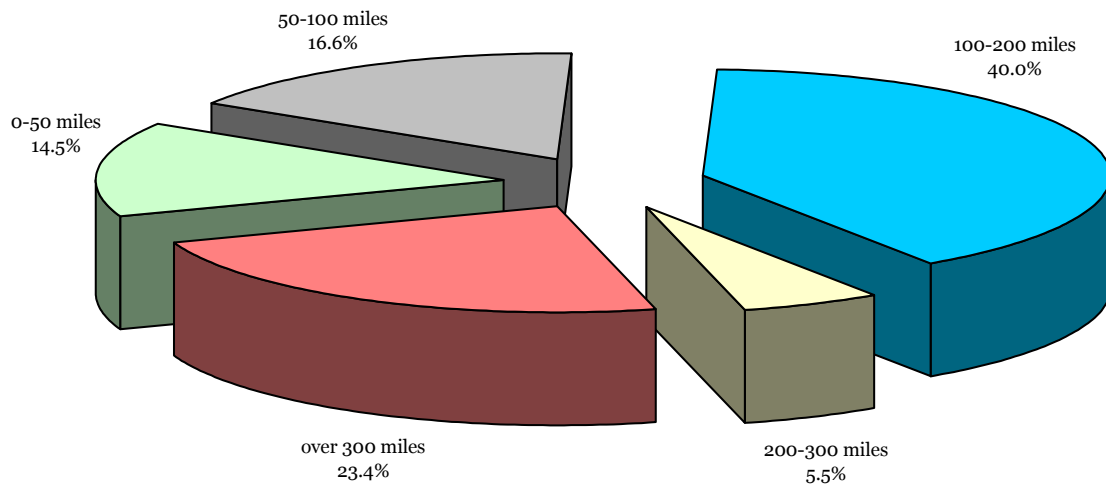
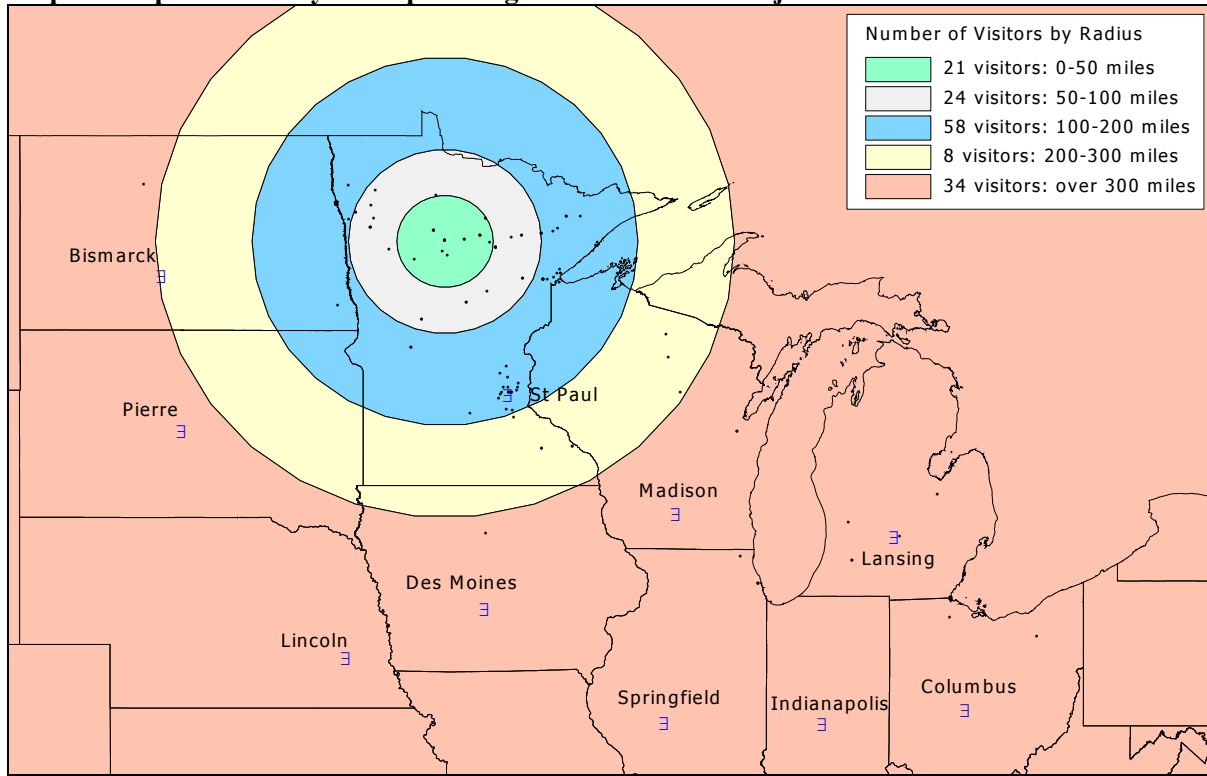


Figure 3.12: Distance Traveled for Segment 6

Map 3.7: Zip Code Analysis Map for Segment 7: TH 371 Nisswa to Pine River

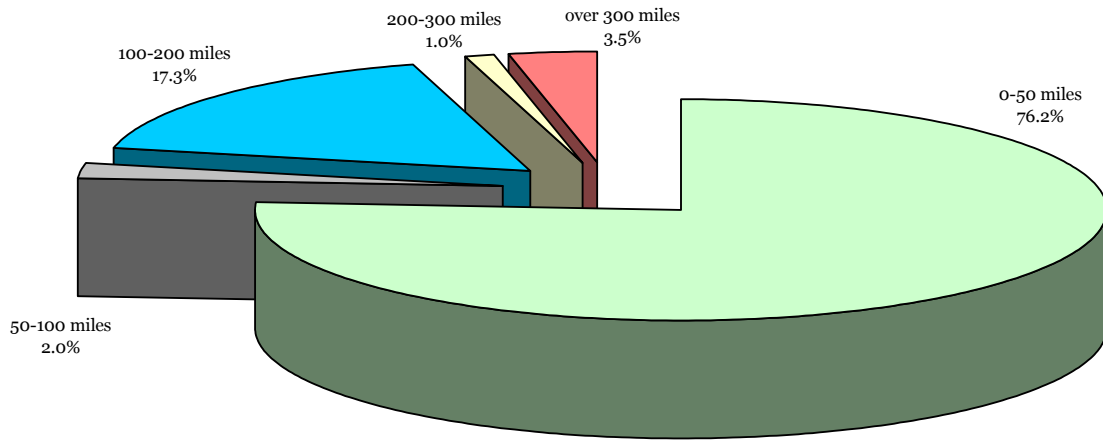
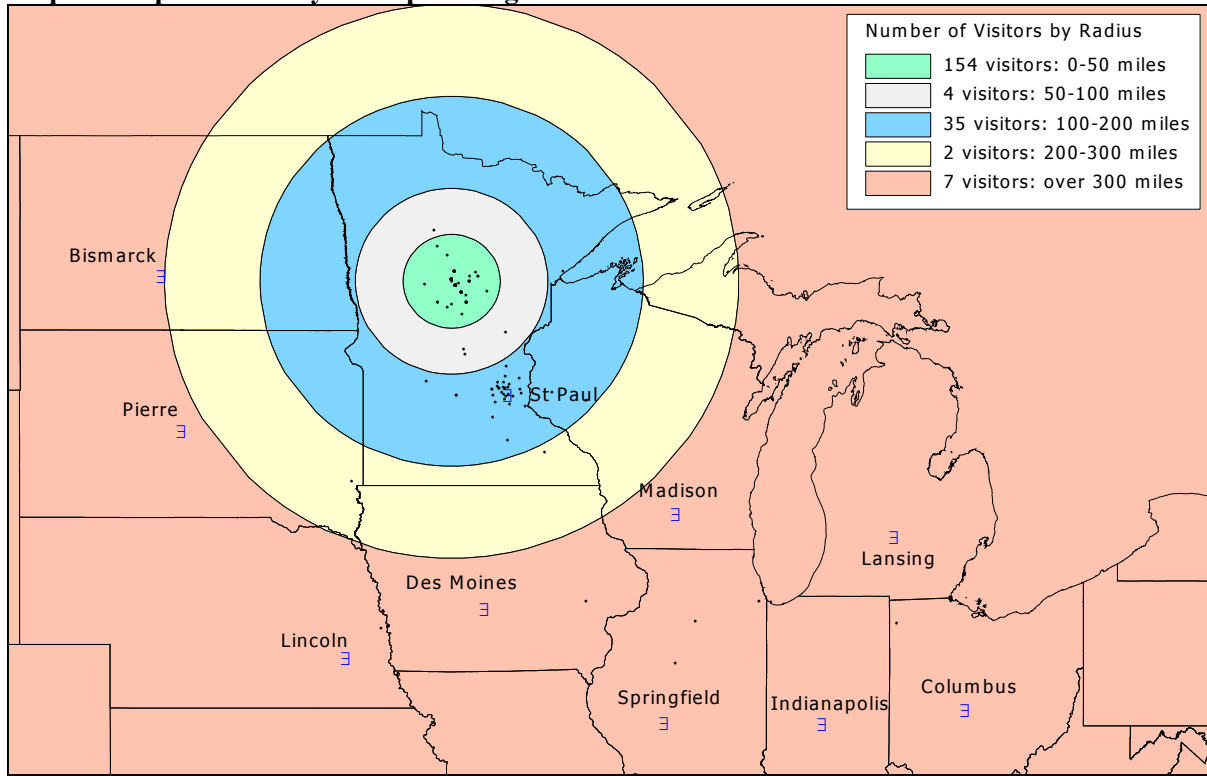


Figure 3.13: Distance Traveled for Segment 7

Map 3.8: Zip Code Analysis Map for Segment 8: TH 28 and TH 29 Sauk Centre to Starbuck via Glenwood

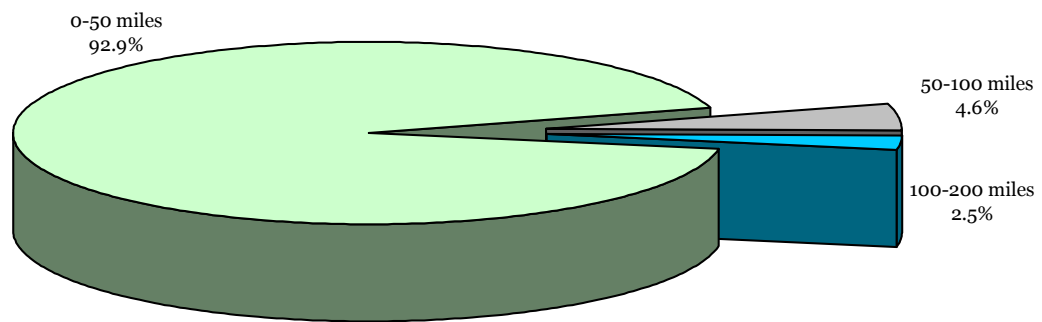
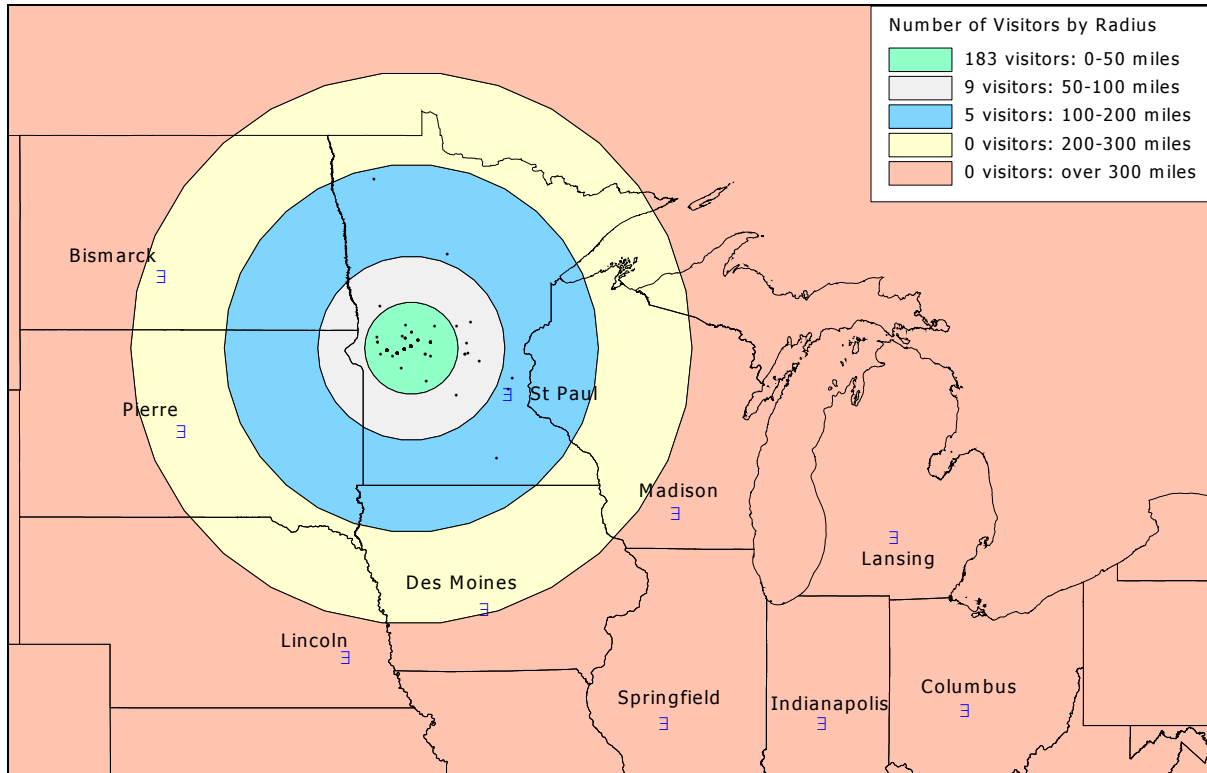


Figure 3.14: Distance Traveled for Segment 8

Map 3.9: Zip Code Analysis Map for Segment 9: TH 95 Taylors Falls to Stillwater

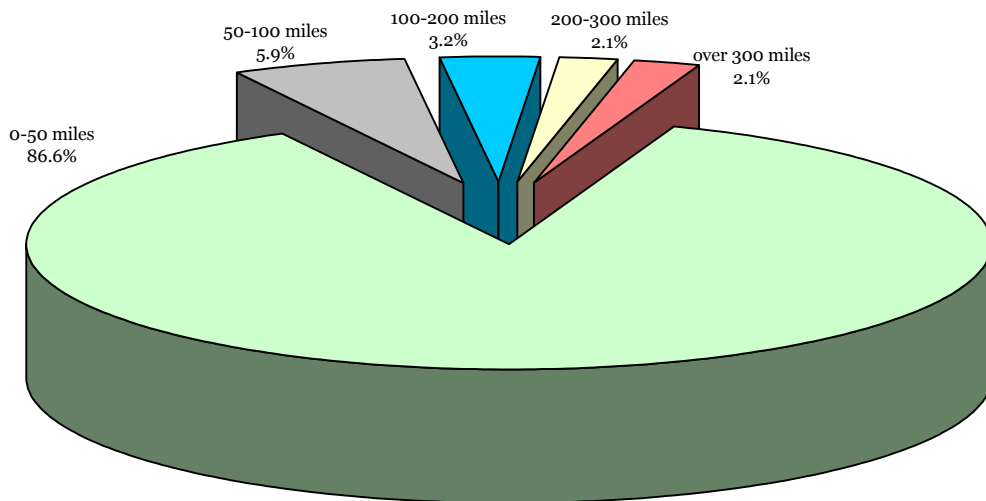
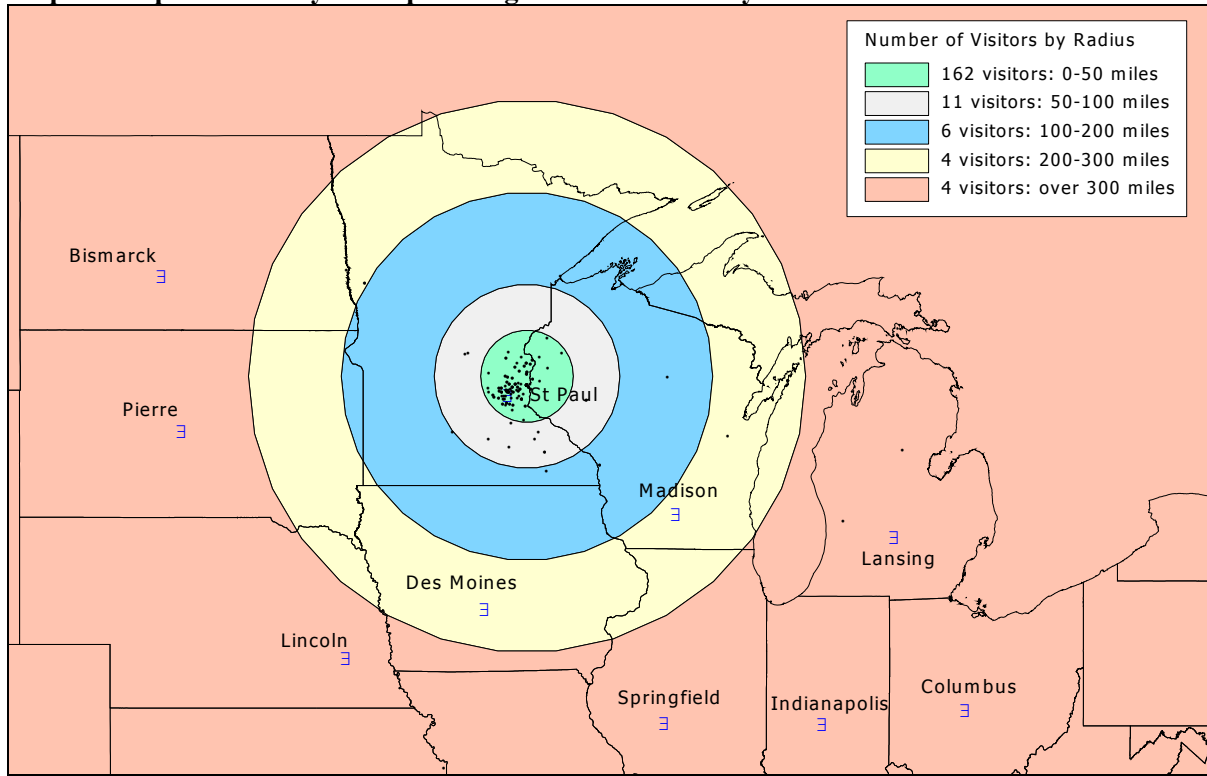


Figure 3.15: Distance Traveled for Segment 9

Map 3-10: Zip Code Analysis Map for Segment 10: TH 16 La Crescent to Preston via Lanesboro

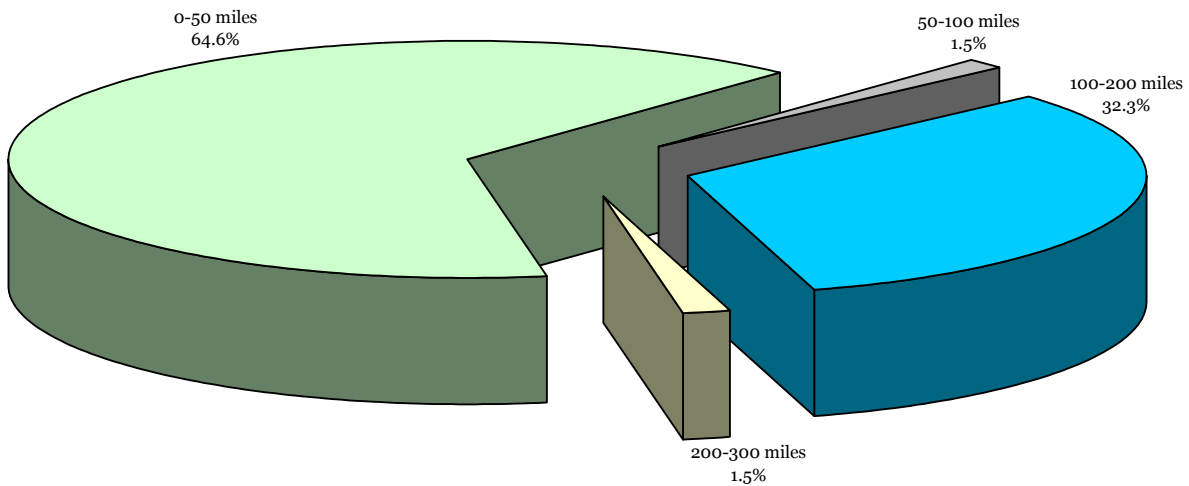
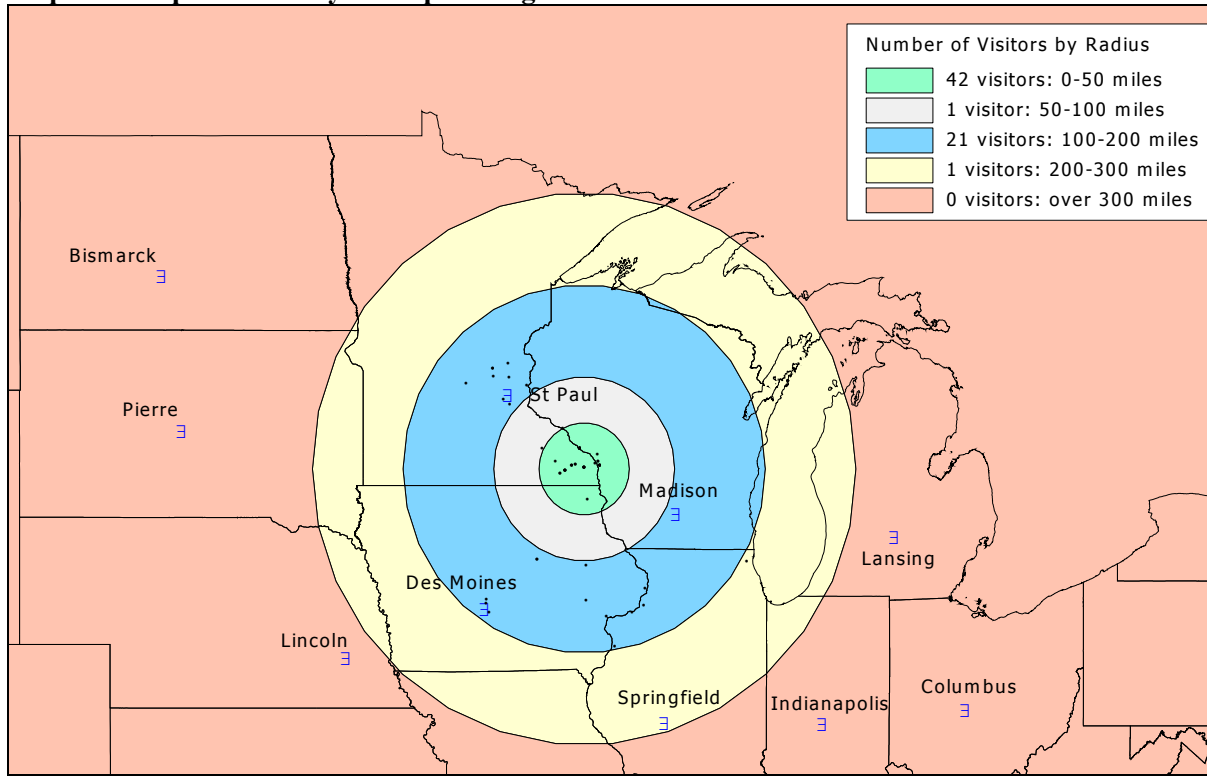


Figure 3.16: Distance Traveled for Segment 10

Map 3.11: Zip Code Analysis Map for Segment 11: TH 61 Red Wing to Wabasha

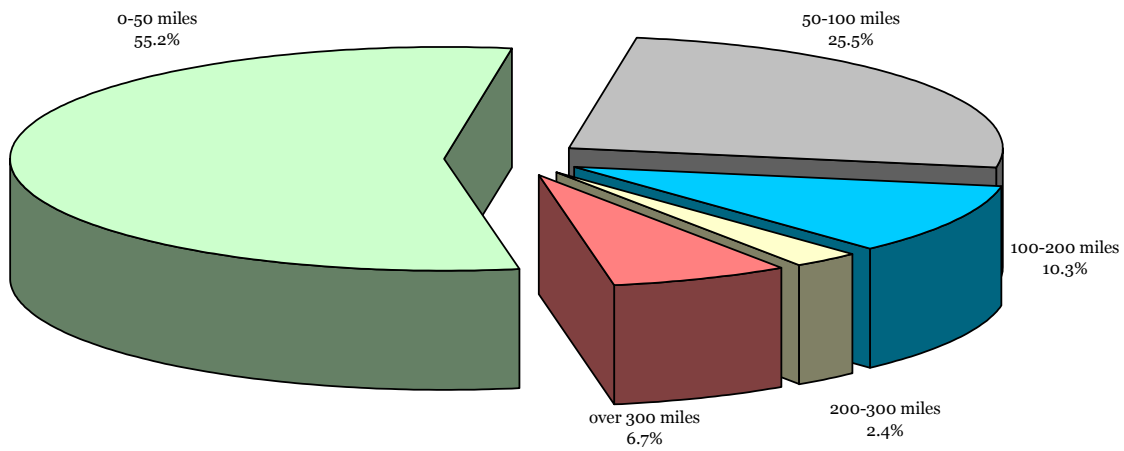
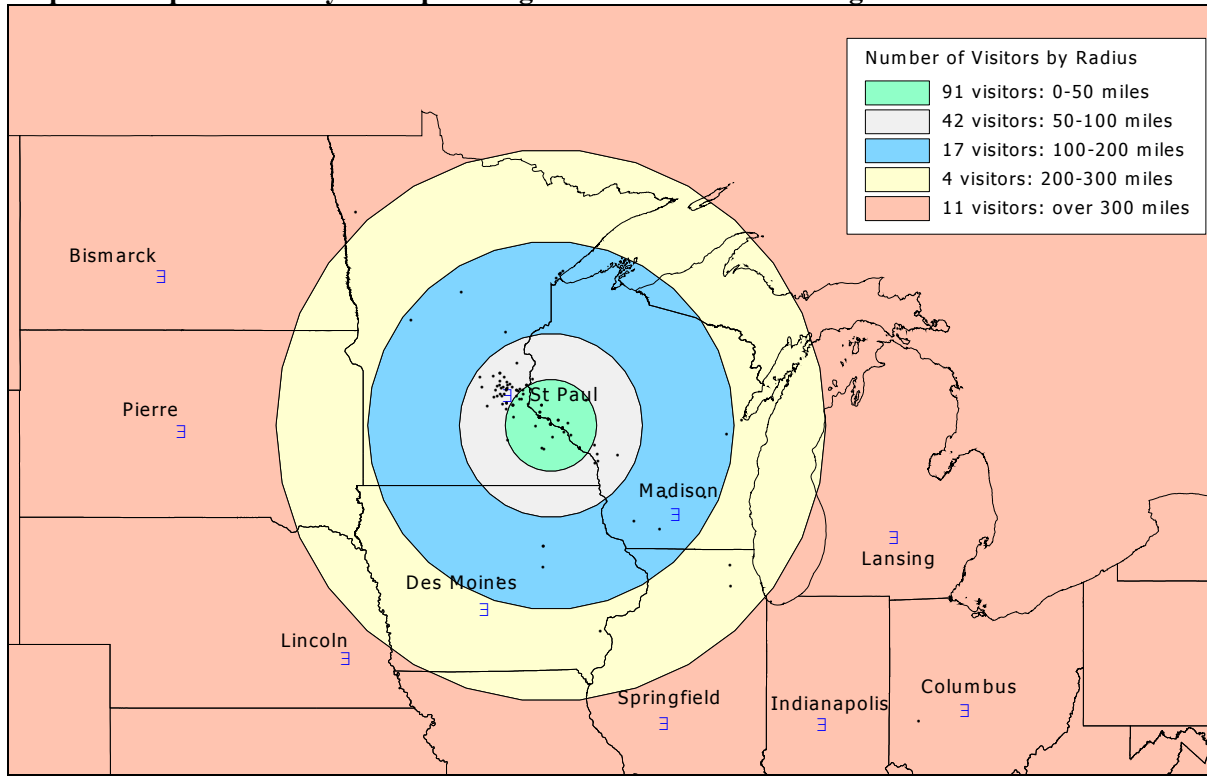


Figure 3.17: Distance Traveled for Segment 11

Gender

The split between numbers of female respondents and male respondents was relatively even, as Figure 3.18 illustrates.

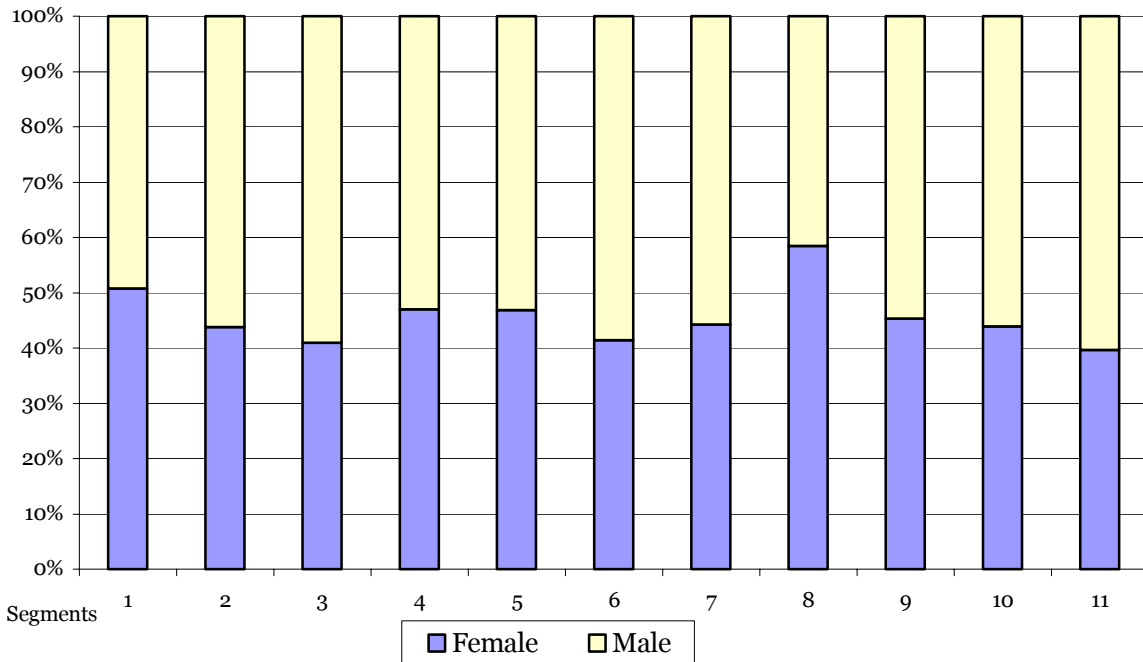


Figure 3.18: Gender

Income

Respondents were also asked to indicate their annual household income. General speaking, average income was highest on segments 3 and 4, and lowest on segments 8 and 10. Despite these slight differences, Table 3.7 details that respondent income categories were relatively well distributed with little variation between road segments.

Table 3.7: Percent of Respondents by Annual Household Income

Segment	Under \$25,000	\$25,000 to \$40,000	\$40,001 to \$55,000	\$55,001 to \$75,000	\$75,000 to \$90,000	\$90,001 to \$120,000	\$120,001 to \$175,000	Over \$175,000
1	12.1%	17.8%	26.4%	12.1%	9.8%	11.5%	8.6%	1.7%
2	10.3%	27.5%	15.7%	17.2%	12.3%	11.3%	3.4%	2.5%
3	14.0%	23.0%	14.0%	13.1%	7.2%	14.9%	7.7%	6.3%
4	12.1%	11.0%	24.3%	17.3%	12.7%	11.0%	8.7%	2.9%
5	12.1%	31.2%	17.9%	17.9%	7.5%	8.7%	2.3%	2.3%
6	12.7%	29.8%	18.2%	17.1%	6.6%	10.5%	2.8%	2.2%
7	16.2%	34.1%	19.1%	8.1%	9.8%	7.5%	1.2%	4.0%
8	37.6%	22.7%	15.5%	11.0%	6.6%	5.5%	1.1%	0.0%
9	12.2%	18.9%	19.4%	15.6%	9.4%	15.0%	6.7%	2.8%
10	38.2%	21.8%	16.4%	12.7%	5.5%	3.6%	1.8%	0.0%
11	14.9%	18.8%	20.8%	16.2%	10.4%	14.9%	3.2%	0.6%

Age

Finally, respondents were asked to indicate the year in which they were born so age categories could be constructed. Similar to income, age was fairly well distributed between age groups, with the oldest mean age found in segment 6 and the youngest mean age found in 8.

Nevertheless, there was minimal variation in age when comparing road segments, as Table 3.8 specifies.

Table 3.8: Percent of Respondents by Age

Segment	Under 21 years old	21 to 30 years old	31 to 40 years old	41 to 50 years old	51 to 60 years old	61 to 70 years old	71 to 80 years old	Over 80 years old
1	1.7%	24.7%	27.0%	14.0%	19.1%	9.0%	2.2%	2.2%
2	1.8%	8.2%	20.5%	30.6%	20.5%	12.8%	5.5%	0.0%
3	6.8%	12.2%	15.8%	22.2%	25.3%	9.0%	8.1%	0.5%
4	8.3%	7.8%	13.9%	32.2%	23.9%	10.6%	2.8%	0.6%
5	1.2%	14.0%	26.4%	21.1%	20.5%	11.7%	3.5%	1.8%
6	4.3%	7.5%	12.8%	20.9%	22.5%	19.8%	9.6%	2.7%
7	2.7%	10.3%	18.9%	27.0%	22.2%	15.7%	3.2%	0.0%
8	22.7%	21.1%	14.6%	22.7%	12.4%	4.3%	1.1%	1.1%
9	4.8%	11.1%	19.0%	25.9%	24.3%	10.1%	3.7%	1.1%
10	15.4%	18.5%	12.3%	13.8%	26.2%	9.2%	4.6%	0.0%
11	5.5%	17.8%	22.7%	24.5%	14.1%	11.0%	3.7%	0.6%

ROAD USER PREFERENCES

A major reason for conducting this study was to ascertain road users preferences for certain roadway related features that we call attributes and amenities. The list of attributes and amenities

chosen for analysis was based on information obtained in phase 1 of this study supplemented with additional information received from Mn/DOT and local area officials.

As mentioned earlier, the guiding null hypothesis for analyzing roadway amenity and attribute features was:

There is no statistically significant difference between how people rate the importance of roadway attributes and amenities present (or absent) along a particular roadway when compared to other road segments in the study.

This hypothesis assumes that road users will not be able to evaluate particular roadway features with enough precision to differentiate between different road segments. If true, we would expect to find – through statistical analysis – that respondent evaluations of the attributes and amenities of a particular roadway would not vary by the specific roadway they travel. As this study demonstrates, the null hypothesis must be rejected as was clear that respondents were able to evaluate roadway features differently, with respect to given road segments.

The section of the questionnaire that covers the items related to specific road features is found in question #10. This section forms the basis for determining user preferences for particular attributes and amenities related to each road segment. Results are presented as comparisons, in terms of mean scores and statistically significant differences, between road segments so that the differences become clear. At the end of this section a summary by road segment is provided.

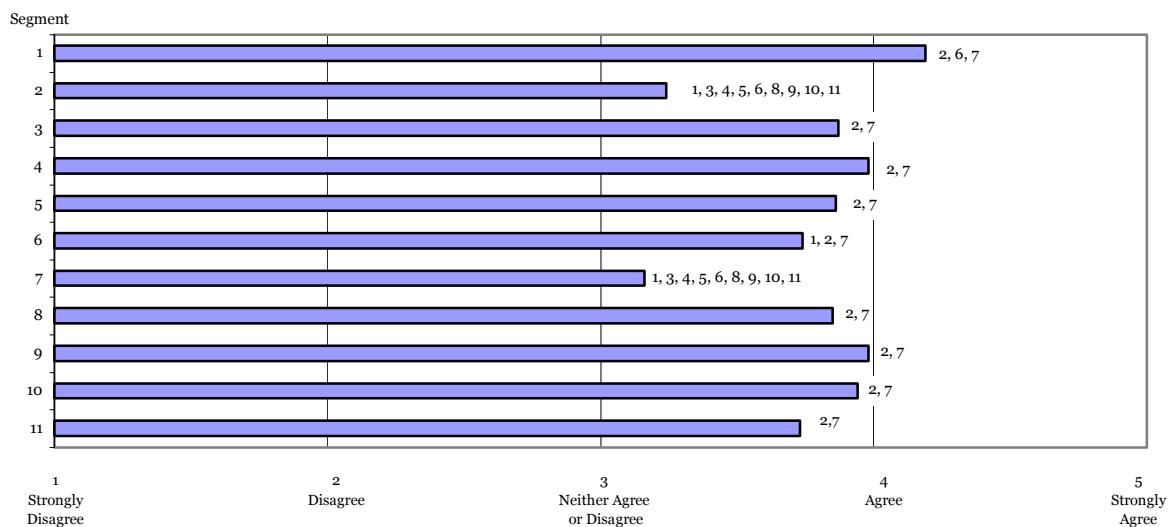
Safety

Safety concerns commonly arise when discussing roadway features. It is probably the overriding concern when designing or reconstructing roadways. As reported earlier, safety concerns related to Scenic Byways designation has been a focus of previous study. When the 11 roadways were compared, it was clear that safety perceptions differ by road segment (Figure 3.19).

All road segments recorded mean scores above 3 meaning that users are, for the most part, in agreement with the statement that “I feel safe driving on this road.” However the mean score range was between 3.16 (segment 7) to 4.19 (segment 1).

When compared, road segment 7 was statistically different (lower score) than all other road segments except segment 2. Segment 7 scores reflect the high density traffic found on TH 371, Nisswa to Pine River, while segment 2's mean score most likely reflects the curving, no shoulder, old roadbed section of TH 38 Edge of the Wilderness Scenic Highway from Grand Rapids to Bigfork.

The only other significant difference noted was between road segments 1 and 6. In this case users of road segment 6 (TH 2 Bemidji to Ball Club) were less inclined to say the roadway was safe compared to users of segment 1 (CSAH 61 Brighton Beach Road to Two Harbors). However road segment 6 was not viewed as any less safe than any of the other road segments except for segments 2 and 7, which have already been discussed.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.19: Safety

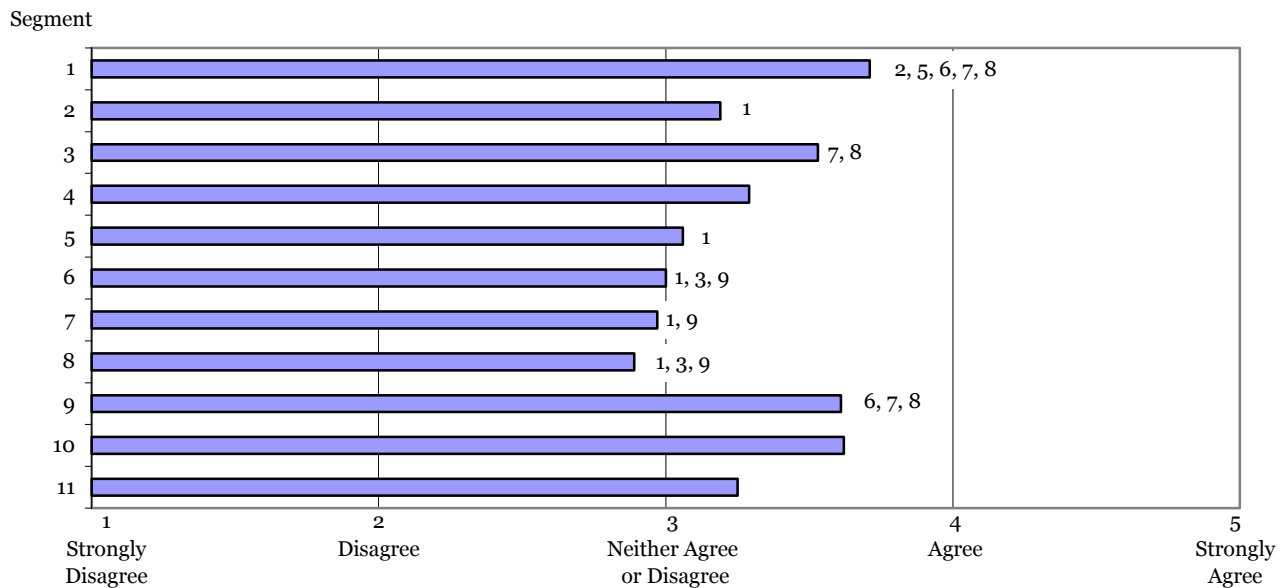
Vegetative Growth

Travelers were asked if natural vegetation (e.g. forest, prairie) should be allowed to grow as close to the road as possible. When travelers responded to, “I think natural vegetation (e.g., forest, prairie) should be allowed to grow as close to this road as possible,” responses were mixed (Figure 3.20).

Most responses clustered around a mean of 3 which is neither agree nor disagree with the highest mean (3.71) recorded for segment 1 (CSAH 61) and the lowest (2.89) associated with segment 8 (TH 29 and TH28).

With respect to significant differences, segment 1 drivers were more in favor of natural vegetation growing close to the road than for drivers of segments 2, 5,6,7, and 8.

Segment 3 (TH 53) drivers were more in favor of natural vegetation growing closer to the road than drivers of segments 6, 7 and 8, with segment 9 (TH 16) drivers more in favor of natural vegetation growing closer to the road than drivers of segments 6,7, and 8.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.20: Vegetative Growth

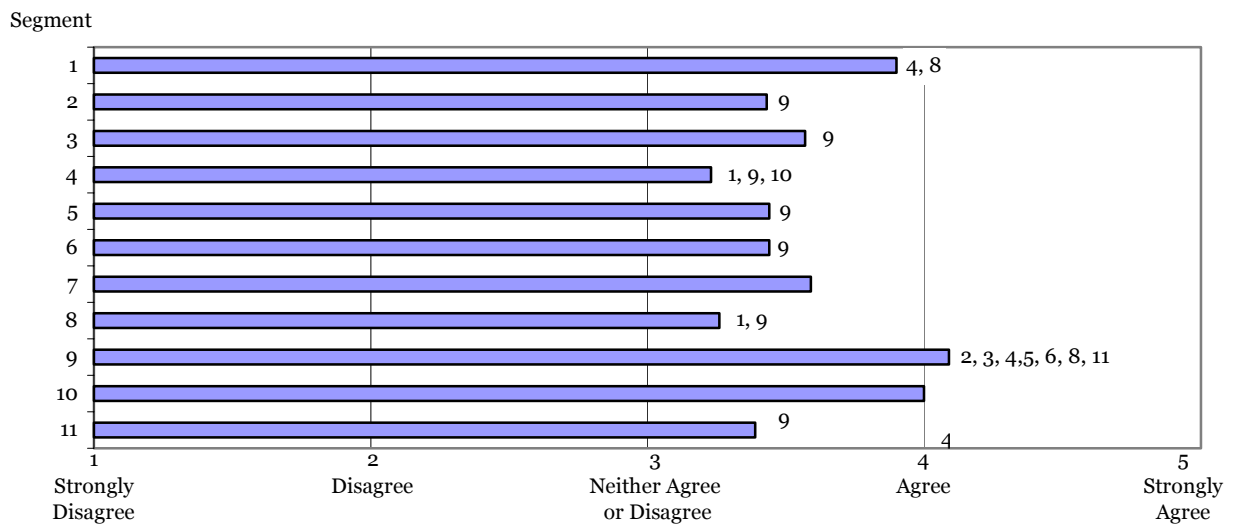
Business Location

Should service businesses (i.e. gas stations, convenience stores, fast food restaurants) be located along the road or should they be clustered in communities? That was the essence of the statement road users were asked to evaluate: “It’s important that gas stations/convenience stores/fast food restaurants are located in communities rather than along this road.”

Without exception all road segment mean scores indicate that service businesses should be located in communities and not scattered along the road (Figure 3.21). However there were significant differences between road segments.

Users of road segment 9 (TH 95) were most in favor of clustering businesses at specific points along that highway. A mean score of 4.09 for segment 9 was significantly different than the mean scores recorded for segments 2 (3.43), 3 (3.57), 4(3.23), 5(3.44), 6 (3.44), 8 (3.26) and 11 (3.39).

Road segment 4 (I 35) drivers recorded the lowest mean score (3.23) compared to all segments and it was significantly different than mean scores recorded for segments 1(3.90), 9 (4.09) and 10(4.00).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.21: Business Location

Intersections and Driveways

Controlled access is often associated with high speed, multi-lane highway corridors. Only two road segments of the eleven evaluated (segments 3 and 4) are in this category.

Travelers responded to, “There are too many intersections and driveways along this road.” For the most part, the number of intersections and driveways entering the road segment does not bother users. All mean scores are less than 3 indicating that, on average, there is not one road segment in the study where users feel this issue is a problem.

However, when road segments are compared, some statistically significant differences were noted, as Figure 3.22 illustrates.

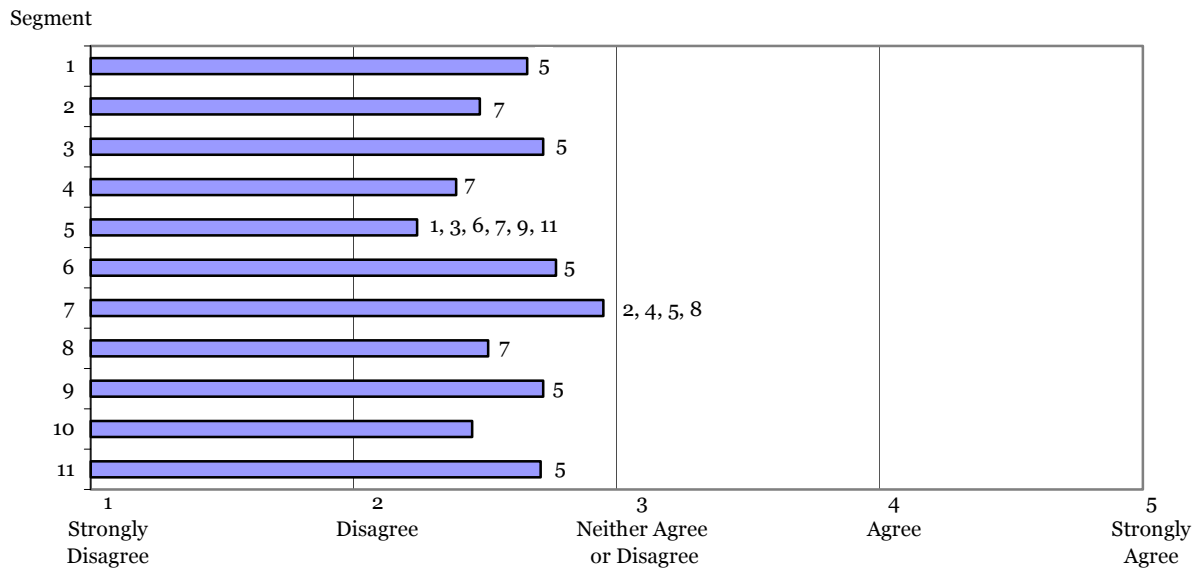
Users of road segment 5 (TH 11) are less inclined (mean score 2.24) to feel there are too many intersections or driveways along the road segment than for users of segments 1(2.66), 3(2.72), 6(2.77), 7(2.95), 9(2.72), and 11(2.71). This is not surprising considering the relatively sparsely populated area TH 11 passes through.

Also users of road segment 7 (2.95) are significantly more likely to feel there are too many intersections or driveways along this road segment than users of road segments 2(2.48), 4(2.39), 5(2.24), and 8(2.51).

Road Segment Speed

Respondents were asked to what extent they agreed or disagreed with this statement: “I think people drive faster on this road than they should.” For the most part, speed was not considered to be an issue as most of the segment mean scores deviated little from the midpoint of 3.00 (Figure 3.23).

However two road segments, in particular, were viewed differently. Users of road segments 2 (3.38) and 7 (3.47) were the two where users felt driver speed was in excess of what it should have been.



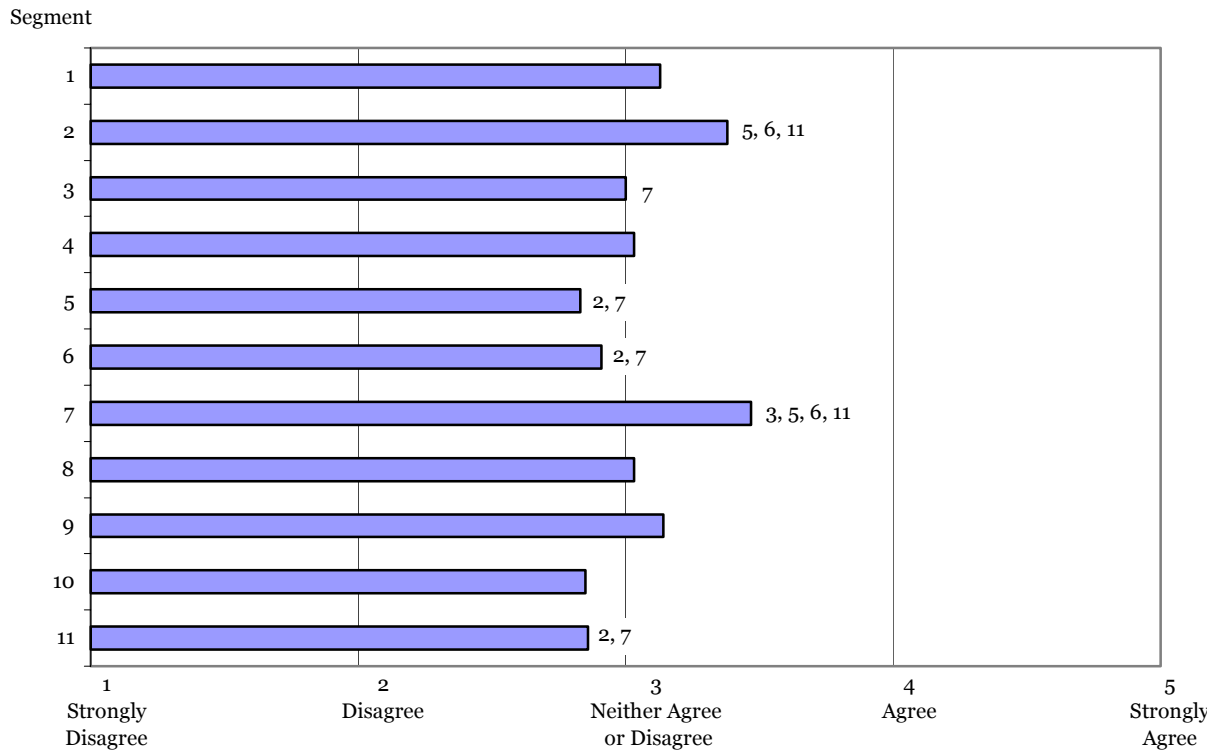
Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.22: Intersections and Driveways

Users of segment 2 were significantly different, with respect to perception of speed, than users of segments 5 (2.83), 6 (2.91) and 11 (2.86).

Similarly users of segment 7 were significantly different than users of segments 3 (3.00), 5 (2.83), 6 (2.91), and 11 (2.86).

It is surmised, then, that users of segment 2 were referencing the winding, no shoulder, and poor road surface part of TH 38 when deciding whether travel speed was excessive and users of road segment 7 were most likely responding the almost urban character of driving along TH 371 in the Pine River to Nisswa segment.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.23: Road Segment Speed

Wildflowers

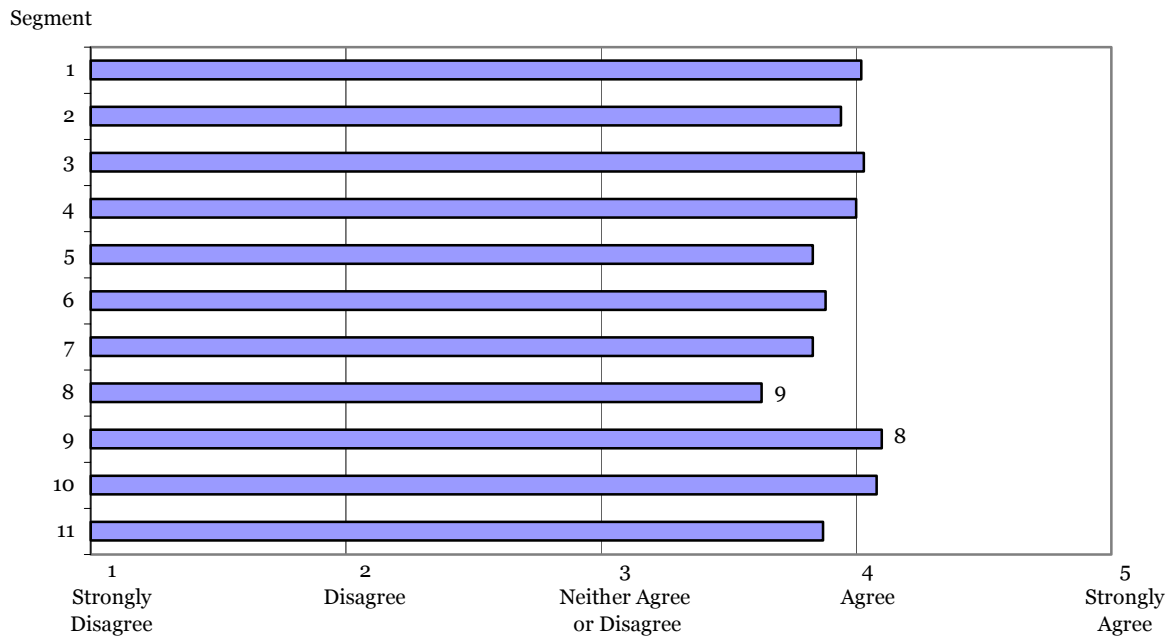
Road users responded to this statement, “I prefer to see attractive vegetation like wildflowers along this road” with consistent agreement (Figure 3.24).

The lowest mean score recorded was for segment 8 (3.63), and the highest for segment 9 (4.10).

The only significant difference recorded was between segments 8 and 9, with users of segment 9 more in favor of vegetative planting along the roadway than users of segment 8.

Gift Shops

Researchers initially viewed gift shops differently as compared to other service businesses discussed above (Business Location). We hypothesized that users would differentiate between



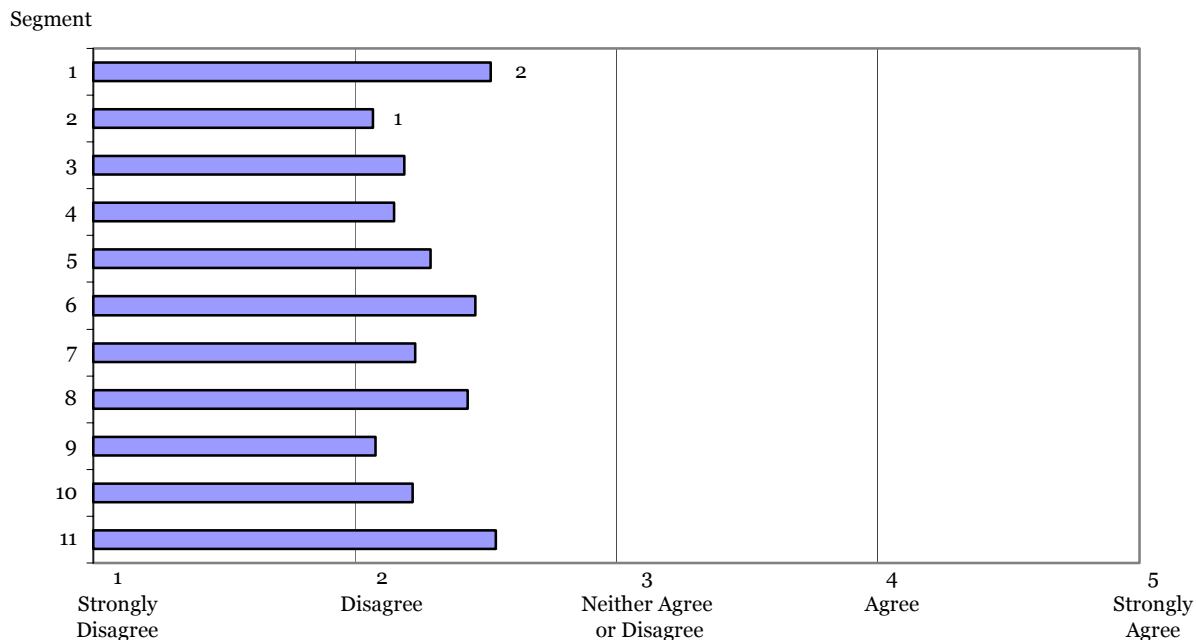
Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.24: Wildflowers

these two different types of businesses with more support for gift shops located along the roadway, but this was not the case.

There was very little support from the users of any segment for this statement: “I prefer to see more gift shops along this road.” This finding indicates that gift shops were not viewed as different than service businesses, suggesting travelers preferred them located in communities rather than along the road.

The only significant difference among segments was between segments 1 and 2. Travelers on segment 1 were slightly more supportive of gift shops located along the road than travelers along segment 2, although responses to this statement by all road travelers were somewhere between the “disagree” and neutral categories (Figure 3.25).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

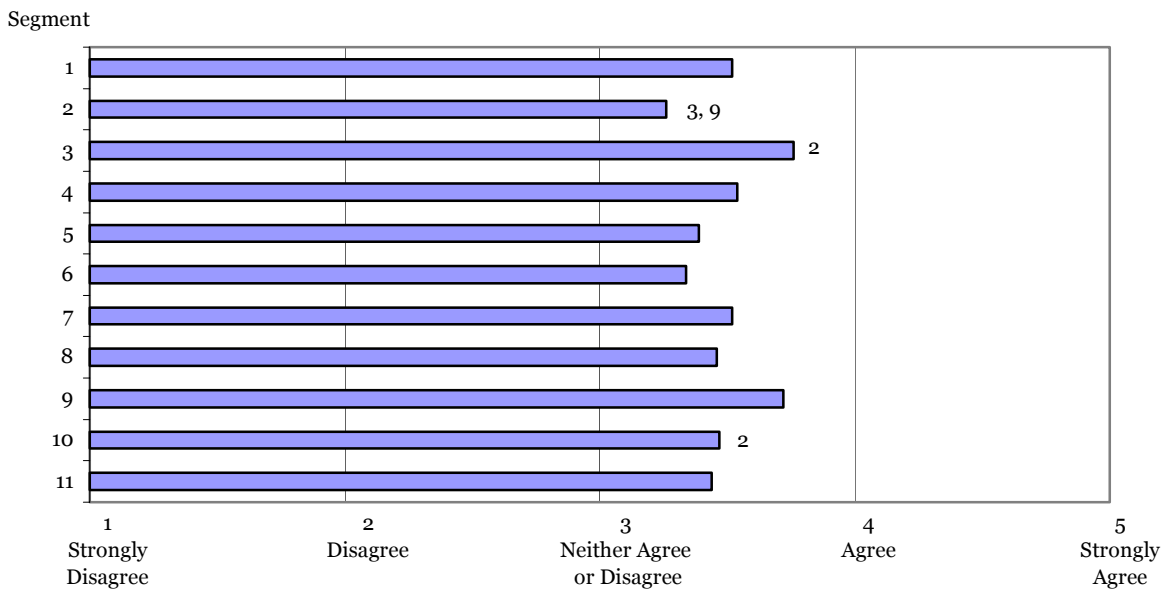
Figure 3.25: Gift Shops

Trees

The increased use of some types of vegetation (i.e. wildflowers) along roadways has already received attention above. However, wildflowers as vegetation have much different characteristics than trees. Do roadway users desire to see more trees growing close to the road?

When travelers were asked to what degree they agreed or disagreed with this statement, “I’d like to see more trees growing along this road,” the response was largely negative. Although roadway segment users did vary in their answers, mean scores for all segments indicate that road users do not want to see trees planted too closely to the roadway (Figure 3.26).

The lowest mean score was recorded for road segment 2 (3.26), which was significantly different than segments 3 (3.76) and 9 (3.72). The lower mean score for segment 2 most likely reflects the wooded nature of the present drive along TH 38.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.26: Trees

Stoplights and Stop Signs

Is the roadway traveling experience affected by too many stoplights or stop signs? When road users were asked if “There are too many stoplights and stop signs on this road,” travelers generally disagreed. Thus, the number of stoplights and/or stop signs along any of the roadways investigated was not viewed as a problem for any of the roadway segments.

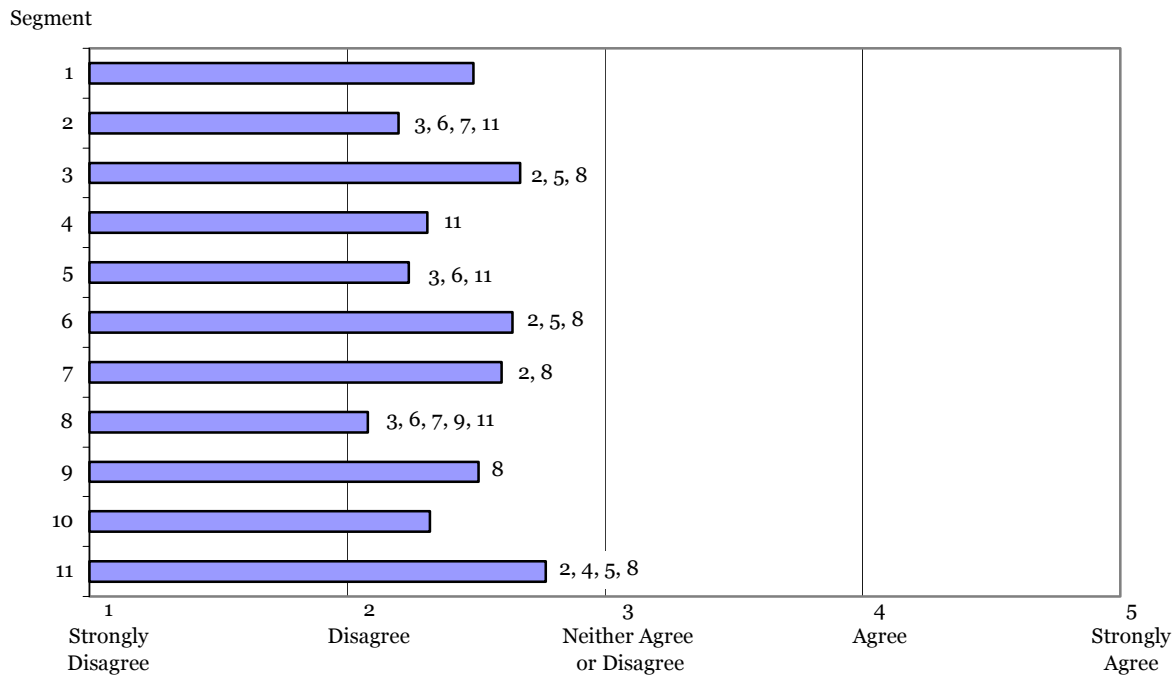
All mean scores recorded were below the midpoint of 3.00 indicating that the number of stoplights and stop signs is not viewed as a big issue for users of the segments investigated (Figure 3.27). Mean scores ranged from a high of 2.77 for segment 11 to a low of 2.08 for segment 8.

Even though the findings, in general, do not indicate a problem exists, there were a number of significant differences found between segments. The differences reflect the degree to which business and residential development exist along the roadway.

For example, little or no problems are found for road segment 2 (TH 38), which is not surprising as there are no stoplights or stop signs located along the stretch of TH 38 that was investigated.

By contrast road segment 11 recorded a higher mean score (2.77) for this question due primarily to its passage through Lake City along TH 61 where numerous stoplights and/or stop signs are encountered.

Other segments where higher mean scores were recorded also had communities along the segment where users are most likely to encounter stoplights and stop signs.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

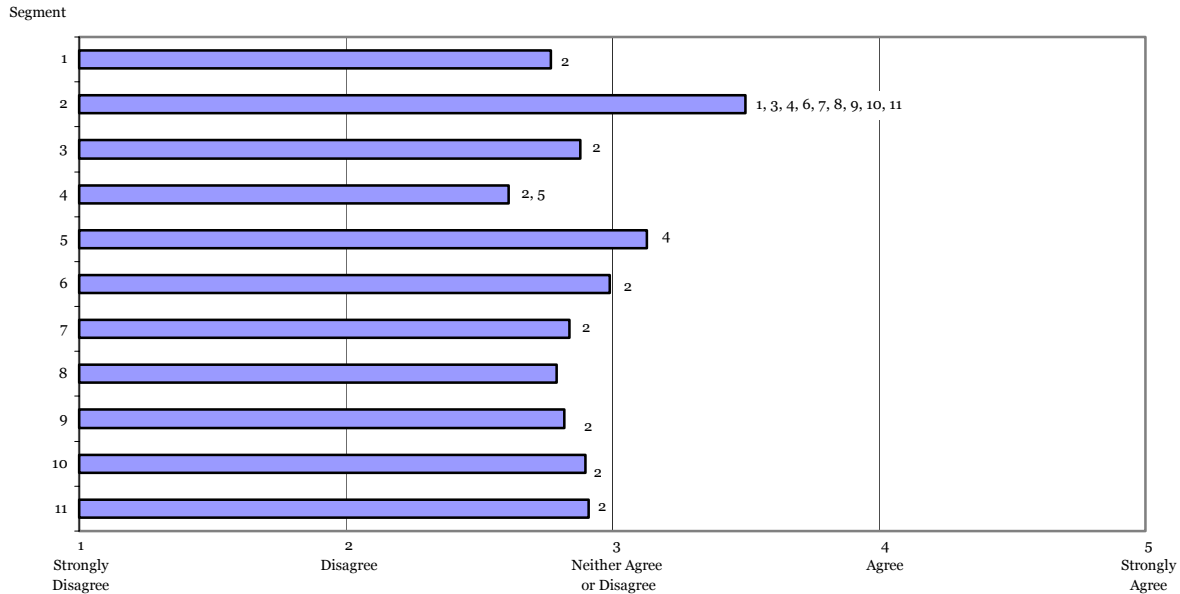
Figure 3.27: Stoplights and Stop Signs

Pull-offs

Scenic vistas, rest stops, trail access, and – on some road segments – picnic areas are common features found along many of the roads in this study. In general, travelers were neutral or slightly negative when responding to this statement: “There are not enough places to pull off this road.”

Users of most segments were relatively neutral about the adequacy of the number of pull offs (Figure 3.28), with the exception of segments 2 (TH 38) and 5 (3.13).

Users of segment 2 recorded the highest mean score (3.50), indicating a fairly strong agreement that there were inadequate pull offs along the road.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

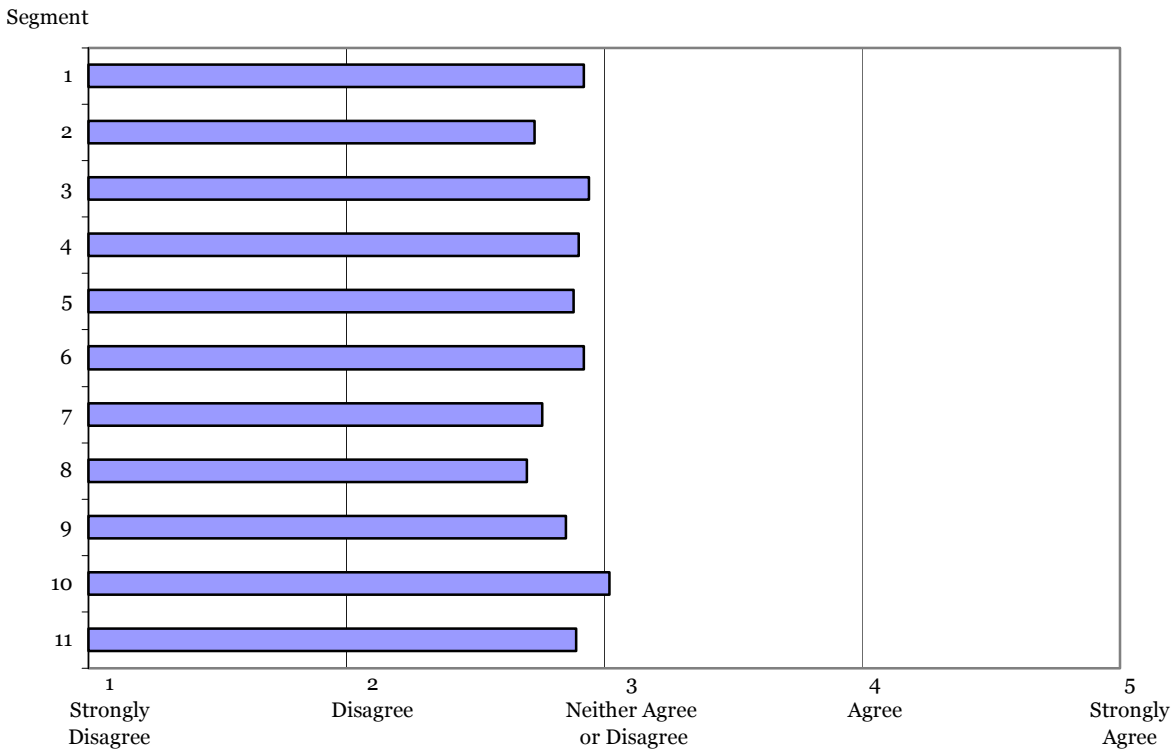
Figure 3.28: Pull-offs

Interpretive Signs

Earlier research found that reading interpretive signs was a common activity for travelers along the Great River Road in Minnesota, although it was not a major reason for choosing that stretch of highway [11].

With respect to the number of interpretive signs, users expressed neutral or slightly negative feelings about this statement, “I think we need more interpretive signs along this road,” although no significant differences were noted between road segments (Figure 3.29).

All road segments, except segment 10 (3.02), recorded mean scores below the midpoint, indicating general disagreement toward the need for more interpretive signs along the stretch of roadway.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.29: Interpretive Signs

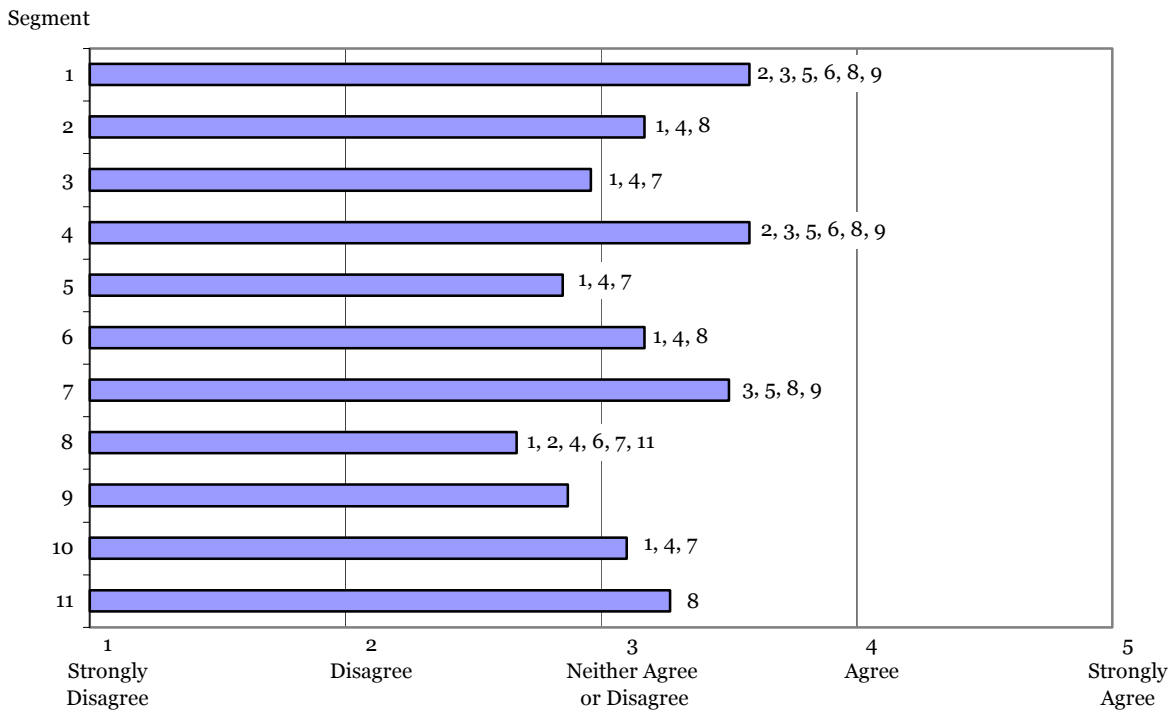
Lodging

The number of lodging establishments located along a particular roadway elicited divergent responses between roadway segment users. Travelers were asked the extent to which they agreed or disagreed with this statement: “There are plenty of lodging choices available along this road.”

The highest mean score was recorded for roadway segment 1 (3.58), indicating that users felt there were plenty of lodging choices to choose from along this road.

By contrast, users of roadway segment 8 (2.67) disagreed with the statement that plenty of lodging choices existed along this stretch of roadway.

Numerous significant differences were found between these road segments, as Figure 3.30 illustrates.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.30: Lodging

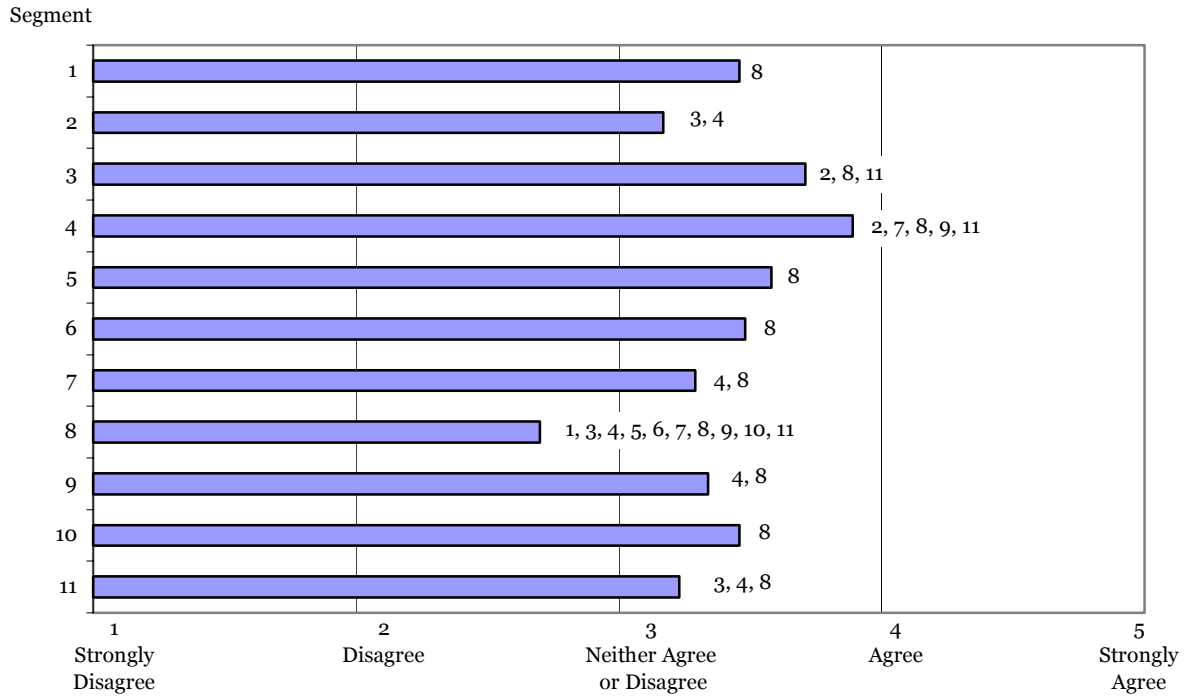
Visitor Center

Does a stretch of roadway need a visitor center? On some of the road segments, respondents indicated strong agreement with the statement that, “A visitor or interpretive center is important for this road.”

Visitor centers currently exist along a few of the road segments included in this study, such as segment 4 where a large state welcome center is located and along segment 5 where a visitor center is located at the eastern end of the segment at Grand Mounds State Historic Site. Not surprisingly, segment 4 recorded the highest mean score (3.89), because the majority of travelers along this segment were intercepted at the Thompson Information Center along Interstate 35.

Segment 8 was the only roadway where the mean score (2.70) indicated disagreement with the statement that an interpretive center is important for that stretch of highway.

The wide range of mean scores is indicative of the number of roadway segments where mean scores differ significantly between segments (Figure 3.31).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.31: Visitor Center

Traffic Congestion

Road users generally disagreed with the statement, “I think traffic congestion is excessive on this road.” However, none of the roadway segments investigated in this study were located in an urban environment, although some essentially began or ended in – or very close to – an urban area.

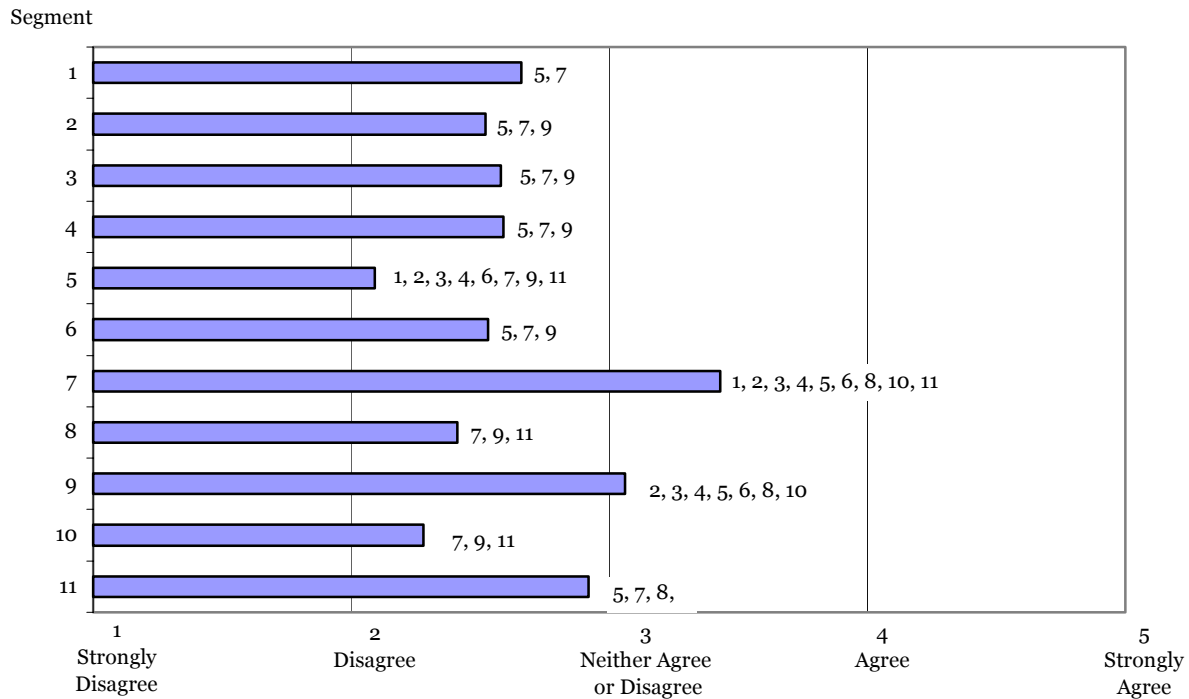
Nonetheless, at least one segment (segment 7), stood out as being perceived as crowded.

Segment 7 (TH 371) is a main corridor in the Brainerd Lakes area. Users felt that this segment, more than any of the others, suffered from excessive traffic.

For the rest of the segments, mean scores below 3.00 were common except for segment 9, which recorded a mean score of 3.06 (slight agreement that traffic is excessive).

As Figure 3.32 illustrates, segment 7 users recorded a mean score of 3.43, which was significantly different than that recorded for all other segments except segment 9.

Segment 9 (3.06) was significantly different than all other segments except segment 7, segment 1 (2.66) and segment 11 (2.92).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

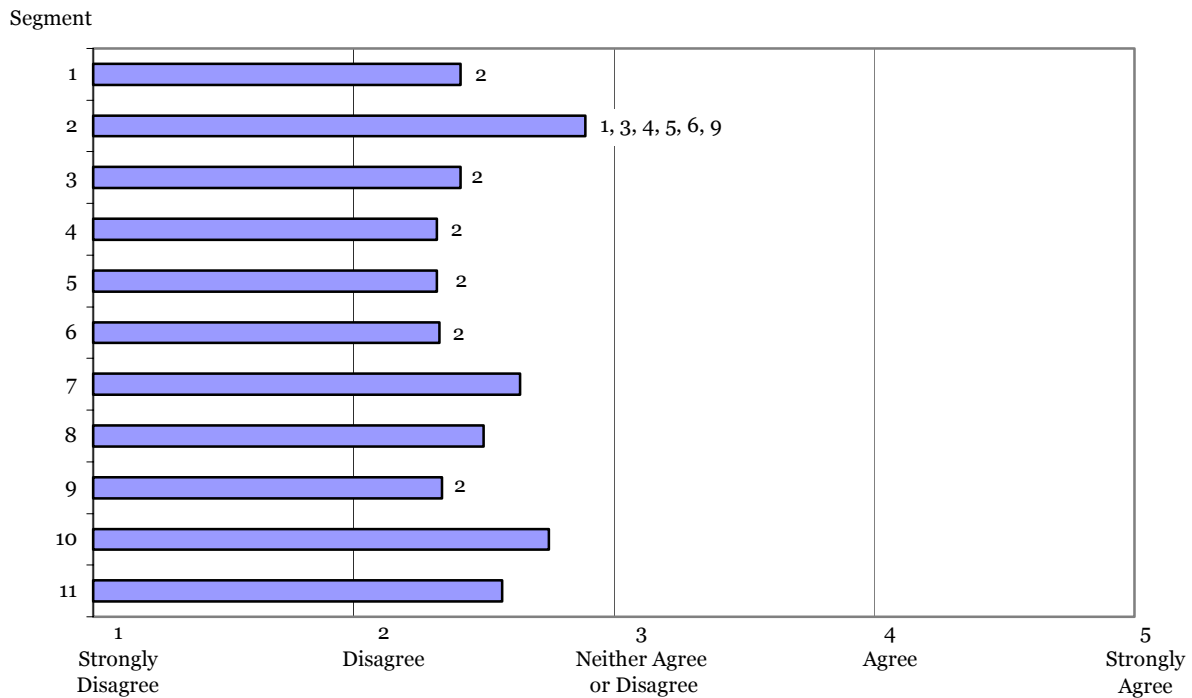
Figure 3.32: Traffic Congestion

Curves

Curves are designed into roadways primarily to control speed or when dictated by topography. Curving roads can also enhance the driving experience if driving is the goal or detract from it if off road sites take a driver’s attention away from the roadway.

Travelers generally disagreed with the statement, “I think there are too many curves on this road.” All mean scores were below the midpoint of 3.00 indicating no agreement with the statement that there are too many curves along the roadway (Figure 3.33).

When significant differences were examined, it became clear that users of segment 2 (2.89) were more inclined to think there were too many curves along the stretch of highway compared to all other segments except segments 7 (2.64), 8 (2.50), 10 (2.75), and 11 (2.57).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.33: Curves

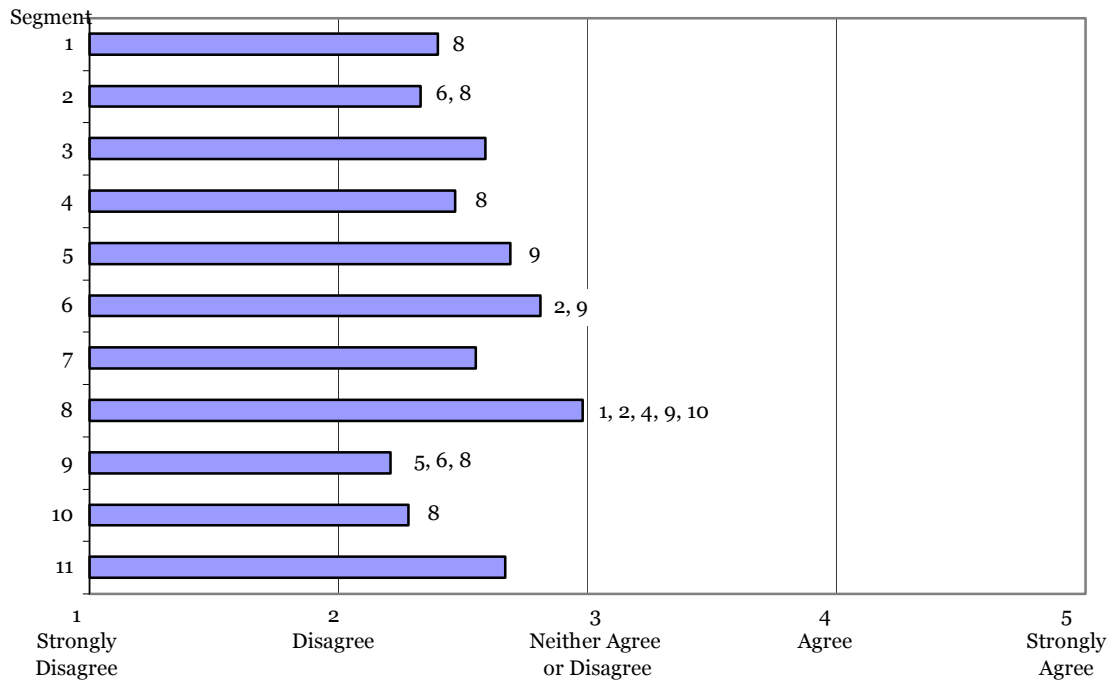
Speed Limit

Users of road segments were asked to comment on whether the posted speed limit sign for the particular road segment they were on was too slow. When responding to: “I think the speed limit on this road is too slow,” travelers generally disagreed.

Not one of the road segments recorded a mean score above 3.00, meaning that posted speed limit signs were either viewed as about right or possibly too fast (Figure 3.34).

Road segment 9 users recorded the lowest mean score (2.21), indicating that many of them disagree with the statement that the posted speed limit is too slow.

Road segment 8 users were the ones most likely to view the posted speed limit as about right as they recorded a mean score of 2.98, which was significantly different than mean scores recorded for segments 1 (2.40), 2 (2.33), 4 (2.47), 9 (2.21), and 10 (2.28).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

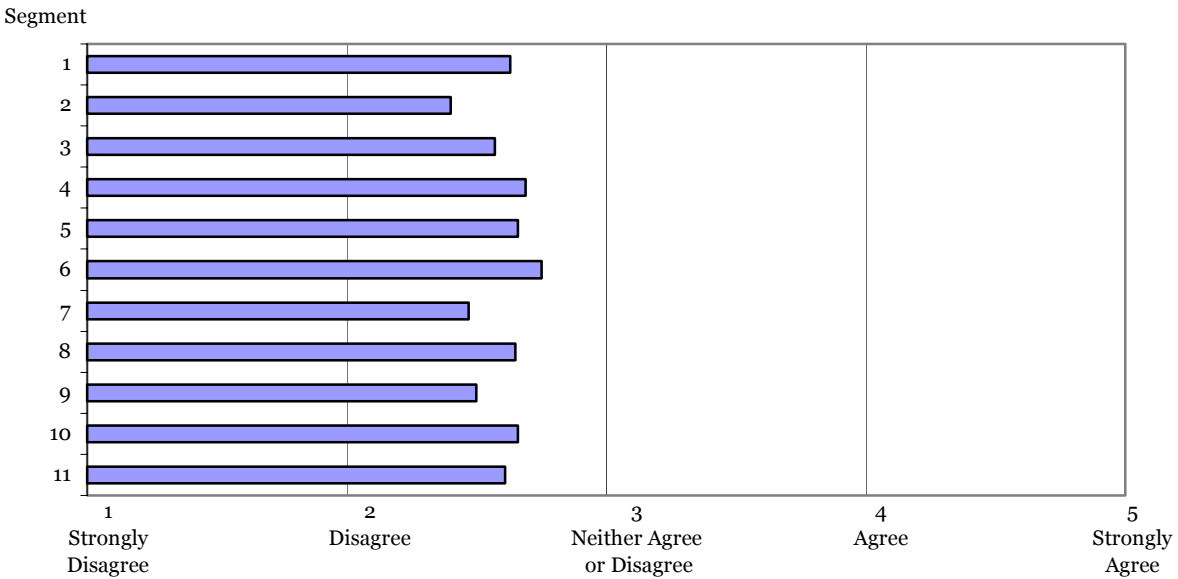
Figure 3.34: Speed Limit

Arts and Crafts

Road users generally disagreed with the statement, “There should be more places to buy local arts and crafts along this road,” which is consistent with responses regarding service and gift shops.

All road segments recorded mean scores less than 3.00, indicating that users were not supportive of more arts and crafts shops located along the road (Figure 3.35).

No significant differences existed, suggesting that little, if any, desire to see further arts and crafts shops along the roadway.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.35: Arts and Crafts

Billboards

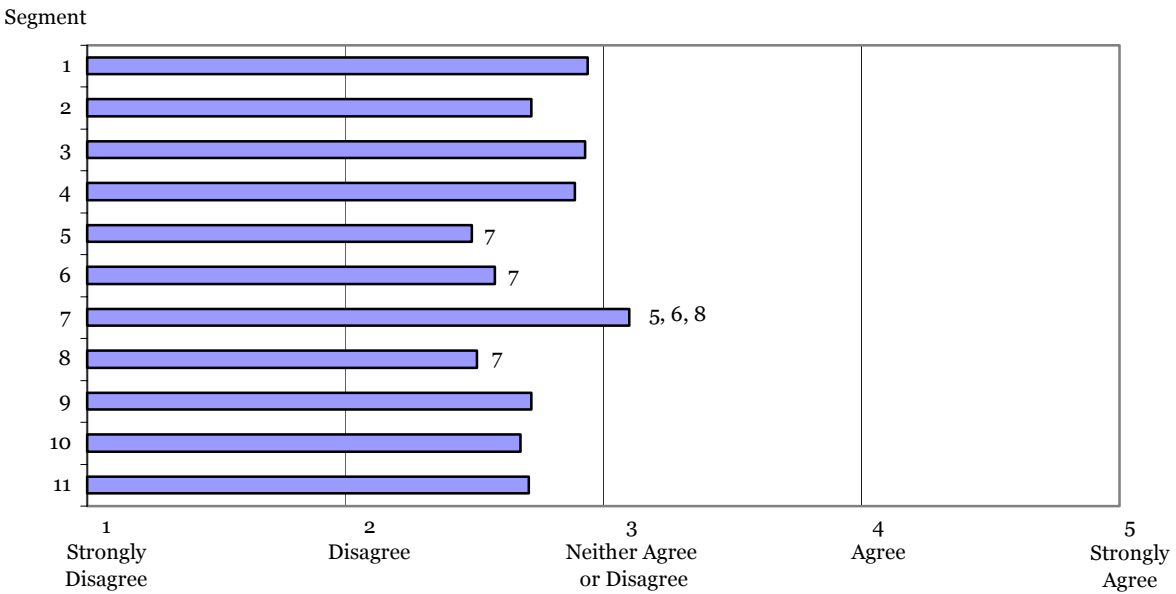
There has been great controversy surrounding the placement of billboards along highways. Federal legislation enacted during the Johnson administration attempted to limit billboards, but the outcome was decidedly mixed, just as travelers responses to this statement were: “Billboard advertising detracted from my travel on this road.”

Do users think billboard advertising detracted from their ride along a particular highway segment? Some road users indicated that they found billboard advertising distracting, while other travelers did not seem to be bothered by billboards along the roadway.

As Figure 3.36 illustrates, there is some indication that users of segment 7 thought too many billboards were located along that stretch of highway.

However, all other segments recorded mean scores below the midpoint of 3.00, indicating that billboards were not seen as detracting from the driving experience.

When significant differences were examined only segment 7 (3.10) was viewed as significantly different than segments 5 (2.49), 6 (2.75), and 8 (2.51).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.36: Billboards

Shoulder Width

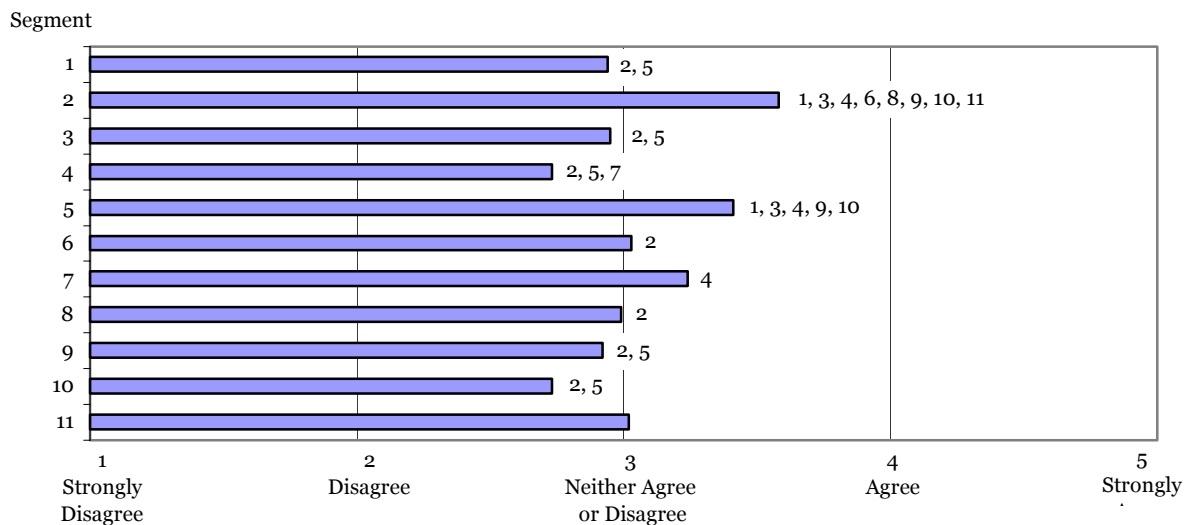
There was a wide range of opinions regarding the width of the shoulder along each roadway segment. Travelers were asked to respond to this statement: “I don’t think the shoulders on this road are wide enough.”

This mixed response is not surprising as shoulder width varied a great deal between segments and even within a particular segment. For example, segment 2 had, at times, almost no shoulder. At other times, especially along the newly reconstructed section, shoulder width was liberal. Road segments 3 and 4 are built to interstate standards with a fairly wide road shoulder, while shoulder width on other segments varied quite a bit. Therefore, it was not surprising to learn that segment users were able to evaluate whether the shoulder was wide enough to suit them (Figure 3.37).

Road segment 2 users were most likely to agree that the shoulders were not wide enough, while users of road segments 4 and 10 both recorded mean scores of 2.73, indicating slight

disagreement with the statement that the shoulders are wide enough along the length of this stretch of road.

Significant differences between segments were numerous; segment 2 (3.58) users differed from all other road segment users, except road segments 5 (3.41) and 7 (3.24). This finding indicates that users of road segments 2, 5 and 7 were the ones most likely to perceive that the road shoulder was not wide enough.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.37: Shoulder Width

Antique Shops

The presence or absence of antique shops was identified as a separate variable, different enough from service businesses, gift shops, and arts and crafts establishments, to stand on its own. Road users were neutral or slightly negative when responding to the statement, “I think it’s appropriate to see antique shops along this road.

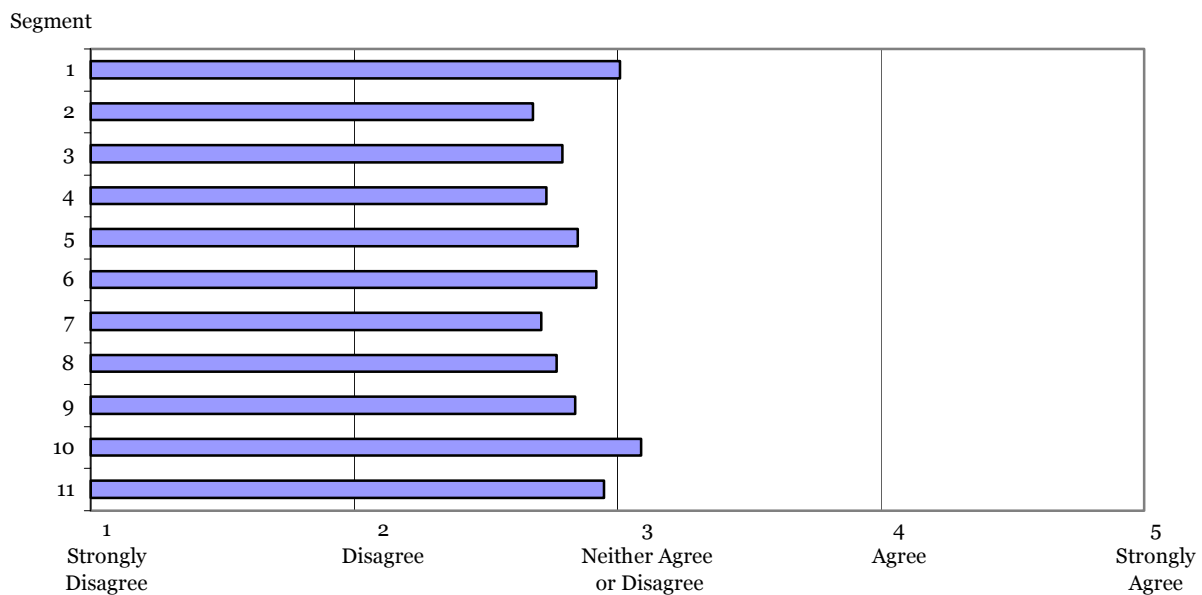
This statement was worded differently than those used to evaluate the other types of businesses located along the roadway. The statement used for this question was not so much interested in the quantity of establishments as it was with the appropriateness of antique shops along the road

segment. Nonetheless, answers were consistent with responses to similar questions about located businesses along the road rather than in communities.

The results indicate that with a few minor exceptions, road segment users did not feel it was appropriate to see antique shops along the road (Figure 3.38).

Segment 1 users recorded a mean score of 3.00 for that roadway, while segment 10 users were slightly in agreement (3.09) that it was appropriate to see antique shops along that roadway segment.

Despite these slight nuances, there were no significant differences noted between segments when the issue of antique shops along the roadway was examined.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.38: Antique Shops

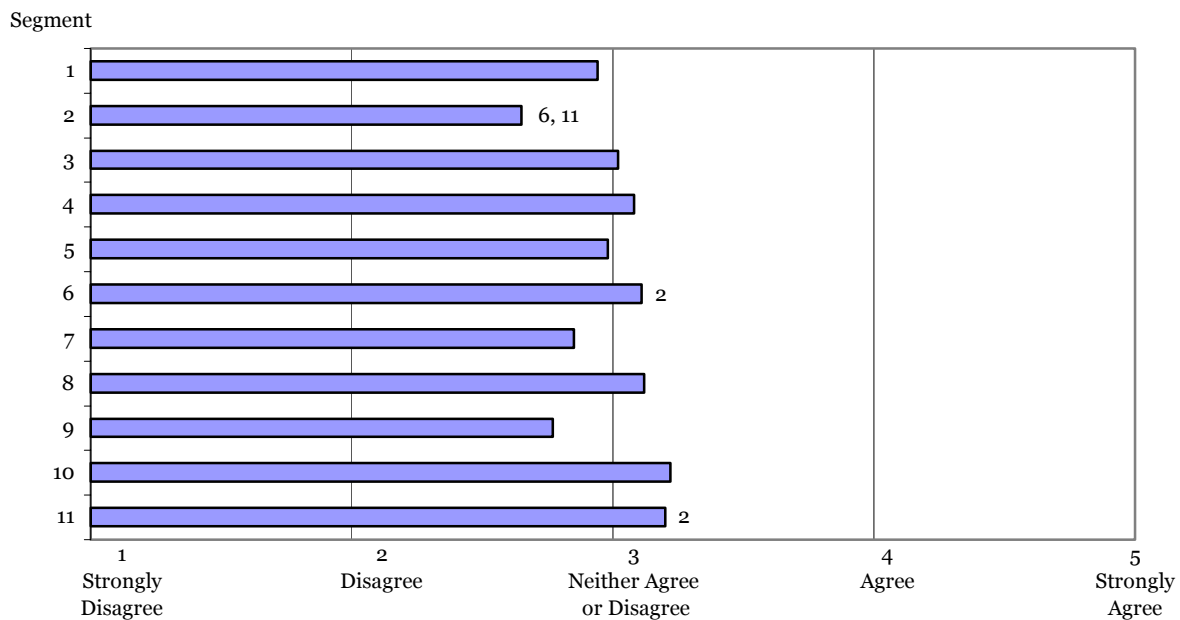
Local Restaurants

Tourism development frequently identifies the utility of local products for increasing economic impact and adding a distinctive appeal to an areas' tourist offering. However, when asked to consider this statement: "I'd like to see more local restaurants along this road," travelers offered mixed opinions.

Users of road segments 3, 4, 6, 8, 10 and 11 were slightly more interested in seeing more local restaurants along the road segment.

In contrast, all other road segment users tended to disagree with the statement. With respect to significant differences, road segment 2 (2.65) users were less likely to want to see more local restaurants along the roadway than were users of segments 6 (3.11) or 11 (3.20), as Figure 3.39 shows.

Note that this question did not ask if more local restaurants were needed in the area, but instead the statement was worded in such a way that respondents were evaluating whether they were needed along the roadway.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.39: Local Restaurants

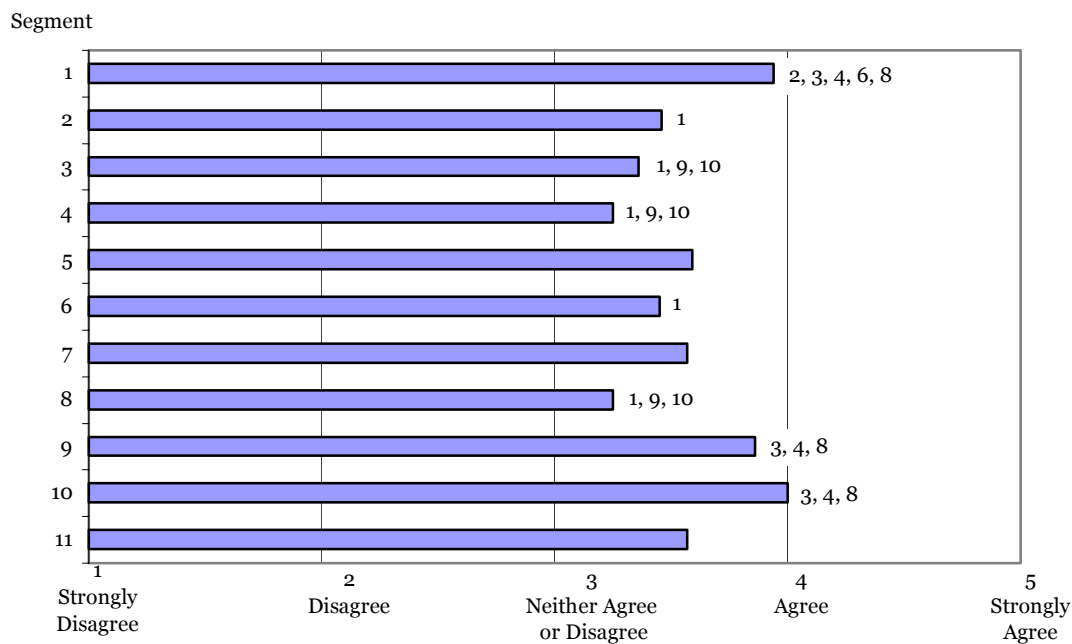
Hiking and Biking

Most roadway users were in agreement with the statement that, “It is important to have opportunities to hike or bike in close vicinity to this road.”

All mean scores were above the midpoint of 3.00, indicating that hiking and biking opportunities are something users are comfortable with and feel are part of the amenity-base for the roadway (Figure 3.40).

The highest mean score was recorded for segment 10 (4.00), indicating agreement with the statement that hiking and biking opportunities are needed in close vicinity to the roadway. The lowest mean score was recorded for segments 4 (3.25) and 8 (3.25).

With respect to significant differences, segments 1 (3.94) and 10 (4.00) were most likely to differ from other segment users, indicating more support for hiking and biking opportunities along these segments than for the others.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.40: Hiking and Biking

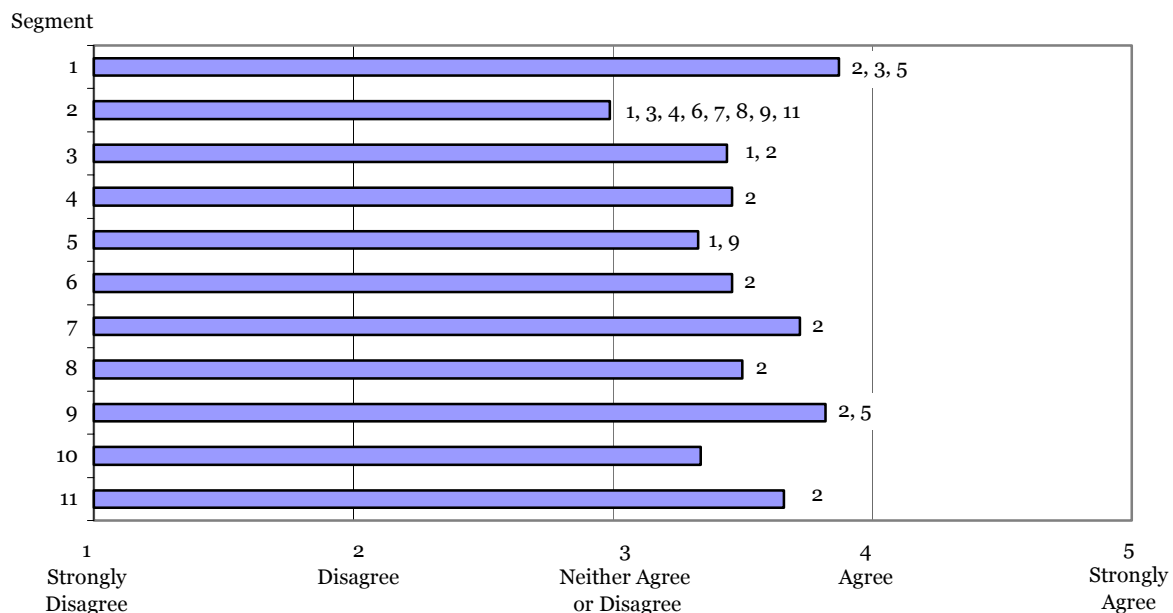
Road Condition

This statement evaluated the condition of the roadway: “I think the condition of the road surface is good along this road.”

There was general agreement with that statement (Figure 3.41). Only one segment (2) recorded a mean score (2.99) less than the midpoint of 3.00.

The highest mean scores, indicating more agreement with the statement, were recorded for road segments 1 (3.87), 9 (3.82), and 7 (3.72).

Significant differences were noted between some segments, with segment 2 (2.99) differing from all others except segments 5 (3.33) and 10 (3.34). This finding indicates that most users of road segment 2 were focusing on the stretches of the roadway that have yet to undergo construction.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.41: Road Condition

Mowing

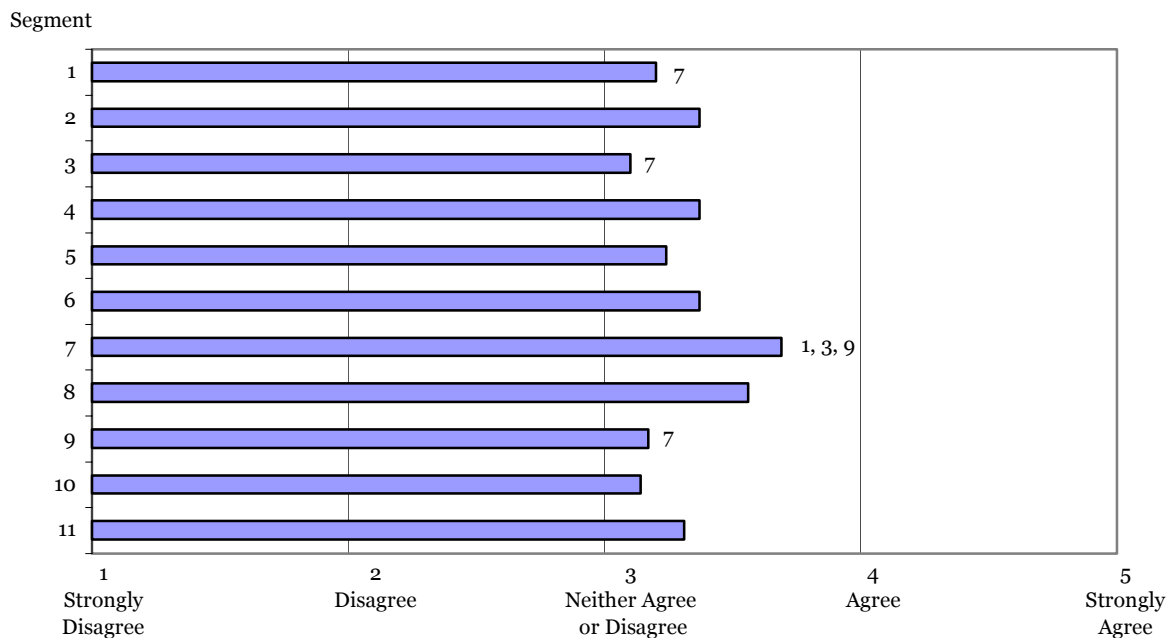
Mowing along a road’s shoulder has been a point of contention for a number of years. Wildlife production and energy consumption savings are often cited as reasons not to mow, with safety and aesthetic issues dominating the decision to mow.

There was general, but weak, agreement found across roadway segments with the statement: “I prefer to see the grass adjacent to the road mowed.”

All mean scores were above the midpoint of 3.00, indicating that mowing is viewed as a good thing although timing and degree of mowing were not analyzed. As Figure 3.42 shows, users of segments 7 (3.69) and 8 (3.56) were most in favor of mowing.

With respect to significant differences between roadway segments, users of segment 7 were more in favor of mowing the shoulders than users of segments 1 (3.20), 3 (3.10), and 9 (3.17).

There is some indication that the more scenic the road is perceived the less likely one finds support for mowing along the shoulders.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.42: Mowing

Scenic Pull-offs

The statement associated with this variable was: “I’d like to see more scenic pull-offs along this road.” Note that this variable is quite similar to the one analyzed above dealing with pull-offs in

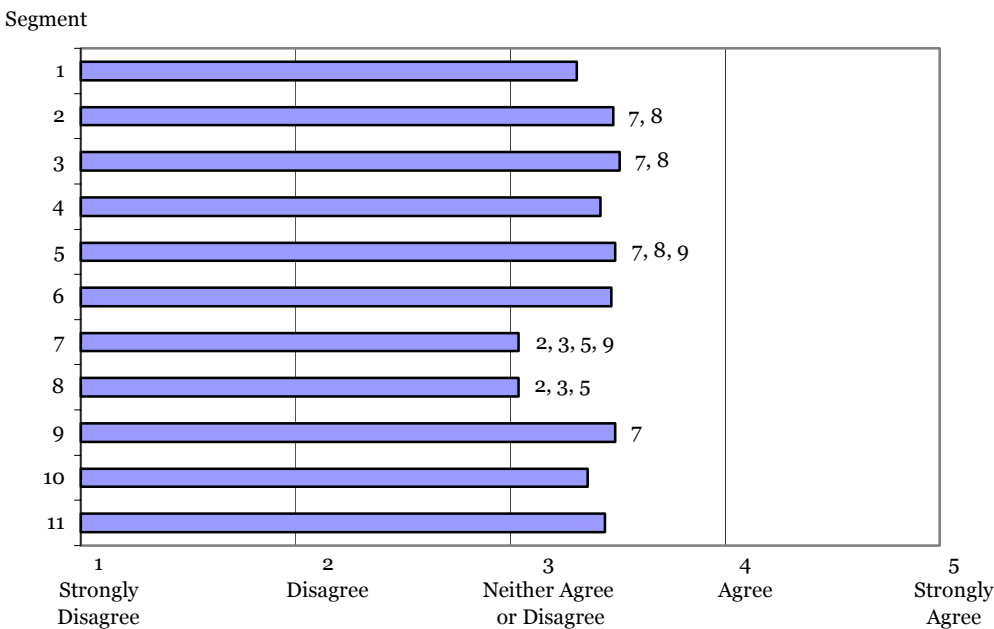
more general terms. The difference is that this variable focuses on “scenic pull-offs” while the other was more broadly defined.

Surprisingly there was more support for further scenic pull-off development than noted for pull-offs in general. It appears that users are able to differentiate between the types of pull-offs they would like to see.

Across the board there was slight agreement with the need to have more scenic pull-offs (Figure 3.43).

The highest support for them was recorded on segment 5 (3.51), followed by segments 9 (3.49) and 2 (3.48), and the lowest support was recorded for segments 7 (3.04) and 8 (3.04).

Significant differences were noted between segment 7 (3.04) and segments 2 (3.48), 3 (3.51), 5 (3.49) and 9 (3.49), and between segment 8 (3.04) and segments 2 (3.48), 3 (3.51), and 5 (3.49).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

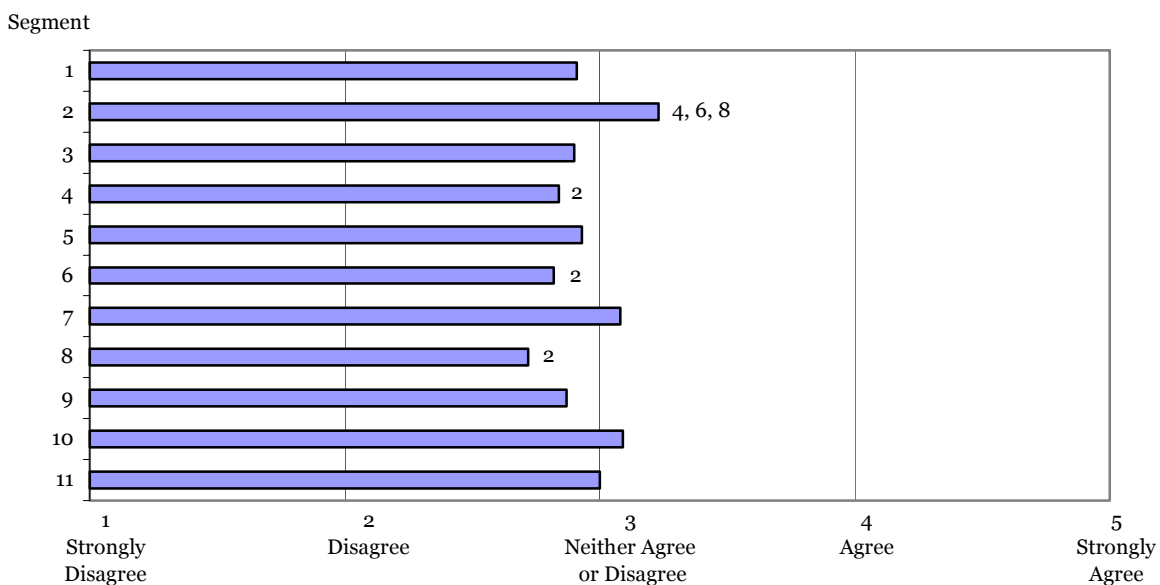
Figure 3.43: Scenic Pull-offs

Guardrails

Should more guardrails be installed along a road segment? Respondents were asked to evaluate this statement: “I’d like to see more guard rails along the shoulders of this road.”

In general, responses were all near the midpoint score of 3.00 (Figure 3.44). Users of segment 2 (3.23) indicated that more guardrails were needed, while users of segment 8 (2.72) disagreed.

Significant differences were noted between segment 2 (3.23) and segments 4 (2.84), 6 (2.82), and 8 (2.72).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

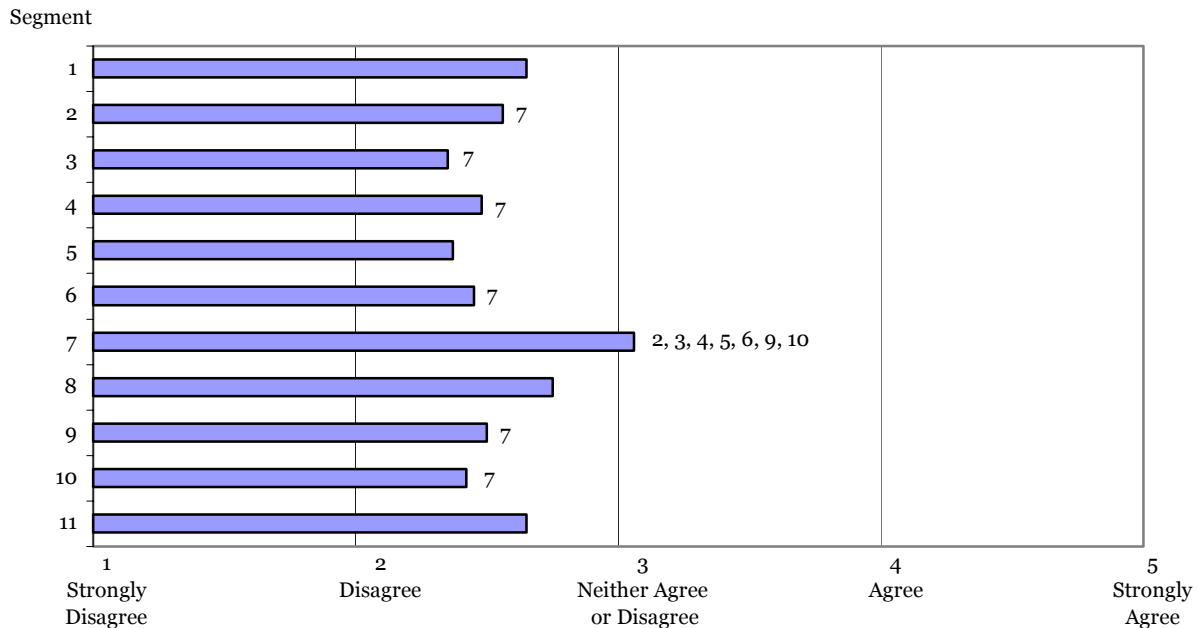
Figure 3.44: Guardrails

Litter

Respondents were asked to state their level of agreement or disagreement with this statement: “There is too much litter along this road.”

For the most part, litter was not a major problem along any stretch of highway as all segment mean scores, except one, were below the midpoint of 3.00, indicating slight disagreement with the statement (Figure 3.45).

Only segment 7 (3.06) users perceived a litter problem. With respect to significant differences, segment 7 (3.06) was seen as different from all other segments except segments 1 (2.65), 8 (2.75), and 11 (2.65).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.45: Litter

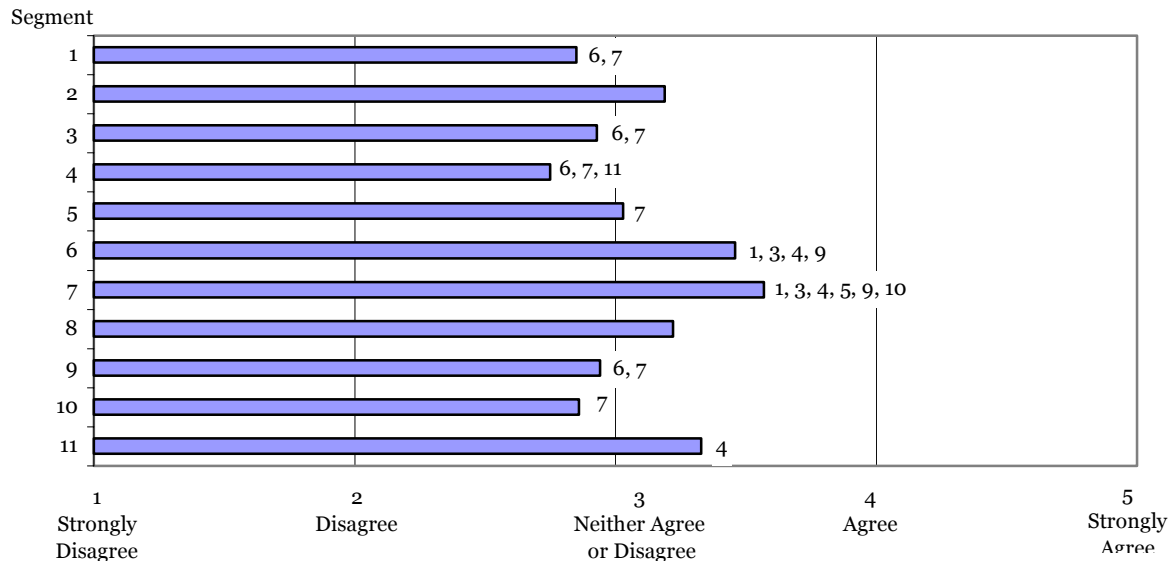
Passing Lanes

Travelers were asked to indicate the degree to which they agreed or disagreed with this statement: “I’d like to see more passing lanes on this road.” This statement elicited strong differences between users of different segments.

As expected, the two four-lane highway segments in this study (3 (2.93) and 4 (2.75) recorded lower mean scores, indicating slight disagreement that more passing lanes are needed.

However, other segments – segments 6 (3.46), 7 (3.57), 8 (3.22), and 11 (3.33) – recorded higher mean scores, suggesting that users of these roadways were more in favor of additional passing lanes than users of other segments.

A number of significant differences between segment users were noted, as Figure 3.46 illustrates.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

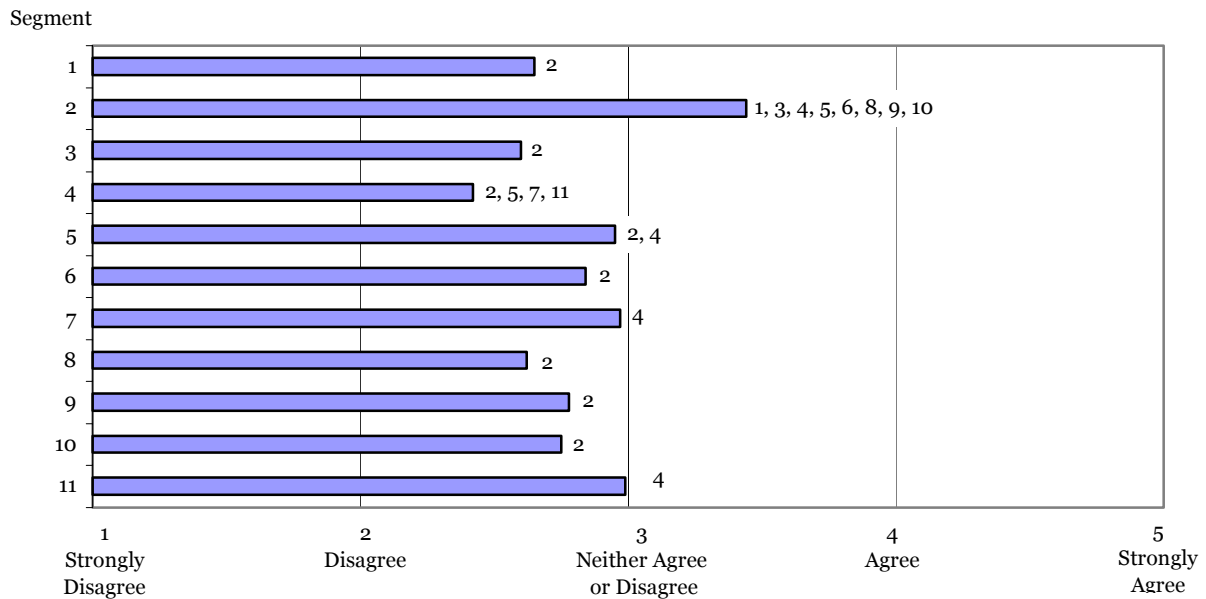
Figure 3.46: Passing Lanes

Accidents with People

Safety is a primary issue when building or reconstructing any roadway. The statement analyzed in this section was, “As a driver, I’m afraid of hitting people walking or riding bicycles along the shoulder of this road.” Responses to this statement were consistent with the statement above that biking and hiking opportunities in close proximity to the roadway was a positive thing.

Overall, travelers generally did not feel afraid of hitting people walking or riding bicycles along the shoulder of the road (Figure 3.47).

However, one noticeable difference did occur. Users of segment 2 (3.44) were in agreement that it would be a problem. The feeling was so strong for users of this segment that the mean score recorded for users of segment 2 (3.44) was significantly different than for all other segments except 7 (2.97) and 11 (2.99).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.47: Accidents with People

Summary and Discussion

It appears from the preceding analysis that the null hypothesis guiding this section of the study must be rejected. There were a number of significant differences noted between road segments and tested variables. Therefore we reject the null hypothesis that essentially says all roads are viewed the same by users and instead conclude that roads have distinctive character with their individual attributes able to be discerned and evaluated by users.

A description of each road segment is provided below along with a discussion of the attributes, amenity, or aesthetic variables important to users of each road segment. Table 3.9 summarizes this information. Note that since the variables are based on statements that the respondent is asked to agree or disagree with, drawing conclusions without reference to question #10 as well as the above discussion might be problematic.

Table 3.9: Road User Preferences Specific to Road Segment

Segments	Safety	Vegetative Growth	Business Locations	Intersections & Driveways	Road Segment Speed	Wildflowers	Gift Shops	Trees	Stoplights & Stop Signs	Pull-offs
1	4.19	3.71	3.90	2.66	3.13	4.02	2.52	3.52	2.49	2.77
2	3.24	3.19	3.43	2.48	3.38	3.94	2.07	3.26	2.20	3.50
3	3.87	3.53	3.57	2.72	3.00	4.03	2.19	3.76	2.67	2.88
4	3.98	3.29	3.23	2.39	3.03	4.00	2.15	3.54	2.31	2.61
5	3.86	3.06	3.44	2.24	2.83	3.83	2.29	3.39	2.24	3.13
6	3.74	3.00	3.44	2.77	2.91	3.88	2.46	3.34	2.64	2.99
7	3.16	2.97	3.59	2.95	3.47	3.83	2.23	3.52	2.60	2.84
8	3.85	2.89	3.26	2.51	3.03	3.63	2.43	3.46	2.08	2.79
9	3.98	3.61	4.09	2.72	3.14	4.10	2.08	3.72	2.51	2.82
10	3.94	3.62	4.00	2.45	2.85	4.08	2.22	3.47	2.32	2.90
11	3.73	3.25	3.39	2.71	2.86	3.87	2.54	3.44	2.77	2.91

Segments	Interpretive Signs	Lodging	Visitor Center	Traffic Congestion	Curves	Speed Limit	Arts & Crafts	Billboards	Shoulder Width	Antique Shops
1	2.92	3.58	3.46	2.66	2.41	2.40	2.63	2.94	2.94	3.01
2	2.73	3.17	3.17	2.52	2.89	2.33	2.40	2.72	3.58	2.68
3	2.94	2.96	3.71	2.58	2.41	2.59	2.57	2.93	2.95	2.79
4	2.90	3.58	3.89	2.59	2.32	2.47	2.69	2.89	2.73	2.73
5	2.88	2.85	3.58	2.09	2.32	2.69	2.66	2.49	3.41	2.85
6	2.92	3.17	3.48	2.53	2.33	2.81	2.75	2.58	3.03	2.92
7	2.76	3.50	3.29	3.43	2.64	2.55	2.47	3.10	3.24	2.71
8	2.70	2.67	2.70	2.41	2.50	2.98	2.65	2.51	2.99	2.77
9	2.85	2.87	3.34	3.06	2.34	2.21	2.50	2.72	2.92	2.84
10	3.02	3.10	3.46	2.28	2.75	2.28	2.66	2.68	2.73	3.09
11	2.89	3.27	3.23	2.92	2.57	2.67	2.61	2.71	3.02	2.95

Segments	Local Restaurants	Hiking & Biking	Road Condition	Mowing	Scenic Pull-offs	Guardrails	Litter	Passing Lanes	Accidents with People
1	2.94	3.94	3.87	3.20	3.31	2.91	2.65	2.85	2.65
2	2.65	3.46	2.99	3.37	3.48	3.23	2.56	3.19	3.44
3	3.02	3.36	3.44	3.10	3.51	2.90	2.35	2.93	2.60
4	3.08	3.25	3.46	3.37	3.42	2.84	2.48	2.75	2.42
5	2.98	3.59	3.33	3.24	3.49	2.93	2.37	3.03	2.95
6	3.11	3.45	3.46	3.37	3.47	2.82	2.45	3.46	2.84
7	2.85	3.57	3.72	3.69	3.04	3.08	3.06	3.57	2.97
8	3.12	3.25	3.50	3.56	3.04	2.72	2.75	3.22	2.62
9	2.77	3.86	3.82	3.17	3.49	2.87	2.50	2.94	2.78
10	3.22	4.00	3.34	3.14	3.36	3.09	2.42	2.86	2.75
11	3.20	3.57	3.66	3.31	3.44	3.00	2.65	3.33	2.99

Road Segment 1: CSAH 61 Brighton Beach Road to Two Harbors

This road segment follows the Lake Superior coastline from just north of Duluth to Two Harbors, Minnesota. It is an alternative route to TH 61 which is the main North Shore Highway connecting with CSAH 61 in Two Harbors. TH 61 does not follow Lake Superior from Duluth to Two Harbors so those who are interested in Lake Superior views and do not mind a slower travel corridor choose CSAH 61. There are many pull offs along the road providing travelers with access to the Lake Superior coastline for hiking, fishing, scenic viewing etc. A number of businesses are located along the roadway including resorts and motels. There are a number of residential homes located along the roadway.

Users of CSAH 61 agree that they feel safe driving on the road, would like to see natural vegetation growing as close to the road as possible, feel it is important to have biking/hiking opportunities in close proximity to the road, would like to see business operations clustered in communities and not spread along the roadway, feel the condition of the road bed is good and there is no problem with the road alignment having too many curves. The rest of the attributes and amenities evaluated do not provoke any intense feelings.

Road Segment 2: TH 38 Grand Rapids to Big Fork

This road segment is a designated scenic highway given the name “Edge of the Wilderness.” Located at the southern end of the road segment is the city of Grand Rapids. Traveling north from Grand Rapids on TH 38 the road is two lanes with narrow gravel shoulders. Residential housing is a common feature along this stretch of the road with some commercial activity apparent as well. Slowly, as one heads north, the corridor changes from one with frequent residential buildings and activity to one more forested. There is a mixed pattern of residential development and forested land for the first five miles north of Grand Rapids. In the more natural areas it is common to see vegetation growing to the edge of the road. “Edge of the Wilderness” scenic highway signs are noticeable and interpretive markers with pull offs are common. At approximately mileage marker 12 the view off the road changes from residential and commercial to more natural and wild views. At mileage marker 13 the newly repaved portion of the road appears. Shoulders are now asphalt/gravel but still narrow. It is about at this point that one enters into the Chippewa National Forest where the corridor becomes much more natural looking with

little or no sign of human habitation. The road itself has many curves and at times the forest is right next to the roadway. At times the forest canopy shades the road completely. At mileage marker 20.9 a rest stop with interpretive signs about the Laurentian Divide is found. The site is well developed. The last few miles leading to Big Fork the forest recedes and the corridor itself becomes very wide. It appears that there exist three distinct road segments that one travels through from Grand Rapids to Big Fork. The first is the old road leading north from Grand Rapids. The second segment is newly reconstructed and the view changes to one that is much more natural. Finally, the third segment appears when one leaves the National Forest, where the road becomes more of a high-speed corridor with a wide sight line, vegetation set back from the road, and the reappearance of mixed residential/commercial development.

User preferences for this road segment indicate that vegetation growing close to the road is preferred, the shoulders are too narrow, there is little support for seeing more residential or commercial development in the corridor, more pull offs are desired, and there is no desire to see the speed limit increased.

Road Segment 3: TH 53 Independence to Virginia

This road segment is a four lane divided highway that appears to have been built according to interstate highway standards but with more access. There was very little change to the highway or the corridor it passes through during its entire length except that there is highway construction activity about seven miles long during the survey period. The road has wide asphalt shoulders, with wide-open sight lines, as the vegetation is set back from the road. Around mileage marker 41 construction ended and the median becomes very wide with trees and other vegetation blocking a view of the opposite direction lanes. At mileage marker 40, a river appears in the median between the lanes. The segment ends at the junction of highway 33 and apart from the construction activity the road has similar features throughout its length with some unusual features (i.e. river in the median) occasionally appearing.

User preferences for this road segment include a desire to see commercial activity clustered in communities and not along the roadway itself, some support for seeing more vegetation (e.g. wildflowers, trees) growing closer to the road, a slight desire to see an interpretive center located

along the roadway and some support for more pull offs. There was no concern about the condition of the road with respect to safety or with the speed of the vehicles on the road. There were also no concerns about the road alignment (i.e. curves).

Road Segment 4: I 35 Carlton to Duluth

This road segment is part of the interstate highway system. It consists of a four lane divided highway with grass growing in the median. The views change from mixed aspen/conifer forest by Carlton to a view of the port city of Duluth and the industrial/residential activity associated with the port, including a number of large granaries along the harbor shore. There is also a nice view of the St. Louis River as one approaches Duluth. Apart from the change in view, the road itself does not change very much.

User preferences reveal that there is little to no concern about the safety of the road, the speed of vehicles on the road, or the alignment or condition of the roadbed. About the only thing that users of this segment would like to see enhanced has to do with having more vegetation (e.g. wildflowers) growing closer to the roadway.

Road Segment 5: TH 11 Baudette to International Falls

This is a fairly long segment but for most of its length road design and surrounding scenery are pretty consistent. This is a designated scenic highway given the name “Waters of the Dancing Sky.” Shoulders are for the most part non-existent until approaching International Falls where new pavement and shoulders appear. Up until this point the road can be rough in spots. The travel corridor is mixed farming, mostly hay, interspersed with vistas of the Rainey River to the north, which forms the border with Canada along this roadway. There are plenty of places to pull off, some with picnic tables and outhouses, and the Grand Mounds Historic Site can be found approximately 8 miles from International Falls.

Users felt that the road condition posed no safety hazards. They would like to see more vegetation such as wildflowers growing closer to the road and also desire to see hiking and biking opportunities made available to them in close proximity to the road. There was also some

support for seeing commercial activity clustered in communities and not spread along the roadway.

Road Segment 6: TH2 Bemidji to Ball Club

This road segment contains some mixed design elements. Beginning at Ball Club the road condition is two lanes, fairly decent pavement, wide, paved shoulders with forested land on both sides. This stretch cuts through the Chippewa National Forest where the views are fairly consistently wooded with limited signs of commercial/residential development. At times the sight lines open up to include low-lying marshes and related vegetation. The Mississippi river passes through this corridor in Cass County. There are very few signs, apart from standard highway signs, found along this corridor. The road begins to change when entering the small town of Bena. A historic gas station/resort is located in Bena. The tourist cabin resort was designed by Frank Lloyd Wright and at one time was used as a Prisoner of War camp.

Although the cabins are no longer in use a gas station, also designed by Wright, is open and operating. It is a very interesting historic site. Traveling west of Bena the road corridor begins to change. There are many more signs of residential and commercial activity as this is a major resort area. The road has been recently repaved with wide paved shoulders. At about mileage marker 136, the road returns to an older condition with more cracks in the surface and a little more bumpy ride. Approximately 14 miles from Bemidji the road becomes a four lane divided highway with much more commercial activity including a casino. Throughout the entire stretch numerous pull offs including recreation sites can be found.

User characteristics include the desire to see more vegetation (e.g. wildflowers) growing closer to the road. There is no indication that users perceive any safety issues with using this road.

Road Segment 7: TH371 Nisswa to Pine River

This two-lane road maintains a fairly consistent character throughout its entire length. It is paved with wide shoulders with lots of commercial activity. Although the speed limit is 55 very few vehicles travel that slow when conditions permit. There also seems to be a lot of traffic on this road compared to others in the study. The road itself has wide sight lines with forested areas set

far back from the edge of the road. The road passes a number of lakes but one thing that is always noticeable is the amount of commercial activity advertised or found along the road.

User preferences are quite pronounced for this stretch of road. There is fairly strong support for clustering commercial establishments in towns rather than along the road. There is also support for planting vegetation (e.g. wildflowers, trees) such that it comes closer to the edge of the road. When grass is found along the shoulder there is a preference to see it mowed. The road itself is viewed as safe to travel on although more passing lanes are desired. Users also express a preference for having hiking/biking opportunities found in close proximity to the road.

Road Segment 8: Intersection of TH 29 and TH 28 Sauk Centre to Starbuck via Glenwood

Most of this road segment has fairly uniform features. The road is two lane paved, with paved shoulders. Travelers pass through heavy residential, some commercial, areas near the cities of Glenwood and Starbuck reverting to farmland outside of town. Part of the Highway is designated the “Glacial Ridge Trail” a scenic Byway, but there very little signage and no interpretation along this stretch of road that provides any additional information about it. There is a nice view of Pelican Lake from the road with evidence of residential development. There is also the Minnewaska High School located along the road. For the most part this road is flat and straight. When the road enters Stearns County its character changes somewhat. It is a bit older highway at this point with a few more bumps on it.

Users of this road segment do not have any strong opinions about the different attributes and amenities encountered. They believe the road poses no safety hazards and would like to see more clustering of businesses in communities rather than along the highway. There is also some support for vegetative planting up to the edge of the road although the mean score for this road segment is the lowest for any of them. There is also no concern about the number of stop lights or stop signs along the road as this stretch of road has very few.

Road Segment 9: TH 95 Taylors Falls to Stillwater

This road segment travels through primarily wooded land with mixed residential/farmland found throughout. There are hills and curves to navigate along the road but the road itself is in good

condition with ample shoulders part paved and part gravel. As one moves south to north residential development gives way to more open farmland. Occasionally the St. Croix National Scenic River can be seen through the trees. William O'Brien State Park is also found along the northern section of this road. Road segment 9 also travels through some picturesque small communities including Stillwater on the southern end and Marine on St. Croix about halfway. Marine on St. Croix is a fairly popular community for tourists.

User preferences are decidedly in favor of clustering most commercial activity in communities and not spread out along the roadway. There is a desire to see more vegetation (e.g. wildflowers, trees) growing close to the road as this segment scored highest of all the segments on the vegetation variable. There does not appear to be any problem with the condition of the road or its alignment. Additionally users feel it is important to have hiking/biking opportunities available in close proximity to the road.

Road Segment 10: TH 16 Preston via Lanesboro to La Crescent

Road segment 10 is a scenic Byway given the name "Historic Bluff Country." It is a picturesque route passing through hilly areas and into the bluff area along the Mississippi river. Some sections of it follow the Root River and throughout numerous recreation opportunities present themselves including the Root River Trail for hiking and biking. The road passes through many small towns, with Lanesboro as the most recognized tourist spot. Farmland and some commercial/residential development were encountered, although the dominant features of the ride are the hills, bluffs and river resources. The road is, at times, a two-lanes corridor with wide shoulders, but at other times, there is not enough of a shoulder to accommodate bicycle traffic. Many pull offs are found along the road including some Department of Natural Resources access sites.

Users are in favor of seeing vegetation growing close to the edge of the road. This segment along with segments 1 and 9 scored the highest with respect to wanting to see vegetation growing close to the road edge. A similar preference pattern for the three road segments was revealed for the desire to see commercial activity clustered in communities rather than along the road. Traffic

congestion was viewed as low and there were no problems identified with respect to road condition or alignment.

Road Segment 11: TH61 Red Wing to Wabasha

Traveling south from Red Wing TH 61 is a four-lane divided highway that turns into a two-lane highway at the Minnesota Correctional Facility. Shoulders are ample and paved at this point. The road travels along the Mississippi river until the river becomes Lake Pepin. The road continues to follow Lake Pepin and it goes through a number of small communities including Lake City, which is the biggest between Red Wing and Wabasha. Apart from the river views there is some evidence of farming but the western scenery is often of large bluffs. There are many pull offs along the road for wildlife viewing and access to the river. There are also state parks, campgrounds, resorts, conference centers, rest stops and numerous other places to stop along the way both in and outside of the communities. This is fairly well traveled route with mixed commercial, residential, farmland and wild land resources apparent throughout. The road itself was being repaved in places but is fairly consistently designed along the entire stretch.

Users of road segment 11 feel that the condition of the road is fairly good with few or no safety issues with which to be concerned. There was some support for seeing more vegetation (e.g. wildflowers) being allowed to grow up close to the road edge. Users also felt that providing hiking/biking opportunities in close proximity to the road would be a good idea.

BENEFITS

What types of benefits do users receive from traveling on any of the segments in this study? That question motivated Questions #11, #12 and #17 on the questionnaire (Appendix A). Since benefit based analysis has not been applied previously to transportation research (to our knowledge), we turned to the recreation literature, where it has been used extensively, for assistance. Dave Lime was hired as a consultant to help develop the benefit questions used in the questionnaire. The questions chosen have been tested in the field on recreation users over the course of many years. The intent of using them here is an attempt to extend Benefits based research into the realm of highway transportation.

As stated in the preceding section it is clear that road segments have character. While it is possible to talk about highway users in general it is also possible to talk about users predilection for particular amenities and attributes present or desired along a specific road segment. Theoretically then it should be possible to pick up different benefits related to specific road segments. However to be consistent with how the analytical part of the study has been conducted a null hypothesis, as stated in the Methods section, was developed to guide the research discussed in this section. The operational null hypothesis for this section of the study is: **There is no indication that different user groups using the same roadway seek different benefits.**

This section has four parts. The first deals only with how users would like to see each road segment managed with respect to seven key features (e.g. economic impact, cultural uniqueness, natural environment etc). Although the features analyzed are not benefits per se, they do allow us to ascertain preferences for how travelers think particular road segments should be managed. The second part of this section evaluates benefits desired from the touring experience in general, summarizing data from all road segments. The third section covers the degree to which travelers attained a particular desired benefit among those who identified that benefit as important for each road segment. Finally, the last section examines if users of the various road segments desire different benefits.

Benefit Management

How would users of each road segment prefer to see that segment managed and for what purpose? That is the question for the line of inquiry contained within Question 12 of the questionnaire. Respondents were not asked to pick one type of resource management over another. Instead, each resource management statement is presented separately, and rated on a 7-point scale as to its importance as a management priority. Analysis generates average mean scores that allow us to determine the relative resource management rankings for each segment.

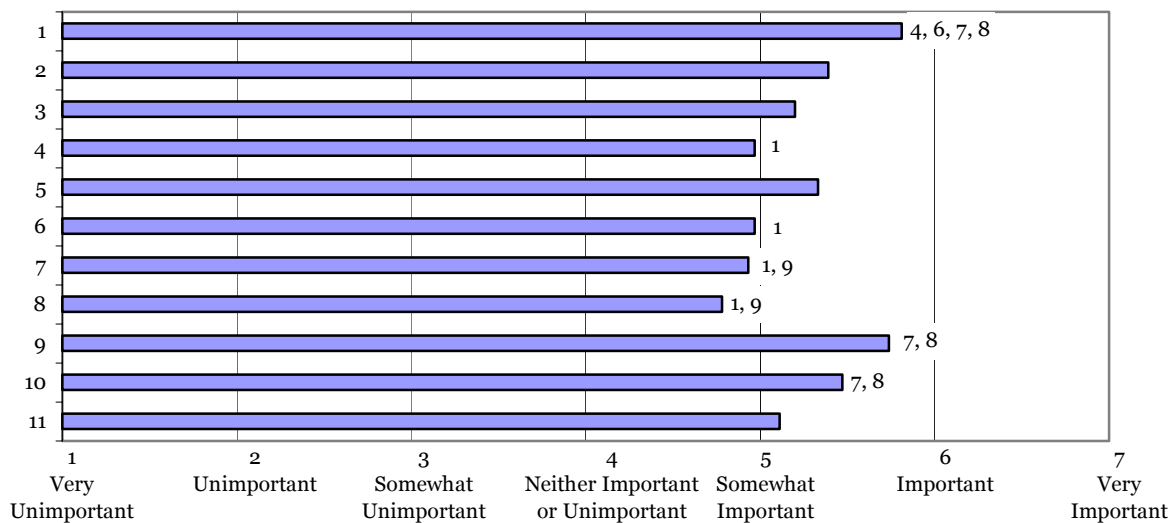
Cultural Uniqueness

Respondents were asked to indicate the relative importance of managing the road segment to “preserve the cultural uniqueness of the area.” Mean scores for all road segments ranged from a

low of 4.78 for segment 8 to a high of 5.81 for segment 1, indicating that users of all segments felt that it was somewhat important to important to manage a road segment for its cultural uniqueness (Figure 3.48).

There were a number of significant differences noted between segments. Users of road segment 1 (5.81) were more likely to favor preserving the cultural uniqueness of the area than were users of segments 4 (4.97), 6 (4.97), 7 (4.93), and 8 (4.78).

Users of road segment 9 (5.74) were also more in favor of managing the roadway for cultural uniqueness than users of road segments 7 (4.93) or 8 (4.78).



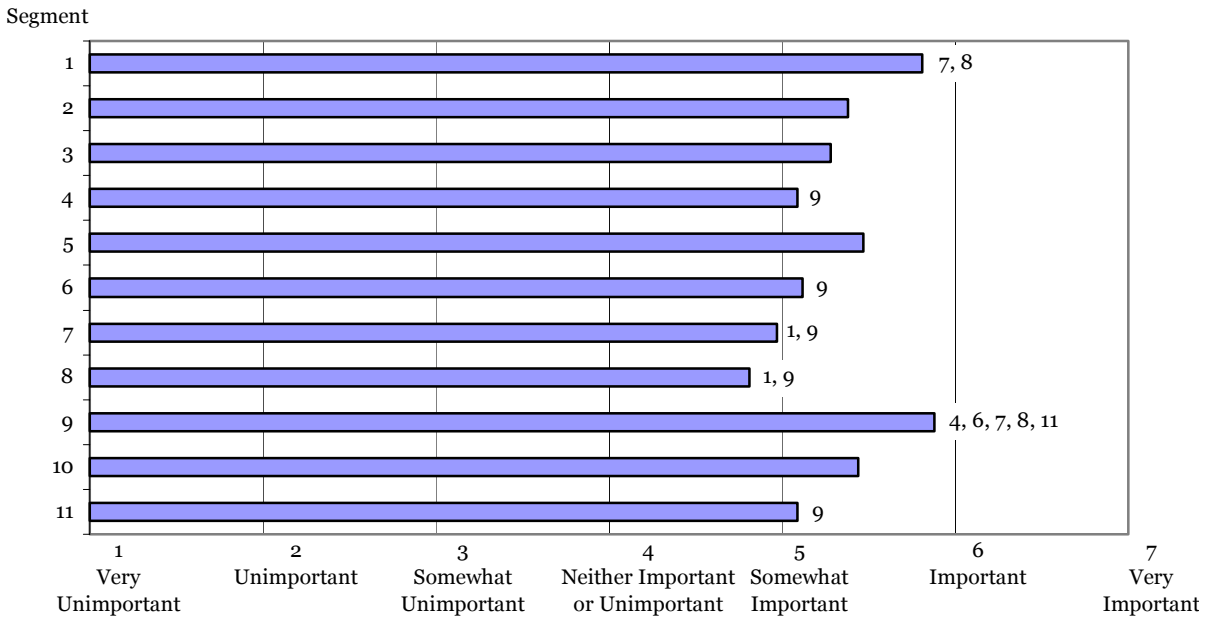
Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.48: Cultural Uniqueness

History

A similar pattern to that recorded for cultural uniqueness was noted for responses regarding management of the road segment for its historical values. Specifically, respondents were asked to indicate the relative importance of managing the road segment to “preserve the history of the area.”

Mean scores for each segment, on this variable, were very similar to segment mean scores for the cultural uniqueness variable (Figure 3.49).



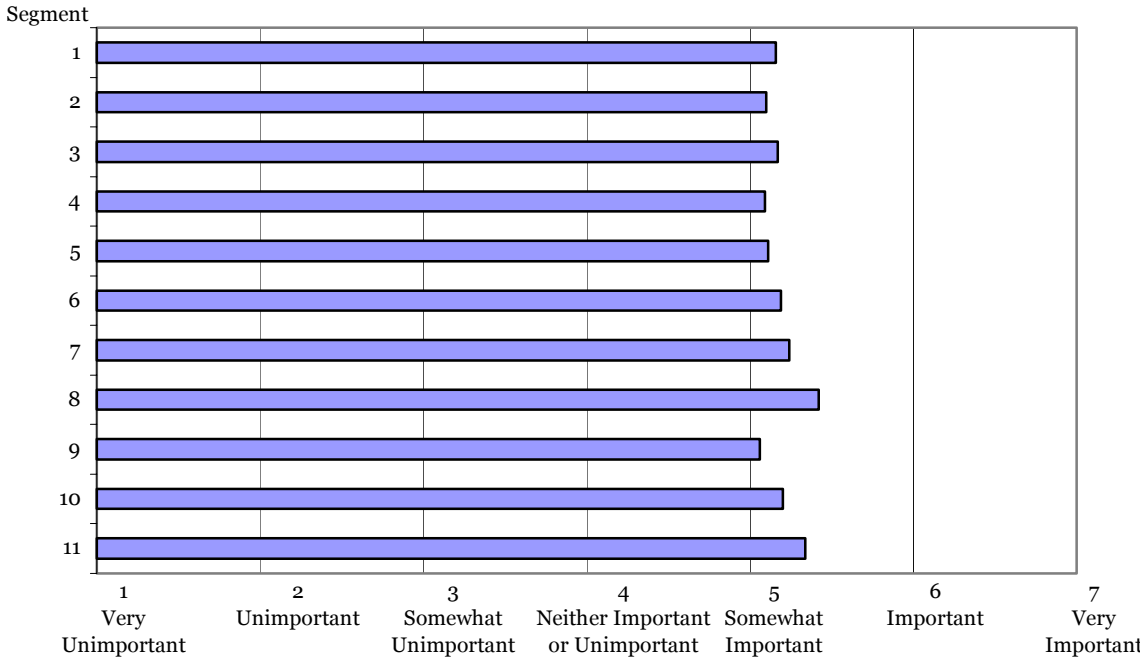
Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.49: History

Economics

There was agreement across all segments that managing a roadway for economic reasons (i.e. jobs and income for local residents) is somewhat important. Specifically, respondents were asked to indicate the relative importance of managing the road segment to “provide income, money and jobs for local communities.”

All mean scores for this variable were above the value of 5.00 but below the value 5.50. There were no significant differences noted between segments for this variable (Figure 3.50).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

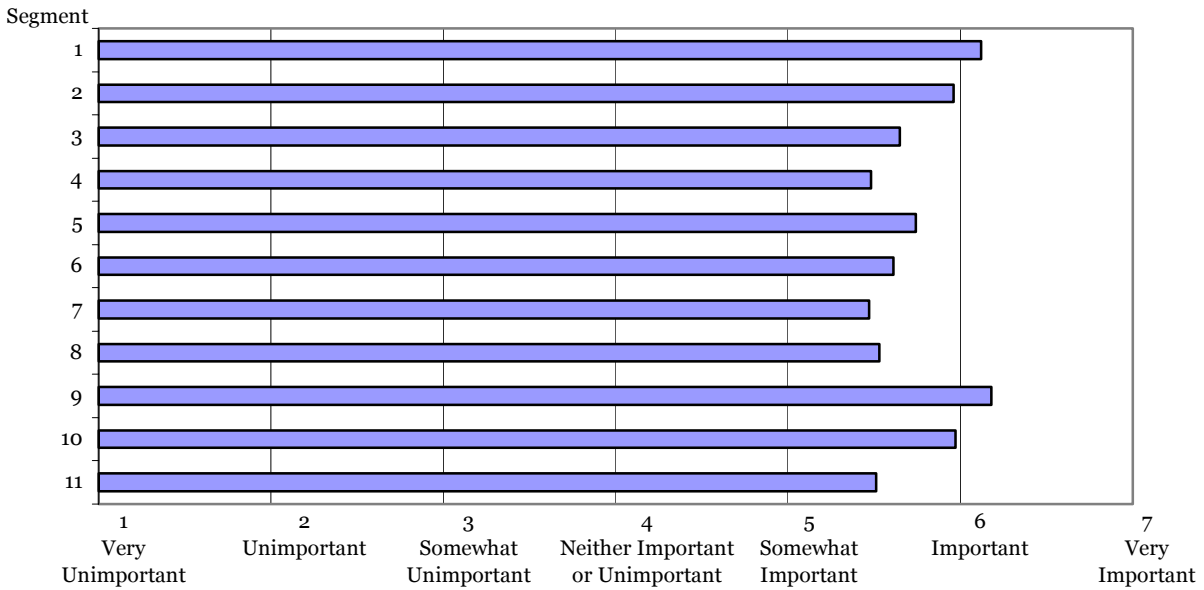
Figure 3.50: Economics

Natural Environment

Protecting the natural environment recorded the highest mean scores for any variable in the benefits management section, which is not surprising. Other research conducted by the Tourism Center (see Current Area Visitors study at www.tourism.umn.edu/research) reinforces the position that regardless of where visitors are encountered, the importance of the natural environment is a primary reason for visiting Minnesota.

Respondents were asked to indicate the relative importance of managing the road segment to “protect the natural environment.” Mean scores for segments ranged from a high of 6.18 for segment 9 to a low of 5.47 for segment 7, indicating that protecting the natural environment is somewhat important to important for each road segment.

No significant differences existed between segments (Figure 3.51).



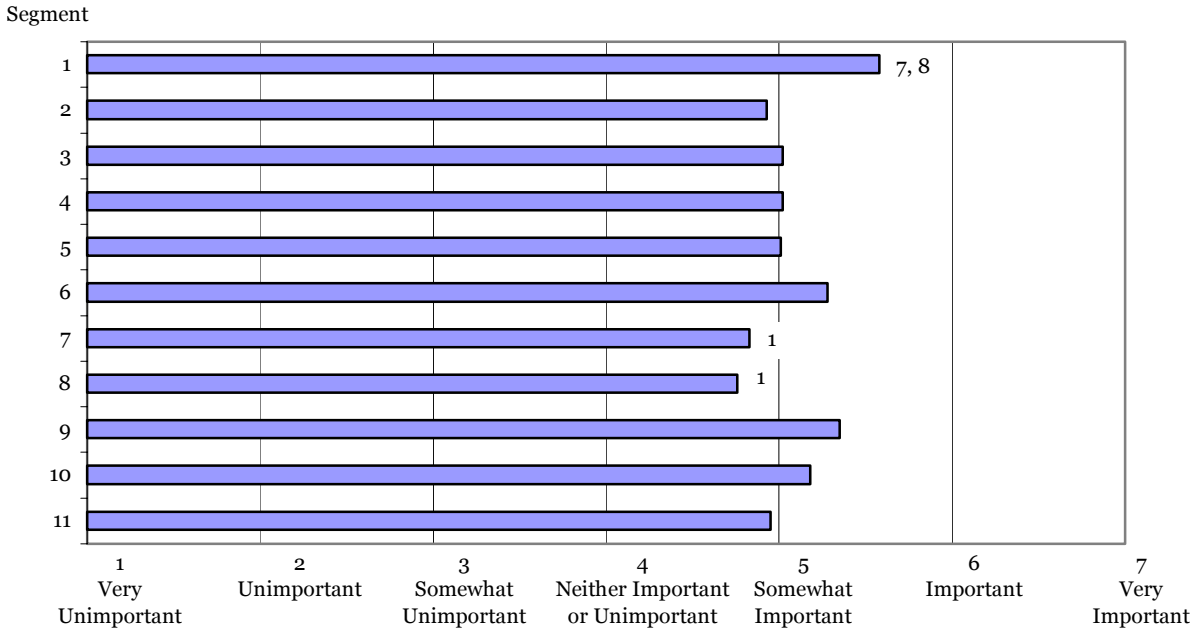
Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.51: Natural Environment

Present Local Culture and History to Visitors

Respondents were asked to indicate the relative importance of managing the road segment to “present the local culture and history to visitors.” In general, visitors are supportive of the idea that roadways should be managed so that local culture and history can be presented to visitors (Figure 3.52).

The only significant differences noted were between segment 1 and segments 7 and 8. In this instance, users of road segment 1 felt it was more important than users of either road segments 7 or 8 to manage the corridor such that local culture and history can be presented to roadway users.



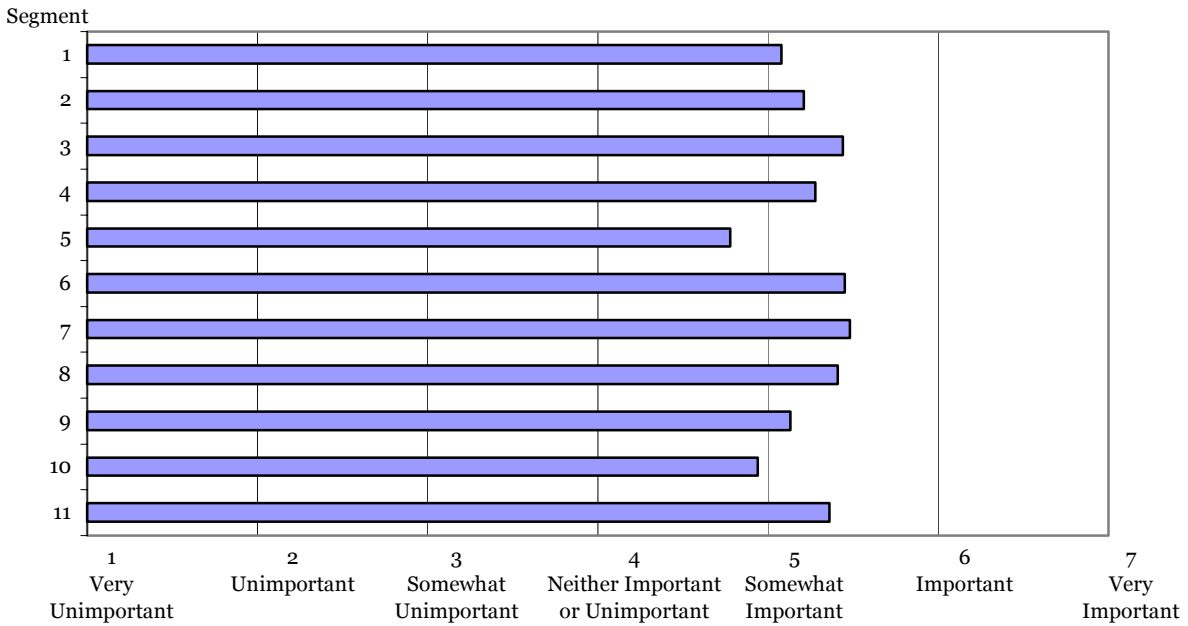
Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.52: Present Local Culture and History to Visitors

Transportation

General support exists for managing road segments as simply a transportation corridor for people passing through an area (Figure 3.53). Specifically, respondents were asked to indicate the relative importance of managing the road segment to “provide a transportation route for people passing through the area.”

Mean scores ranged from a high of 5.48 (segment 7) to a low of 4.78 (segment 5), indicating that it is important to manage a segment as a transportation corridor. No significant differences existed between the segments.



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.53: Transportation

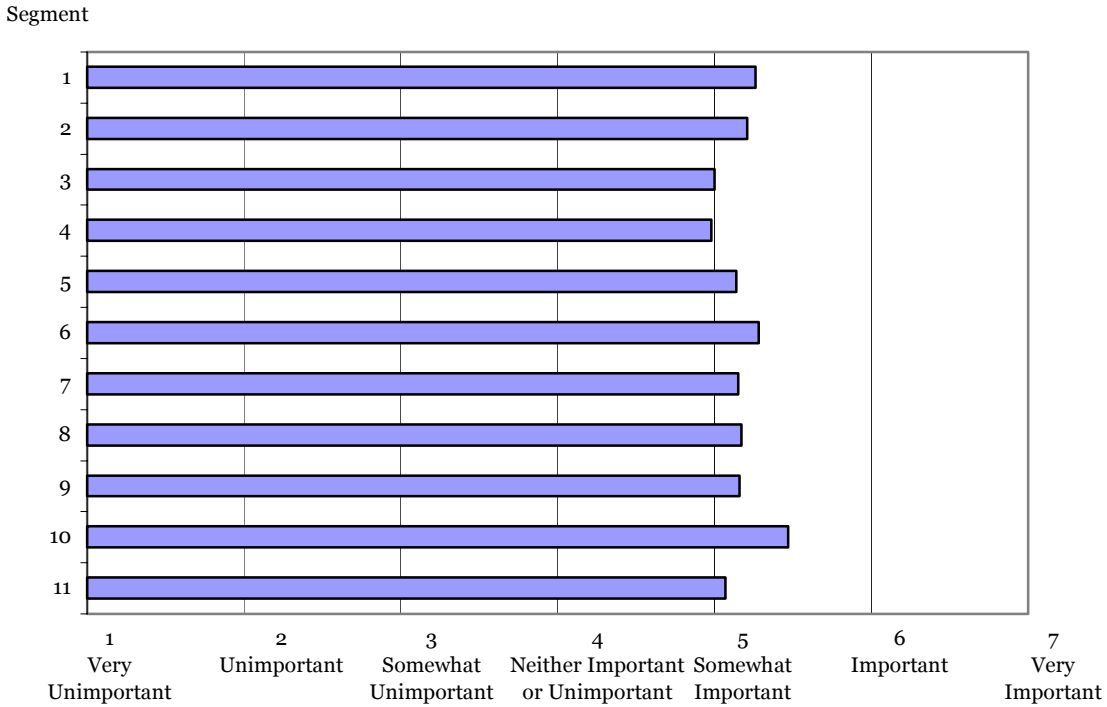
Recreation

Should roadways be managed to provide recreation opportunities for local community residents?

Respondents generally agreed that recreation was a somewhat important management consideration. Specifically, respondents were asked to indicate the relative importance of managing the road segment to “provide recreation opportunities for local communities.”

Mean scores ranged from a high of 5.47 (segment 10) to a low of 4.98 (segment 4).

There were no significant differences between segments (Figure 3.54).



Note: A number appearing at the end of a bar identifies segment(s) that are significantly different than that bar.

Figure 3.54: Recreation

Summary

With one exception road segment users were fairly consistent in how they rated the importance of different management priorities. The one exception had to do with the natural environment. Users, regardless of road segment, rated the importance of the natural environment for management attention as more important than for any of the other variables (Table 3.10). Some roads, such as segment 1 rated “preserve cultural uniqueness,” “preserve history of the area,” and “present local culture and history” as important features as well. Users of road segment 1 rated those management options the highest of any one of the segments. The lowest scores, across all road segments, were recorded for “provide income, money and jobs for local communities,” “provide a transportation route,” and “provide recreational opportunities.”

Table 3.10: Importance of Management Priorities Specific to Road Segment

Segments	Preserve Cultural Uniqueness	Preserve History of the Area	Provide Income, Money, and Jobs for Local Communities	Protect Natural Environment	Present Local Culture & History	Provide Transportation Route	Provide Recreational Opportunities
1	5.81	5.81	5.16	6.12	5.58	5.08	5.26
2	5.39	5.38	5.10	5.96	4.93	5.21	5.21
3	5.20	5.28	5.17	5.65	5.02	5.44	5.00
4	4.97	5.09	5.09	5.48	5.02	5.28	4.98
5	5.33	5.47	5.11	5.74	5.01	4.78	5.14
6	4.97	5.12	5.19	5.61	5.28	5.45	5.28
7	4.93	4.97	5.24	5.47	4.83	5.48	5.15
8	4.78	4.81	5.42	5.53	4.76	5.41	5.17
9	5.74	5.88	5.06	6.18	5.35	5.13	5.16
10	5.47	5.44	5.20	5.97	5.18	4.94	5.47
11	5.11	5.09	5.34	5.51	4.95	5.36	5.07

Benefit Types

A series of statements, examining benefits from the traveling experience, was presented to road segment users in question #11 on the questionnaire. The purpose of this question was twofold. The first was to determine the types of users groups, based on benefits sought, that were found traveling on all road segments under study. The second was to examine particular road segment users with respect to how many people rated a particular benefit as important (i.e. scores greater or equal to 5), and whether that user was able to attain the sought benefit from traveling on particular a road segment.

Overall Benefits

Factor analysis was used to find commonality among users of 11 road segments. Factor analysis is a data reduction technique that examines how each person answers a particular question. Questions answered in a similar manner are correlated with each other such that they reveal the types of users groups encountered, the size of each group, and the importance of each benefit to a particular segment. When the statements in question #11 were analyzed using factor analysis for all user responses three distinct groups emerged.

Local Color Seekers show a preference for locally unique attractions. This group enjoys the cultural history of the area, natural history of the area, local agricultural practices, and local architecture. Members of this group are attracted to local communities along the roadway that project a small town atmosphere. In addition they are likely to attend locally produced cultural events and are in search of local shopping experiences. Meeting new people is often cited as an important reason for traveling on a road segment. This group also values roadways that allow them to visit small communities and take advantage of what is unique about those communities. The size of this user group is approximately 26% of all roadway users who responded to the survey.

Unexplored Area Explorers like getting away from the crowd and the usual demands of life. They like to explore new areas with people who enjoy the same things they do. This group is also keen to learn about the cultural and natural history of the area they are passing through and want to view wildlife in natural habitats. Roadways in rural areas that are not crowded with other users and possess other sought after attributes such as wildlife viewing would be prime candidates to be chosen by members of this group. The size of this group is approximately 19% of all roadway users responding to the survey.

Social Group Relaxers place high value on roadway segments that allow them to relax physically. They do this by choosing a roadway that allows them to enjoy the scenery and experience a sense of adventure. Enjoying the traveling experience with members of their travel party is an important benefit. Member of this group also find it important to get away from the usual demands of life when choosing a road. Other attributes of the traveling experience are much less important than the need to relax physically, yet experience a sense of adventure with people in their own travel party when deciding what road segment to take. The size of this group is approximately 17% of all roadway users responding to the survey.

Importance/Attainment

As mentioned above, each road segment was analyzed with respect to how important specific benefits were to selecting a road for travel.

Only those users who checked a five or higher on the importance scale (see question #11), for a particular benefit, were included in an “attainment rating” assessment for that benefit. The attainment scale ranges from a low of 1 (did not attain) to a high of 4 (totally attained). A mean score greater than 3.00 indicates a moderate to high level of attainment on that benefit. Tables 3.11 through 3.21 detail the number of individuals who checked a 5 or higher for attainment over the total number of individuals who checked anything on the importance scale for that benefit. Both mean attainment score and segment size should be taken into consideration when analyzing the output contained in Tables 3.11 through 3.21.

Road Segment 1

Highest attainment benefit scores among travelers along segment 1 were recorded for “get away from the usual demands of life (3.51),” and “enjoy the scenery of the area (3.49).” Both benefits had 149 of 200 users rate them as very important to road selection.

Lowest attainment scores were recorded for “learn about the cultural history of the area (2.45)” and “experience local agricultural practices (2.46).”

Responses of 5 or higher included in calculating mean attainment were 88 and 35, respectively. Other cultural related benefits for this segment scored low on attainment as well.

Table 3.11: Segment 1 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	3.49	149/200
Relax physically	3.32	146/200
Be with members of my travel party	3.54	128/200
Experience a sense of adventure	3.03	121/200
Visit local communities along the road	2.82	93/200
Experience the local culture and history	2.70	92/200
Meet new people	2.93	56/200
Experience the local small town atmosphere	2.84	87/200
See wildlife in natural habitats	2.83	138/200
Experience local shopping opportunities	2.82	56/200
Experience local cultural events	2.48	58/200
Experience local architecture	2.72	65/200
Get away from crowds	3.27	132/200
Learn about the natural history of the area	2.64	104/200
Experience local agricultural practices	2.46	35/200
Experience a new area	2.92	106/200
Be with people who enjoy the same things I do	3.39	119/200
Learn about the cultural history of the area	2.45	88/200
Get away from the usual demands of life	3.51	149/200

* Among respondents scoring 5 or higher on benefit importance score

Road Segment 2

Benefits that were attained from traveling on road segment 2 were “enjoy the scenery of the area (3.41, 120/234)” and “Get away from the usual demands of life (3.35, 117/234). Benefits that recorded the lowest level of attainment were “Experience local cultural events (2.08, 37/234)” and “Experience local agricultural practices (2.36, 28/234).

Road Segment 3

Benefits attained from traveling on segment 3 were “Be with members of my travel party (3.46, 106/244)” and “Get away from the usual demands of life (3.27, 128/244).” Benefits that recorded lowest level of attainment were “Experience local agricultural practices (1.87, 38/244)” and “Experience local cultural events (1.98, 55/244).” Segment 3 users recorded lower attainment scores, across almost all benefits, than found for all other road segments except segments 4 and 8.

Table 3.12: Segment 2 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	3.41	120/234
Relax physically	2.92	105/234
Be with members of my travel party	3.28	83/234
Experience a sense of adventure	2.96	84/234
Visit local communities along the road	3.00	48/234
Experience the local culture and history	2.52	66/234
Meet new people	2.53	40/234
Experience the local small town atmosphere	3.01	75/234
See wildlife in natural habitats	2.80	117/234
Experience local shopping opportunities	2.69	42/234
Experience local cultural events	2.08	37/234
Experience local architecture	2.38	34/234
Get away from crowds	3.27	108/234
Learn about the natural history of the area	2.47	78/234
Experience local agricultural practices	2.36	28/234
Experience a new area	2.86	72/234
Be with people who enjoy the same things I do	3.03	99/234
Learn about the cultural history of the area	2.45	60/234
Get away from the usual demands of life	3.35	117/234

* Among respondents scoring 5 or higher on benefit importance score

Table 3.13: Segment 3 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	3.13	118/244
Relax physically	3.01	103/244
Be with members of my travel party	3.46	106/244
Experience a sense of adventure	3.01	82/244
Visit local communities along the road	2.49	53/244
Experience the local culture and history	2.26	76/244
Meet new people	2.49	45/244
Experience the local small town atmosphere	2.45	67/244
See wildlife in natural habitats	2.33	108/244
Experience local shopping opportunities	2.39	36/244
Experience local cultural events	1.98	55/244
Experience local architecture	2.33	60/244
Get away from crowds	2.93	111/244
Learn about the natural history of the area	2.41	88/244
Experience local agricultural practices	1.87	38/244
Experience a new area	2.63	92/244
Be with people who enjoy the same things I do	3.09	108/244
Learn about the cultural history of the area	2.37	83/244
Get away from the usual demands of life	3.27	128/244

* Among respondents scoring 5 or higher on benefit importance score

Road Segment 4

Benefits attained from traveling on segment 4 were “Be with members of my travel party (3.62, 104/204),” “Get away from the usual demands of life (3.21, 121/204),” and “Be with people who enjoy the same things I do (3.19, 95/204).” Benefits recording lowest levels of attainment were “Experience local cultural events (1.87, 47/204),” and “See wildlife in their natural habitat (2.02, 96/204).”

Table 3.14: Segment 4 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	3.07	113/204
Relax physically	3.12	102/204
Be with members of my travel party	3.62	104/204
Experience a sense of adventure	2.94	97/204
Visit local communities along the road	2.58	55/204
Experience the local culture and history	2.34	76/204
Meet new people	2.75	36/204
Experience the local small town atmosphere	2.63	60/204
See wildlife in natural habitats	2.02	96/204
Experience local shopping opportunities	2.72	43/204
Experience local cultural events	1.87	47/204
Experience local architecture	2.54	61/204
Get away from crowds	2.72	92/204
Learn about the natural history of the area	2.31	84/204
Experience local agricultural practices	2.09	33/204
Experience a new area	2.80	82/204
Be with people who enjoy the same things I do	3.19	95/204
Learn about the cultural history of the area	2.26	77/204
Get away from the usual demands of life	3.21	121/204

* Among respondents scoring 5 or higher on benefit importance score

Road Segment 5

Benefits that were attained from traveling on road segment 5 were “Be with members of my travel party (3.62, 103/195),” and “Enjoy the scenery of the area (3.55, 115/195).” Benefits that recorded the lowest level of attainment were “Experience local agricultural practices (2.35, 52/195),” and “Experience local architecture (2.62, 64/195).”

Table 3.15: Segment 5 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	3.55	115/195
Relax physically	3.39	114/195
Be with members of my travel party	3.74	103/195
Experience a sense of adventure	3.31	101/195
Visit local communities along the road	2.96	79/195
Experience the local culture and history	3.11	97/195
Meet new people	3.12	64/195
Experience the local small town atmosphere	3.11	92/195
See wildlife in natural habitats	2.92	121/195
Experience local shopping opportunities	2.83	30/195
Experience local cultural events	2.68	60/195
Experience local architecture	2.62	64/195
Get away from crowds	3.49	112/195
Learn about the natural history of the area	3.26	95/195
Experience local agricultural practices	2.35	52/195
Experience a new area	3.25	97/195
Be with people who enjoy the same things I do	3.56	116/195
Learn about the cultural history of the area	3.17	92/195
Get away from the usual demands of life	3.66	125/195

* Among respondents scoring 5 or higher on benefit importance score

Road Segment 6

Benefits that were attained from traveling on road segment 6 were “Be with members of my travel party (3.37, 94/210),” and “Enjoy the scenery of the area (3.25, 108/210).” Benefits that recorded the lowest level of attainment were “Experience local agricultural practices (2.00, 53/210),” and “Learn about the natural history of the area (2.17, 88/210).”

Road Segment 7

Benefits attained on segment 7 were “Be with members of my travel party (3.14, 36/204)” and “Enjoy the scenery of the area (2.99, 71/204).”

Benefits recording lowest levels of attainment were “Experience local agricultural practices (2.26, 42/204),” and “Learn about the natural history of the area (2.26, 42/204).”

Mean attainment scores and the number of people recording a score of 5 or higher for benefit importance on segment 7 benefits were some of the lowest recorded of all 11 segments, with the exception of segment 8.

Table 3.16: Segment 6 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	3.25	108/210
Relax physically	3.07	95/210
Be with members of my travel party	3.37	94/210
Experience a sense of adventure	3.00	80/210
Visit local communities along the road	2.84	51/210
Experience the local culture and history	2.44	71/210
Meet new people	2.69	52/210
Experience the local small town atmosphere	2.52	64/210
See wildlife in natural habitats	2.44	111/210
Experience local shopping opportunities	2.44	36/210
Experience local cultural events	2.26	43/210
Experience local architecture	2.47	53/210
Get away from crowds	3.05	87/210
Learn about the natural history of the area	2.17	88/210
Experience local agricultural practices	2.00	53/210
Experience a new area	2.82	87/210
Be with people who enjoy the same things I do	2.95	87/210
Learn about the cultural history of the area	2.19	77/210
Get away from the usual demands of life	3.14	108/210

* Among respondents scoring 5 or higher on benefit importance score

Table 3.17: Segment 7 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	2.99	71/204
Relax physically	2.67	60/204
Be with members of my travel party	3.14	36/204
Experience a sense of adventure	2.61	36/204
Visit local communities along the road	2.92	48/204
Experience the local culture and history	2.59	46/204
Meet new people	2.63	30/204
Experience the local small town atmosphere	2.91	64/204
See wildlife in natural habitats	2.45	69/204
Experience local shopping opportunities	2.91	47/204
Experience local cultural events	2.37	41/204
Experience local architecture	2.61	33/204
Get away from crowds	2.81	62/204
Learn about the natural history of the area	2.26	42/204
Experience local agricultural practices	2.26	27/204
Experience a new area	2.34	38/204
Be with people who enjoy the same things I do	2.92	52/204
Learn about the cultural history of the area	2.33	39/204
Get away from the usual demands of life	2.98	66/204

* Among respondents scoring 5 or higher on benefit importance score

Road Segment 8

Benefits that were attained from traveling on road segment 8 were “Be with members of my travel party (3.17, 35/213),” and “Experience the small town atmosphere (3.05, 39/213).”

Benefits that recorded the lowest level of attainment were “Learn about the natural history of the area (2.00, 30/213),” and “Experience local cultural events (2.06, 3/213).”

Mean attainment scores and number of people who recorded a 5 or higher for benefit importance for road segment 8 benefits were some of the lowest recorded, with the exception of road segment 7, amongst the segments.

Table 3.18: Segment 8 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	2.82	62/213
Relax physically	2.77	56/213
Be with members of my travel party	3.17	35/213
Experience a sense of adventure	2.52	27/213
Visit local communities along the road	2.61	33/213
Experience the local culture and history	2.42	26/213
Meet new people	2.57	30/213
Experience the local small town atmosphere	3.05	39/213
See wildlife in natural habitats	2.50	58/213
Experience local shopping opportunities	2.29	38/213
Experience local cultural events	2.06	3/213
Experience local architecture	2.15	27/213
Get away from crowds	2.85	47/213
Learn about the natural history of the area	2.00	30/213
Experience local agricultural practices	2.75	24/213
Experience a new area	2.34	38/213
Be with people who enjoy the same things I do	2.62	47/213
Learn about the cultural history of the area	2.33	27/213
Get away from the usual demands of life	2.67	55/213

* Among respondents scoring 5 or higher on benefit importance score

Road Segment 9

Benefits that were attained from traveling on road segment 9 were “Be with members of my travel party (3.66, 89/202),” and “Enjoy the scenery of the area (3.40, 122/202).” Benefits that recorded the lowest level of attainment were “Experience local cultural events (2.36, 44/202),” and “Experience local agricultural practices (2.39, 36/202).”

Table 3.19: Segment 9 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	3.40	122/202
Relax physically	3.23	104/202
Be with members of my travel party	3.66	89/202
Experience a sense of adventure	3.09	92/202
Visit local communities along the road	3.03	69/202
Experience the local culture and history	2.71	72/202
Meet new people	3.03	34/202
Experience the local small town atmosphere	3.10	89/202
See wildlife in natural habitats	2.66	96/202
Experience local shopping opportunities	3.00	42/202
Experience local cultural events	2.36	44/202
Experience local architecture	2.69	68/202
Get away from crowds	2.73	89/202
Learn about the natural history of the area	2.51	76/202
Experience local agricultural practices	2.39	36/202
Experience a new area	2.88	83/202
Be with people who enjoy the same things I do	3.43	88/202
Learn about the cultural history of the area	2.50	64/202
Get away from the usual demands of life	3.39	109/202

* Among respondents scoring 5 or higher on benefit importance score

Road Segment 10

Benefits that were attained from traveling on road segment 10 were “Enjoy the scenery of the area (3.74, 35/71)” and “Be with people who enjoy the same things I do (3.53, 36/71).” Benefits that recorded the lowest level of attainment were “Experience local agricultural practices (2.39, 18/71)” and “Experience local cultural events (2.50, 20/71).”

Road Segment 11

Benefits that were attained from traveling on road segment 11 were “Be with members of my travel party (3.43, 65/180)” and “Enjoy the scenery of the area (3.30, 81/180).” Benefits that recorded the lowest level of attainment were “Experience local cultural events (2.21, 38/180)” and “Learn about the natural history of the area (2.29, 55/180).”

Table 3.20: Segment 10 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	3.74	35/71
Relax physically	3.33	30/71
Be with members of my travel party	3.52	29/71
Experience a sense of adventure	3.20	30/71
Visit local communities along the road	3.30	27/71
Experience the local culture and history	2.75	24/71
Meet new people	3.11	19/71
Experience the local small town atmosphere	3.11	28/71
See wildlife in natural habitats	2.94	35/71
Experience local shopping opportunities	3.13	15/71
Experience local cultural events	2.50	20/71
Experience local architecture	2.89	18/71
Get away from crowds	3.45	33/71
Learn about the natural history of the area	2.82	28/71
Experience local agricultural practices	2.39	18/71
Experience a new area	3.34	32/71
Be with people who enjoy the same things I do	3.53	36/71
Learn about the cultural history of the area	2.64	25/71
Get away from the usual demands of life	3.43	40/71

* Among respondents scoring 5 or higher on benefit importance score

Table 3.21: Segment 11 Benefit Attainment Scores

Benefit Item	Mean Attainment Score	n/segment sample
Enjoy the scenery of the area	3.30	81/180
Relax physically	3.17	71/180
Be with members of my travel party	3.43	65/180
Experience a sense of adventure	2.96	51/180
Visit local communities along the road	2.59	54/180
Experience the local culture and history	2.44	54/180
Meet new people	2.47	32/180
Experience the local small town atmosphere	2.63	51/180
See wildlife in natural habitats	2.52	75/180
Experience local shopping opportunities	2.57	44/180
Experience local cultural events	2.21	38/180
Experience local architecture	2.43	46/180
Get away from crowds	2.90	58/180
Learn about the natural history of the area	2.29	55/180
Experience local agricultural practices	2.33	27/180
Experience a new area	2.55	60/180
Be with people who enjoy the same things I do	2.87	69/180
Learn about the cultural history of the area	2.33	54/180
Get away from the usual demands of life	2.99	83/180

* Among respondents scoring 5 or higher on benefit importance score

Benefit Groups by Roadway

The above analysis was conducted for the entire survey respondent population in response to question #11. The purpose of question #11 was to determine if a specific road segment attracts a different type of user based on desired benefits. Question #11 was specific to the road segment.

In contrast, question #17 focused on driving in general, rather than with reference to a specific road segment. Respondents were asked to state their level of agreement or disagreement with a series of statements that are similar to, but phrased differently from, the statements in question #11 in that items in question #17 focus more broadly on the driving experience in general. That is, respondents were not asked to evaluate particular road segments. However if a particular road segment attracts a particular type of user it should become clear when the responses to the statements in question #17 are analyzed by road segment.

Factor analysis was the analytical method of choice for determining the types of user groups found along each particular road segment.

Road Segment 1

There were four user groups that could be identified for those respondents along road segment 1. They were called: Social Learners and Doers; Nature/Scenery Lovers; Time Savers; Safety Seekers.

Social Learners and Doers are characterized by five dominant traits. They enjoy traveling with family and friends and while doing so will stop to read interpretive signs located along the roadway and if available would make use of a brochure/map that uses mile markers to identify places of interest along the route. They also frequently choose secondary routes while traveling even if it means increasing the amount of time before reaching the desired destination. They are also prone to stop spontaneously and engage in preferred activities while traveling. The approximate size of the Social Learners and Doers group for roadway segment 1 is 18% of all respondents for this road segment.

Nature/Scenery Lovers enjoy traveling in an area free of billboards with an opportunity to view wildlife in their native habitat. They often choose a designated scenic highway because of what the designation implies, and prefer a road that allows scenic viewing even if it means traveling at a slower rate of speed. Secondary routes will be chosen if the route promises to deliver a better understanding of the area's natural resources and/or people. The approximate size of the Nature/Scenery Lovers group for segment 1 is 18% of all respondents for this road segment.

Time Savers are primarily interested in getting from point A to B as quick as possible. They prefer to travel at a high rate of speed provided the roadway is safe and they do not care what a road is called as long as it is fast and safe. They are interested in the activities available to them at the destination rather than what can be encountered en route. The approximate size of the Time Savers group for roadway segment 1 is 15% of all respondents for this road segment.

Safety Seekers only have two characteristics that bind members of this group together and they both relate to the safety of the driving experience. Members of this group believe that scenic highways pose safety hazards because too many people are distracted by the scenery and do not pay attention to their driving. They also do not care what a road is called as long as it is fast and safe. The approximate size of the Safety Seekers group for roadway segment 1 is 10% of all respondents for this road segment.

Road Segment 2

Five distinct user groups were found along segment 2: Learners, Nature/Scenery Lovers, Safety Seekers, Time Savers, and Destination Bound. Some of the user groups described above appear again for segment 2, which is not surprising as road segment 2 has similar features to those along road segment 1. However, the number of items emphasized and the size of each user group vary between segments, even for groups with the same name.

Learners are very interested in stopping to read interpretive signs located along the roadway. They would also be prime candidates to use a brochure that lists places of interest along a road indexed by mile markers. Additionally they are likely to take a secondary route to their final destination if it promises to inform them of the areas natural resources, activities and local

people. The approximate size of the Learners group for segment 2 is 17% of respondents for this road segment.

Nature/Scenery Lovers share similar characteristics to the one identified for road segment 1. Members of this group want a billboard free scenic roadway that offers an opportunity to view wildlife in their native habitats. They also select a road that is designated as a scenic highway even if it means increasing the travel time to their final destination. There is also an indication that sharing the travel experience with family and friends is a desirable activity. The approximate size of the Nature/Scenery Lovers group for segment 2 is 15% of respondents for this road segment.

Safety Seekers share almost exactly the same characteristics as the Safety Seekers group discussed in segment 1. Members of this group believe that scenic highways pose safety hazards because too many people are distracted by the scenery and do not pay attention to their driving. Additionally, they do not care what a road is called as long as it is fast and safe. The approximate size of the Safety Seekers group for segment 2 is 12% of respondents for this road segment.

Time Savers are, again, very similar to the group described in segment 1. Time Savers are primarily interested in getting from point A to B as quick as possible. They prefer to travel at a high rate of speed provided the roadway is safe and they do not care what a road is called as long as it is fast and safe. The approximate size of the Time Savers group for roadway segment 2 is 11% of all respondents for this road segment.

Destination Bound members have only two characteristics that bind them together. They are only interested in the activities available at the destination and not those offered en route and they act deliberately when choosing a road. In other words since they are most interesting in getting to the destination to engage in activities they are much less likely to act spontaneously and stop along the way to do the same things they could do at the destination. The approximate size of the Destination Bound group for segment 2 is 9% of respondents for this segment.

Road Segment 3

Road segment 3 is distinctively different from road segments 1 and 2. It is a four-lane divided highway experiencing relatively little traffic congestion, with natural wooded features found along the segment under study. When user groups were analyzed four distinct groups emerged: Learners and Doers, Time Savers, Scenic Seekers, and Destination Bound. Although many of the user groups identified for road segment 3 are similar to those described above they do exhibit, in some cases, different tendencies and different group size.

Learners and Doers, as described above for road segment 1, are very interested in stopping to read interpretive signs located along the roadway. They would also be prime candidates to use a brochure that lists places of interest along a road indexed to mile markers. Additionally they are likely to take a secondary route to their final destination if it promises to inform them of the areas natural resources, activities and local people and they will spontaneously stop while traveling to engage in some desired activity (e.g. golf, bird watching, shopping). This group, unlike the Learners and Doers described for some other road segments is very much interested in viewing wildlife in their native habitat. They are also more likely to choose a road for travel if it is designated as a scenic highway. The approximate size of the Learners and Doers group for roadway segment 3 is 23% of all respondents for this road segment.

Time Savers are primarily interested in getting from point A to B as quick as possible. They prefer to travel at a high rate of speed provided the roadway is safe and they do not care what a road is called as long as it is fast and safe. The approximate size of the Time Savers group for roadway segment 3 is 13% of all respondents for this road segment.

Scenic Seekers have only two characteristics that bind members of this user group together. They seek highways that are free of commercial activity that have scenic qualities and they do not value the information contained on billboards. The approximate size of the Scenic Seekers group for roadway segment 3 is 11% of all respondents for this road segment.

Destination Bound members are connected by two primary characteristics. They are only interested in the activities available at the destination (not those en route) and they like to travel

to their destination with family and/or friends. The approximate size of the Destination Bound group for segment 3 is 9% of respondents for this segment.

Road Segment 4

This was the only interstate road segment analyzed in the study. It was selected to obtain responses from users of the interstate system to help determine if different users were attracted to different types of highway systems. The results are, for the most part, consistent with what has been described above, but a few surprises emerged. There were four user groups identified. They were called: Social Learners and Doers; Time Savers; Scenic Seekers, Destination Bound.

Social Learners and Doers, for this segment, possess more characteristics than the Social Learners user groups described above. They enjoy traveling with family and friends and, while doing so prefer a slower more scenic route to their final destination even it means increasing total travel time. If available, members of this group would use a brochure/map that indexes mile markers to identify places of interest along the route. They also frequently choose secondary routes while traveling with the expectation that they will learn something about the natural resources of the area and its people. They choose a designated scenic highway given the opportunity and hope to view wildlife in their natural habitat. Members of this group show a propensity to stop, spontaneously, along the way and engage in some preferred activity. The approximate size of the Social Learners and Doers groups for segment 4 is 25% of respondents for this road segment.

Time Savers, like groups discussed above, are characterized by two dominant traits. They prefer to travel at a high rate of speed provided the roadway is safe and they do not care what a road is called as long as it is fast and safe. The approximate size of the Time Savers group for segment 4 is 13% of all respondents for this road segment.

Scenic Seekers are bound together by two characteristics that bind members of this user group together. They seek highways that are free of commercial activity that have scenic qualities and they do not value the information contained on billboards. The approximate size of the Scenic Seekers group for roadway segment 4 is 10% of all respondents for this road segment.

Destination Bound members are mostly interested in the activities available at the destination and not those offered en route and they believe scenic highways are safety hazards because too many people are distracted by the scenery and do not pay attention to their driving. Surprisingly though this user group shows a propensity to stop while traveling to read interpretive signs. The approximate size of the Destination Bound group for roadway segment 4 is 10% of all respondents for this road segment.

Road Segment 5

Four factors, similar to the ones reported above, were identified for users of roadway segment 5. The user groups identified were: Social Learners and Doers, Scenic Seekers, Time Savers, and Destination Bound.

Social Learners and Doers, for this segment possess similar characteristics to those identified for roadway segment 4. They enjoy traveling with family and friends and while doing so prefer a slower more scenic route to their final destination even it means increasing total travel time. If available, members of this group would make use of a brochure/map that uses mile markers to identify places of interest along the route. They also frequently choose secondary routes while traveling with the expectation that they will learn something about the natural resources of the area and its people. They choose a designated scenic highway given the opportunity and hope to view wildlife in their natural habitat. Members of this group are prone to stop while traveling and engage in some preferred activity. The approximate size of the Social Learners and Doers group for roadway segment 5 is 29% of all respondents for this road segment.

Scenic Seekers seek highways that are free of commercial activity that also have scenic qualities and they do not value the information contained on billboards. The approximate size of the Scenic Seekers group for roadway segment 5 is 12% of all respondents for this road segment.

Time Savers prefer to travel at a high rate of speed provided the roadway is safe and they do not care what a road is called as long as it is fast and safe. The approximate size of the Time Savers group for roadway segment 5 is 12% of all respondents for this road segment.

Destination Bound members are mostly interested in the activities available at the destination and not those offered en route and they believe scenic highways are safety hazards because too many people are distracted while viewing the scenery and do not pay attention to their driving. The approximate size of the Destination Bound group for roadway segment 5 is 9% of all respondents for this road segment.

Road Segment 6

There were four distinct user groups revealed for roadway segment 6. However unlike the user groups identified above only one of the user groups is consistent with what has already been reported. For three of the identified user groups different variables were related thus new names have been given to those user groups. The four user groups revealed for roadway segment 6 are: Learners and Doers, Time Savers, Cruisers, and Social Seekers.

Learners and Doers enjoy getting off the well-traveled routes and therefore exhibit a propensity to take secondary roads to their final destination. They are interested in viewing wildlife in their natural habitats and would make use of a brochure that identifies points of interest by mileage markers. They are also inclined to stop while traveling and engage in some preferred activity prior to arriving at their final destination. The approximate size of the Learners and Doers group for roadway segment 6 is 17% of all respondents on this road segment.

Time Savers share the same characteristics as the Time Savers group discussed above. This group is characterized by two dominant traits. They prefer to travel at a high rate of speed provided the roadway is safe and they do not care what a road is called as long as it is fast and safe. The approximate size of the Time Savers group for roadway segment 6 is 14% of all respondents for this road segment.

Cruisers are similar in some respects to the Destination Bound user groups discussed above. However there are some noticeable differences. First although the Cruisers user group shows a tendency to not engage in activities along the way to their final destination they do want to travel on scenic highways. Designation of a highway as scenic has value to them such that they will choose it over a more direct route to their destination provided the opportunity presents itself.

They are also looking for transportation routes that are free of any unnecessary commercial activity. The approximate size of the Cruisers group for roadway segment 6 is 12% of all respondents for this road segment.

Social Seekers enjoy the experience of traveling with family and friends. Whenever possible they will choose a slower, more scenic route to their final destination – even if total travel time increases. In addition they do not value the information contained on billboards. There is no indication that they stop along the way to engage in activities, as it seems the opportunity to share a scenic drive with family and friends is the most important outcome for this user group. The approximate size of the Social Seekers group for road segment 6 is 11% of the all respondents for this road segment.

Road Segment 7

Analysis of users of roadway segment 7 reveals four distinct user groups. Some are similar to those reported above while others are somewhat new as they share slightly different characteristics. The five user groups revealed for road segment 7 are: Learners and Doers, Time Savers, Wildlife Seekers, Scenic Seekers, and Destination Bound.

Learners and Doers consist of people who enjoy getting off the well-traveled routes and therefore exhibit a propensity to take secondary roads to their final destination. They would make use of a brochure that identifies points of interest by mileage markers and they show an inclination to stop and read interpretive markers while traveling. Members of this group are likely to spontaneously stop along the way and engage in some preferred activities. The major difference between this user group for road segment 7 and the similarly named user group for road segment 6 is that this group does not place such a high value on seeing wildlife in their natural habitats while traveling. The approximate size of the Learners and Doers group for roadway segment 7 is 19% of all respondents on this road segment.

Time Savers are characterized by two dominant traits. They prefer to travel at a high rate of speed provided the roadway is safe and they do not care what a road is called as long as it is fast

and safe. The approximate size of the Time Savers group for roadway segment 7 is 13% of all respondents for this road segment.

Wildlife Seekers enjoy seeing wildlife in their native habitats while traveling and they do not believe that scenic highways possess any inherent safety hazards. The approximate size of the Wildlife Seekers group for roadway segment 7 is 12% of all respondents for this road segment.

Scenic Seekers do not feel information contained on billboards has any value to them and they want a highway as free of commercial activity as possible. Other characteristics found for this group include a propensity to take secondary roads whenever possible even if total driving time increases and their willingness to take a highway if it has a scenic designation. The approximate size of the Scenic Seekers group for roadway segment 7 is 12% of all respondents for this road segment.

Destination Bound members differs somewhat from the Destination Bound groups discussed above for other user groups. There are only two characteristics that tie members of this user group together. They are only interested in the activities available to them at the destination and not those encountered along the way and they like to travel to their final destination with family and friends. The approximate size of the Destination Bound group for roadway segment 7 is 8% of all respondents for this road segment.

Road Segment 8

There were five users groups identified for users of road segment 8. They were similar to those reported above with only minor differences noted. The five user groups identified are: Scenic Learners, Time Savers, Social Seekers, Scenic Seekers, and Wildlife Seekers.

Scenic Learners are likely to choose a highway because it has a scenic designation. They are also likely to select secondary routes that allow them to learn about the natural and human resources of the area even if it means total travel time increases. Scenic routes to the final destination are preferred over faster less scenic options. Members of this group are likely to stop and read interpretive signs and would make use of a brochure that identifies points of interest by mileage

markers. The approximate size of the Scenic Learners group for roadway segment 8 is 20% of all respondents for this road segment.

Time Savers prefer to travel at a high rate of speed provided the roadway is safe and they do not care what a road is called as long as it is fast and safe. The approximate size of the Time Savers group for roadway segment 8 is 13% of all respondents for this road segment.

Social Seekers enjoy the experience of traveling with family and friends. They are also prone to spontaneously stop along the way to engage in activities important to them. The approximate size of the Social Seekers group for road segment 8 is 12% of the all respondents for this road segment.

Scenic Seekers differ from Scenic Learners in that they show no indication of collecting information as they travel. In other works they show no propensity to stop and read interpretive signs or take a highway because it promises to provide more insight about natural resources or local people. What members of this group prefer is to travel along a scenic highway that does not have any unnecessary commercial activity found along it. Additionally they do not value the information found on billboards. The approximate size of the Scenic Seekers group for road segment 8 is 9% of the all respondents for this road segment.

Wildlife Seekers enjoy seeing wildlife in their native habitats while traveling and they do not believe that scenic highways possess any inherent safety hazards. The approximate size of the Wildlife Seekers group for roadway segment 8 is 9% of all respondents for this road segment.

Road Segment 9

There were five user groups identified for this road segment. They were named: Learners and Doers, Wildlife Seekers, Scenic Highway Aficionados, Service Seekers, and Destination Bound.

Learners and Doers enjoy stopping while traveling to learn more about the area they are traveling in and they also show a propensity to stop and do things while traveling. They are likely to stop and read interpretive signs and would make use of a brochure that identified points of interest

along the road by mileage marker. Whenever possible secondary routes are chosen if they promise to provide more information about an area's natural resources, things to do, or the people that live in the area. They are prone to spontaneously stop and do things if the urge strikes. The approximate size of the Learners and Doers group for roadway segment 9 is 17% of all respondents for this road segment.

Wildlife Seekers enjoy seeing wildlife in their native habitats while traveling. They want to take a highway that is free of any unnecessary commercial activity and they do not believe that scenic highways possess any inherent safety hazards. The approximate size of the Wildlife Seekers group for roadway segment 9 is 15% of all respondents for this road segment.

Scenic Highway Aficionados are very much influenced by the designation given to a road. If a road receives a scenic highway designation they are likely to choose it even if it means increasing travel time to their final destination. They do care what a road is called and they will often choose the more scenic route to their final destination even if it is slower than alternate routes. The approximate size of the Scenic Highway Aficionados group for roadway segment 9 is 13% of all respondents for this road segment.

Service Seekers place high value on the information contained on billboards. They also prefer to travel at a high rate of speed provided the route is safe. The approximate size of the Service Seekers group for roadway segment 9 is 9% of all respondents for this road segment.

Destination Bound users are only interested in the activities available at the destination and not those that might be encountered en route. The approximate size of the Destination Bound group for roadway segment 9 is 8% of all respondents for this road segment.

Road Segment 10

Segment 10 users converged into three distinct groups: Social Learners and Doers, Time Savers, and Destination Bound.

Social Learners and Doers, for this segment possess more characteristics than the Social Learners user groups described above. They enjoy traveling with family and friends and while doing so prefer a slower more scenic route to their final destination even it means increasing total travel time. If available, members of this group would make use of a brochure/map that uses mile markers to identify places of interest along the route. They also frequently choose secondary routes while traveling with the expectation that they will learn something about the natural resources of the area and its people. They choose a designated scenic highway given the opportunity and hope to view wildlife in their natural habitat. Members of this group show a propensity to stop, spontaneously, along the way and engage in some preferred activity. They will also select a road because it has a scenic highway designation. The approximate size of the Social Learners and Doers group for roadway segment 10 is 31% of all respondents for this road segment.

Time Savers are characterized by three dominant traits. They prefer to travel at a high rate of speed provided the roadway is safe; they do not care what a road is called as long as it is fast and safe; and selecting a more scenic route is not desired if it means the ride will be slower. The approximate size of the Time Savers group for roadway segment 10 is 14% of all respondents for this road segment.

Destination Bound users share only three traits. They are only interested in the activities available at the destination and not those that might be encountered en route. They find billboards provide important information about services and activities available to them and they believe Scenic Highway designations pose a safety hazard because too many people do not pay attention to their driving while traveling on these designated roads. The approximate size of the Destination Bound group for roadway segment 10 is 14% of all respondents for this road segment.

Road Segment 11

There were four user groups revealed for road segment 11. Four of these user groups have been identified above for other road segments but, once again, there are slight differences noted

between similarly named user groups. The four user groups identified using road segment 11 are: Learners and Doers, Time Savers, Information Seekers, and Destination Bound.

Learners and Doers prefer a slower more scenic route to their final destination even it means increasing total travel time. If available, members of this group would make use of a brochure/map that uses mile markers to identify places of interest along the route. They also frequently choose secondary routes while traveling with the expectation that they will learn something about the natural resources of the area and its people. Members of this group show a propensity to stop, spontaneously, along the way and engage in some preferred activity. They will also select a road because it has a scenic highway designation. The approximate size of the Learners and Doers group for roadway segment 11 is 26% of all respondents for this road segment.

Time Savers prefer to travel at a high rate of speed provided the roadway is safe and they do not care what a road is called as long as it is fast and safe. They also believe that designating a road as scenic poses a safety threat as drivers will have a tendency to pay attention to the scenery and not their driving. The approximate size of the Time Savers group for roadway segment 11 is 15% of all respondents for this road segment.

Information Seekers find that billboard provide them with important information about services and activities in an area. It is also not necessary for them to select a commercial free transportation corridor to enjoy the ride. The approximate size of the Information Seekers group for roadway segment 11 is 11% of all respondents for this road segment.

Destination Bound members share three traits. They are only interested in the activities available at the destination and not those that might be encountered en route. They enjoy traveling with family and friends and they also derive more enjoyment from traveling in a relatively commercial free corridor. The approximate size of the Destination Bound group for roadway segment 11 is 10% of all respondents for this road segment.

Summary of Benefit Groups

Benefit-based research is new to transportation. During the literature review for this study not one example of benefit-based transportation research could be found. Existing literature relating to this study examined users' desire for specific features of the roadway, which is similar to the findings discussed in the first section of this report. However, to obtain a better picture of how benefits may affect individual item preference, a series of questions, dealing with benefits desired from the driving experience, was developed and presented to travelers encountered on the eleven different road segments under study. Some interesting differences between users of each road segment were uncovered.

First, all road segment users were asked how they felt the roadway on which they were traveling should be managed. For the most part, there was consistency across users of all road segments. However, with respect to a few road segments, desired management approaches were different. Also, in general, travelers – regardless of road segment – were more supportive of managing for natural environment protection than for any other management option.

The second part of this section looked at user groups in general with respect to the benefits desired from the traveling experience. Three distinct user groups were found across all roadway segments. They were called: Local Color Seekers, Unexplored Area Explorers, and Social Group Relaxers. Since the benefit scale used for this part of the research was drawn from the recreation literature, it is decidedly biased to leisure-related pursuits. However, leisure groups are the main population for this study so the benefit scale was deemed appropriate for this part of the research.

The third part of this section was an examination, by specific road segment, of particular benefits one might attain from traveling on that road. High mean attainment scores were recorded for variables such as “enjoy the scenery of the area,” “get away from the usual demands of life,” and “be with members of my travel party.” Low mean attainment scores – indicating that this benefit was not realized – were recorded for variables such as “experience local agricultural practices,” “experience local cultural events,” and “experience the local culture and history.” In almost all cases, high attainment was associated with a large percentage of users of that road segment indicating it was an important reason for choosing that particular road. Conversely, low

attainment was often associated with low numbers of users indicating that benefit was important to their choice of road. It can be concluded then, with some reservation, that benefits sought from a particular road were, for the most part, realized.

The final part of this section compared user groups across road segments with respect to benefits sought based on a scale that had been used for previous recreation/tourism highway use [11]. Factor analysis results revealed that there were between three and five distinct user groups identified, based on benefits sought, for each road segment. For example a user group called “Time Savers” emerged for each road segment except segment 9. The size of the “Time Savers” group was between 10% and 15% of the population of users on that road. The size of this group varied little between different road segments. Another user groups was the “Learners and Doers” group – sometimes called the “Social Learners and Doers” as, at times, the social benefit of “being with other people in my travel party” also shows up as a desired benefit. What binds the members of this user group together is their desire to learn about, and do, different things in an area. The size of this group varied between 16% and 31% of all users on a particular road segment. A “Nature and Scenery” user group, with some minor variations, appears as important to all road segments with the exception of segments 6, 10, and 11. Some road segments also recorded a “Destination Bound” user group that comprising about 10% of the population of travelers.

When results from the benefits section are taken together, we have strong evidence to reject the guiding null hypothesis, which stated:

There is no indication that different user groups using the same roadway seek different benefits.

The results of this study suggest that different user groups using the road segments under study seek different benefits and that benefits sought by users of the different road segments do often differ.

CHAPTER 4

SUMMARY

This was an exploratory study looking at users preference for various roadway attributes and amenities. A great deal of information is contained in this report allowing management for road segments selected for study to be decided on a case-by-case basis. There is enough difference exhibited by users of different road segments to state that roads do possess individual character that is considered in the road selection process, with the expectation that travel on them will provide certain benefits.

Even though very little literature is available on this subject, what is published resonates well with the results presented here. Some of the road attribute preferences discussed in other research (e.g. more hiking and biking opportunities, more passing lanes) are reinforced in this study.

As with any exploratory study, the findings presented here lead to more questions than answers. Specifically, the question as to whether preference leads to action still needs further work.

Tentatively, the results from this study would suggest that people do act on their preferences when selecting a roadway. However, there is also conflicting evidence suggesting they do not always act in this way. It is recommended that further work on preferences, particularly as they influence action, and the relationship to benefits be examined in a much more intensive and focused study. While this study goes a long way in helping understand travelers' considerations in selecting a road, it does not take into what might have triggered the actual decision process.

There is also the question of how roads should be designed with respect to business interests.

There is strong evidence that many travelers are looking for a commercial-free corridor, with commercial establishments confined to communities. Given the land ownership pattern in this state, that is a difficult thing to achieve. Nonetheless, policies can be investigated that might make this more of a reality than just wishful thinking on the part of travelers.

Finally, the question of scenic highway designation needs to be considered. This study supports long-standing beliefs held by proponents of scenic byways, which is that scenic byways do affect a traveler's decision process. There is enough evidence, both pro and con, to suggest that people

either are attracted to or avoid designated scenic roads because of the inherent attributes one expects to encounter when selecting a roadway with an official scenic byway designation. Proponents of scenic highways state that economic impact for communities is enhanced when a road receives this designation. There is nothing in this study to suggest otherwise, but there are some indications that a few people view designated scenic byways as safety hazards. Again, “Does preference give way to action?” is the question that needs to be addressed.

There were a number of limitations that may have affected the results of this study. First, the data collection period was in the summer and early fall of 2001 – a heavy travel period for tourists. Since locating and surveying tourists was a goal of this study, the choice of time period was one of convenience. However, because of that, little generalization can be made to users of these road segments during different times of the year. If this study were to be repeated in different seasons, it is likely some of the findings would change. Second, recall bias is always an issue. Are travelers able to evaluate features of a road that they have just traveled? It appears from some of the findings that they can and did, but for some variables, recall bias may be an issue. One of the ways to avoid recall bias is to conduct a similar survey on people seated in a simulator and not actually driving the road segment under study. Finally, the lack of relevant literature makes cross-study comparisons difficult. This is not a major issue for an exploratory study like this one, but it does become problematic when management decisions, for a particular stretch of road, are being made.

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APPENDIX A
QUESTIONNAIRE

Date: _____

ROAD SEGMENT SURVEY

Site: _____

Interviewer _____	Time to complete survey: _____
1. Enter road segment: _____ (12 intercept locations that correspond to 12 specific road segments)	
2. Show respondent map with labeled points along the road segment; ask: Which point best identifies the location where you entered this road segment today? _____ (1-20 from map)	
3. How many minutes have you traveled on this road segment today (since your point of entry onto this road segment)? _____	
Minutes	

1. What would you say are the most interesting aspects of this road segment? (Mark up to 3)

<input type="checkbox"/> Small towns	<input type="checkbox"/> Recreational opportunities	<input type="checkbox"/> Historic or cultural sites	<input type="checkbox"/> Farms
<input type="checkbox"/> Shopping	<input type="checkbox"/> Natural scenery	<input type="checkbox"/> Lakes and rivers	<input type="checkbox"/> Forests
<input type="checkbox"/> None of these			

2. I'm on this road segment today because... (Mark 1)

<input type="checkbox"/> It's the most scenic route.	<input type="checkbox"/> I ended up on this road today without specifically deciding to take it.
<input type="checkbox"/> It's the most direct route.	<input type="checkbox"/> It was the only reasonable road to take.
<input type="checkbox"/> It's the fastest road to my destination.	<input type="checkbox"/> I selected this road among several others I could have taken.
<input type="checkbox"/> Other: _____	

<p>3. Have you driven on this road segment before today? (Mark 1)</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>3a. If so, how often in the last 12 months have you traveled this road? (Circle 1)</p> <table style="width: 100%; text-align: center;"> <tr> <td>Rarely</td> <td>Occasionally</td> <td>Almost daily</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> </tr> </table>	Rarely	Occasionally	Almost daily	1	2	3
Rarely	Occasionally	Almost daily					
1	2	3					

4. How many people (including yourself) are in your vehicle today? (Mark 1)

1 2 3 4 5 6 7 8 9 or more

5. What is the purpose of your trip along this road segment today? (Mark 1)

<input type="checkbox"/> Business travel	<input type="checkbox"/> Leisure travel	<input type="checkbox"/> Personal travel
↓	↓	↓
SKIP to Question 6	SKIP to Question 7	SKIP to Question 7

<p>6. <u>If Business Travel:</u> What type of vehicle are you traveling in today? (Mark 1)</p> <p><input type="checkbox"/> Car/pickup/van with trailer</p> <p><input type="checkbox"/> Car/pickup/van without trailer</p> <p><input type="checkbox"/> Commercial vehicle <input type="checkbox"/> Bus</p> <p><input type="checkbox"/> Other: _____</p> <p>➔ Now SKIP to Question 12</p>	<p>7. <u>If Leisure or Personal Travel:</u> What type of vehicle are you traveling in today? (Mark 1)</p> <p><input type="checkbox"/> Car/pickup/van with trailer</p> <p><input type="checkbox"/> Car/pickup/van without trailer</p> <p><input type="checkbox"/> Motorcycle <input type="checkbox"/> Recreational vehicle (RV)</p> <p><input type="checkbox"/> Bus <input type="checkbox"/> Other: _____</p> <p>➔ CONTINUE to Question 8</p>
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<p>8. Which of the following items do you have with you today? (Mark all that apply)</p> <p><input type="checkbox"/> None of these <input type="checkbox"/> Kayak/canoe/raft</p> <p><input type="checkbox"/> Bicycle <input type="checkbox"/> Boat</p> <p><input type="checkbox"/> Jet ski <input type="checkbox"/> All terrain vehicle (ATV)</p>	<p>9. Are you the driver or a passenger? (Mark 1)</p> <p><input type="checkbox"/> Driver</p> <p><input type="checkbox"/> Front-seat passenger</p> <p><input type="checkbox"/> Back-seat passenger</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

10. Circle the number that best describes the extent to which you disagree or agree with each statement as it relates specifically to this road segment you're currently on.	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I feel safe driving on this road.	1	2	3	4	5
I think natural vegetation (e.g., forest, prairie) should be allowed to grow as close to this road as possible.	1	2	3	4	5
It's important that gas stations/convenience stores/fast food restaurants are located in communities rather than along this road.	1	2	3	4	5
There are too many intersections and driveways along this road.	1	2	3	4	5
I think people drive faster on this road than they should.	1	2	3	4	5
I prefer to see attractive vegetation like wildflowers along this road.	1	2	3	4	5
I prefer to see more gift shops along this road.	1	2	3	4	5
I'd like to see more trees growing along this road.	1	2	3	4	5
There are too many stoplights and stop signs on this road.	1	2	3	4	5
There are not enough places to pull off this road.	1	2	3	4	5
I think we need more interpretive signs along this road.	1	2	3	4	5
There are plenty of lodging choices available along this road.	1	2	3	4	5
A visitor or interpretive center is important for this road.	1	2	3	4	5
I think traffic congestion is excessive on this road.	1	2	3	4	5
I think there are too many curves on this road.	1	2	3	4	5
I think the speed limit on this road is too slow.	1	2	3	4	5
There should be more places to buy local arts and crafts along this road.	1	2	3	4	5
Billboard advertising detracted from my travel on this road.	1	2	3	4	5
I don't think the shoulders on this road are wide enough.	1	2	3	4	5
I think it's appropriate to see antique shops along this road.	1	2	3	4	5
I'd like to see more local restaurants along this road.	1	2	3	4	5
It is important to have opportunities to hike or bike in close vicinity to this road.	1	2	3	4	5
I think the condition of the road surface is good along this road.	1	2	3	4	5
I prefer to see the grass adjacent to the road mowed.	1	2	3	4	5
I'd like to see more scenic pull-offs along this road.	1	2	3	4	5
I'd like to see more guard rails along the shoulders of this road.	1	2	3	4	5
There was too much litter along this road.	1	2	3	4	5
I'd like to see more passing lanes on this road.	1	2	3	4	5
As a driver, I'm afraid of hitting people walking or riding bicycles along the shoulder of this road	1	2	3	4	5

11. Below is a list of experiences you may have had while traveling today on this road segment.
Please indicate how important each experience was to you in traveling this road segment today.
Then, indicate how much you were able to attain that experience on this road segment.

Driving along this road segment today allowed me to...	Very Unimportant	Unimportant	Somewhat Unimportant	Neither Important or Unimportant	Somewhat Important	Important	Very Important	Did not attain	Somewhat attained	Moderately attained	Totally attained
Enjoy the scenery of the area	1	2	3	4	5	6	7	1	2	3	4
Relax physically	1	2	3	4	5	6	7	1	2	3	4
Be with members of my travel party	1	2	3	4	5	6	7	1	2	3	4
Experience a sense of adventure	1	2	3	4	5	6	7	1	2	3	4
Visit local communities along the road	1	2	3	4	5	6	7	1	2	3	4
Experience the local culture and history	1	2	3	4	5	6	7	1	2	3	4
Meet new people	1	2	3	4	5	6	7	1	2	3	4
Experience the local small town atmosphere	1	2	3	4	5	6	7	1	2	3	4
See wildlife in natural habitats	1	2	3	4	5	6	7	1	2	3	4
Experience local shopping opportunities	1	2	3	4	5	6	7	1	2	3	4
Experience local cultural events	1	2	3	4	5	6	7	1	2	3	4
Experience local architecture	1	2	3	4	5	6	7	1	2	3	4
Get away from crowds	1	2	3	4	5	6	7	1	2	3	4
Learn about the natural history of the area	1	2	3	4	5	6	7	1	2	3	4
Experience local agricultural practices	1	2	3	4	5	6	7	1	2	3	4
Experience a new area	1	2	3	4	5	6	7	1	2	3	4
Be with people who enjoy the same things I do	1	2	3	4	5	6	7	1	2	3	4
Learn about the cultural history of the area	1	2	3	4	5	6	7	1	2	3	4
Get away from the usual demands of life	1	2	3	4	5	6	7	1	2	3	4

12. In your opinion, how important is it to manage this stretch of road so it provides each of the benefits listed below?

	Very Unimportant	Unimportant	Somewhat Unimportant	Neither Important or Unimportant	Somewhat Important	Important	Very Important
Preserve the cultural uniqueness of the area	1	2	3	4	5	6	7
Preserve the history of the area	1	2	3	4	5	6	7
Provide income, money and jobs for local communities	1	2	3	4	5	6	7
Protect the natural environment	1	2	3	4	5	6	7
Present the local culture and history to visitors	1	2	3	4	5	6	7
Provide a transportation route for people passing through the area	1	2	3	4	5	6	7
Provide recreation opportunities for local communities	1	2	3	4	5	6	7

13. What is your zip code? _____	14. What is your gender? <input type="checkbox"/> Female <input type="checkbox"/> Male
-----------------------------------------	-----------------------------------------------------------------------------------------------

15. What is your annual household income? <input type="checkbox"/> Under \$25,000 <input type="checkbox"/> \$25,000-40,000 <input type="checkbox"/> \$40,001-55,000 <input type="checkbox"/> \$55,001-75,000 <input type="checkbox"/> \$75,001-90,000 <input type="checkbox"/> \$90,001-120,000 <input type="checkbox"/> \$120,001-175,000 <input type="checkbox"/> Over \$175,001

16. In what year were you born? 19 _____

17. Please circle the number that best describes your feelings toward the statement as it relates to driving in general.	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
When possible, I choose the slower, more scenic route to my final destination rather than the faster more direct route.	1	2	3	4	5
I prefer to travel at a high rate of speed provided the roadway is safe.	1	2	3	4	5
While traveling, billboards are an important way to find out about services and activities available to me.	1	2	3	4	5
I consider driving with family and friends to be an enjoyable experience.	1	2	3	4	5
For me to enjoy the drive I want a natural scenic highway corridor free of unnecessary commercial activity (e.g., businesses, billboards, etc.).	1	2	3	4	5
If a road is designated as a scenic highway I will choose it even if it means increasing the amount of time it takes me to get to my destination.	1	2	3	4	5
I am interested in the activities available to me at the destination rather than what is available to me along the way.	1	2	3	4	5
I stop to read interpretive signs located along the road when traveling.	1	2	3	4	5
When driving in unfamiliar areas I choose secondary routes to find out more about the area's natural resources, activities, people, etc.	1	2	3	4	5
I would use an interpretive brochure/map that locates points of interest by mile marker or numbered sites to find out more about an area I am traveling through.	1	2	3	4	5
During my trips I will often stop spontaneously to engage in some activity (e.g. golf, bird-watching, shopping, etc.) along the way.	1	2	3	4	5
Viewing wildlife in their natural environment is an important part of the driving experience.	1	2	3	4	5
Scenic highways are a safety hazard because too many people are distracted by the scenery and do not pay attention to their driving.	1	2	3	4	5
I don't care what a road is called as long as it is fast and safe.	1	2	3	4	5

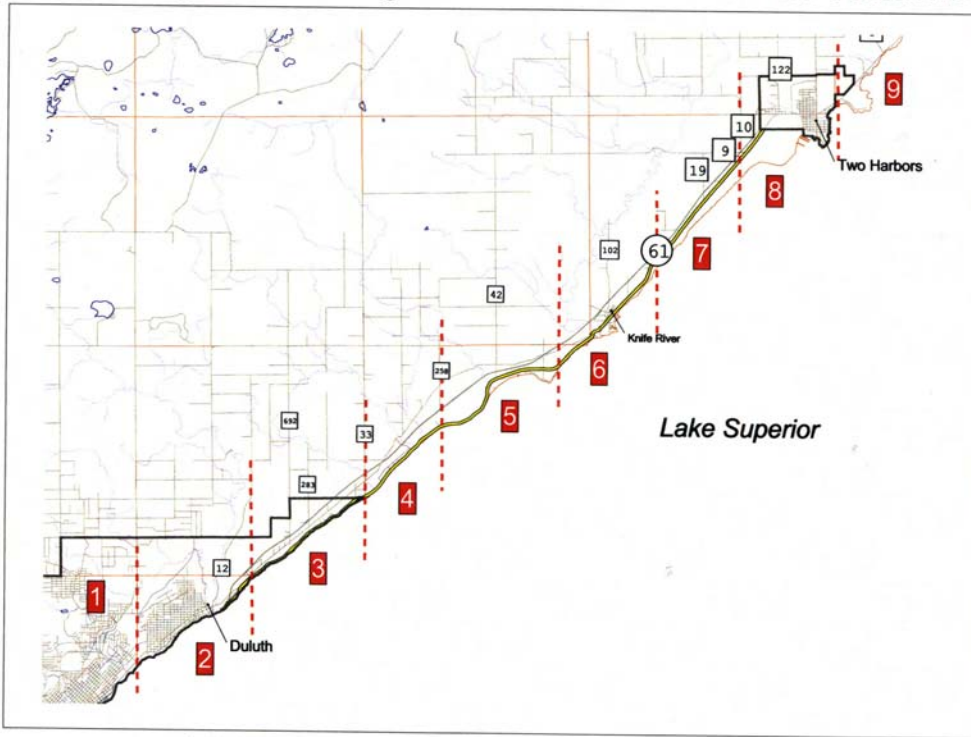


Thanks for your help!



APPENDIX B
ROAD SEGMENT MAPS

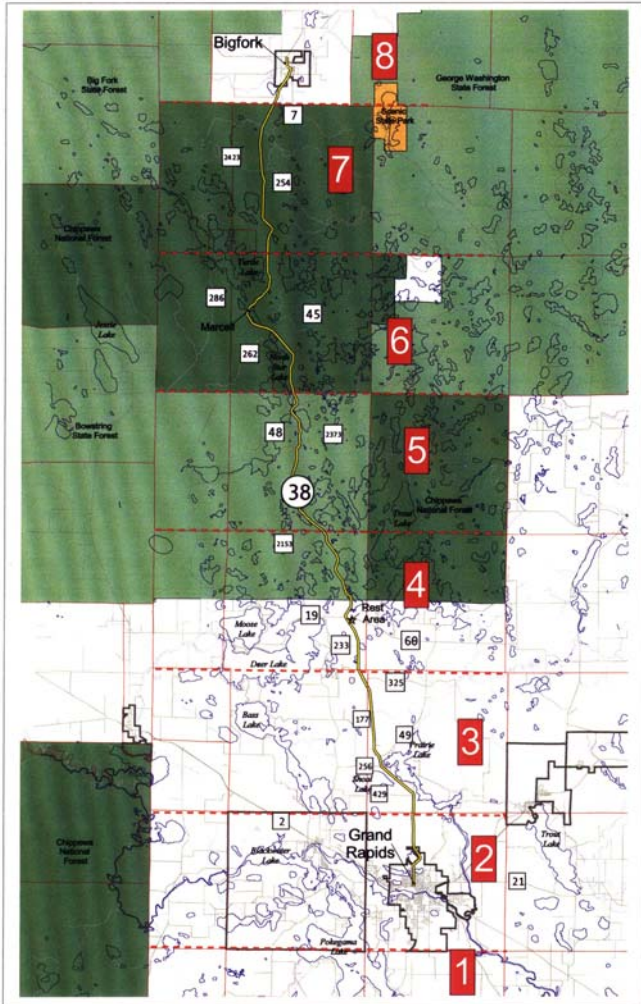
Road Segment 1: Brighton Beach Road to Two Harbors



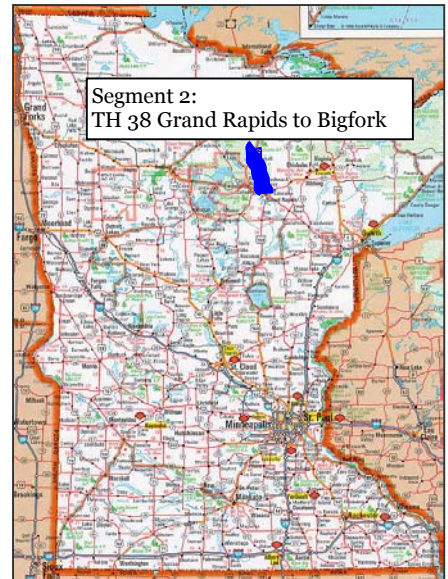
Tourism Survey - Segment 1
 Data Source: MN Dept. of Transportation
 U of MN - Extension Service
 August 2001



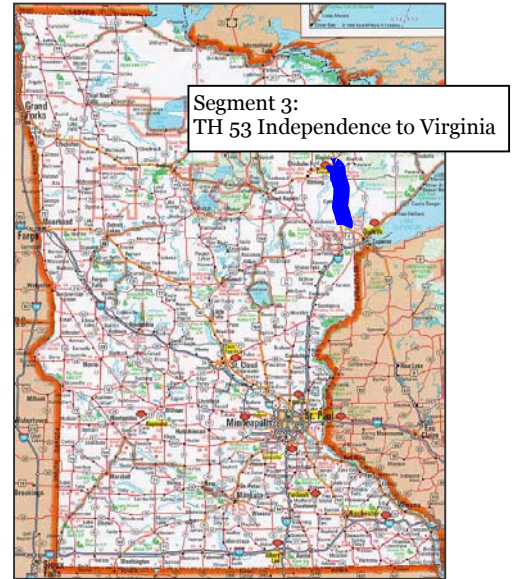
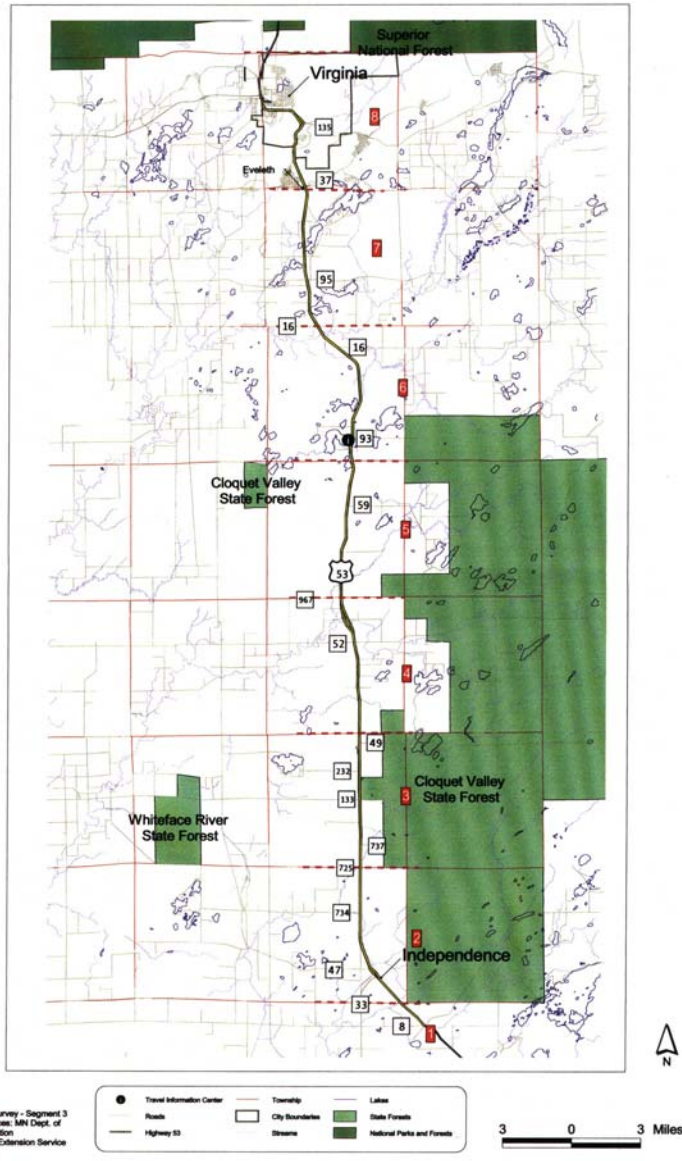
Road Segment 2: Grand Rapids to Bigfork



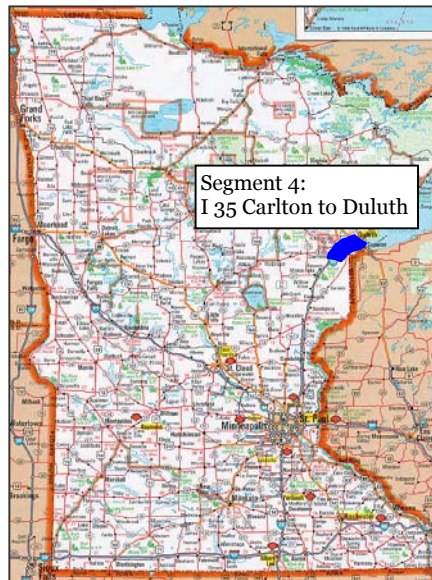
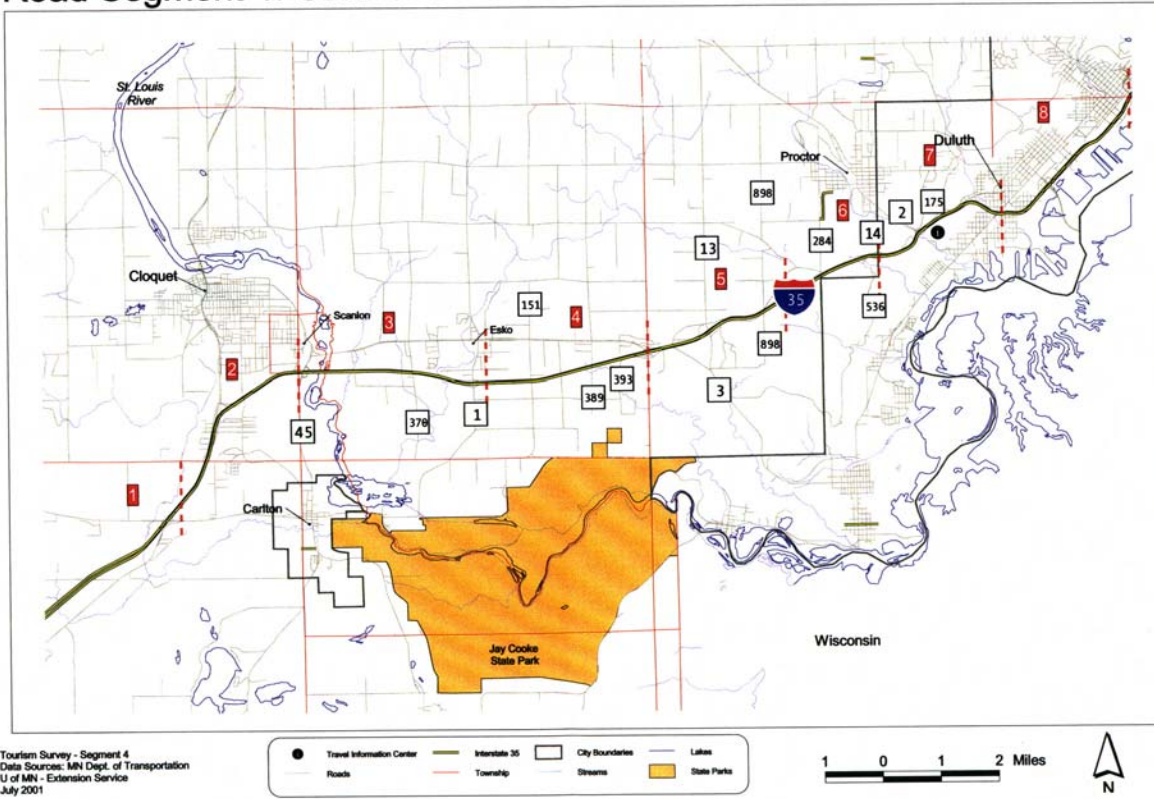
Tourism Survey - Segment 2
 Data Source: MN Dept. of Transportation
 U of MN - Extension Service
 July 2001



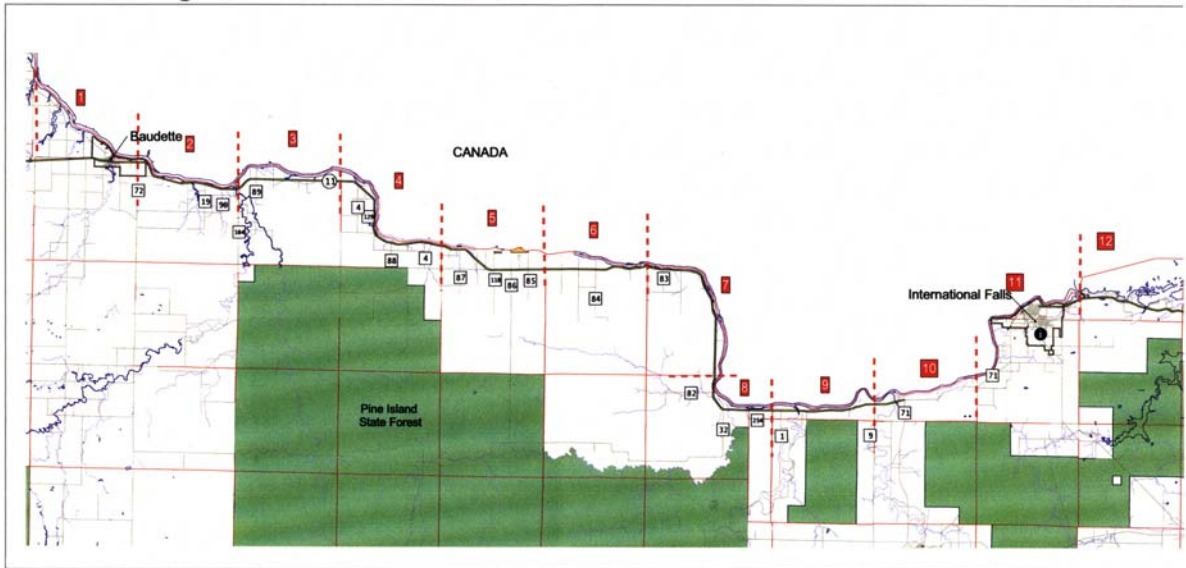
Road Segment 3: Independence to Virginia



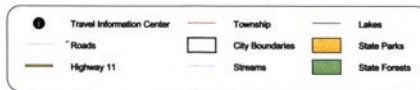
Road Segment 4: Carlton to Duluth



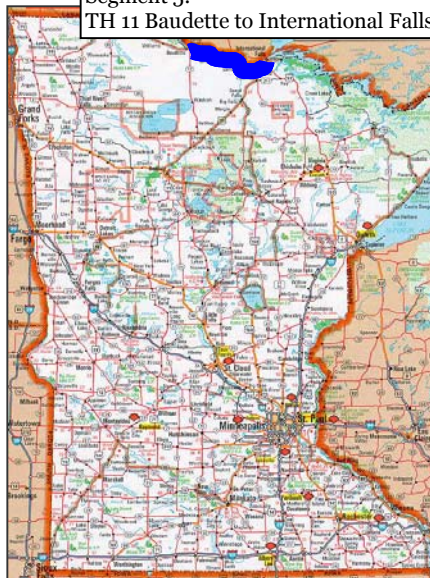
Road Segment 5: Baudette to International Falls



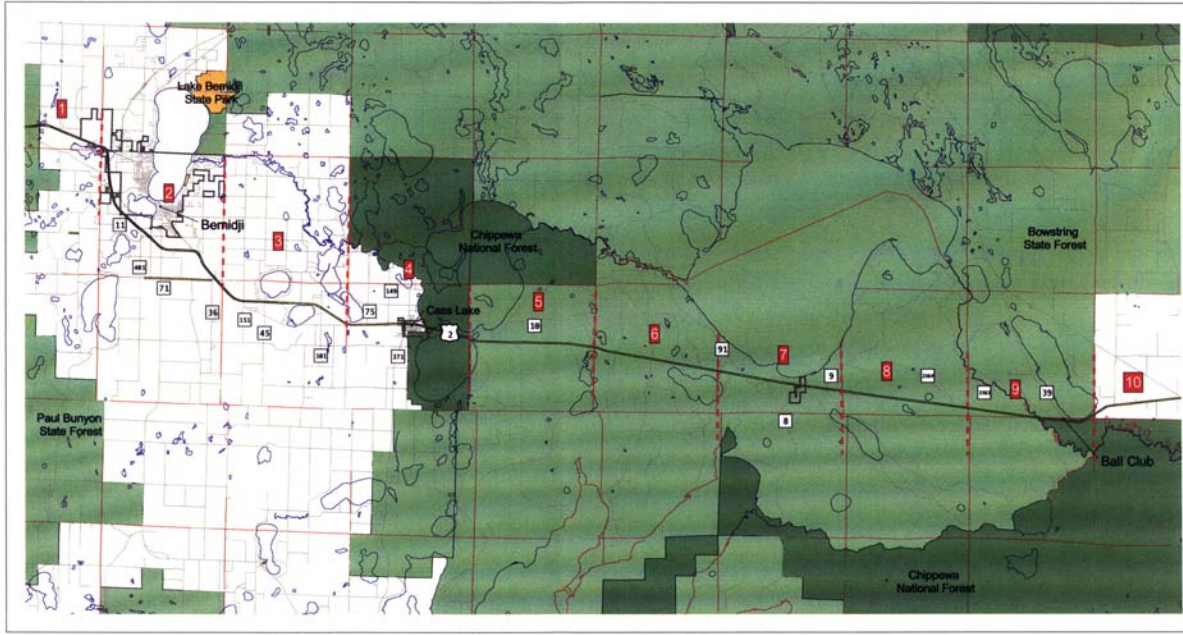
Tourism Survey - Segment 5
 Data Source: MN Dept. of Transportation
 U of MN - Extension Service
 July 2001



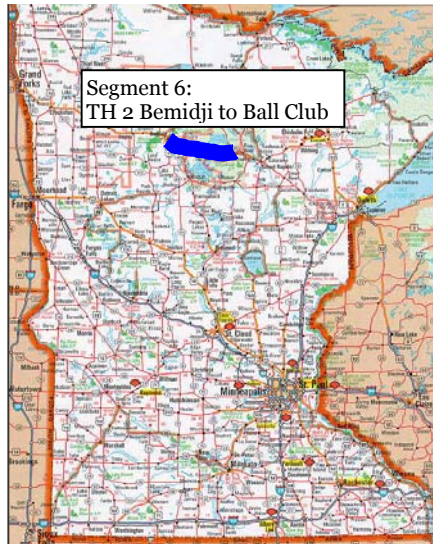
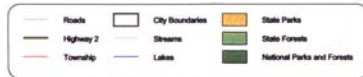
Segment 5:
 TH 11 Baudette to International Falls



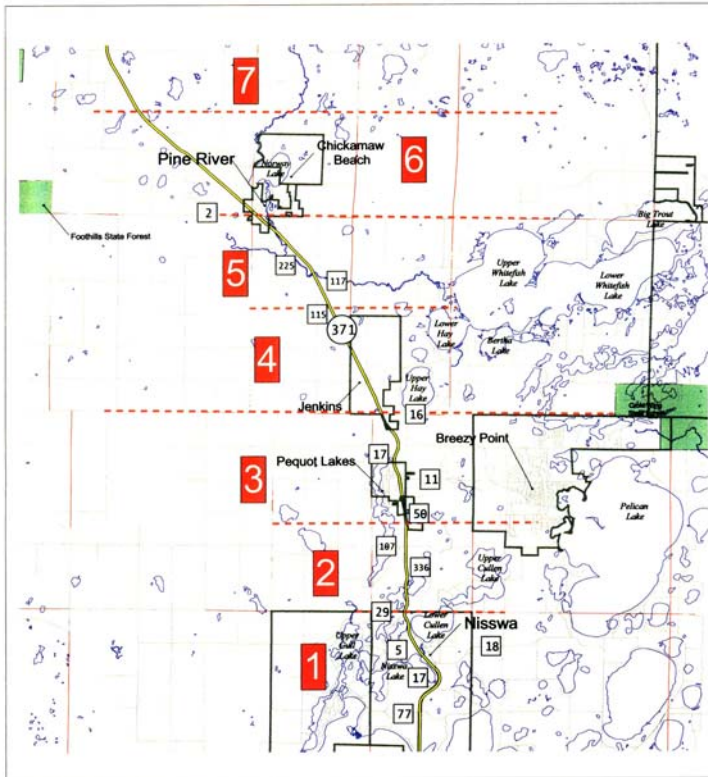
Road Segment 6: Bemidji to Ball Club



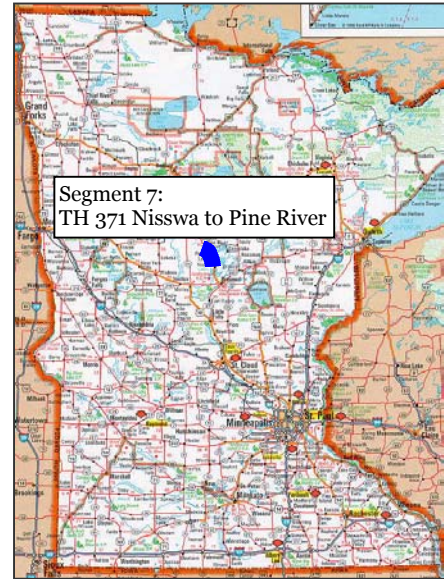
Tourism Survey - Segment 6
 Data Source: MN Dept. of Transportation
 U of MN - Extension Service
 July 2001



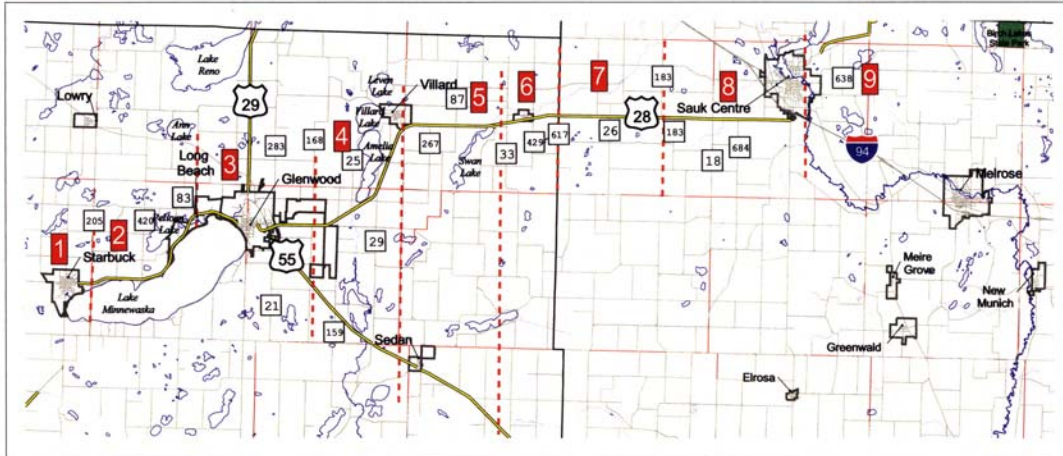
Road Segment 7: Nisswa to Pine River



Tourism Survey - Segment 7
 Data Sources: MN Dept. of Transportation
 U of MN - Extension Service
 August 2001



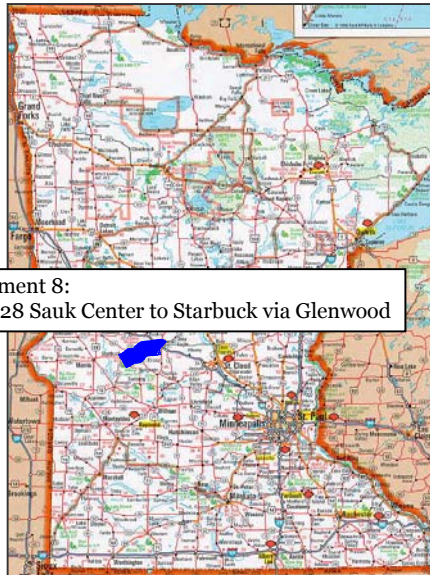
Road Segment 8: State Highway 29 and Highway 28



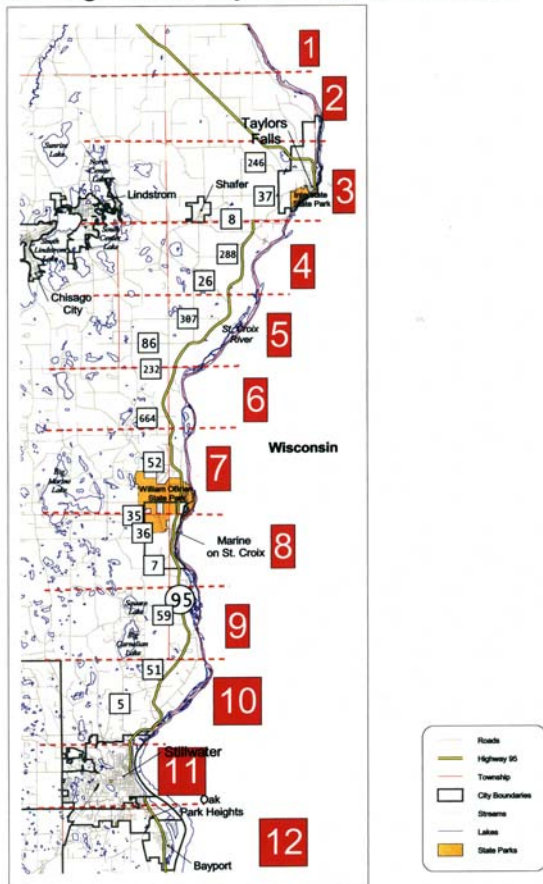
Tourism Survey - Segment 8
 Data Source: MN Dept. of Transportation
 U of MN - Extension Service
 August 2001



1 0 1 2 3 Miles



Road Segment 9: Taylors Falls to Stillwater

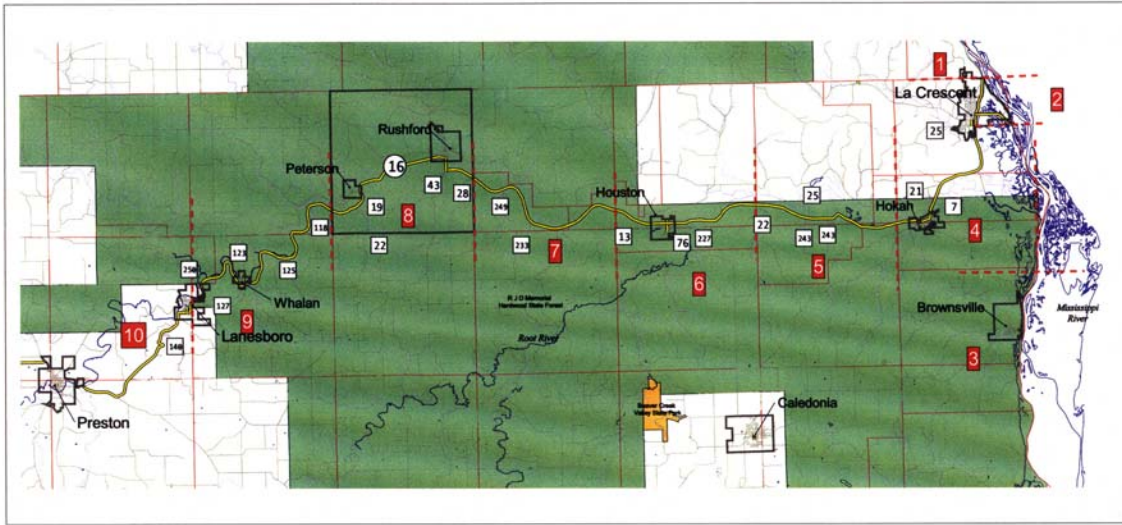


Tourism Survey - Segment 9
 Data Source: MN Dept. of Transportation
 U of MN - Extension Service
 August 2001

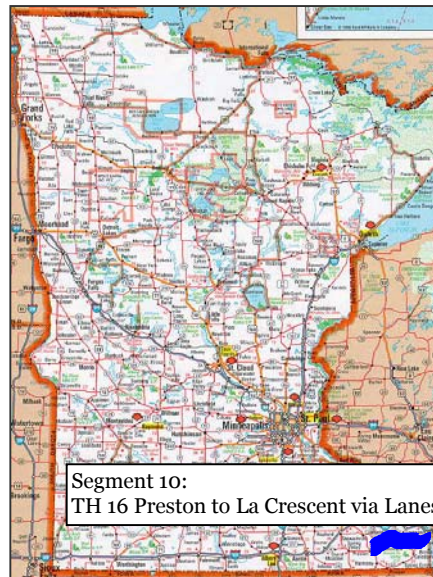
2 0 2 4 Miles



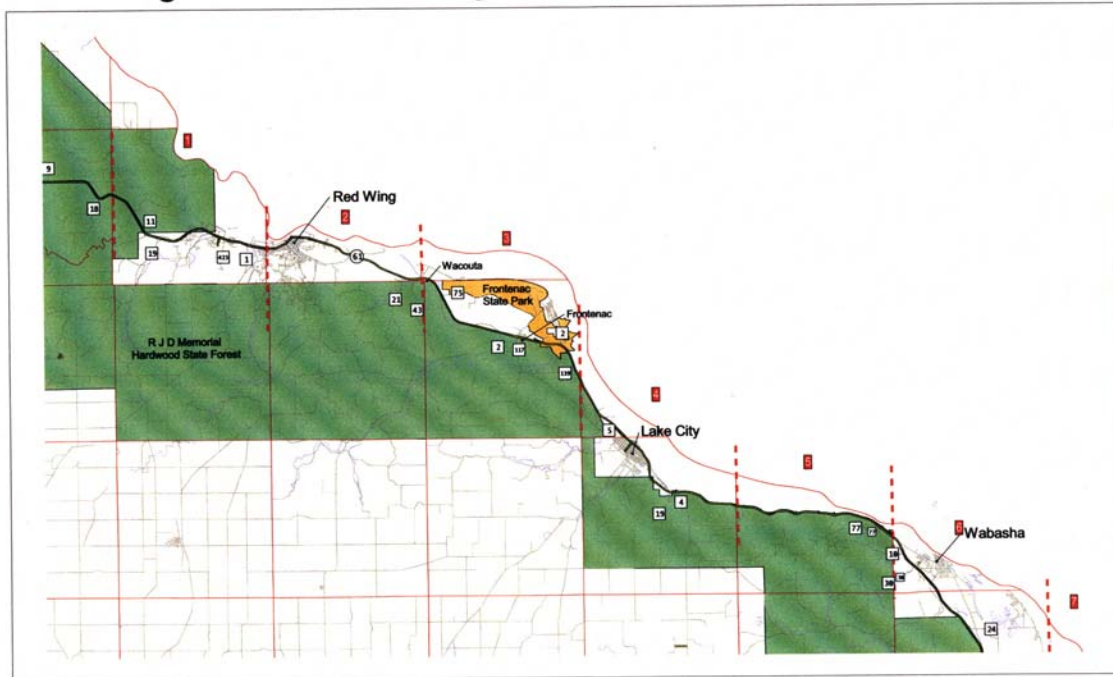
Road Segment 10: Lanesboro to La Crescent



Tourism Survey - Segment 10
 Data Source: MN Dept. of Transportation
 U of MN - Extension Service
 August 2001



Road Segment 11: Red Wing to Wabasha



Tourism Survey - Segment 11
 Data Source: MN Dept. of Transportation
 U of MN - Extension Service
 July 2001



2 0 2 4 Miles

