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Aesthetic Initiative Measurement System

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For the Aesthetic Initiative Measurement System (AIMS) project, researchers developed and tested the instruments and protocols that the Minnesota Department of Transportation uses to understand and document how travelers perceive the attractiveness of Minnesota's transportation corridors.

In summer 1999, researchers collected quantitative and qualitative data for three cities: Rochester, Twin Cities, and Duluth, Minnesota. Four key topics produced highly noticeable aesthetic effects to the travelers: maintenance, planting design, structural design, and vistas from the highway. The consistency of AIMS results with previous studies of other landscaped settings suggested that AIMS results are valid and could be replicated in other urban highway routes and with rural highways.

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Aesthetic Initiative Measurement System

Final Report

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EXECUTIVE SUMMARY

Quality of life in our communities can be influenced by the visual quality of the highway travel experience. Since many of us spend a great deal of time each day commuting in and around metropolitan areas, the highway corridor landscape can have a significant impact on how we view the attractiveness of the places we live and work. The Aesthetic Initiative Measurement System (AIMS) project was conducted to develop and test instruments and protocols that the Minnesota Department of Transportation (Mn/DOT) can use to understand and document how travelers perceive the attractiveness of Minnesota's highway corridor landscapes.

AIMS routes selected for 1999 focused on the metropolitan highway experience. Data-gathering days, in which volunteer AIMS participants traveled in vans along selected routes while responding to the landscape views along the way, were conducted in the summer. The study was done in three cities: Rochester, Twin Cities Metro, and Duluth, Minnesota. Route lengths were 62.5 miles for the Rochester route, 60.5 miles for the Twin Cities Metro route, and 66.5 miles for the Duluth route. Each route originated from an area Mn/DOT office. Each trip lasted six hours, with an hour of lunch break. A total of 63 individuals participated. Twenty-three people joined the three-van tour in Rochester, 14 in the Twin Cities Metro, and 26 in Duluth.

AIMS participants provided three types of data. First, they provided demographic information on a short electronically scannable form. Second, qualitative data were entered by a trained recorder in each van while participants traveled along the AIMS route. Third, individuals' recorded attractiveness ratings for each view they observed were recorded on a large scannable form. All of these forms were completed with the guidance of the interviewers and recorder/driver using the facilitators manual. Data were analyzed using content analysis and the Statistical Package for the Social Sciences (SPSS).

While they were riding in the vans along the AIMS routes, participants were instructed to call out any views along the way that attracted their attention. The specific view was assigned a view note number and a corresponding mileage location by the trained facilitator in the van. At listening posts at regular intervals along each route, each view that had been called was identified as attractive or unattractive by the person who had called it ,and the viewer described what made the view attractive or unattractive. Then, the rest of the travelers in the van were asked if they had seen this view and , if so, to rate its attractiveness on the larger scantron (5 as very attractive and 1 as unattractive).

Major highlights of the report include the following:

- The four key topics that produced highly noticeable aesthetic effects to the travelers were (1) maintenance, (2) planting design, (3) structural design, and (4) vistas from the highway.

- Accompanying this report are three AIMS reference manuals, one for each study route (Rochester, Twin Cities Metro, and Duluth). Specific elements (e.g., routes, mileage location, and corresponding attractiveness data) and strategies that produce aesthetic benefits could be reviewed in the field using these reference manuals.

- To have more participants of more diverse backgrounds, recruitment of focus group members should begin at least three to six months in advance of the AIMS day. The recruitment process should be highly coordinated with local community groups such as the Minnesota Extension Service and Chamber of the Commerce.

- For data validity, future data gathering should be repeated in the same season as AIMS 1999: summer during full leaf-on. Focusing on winter landscape perceptions would allow cross-seasonal comparison.

- In future applications of AIMS, routes for each study area can be shortened. AIMS 1999 results can be used as a baseline against which future urban AIMS routes can be measured. Travel time can be reduced from six to three hours to eliminate participants' fatigue.

- The consistency of AIMS results with previous studies of other landscape settings suggested that AIMS results are valid and could be replicated on other urban highway routes and that the AIMS methodology could be applied to rural highway corridors.

- Future urban AIMS projects could gather more detailed data by using the 1999 AIMS results as a baseline and by increasing the frequency of data-gathering stops (or listening posts) along highway segments that have aesthetic importance to Mn/DOT.

- Data-gathering efficiency could be improved by recording all the data directly on electronically scannable forms developed from the 1999 AIMS content analysis. This would reduce hand-writing during data gathering, and it would reduce time spent encoding data after AIMS days.

1 INTRODUCTION

What do we see when we are driving or riding in a car as a passenger? What landscape characteristics are more attractive to travelers? What is less attractive? How can design and maintenance choices affect the attractiveness of highways and transportation corridors? As Minnesota invests to enhance the aesthetic appeal of its roadways, these and similar questions become salient.

The attractiveness of a highway can influence our choice of routes and our general perception of the livability of our communities. In metropolitan areas and across regions, highways provide vital links for daily travel, for business, and for recreation. Since many of us spend a great deal of time each day commuting in and around major transportation corridors, highway corridors can have significant impact on how we view the attractiveness of the places we live and work.

This project developed and tested instruments and protocols that the Minnesota Department of Transportation (Mn/DOT) can use to understand and document how travelers perceive the attractiveness of Minnesota's highway corridors. The project produced an aesthetic initiative measurement system (AIMS) that documents how highway design and maintenance initiatives contribute to public perceptions of Minnesota highways. It also suggests how future design and maintenance plans might more efficiently enhance the aesthetics and visual quality of Minnesota's highways.

The primary purpose of AIMS is to produce information about how design and maintenance decisions are working to enhance the visual experience of Minnesota motorists and to assess what drivers perceive as visually desirable both on and off the highway's right-of-way. AIMS uses multiple measures of traveler perceptions. To produce information about design and management decisions that are germane and useful to Mn/DOT staff, AIMS is a replicable process wherein travelers concerns and perceptions are documented in a fashion that is applicable to highway design management and enhancements.

In this way, AIMS can be a monitoring system for travelers' visual experience of the Minnesota highway system and it also can be a tool for decision-making. It generates qualitative and quantitative measurements of highway aesthetics that are location specific. Finally, it enhances the capacity of the Mn/DOT staff to analyze the public's perception of existing and proposed design and management decisions.

2 METHODOLOGY

The AIMS methodology combines several qualitative and quantitative interview and survey methods to identify, document, and analyze travelers' written and verbal commentary on the visual characteristics of a transportation corridor. Blending aspects of focus groups, visual-preference surveys, and content analysis, the AIMS method optimizes the construct validity of individuals' responses to characteristics of the highway corridor that are noticeable while traveling along the highway.

The advantage of the AIMS method is its construct validity: it conveys what travelers notice rather than only what professionals or staff think is likely to be noticeable. AIMS travelers in vans were asked to call out "view note" when they noticed something they perceived as attractive or unattractive at any point along the AIMS route. A recorder in each van then recorded the mileage location of the view note and called a "view number" ID back to the traveler. The respondent was then asked to record in a notebook that number along with reference notes and whether the view was attractive or unattractive.

The van was then stopped at designated locations, called listening posts (LPs), along the assigned route (see Appendices A, B, and C for information regarding routes), and the notes taken by each respondent were reviewed. At the listening posts, recorders asked respondents to detail what they had seen and give their impressions in greater detail of what made their views attractive or unattractive.

Recorders asked respondents for view notes identified by the number as sequenced in the order called along the route. Each remaining person in the van was asked whether he/she had observed the same item or view. Those who responded were asked to indicate the observation on a supplied scantron and indicate on a five-point scale the perceived attractiveness of the view in question (with 1 as unattractive and 5 as attractive). Respondents not seeing the view in question were asked to leave the appropriate portion of the scantron sheet blank. Respondents were instructed that there are no right or wrong answers, and that perceptions and values of what might make something attractive or unattractive were defined as what they perceived as attractive or unattractive in the context of this highway route.

The data collected from the this AIMS methodology result in written documentation of attractive or unattractive views by each individual. An aggregate list of descriptors for each noted view was then recorded by the recorder from those who also observed the same view. Finally, all travelers who saw the noted view rated it on a 1–5 scale on their own electronically scannable form.

During the process of conducting data collection in the vans, respondents were asked to pay special attention to certain visual aspects in predetermined zones called collective image zones (CIZs). These zones had been selected by Mn/DOT staff because design or maintenance characteristics that were of particular interest for Mn/DOT initiatives were evident in the zone. Travelers were cued to look for certain characteristics within a given zone (e.g., tree plantings, landscaping, and structures) and comment on their attractiveness or unattractiveness in the same way as at other listening posts along the route. In the collective image zones, additional information was asked of all travelers who noticed the view—not only the first person who noticed it. All travelers were asked to give detailed descriptions of the view's attractiveness or unattractiveness.

2.1 THE ROUTES SELECTED

Three AIMS 1999 routes were selected by Mn/DOT staff in consultation with the research team. The first route involved a number of highways in and around Rochester, Minnesota. The second route included sections of the urban freeway system in Minneapolis–St. Paul, Minnesota, hereafter referred to as Twin Cities Metro, and the third route selected involved urban highways and freeways around the greater Duluth, Minnesota, area.

The Rochester route included 62.5 miles with eight listening posts. It started at Mn/DOT District 6 headquarters at 2900 48th Street NW, Rochester, Minnesota, and went on TH 52 south to Cty 1, then TH 52 north, then US 14 west, then TH 57 north to the Zumbro River in Mantorville, then back on TH 57 south, then US 14 east, then US 63 north, then Cty 22 south, then US 14 west, then Cty 22 north. See Table 2.1 and Figure 2.1 (complete AIMS Reference Manual: Rochester Route is included in Appendix A).

The Twin Cities Metro route was the shortest (60.5 miles) with nine listening posts. It started at the Mn/DOT office at 3485 Hadley Avenue N, Oakdale, Minnesota, and went on I-694 south, then I-94 west, then I-394 west, then US 169 north, then TH 55 east, then TH 100 south, then I-394 east, then I-94 east, then I-35W south to Diamond Lake Road, then back on I-35W north, then I-94 east, then I-35E south to West 7th Street, then back on I-35E north, then I-94 east, then I-694 north. See Table 2.2 and Figure 2.2 (complete AIMS Reference Manual: Twin Cities Metro Route is included in Appendix B).

The Duluth route was the longest (66.5 miles) and had the fewest listening posts (seven). It started at the Mn/DOT District 1 headquarters at 1123 Mesaba Avenue, Duluth, Minnesota, and went on TH 194 west, then US 53 south, then I-535 south, then US 2 west, then I-35 south, then TH 23 south, then TH 210 west,

then TH 45 north to Cloquet, then back on TH 45 south, then Cty 61 east, then I-35 north to 26th Avenue, then I-35 south, then TH 194 north. See Table 2.3 and Figure 2.3 (complete AIMS Reference Manual: Duluth Route is included in Appendix C).

2.2 WHO PARTICIPATED

It was the aim of the project to have diverse travelers in the van data gathering. The target was to include traveler respondents who were both rural and nonrural residents, Chamber of Commerce members and non-Chamber of Commerce members, tourists and nontourists, long-time residents and new residents, and commuters and noncommuters. For each of the three locations, a total of 24 participants was targeted, composed of three tourists, five commuters, six business managers/owners, six long-time residents, and four others. The actual participants recruited for AIMS 1999 were not as representative as planned, but these targets would be a reasonable goal for future AIMS recruitment.

A total of 63 individuals participated in the survey. Twenty-three people joined the van tour in Rochester, 14 in the Twin Cities Metro, and 26 in Duluth. They were equally divided into three vans for each site. All of the participants have lived in Minnesota for at least one year. The shortest period of stay is 1–5 years. Ninety-two percent of them are long-time residents (82 percent for Rochester, 100 percent for Twin Cities Metro, and 96 percent for Duluth). All of them live within the vicinity of the project sites they represent. The participants came from diverse backgrounds. The type of town/city they have lived in since age 16 was well represented. Less than half (40 percent) of the participants have lived in a rural town and/or small town, one-third in a town or suburb, and one-fourth in a city of at least 100,000 population. Almost half of the participants were senior citizens (71 years or older). Only four participants were 40 years or younger. The rest were from ages 41 to 70. There is almost an even distribution in terms of gender (43 percent female and 57 percent male). Only 14 percent were business owners. In terms of commuting patterns, almost one-fourth of the respondents work near their homes and another 25 percent travel more than 10 miles from home to work. The rest travel from 10 to 20 miles to get to work. The majority of the participants (97 percent) had driven some of the commuter route segments. When asked how often they drove around a certain specific part of route (from A to F), more than 90 percent noted that they had passed those segments at least once a month. See Table 2.4 for additional data on participant characteristics.

Table 2.1 Commuter Route Segments for Rochester

Segment	Commuter Route	Segment Mileage	Mileage Location
Mn/DOT building to LP1	TH 52 south	5.75	0.00–5.75
LP1 to LP2	TH 52 south	3.75	5.75–9.50
LP2 to LP3	TH 52 north	6.25	9.50–15.75
LP3 to LP4	US 14 west	14.00	15.75–29.75
	TH 57 north	3.00	29.75–32.75
LP4 to LP5	TH 57 south	3.00	32.75–35.75
	US 14 east	11.25	35.75–47.00
LP5 to LP6	US 14 east	4.50	47.00–51.50
	US 63 north	2.50	51.50–54.00
LP6 to LP7	Cty 22 south	3.50	54.00–57.50
LP7 to LP8	Cty 22 south	0.75	57.50–58.25
	US 14 west	4.25	58.25–62.50

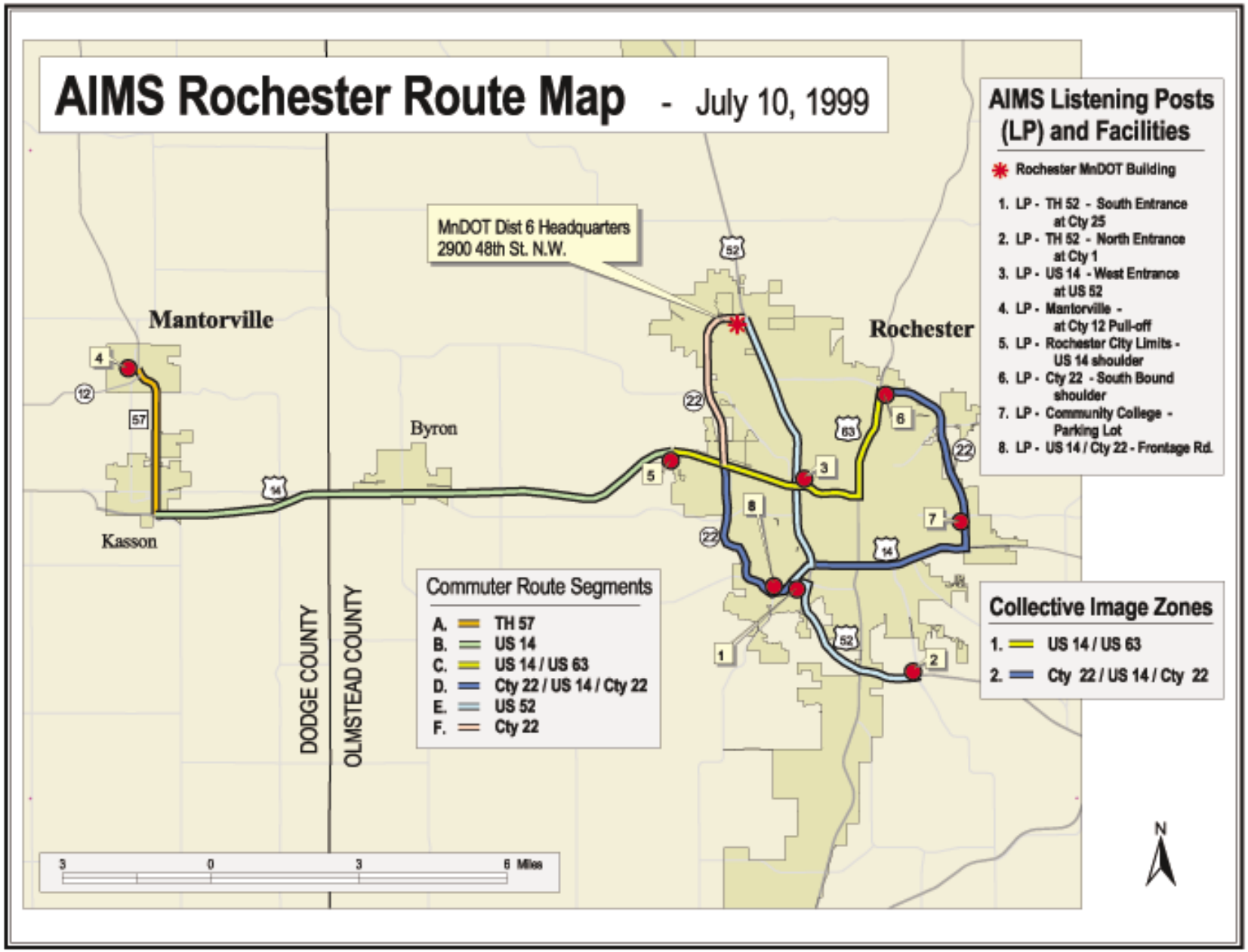

Figure 2.1 Rochester Route Map

TABLE 2.2 Commuter Route Segments for Twin Cities Metro

Segment	Commuter Route	Segment Mileage	Mileage Location
Mn/DOT building to LP1	I-694 south	3.50	0.00–3.50
	I-94 west	3.50	3.50–7.00
LP1 to LP2	I-94 west	5.75	7.00–12.75
LP2 to LP3	I-94 west	4.00	12.75–16.75
LP3 to LP4	I-94 west	2.25	16.75–19.00
	I-394 west	3.00	19.00–22.00
LP4 to LP5	I-394 west	3.75	22.00–25.75
	US 169 north	1.00	25.75–26.75
	TH 55 east	2.00	26.75–28.75
LP5 to LP6	TH 55 east	0.25	28.75–29.00
	TH 100 south	1.00	29.00–30.00
	I-394 east	3.75	30.00–33.75
	I-94 east	0.25	33.75–34.00
	I-35W south	4.00	34.00–38.00
LP6 to LP7	I-35W north	4.00	38.00–42.00
	I-94 east	2.00	42.00–44.00
LP7 to LP8	I-94 east	6.75	44.00–50.75
	I-35E south	3.00	50.75–53.75
LP8 to LP9	I-35E north	3.00	53.75–56.75
	I-94 east	3.75	56.75–60.50

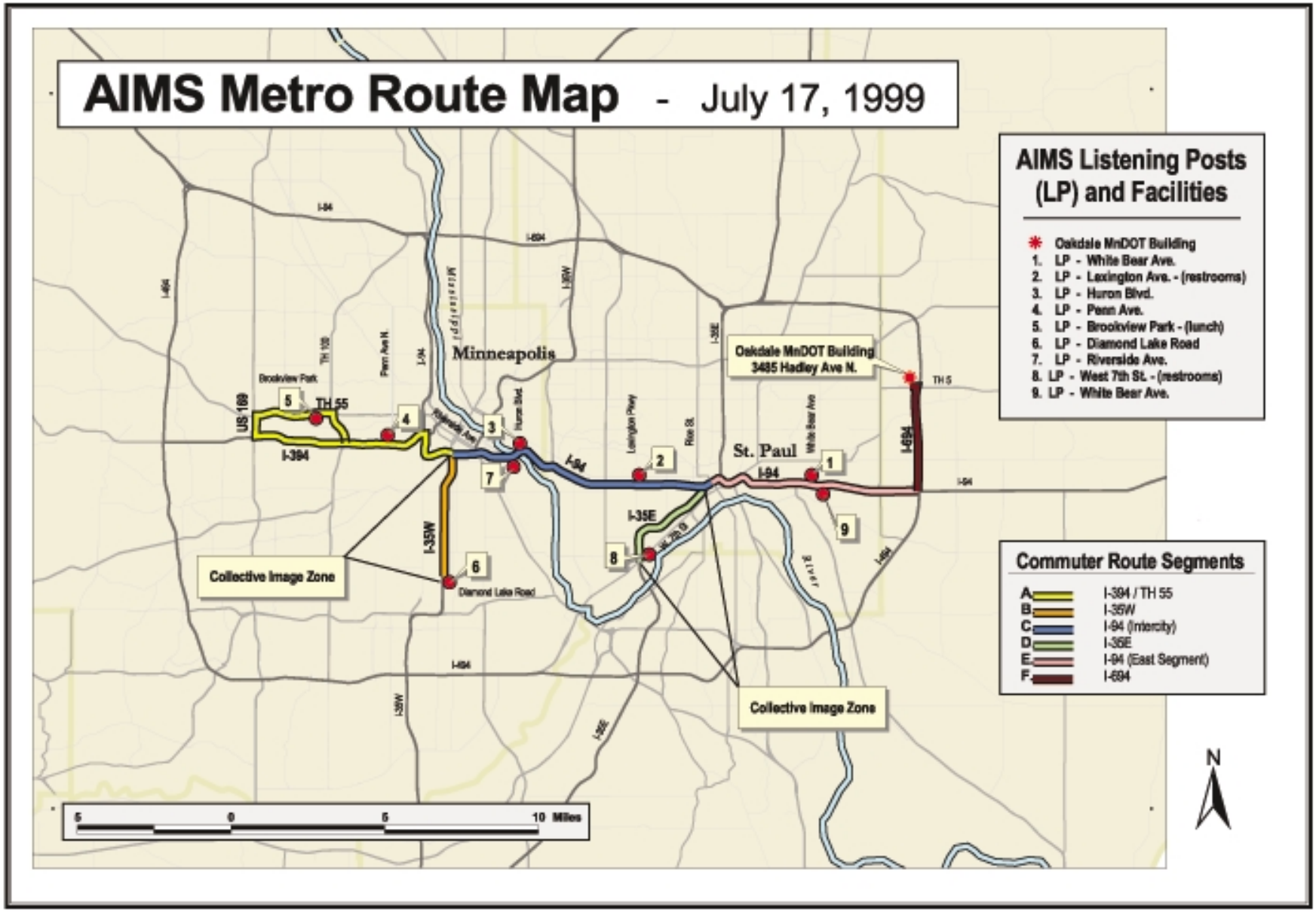

Figure 2.2 Twin Cities Metro Route Map

TABLE 2.3 Commuter Route Segments for Duluth

Segment	Commuter Route	Segment Mileage	Mileage Location
Mn/DOT building to LP1	TH 194 west	2.50	0.00–2.50
	US 53 south	4.00	2.50–6.50
	I-535 south	2.50	6.50–9.00
LP1 to LP2	I-535 south	1.25	9.00–10.25
	US 2 west	3.50	10.25–13.75
	I-35 south	1.00	13.75–14.75
	TH 23 south	1.00	14.75–15.75
LP2 to LP3	TH 23 south	6.25	15.75–22.00
LP3 to LP4	TH 210 west	8.00	22.00–30.00
LP4 to LP5	TH 210 west	4.00	30.00–34.00
	TH 45 north	6.25	34.00–40.25
	TH 45 south	3.25	40.25–43.50
	Cty 61 east	6.00	43.50–49.50
	I-35 north	5.00	49.50–54.50
LP5 to LP6	I-35 north	6.00	54.50–60.50
LP6 to LP7	I-35 north	6.00	60.50–66.50

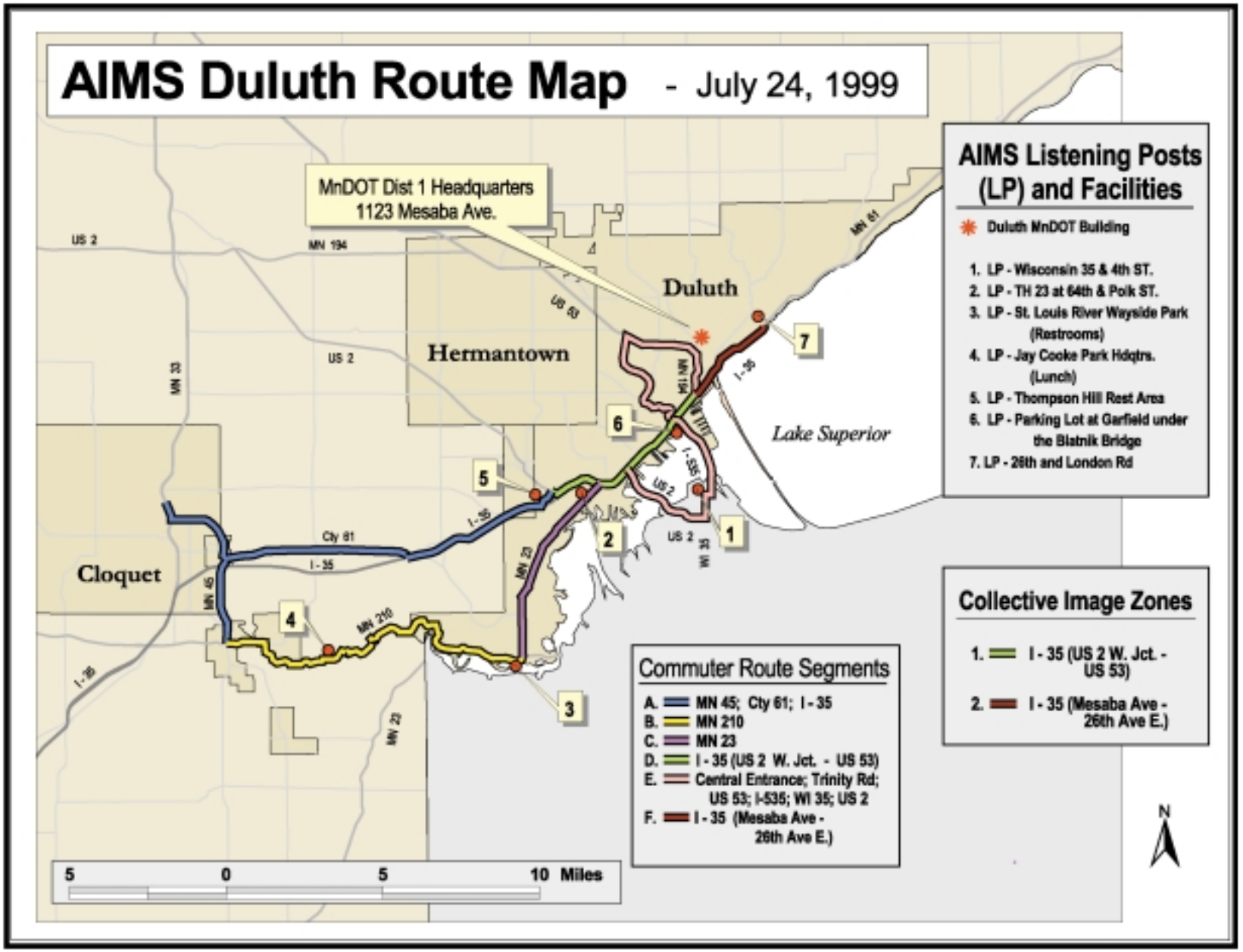

Figure 2.3 Duluth Route Map

Table 2.4 General Characteristics of Participants

Van	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
1	8	30.8	7	30.4	4	28.6	19	30.2
2	9	34.6	8	34.8	5	35.7	22	34.9
3	9	34.6	8	34.8	5	35.7	22	34.9
Total	26	100	23	100	14	100	63	100

Time Lived in Minnesota	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Don't live in		—		—		—		—
< 1 year		—		—		—		—
1–5 years	1	3.8	3	13		—	4	6.3
5–10 years		—	1	4.3		—	1	1.6
> 10 years	25	96.2	19	82.6	14	100	58	92.1
Total	26	100	23	100	14	100	63	100

Live Near	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Duluth	26	100		—		—	26	41.3
Metro		—		—	14	100	14	22.2
Rochester		—	23	100		—	23	36.5
Not near to any		—		—		—		—
Total	26	100	23	100	14	100	63	100

Miles Travel from Office	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
< 2	3	11.5	9	39.1	4	28.6	16	25.4
2–5	7	26.9	3	13	3	21.4	13	20.6
5–10	9	34.6	5	21.7	1	7.1	15	23.8
10–20	6	23.1	4	17.4	4	28.6	14	22.2
> 20	1	3.8	2	8.7	2	14.3	5	7.9
Total	26	100	23	100	14	100	63	100

Until 16 Years Lived Mostly in	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Rural not in town	4	15.4	7	30.4	1	7.1	12	19
Small town	5	19.2	5	21.7	3	21.4	13	20.6
Town or suburbs	12	46.2	7	30.4	3	21.4	22	34.9
City at least 100,000	5	19.2	4	17.4	7	50	16	25.4
Total	26	100	23	100	14	100	63	100

Age (years)	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
25 or younger	1	3.8		—		—	1	1.6
26–40	1	3.8	1	4.3	1	7.1	3	4.8
41–55	4	15.4	6	26.1	4	28.6	14	22.2
56–70	5	19.2	9	39.1	3	21.4	17	27
71 or older	15	57.7	7	30.4	6	42.9	28	44.4
Total	26	100	23	100	14	100	63	100

Gender	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Female	11	42.3	9	39.1	7	50	27	42.9
Male	15	57.7	14	60.9	7	50	36	57.1
Total	26	100	23	100	14	100	63	100

Own or Manage Business	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Yes	2	7.7	5	21.7	2	14.3	9	14.3
No	24	92.3	18	78.31	12	85.7	54	85.7
Total	26	100	23	100	14	100	63	100

Driven Some of the Route	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Yes	25	96.2	22	95.7	14	100.0	61	96.8
No	1	3.8	1	4.3		—	2	3.2
Total	26	100	23	100	14	100	63	100

Drove Part A	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Several times a week	3	11.5	4	17.4	2	14.3	9	14.3
Occasionally	15	57.7	7	30.4	8	57.1	30	47.6
< once a month	8	30.8	9	39.1	1	7.1	18	28.6
None of part A		—	3	13.0	3	21.4	4	9.5
Total	26	100	23	100	14	100	63	100

Drove Part B	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Several times a week		—	7	30.4	4	28.6	11	17.5
Occasionally	11	42.3	12	52.2	7	50.0	30	47.6
< once a month	11	42.3	4	17.4	1	7.1	16	25.4
None of part B	4	15.4			2	14.3	4	9.5
Total	26	100	23	100	14	100	63	100

Drove Part C	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Several times a week	5	19.2	20	87.0	4	28.6	29	46.0
Occasionally	5	19.2	2	8.7	6	42.9	13	20.6
< once a month	14	53.8	1	4.3	3	21.4	18	28.6
None of part C	2	7.7		—	1	7.1	3	4.8
Total	26	100	23	100	14	100	63	100

Drove Part D	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Several times a week	9	34.6	12	52.2	2	14.3	23	36.5
Occasionally	14	53.8	8	34.8	4	28.6	26	41.3
< once a month	3	11.5	3	13.0	4	28.6	10	15.9
None of part D		—		—	4	28.6	4	6.3
Total	26	100	23	100	14	100	63	100

Drove Part E	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Several times a week	12	46.2	20	87.0	1	7.1	33	52.4
Occasionally	11	42.3	1	4.3	3	21.4	15	23.8
< once a month	3	11.5	2	8.7	7	50.0	12	19.0
None of part E		—		—	3	21.4	3	4.8
Total	26	100	23	100	14	100	63	100

Drove Part F	Duluth		Rochester		Twin Cities		Total	
	No.	%	No.	%	No.	%	No.	%
Several times a week	18	69.2	7	30.4			25	39.7
Occasionally	7	26.9	9	39.1	2	14.3	18	28.6
< once a month	1	3.8	3	13.0	7	50	11	17.5
None of part F		—	4	17.4	5	35.7	9	14.3
Total	26	100	23	100	14	100	63	100

3 STUDY PREPARATIONS

3.1 PRETEST OF INSTRUMENT AND STUDY PROTOCOL

Two pretests of the instrument and protocol were completed before training was implemented in summer of 1999. The first pretest focussed on testing a route considering what was visible along the route, traveler fatigue on an AIMS day, and safety and pacing of listening posts. A second pretest was completed of the instrument and protocol included a number of Mn/DOT staff and community volunteers to have a more unbiased appraisal of the instrument and route protocol. Volunteers for the pretest were selected from Mn/DOT employees who had a particular interest in the research being conducted. In addition, volunteers from the community were recruited by Mn/DOT staff to participate in the study. The pretest event was conducted in a fashion similar to the way the actual AIMS days were to be conducted.

Throughout the day many things were learned by conducting the pretest:

- The Twin Cities Metro route was shortened to further reduce the possibility of traveler respondent fatigue. This also informed the design of the other routes, in Rochester and Duluth, which were not yet finalized.

- The interviewer/recorder position was extremely demanding and required a person who would be very attuned to the survey process. Consequently, some recorder responsibilities were assigned to the driver when the van was stopped at listening posts.

- The logistics of the vans was an important factor. The ability to hear questions and comments as well as the ability to see out from the van was very much affected by where participants were seated. Louder people were best placed in the back of the van and taller people were best placed farther from the front of the van. The number of people in the van was limited so that no one had a center seat; each traveler was seated next to a window.

- The process was difficult for some participants to grasp. For example, some participants questioned whether they should call view notes out if another participant called out at approximately the same time, stressing the need for clear instruction in orientation and throughout the entire survey day.

3.2 FACILITATOR TRAINING

In response to the pretest, the instrument and protocol were revised and shortened. A training protocol (Appendix D) was developed, and a training session for Mn/DOT staff who volunteered to be AIMS-day facilitators was conducted in July 1999. This took place at the Mn/DOT facility in Oakdale, Minnesota.

Background information and orientation of the facilitators to the research instrument and protocol were given (see Appendix E for facilitators workbook). After a brief break, the group was split into three separate subgroups. Each subgroup went through a mock AIMS survey in a van scenario. Chairs were set up as if in a van. A slide projector provided the views and facilitators took turns in the various roles of participant, driver, and interviewer. This exercise proved very beneficial in the afternoon when vans were taken out on the Twin Cities Metro route for additional training. Here again, the facilitators took turns practicing the various roles of participant, driver, and interviewer that would be present during the actual AIMS day. By experiencing these roles first hand on the road, the facilitators were given great insight as to how the actual AIMS days would play out. Finally, a discussion session was conducted at the end of the training day. This allowed for feedback from all parties as to how the survey process should be done.

The training session proved to be invaluable in further refining the research instrument and protocol. Perhaps the most important outcome from the training session was a transfer of ownership in the research process to the people who would be implementing it. Mn/DOT employees were clearly and enthusiastically engaged in the process, informed about its requirements, and excited about carrying it out.

3.3 PARTICIPANT RECRUITMENT

Participant recruitment was primarily conducted by Iowa State University (ISU) staff from the Ames, Iowa, campus location. Likewise, Mn/DOT personnel were asked for local leads to be contacted by ISU staff. Recruitment for July 1999 AIMS days began in late May. While a substantial amount of time was spent in recruitment, an earlier start on recruitment, at least four months in advance of AIMS days, is likely to improve respondent volunteer rates for future AIMS days.

The process of recruiting involved identifying business, volunteer, service, civic, and religious groups in the communities where surveys were to be held. A list of all organizations in and near the project sites was generated from the internet. Non-profit and service organizations were also offered a donation of $20.00 per person for their members' service.

These organizations were then contacted by phone to determine their level of interest in participating in the survey. Those organizations that expressed any degree of interest in participating were mailed or faxed a letter detailing the specifics of the study and the types of participant groups desired. These same groups were then called back to relay more information and to determine whether any members could be recruited for the survey. Subsequent follow-up calls were then made as needed to obtain volunteers. One hundred one organizations and individuals were contacted in Rochester, 166 in the Twin Cities Metro, and 115 in Duluth. The majority of the calls were made to churches and service or civic organizations (see Table 3.1).

Table 3.1 Number of Contacts Made to Different Organizations

Type of Organization	Rochester	Twin Cities Metro	Duluth
Church	30	72	83
Service	54	59	18
Government	3	16	—
Business	10	11	14
University	2	4	—
Individual	2	4	—
Total	101	166	115

Participant recruitment did not start well in advance of the scheduled AIMS days. An important lesson learned was that recruitment for summertime participation in the AIMS process should begin at least four months in advance of AIMS days. Many contacts cited the timing of the survey as a problem because of summer vacations and weekend events. Understandably, summer weekends in Minnesota are a precious commodity. However, some contacts referred us to other organizations or individuals that might be interested in joining the survey. These were helpful.

Though the newspaper and public access television were also contacted, no survey participants were obtained through the use of the newspaper or public access television in any survey area.

3.4 AIMS DAYS

AIMS days were conducted by Mn/DOT staff. David Larson, senior landscape architect, was the registration coordinator for all the survey sites. Larson conducted the registration and orientation sessions

at each of the Mn/DOT facilities prior to the van rides as well as the collective image zone orientation during the lunch hour. Van drivers and interviewers were also Mn/DOT staff recruited by Larson.

Each AIMS day was scheduled to begin at 9:00 a.m. and end at 3:00 p.m. From approximately 9:00 a.m. to 10:00 a.m. registration and orientation sessions were held. Van rides began at approximately 10:15 a.m., after a brief break. Lunch took place from approximately 12:00 noon to 1:00 p.m. The survey was then finished at about 3:00 p.m. back at the Mn/DOT facility where the survey originated.

During the registration/orientation period, participants were given materials to be used throughout the day. These included forms, clipboards, steno pads, maps, and pencils. Participants were asked to answer short background questions regarding their experience with the Mn/DOT highways to be encountered during the day. Participants were also given detailed instructions relating to the view note process. This included a mock view note session in the training room to accustom participants to the process.

After completing the registration/orientation process the participants were directed to predetermined vans. Each van would accommodate up to nine participants, one driver, and one interviewer for a maximum total of 11 persons per van. The AIMS route selected previously by Mn/DOT staff was then driven with the data-gathering process being carried out throughout the route. As the participants became more confident with the process they became more engaged in the research and its use.

Lunch time provided a much needed break and also an opportunity for participants to share their collective experiences. It was also a time chosen to introduce the collective image zone process. This discussion was led by David Larson of Mn/DOT.

A great benefit was obtained by having the same person register, orient, and educate participants at all three survey locations. The familiarity and confidence gained through repetition of the process showed through in the delivery of the material and provided a significant level of comfort for the participants. In addition, the consistency of each presentation was increased, thereby providing a more uniform level of instruction for all survey groups as well as helping to eliminate bias through instruction. The research results were thus strengthened by this approach.

4 RESULTS

In describing the views they had noted along the AIMS route, traveler respondents provided a series of word descriptors that articulated not only what was seen, but also its perceived attractiveness or unattractiveness. Records of these descriptors were made by the facilitators at listening posts as part of the data-gathering process on AIMS days. These records provide a visual log of each trip by site. Utilizing a content analysis, descriptive words and phrases indicating what was noticed and what was perceived as attractive or unattractive were recorded as binomial data in SPSS records for each view note. By examining the logs in Tables A.5, B.5, and C.5 (see Appendices A, B, and C, respectively), the reader can determine the descriptors used to describe specific sights at specific locations along each of the three routes. After the initial sighting of a view note by a respondent, fellow travelers were asked at listening posts to detail to the facilitator their assessment of the view as to positive or negative appearance.

In the data set, aggregation of responses does not indicate statistical significance that would allow generalization to a broader population. The purpose of this data set is to identify aesthetic issues that are noticeable to Minnesota travelers. These issues then can be used for a broader population survey if such a survey is desirable in a later phase of research. In these AIMS data, the frequency of respondents noticing and identifying a given view or a given landscape feature suggests how apparent or noticeable it is.

With a scale of 1 (unattractive) to 5 (attractive) and a midpoint of 3, the average response to the noted views of all passengers was 3.4. The average response to all three urban highway corridors was positive (see Table 4.1). The Duluth route was perceived as the most attractive on the average. The Rochester response was virtually identical to the overall average response toward the three routes. The standard deviation indicates little variation in the overall response to the aggregate appearance of the three transportation systems that were visually scanned. While the total number of traveler respondents in each site ranged from 14 to 26, the total number of observations indicated shows little variation.

The AIMS process not only provides an assessment of the general attractiveness of a transportation corridor, it also provides great specificity by location within a corridor. Examination of attractiveness ratings by one-tenth mile increments suggests where future enhancements may be needed as well as the effect of existing enhancements.

Table 4.1 Mean Responses of View Notice Variable

Urban System	Total Miles	Number of Respondents	Mean Response	Median Response	Standard Deviation	Number of Observations
Duluth	66.5	26	3.6	4.1	1.2	262
Rochester	62.5	23	3.4	3.8	1.2	224
Twin Cities Metro	60.5	14	3.2	3.4	1.3	246
Average	63.2	21	3.4	3.8	1.2	732

4.1 INTERNAL VALIDITY AND RELIABILITY OF DATA

A key test of the internal validity of the AIMS method is whether the same phenomenon is seen by both the individual respondent and the other passengers in the van as attractive or unattractive. While some inconsistency should be expected (e.g., mowed grass is "neat" and attractive to one person, while unattractive and "unnatural" to another), the mean value ascribed to a view note should be consistent with the nominal value given by the initial respondent.

As can be seen in the Table 4.2, the consistency between the individual's perception and the subsequent mean aggregate perception of the attractiveness or unattractiveness of noticed views is very high. In each of respective transportation corridors studied, only six to eight percent of responses to a given visual stimuli had an aggregate response different from the original description of attractive or unattractive. With a total of nine vans traveling along three different routes, this level of consistency tends to support the premise of a high level of internal validity with the methodology.

Table 4.2 Consistency Between the Individual's Perception and the Group's Ratings of the Degree of Attractiveness

	All Three Sites		Rochester		Twin Cities Metro		Duluth	
	No.	%	No.	%	No.	%	No.	%
Attractive consistency	240	33.0	78	34.8	95	38.8	67	26.0
Inconsistency	53	7.3	16	7.1	20	8.2	17	6.6
Unattractive consistency	434	59.7	130	58.0	130	53.1	174	67.4
Total	727	100.0	224	100.0	245	100.0	258	100.0

As an additional check of reliability, a moving average was calculated based upon the mean perception of respondents over moving increments of four responses. This process in essence blurs the specific mileage point of each response and allows for an examination to see whether perceptions among vans are consistent both by location and aesthetic valuation. Thus, tendencies of positive or negative perceptions over longer mileage increments are derived.

Figures A.4, B.4, and C.4 (see Appendices A, B, and C, respectively) show the moving averages of responses to each of the three highway systems examined. With a few exceptions, respondents from each of the vans tended to be consistent in their response to the visual surroundings, especially if one examines their responses over given increments of mileage. The data from each respective van do appear to trend together, especially when examining sections of each of the corridors, and at least a basic level of reliability is achieved.

As stated, some exceptions to the trend of consistency of views between vans is noted. In Rochester, around the 30- to 32-mile mark, van 1 tended to see unattractive views, while vans 2 and 3 consistently were viewing scenes in positive terms. In the Twin Cities Metro area, van 1 also tended to have more negative or unattractive views than vans 2 and 3, especially from mile 6 to mile 10 and again around miles 13, 15, and 18. Conversely, van 1 in Duluth saw something attractive between miles 5 and 6, while the last two vans tended to see unattractive views. In the context of the almost 190 miles of transportation corridors covered, however, these inconsistencies were exceptions.

One common trend that appeared among virtually all vans and routes was the tendency for each respective aggregate of respondents to react more positively to their visual surroundings as the trip proceeded. Each figure (Figures A.4, B.4, and C.4) has a midpoint or neutral point of three with mean positive responses above that line and mean negative response below that line. By examining the figures, the reader can visually see this trend toward the positive by comparing typical responses in the first five or ten miles of each of the routes with responses in the last five to ten miles. These data are a byproduct of the structure of the AIMS protocol that located CIZs, which tended to be viewed as attractive in the second half of the AIMS data so that traveler response was not biased by their attention to landscape characteristics that they were asked to notice in the CIZs.

4.2 HOW HIGHWAY DESIGN AND MAINTENANCE CONTRIBUTE TO AESTHETICS

AIMS is intended to allow Mn/DOT to periodically measure the aesthetic value that highway landscape characteristics hold for Minnesota travelers. Past research suggested that a familiar and effective way for people to talk about landscape aesthetics is in terms of attractiveness (1, 2). The AIMS instrument asked Minnesota travelers to rate the attractiveness of each view they selected on a five-point scale relative to all highway views in the study area.

Attractive meant anything the traveler noticed and perceived as nice to look at, pretty, or enjoyable to see. Travelers were instructed, "Attractive is what you think is attractive." The most attractive views in the highway study area were rated 5. Unattractive meant anything the viewer noticed and perceived as detracting from the way the landscape looked. Travelers were instructed, "Unattractive is what you think is unattractive." The most unattractive views in the study area were rated 1.

4.2.1 Attractive Aspects of the Highway Landscapes

Results of the data analysis pointed to four key design and maintenance related reasons for perceived attractiveness of highway landscapes:

1. good fit of the highway location and design with its landscape context
2. good design of elements within the highway right-of-way, including some functional aspects of the highway and its right-of-way
3. the perception of nature as seen from the highway
4. good maintenance—from neatly mown grass to well-maintained structures

Results of the data analysis related to attractive aspects of highway landscapes are summarized in Table 4.3. The table lists mean attractiveness ratings (5 being most attractive) for all landscapes noted as attractive in some way by travelers who participated in AIMS, along with what people noticed and what they found attractive in the landscape. Note that this table focuses on only what makes landscapes attractive, so in column 5 it lists only a portion of the views noted in each study area, those that were most and least attractive overall. See Tables A.5, B.5, and C.5 for a full listing of views noted and their mean ratings and Figures A.2, B.2, and C.2 for mean attractiveness ratings by mileage location for each of the routes.

Table 4.3 Trends and Locations in All Study Areas: Attractive Aspects of Highway Landscapes

Mean Rating*	N of Raters	What People Noticed**	What People Found Attractive**	Where to See It (by Study Area 0.1 mile)
4.90–5.00	62	Vistas and v'sheds Architec. character Planting design Structures in v'shed	**Good design** (e.g., aesthetic characteristics of planting, or structural elements within the right of way) **Good fit with context** (e.g., focal views of attractive landscapes or landmark bldgs. or bridges)	**Duluth**: 5.3, 7.2, 10.7, 11.9, 22.8, 25.6, 27.9, 28.0, 29.6, 30.5, 49.7, 53.3, 53.4, 62.9, 63.1, 63.2, 63.9, 64.2, 64.4, 65.1 **Metro:** 5.1, 8.9, 12.1, 16.9, 19.3, 26.1, 26.8, 35.4, 36.2, 37.2, 38.7, 53.1, 53.5, 56.1, 56.8, 58.5, 59.6, 59.7, 59.9 **Rochester**: 6.8, 13.2, 13.6, 13.8, 18.7, 27.0, 29.4, 30.1, 31.0, 32.1, 32.3, 50.9, 51.1, 61.7
4.60–4.89	109	Vistas and v'sheds Planting design Architec. Character Structures in v'shed Condition of hwy Signs	**Good fit with context** (e.g., focal views of attractive landscapes, landmark bldgs.) **Good design** (e.g., aesthetic characteristics of planting, or structural elements within the right of way) **Nature** (e.g., wildflowers, wildlife, bedrock exposures) **Good maintenance** (e.g., mowing, no trash, good repair) **Pleasant or nice**	**Duluth:** 7.3, 7.5, 12.0, 12.1, 12.2, 12.7, 14.9, 15.9, 16.6, 17.0, 19.9, 21.3, 23.9, 25.0, 26.1, 27.7, 29.5, 30.1, 30.4, 31.5, 32.7, 32.8, 33.2, 33.3, 38.0, 38.6, 40.6, 46.0, 50.0, 53.7, 55.0, 59.2, 61.5, 63.6, 63.8, 64.5, 65.0 **Metro:** 4.4, 9.6, 10.1, 11.3, 17, 26.7, 27.0, 36.9, 37.5, 39.7, 52.6, 53.0, 53.7, 54.4, 56.2, 58.1, 58.2 **Rochester:** 1.7, 3.1, 5.5, 6.2, 7.5, 7.6, 8.0, 8.1, 8.2, 10.2, 14.1, 15.5, 19.4, 19.6, 22.5, 25.1, 26.0, 26.6, 27.6, 27.9, 29.5, 30.9, 31.4, 48.7, 53.7, 54.8, 56.1, 56.3, 56.5, 56.6, 57.5, 57.8, 60.6
4.30–4.59	131	Vistas and viewsheds Planting design Structures in v'shed Architec. Character Condition of highway	**Good fit with context** (e.g., focal views of attractive landscapes, landmark bldgs.) **Good design** (e.g., aesthetic characteristics of planting, or structural elements within the right of way) **Good maintenance** (e.g., mowing, no trash, good repair) **Pleasant or nice** **Unique** **Nature** (e.g., wildflowers, wildlife, bedrock exposures)	**Duluth:** 1.1, 4.6, 5.5, 6.5, 7.9, 8.1, 8.2, 9.0, 9.2, 10.0, 10.3, 11.7, 15.3, 15.5, 15.8, 16.3, 17.4, 17.6, 19.0, 20.7, 221.2, 22.0, 24.1, 24.2, 24.8, 27.6, 28.9, 30.6, 32.5, 33.4, 33.5, 34.6, 37.0, 38.4, 38.8, 39.8, 40.1, 45.1, 45.8, 45.9, 50.1, 54.1, 54.2, 54.9, 65.3 **Metro**: 8.8, 10.8, 14.2, 17.1, 17.3, 17.4, 17.5, 18.5, 19.7, 20.9, 23.7, 25.4, 26.3, 36.0, 36.7, 40.0, 40.9, 43.7, 46.4, 52.7, 53.3, 53.8, 53.9, 54.1, 54.7, 54.8, 55.6, 57.4, 58.0, 59.1, 59.2, 59.6, 60.5 **Rochester:** 0.5, 3.0, 4.3, 6.0, 7.0, 7.1, 8.9, 9.6, 9.7, 10.7, 12.6, 13.7, 16.2, 19.7, 23.7, 29.8, 30.0, 30.8, 31.5, 50.6, 50.8, 51.4, 53.0, 54.1, 54.9, 55.2, 58.6, 59.0, 62.6
4.00–4.29	127	Vistas and v'sheds Struct. in v'shed Planting design Architec. character Condition of hwy Signs	**Good fit with context** **Good design** **Good maintenance** (e.g., mowing, no trash, good repair) **Nature** (e.g., wildflowers)	
3.00–3.99	164	Vistas and v'sheds Struct. in v'shed Planting design Architec. character Condition of hwy Signs Maintenance	**Good design** **Good fit with context** **Nice** **Good maintenance** (e.g., mowing, no trash, good repair)	
1.00–2.99	35	Architec. Character Vistas and v'sheds Signs	**Good design** (e.g., of a bridge, walls, a railing, or a planting) **Attractive context** (even if hwy. is not a good design fit)	**Duluth** 1.7, 5.4, 6.4,15.6,23.6,23.7, 47.3, 66.5 **Metro** 8.5, 9.1, 10.0, 16.4, 16.7, 17.2, 17.7, 19.4, 20.8,23.3, 23.9, 24.6, 25.9, 38.9, 43.9, 53.6 **Rochester** 7.2, 15.6, 47

*5 = most attractive.

**Listed by order of relative frequency with which characteristics were mentioned by viewers. Minimum frequency = 6.

Good fit with context. The most attractive landscape views (see mean ratings above 4.3 out of 5 in Table 4.3) are typically related to a good fit between highway design and an attractive landscape context. Where highway design creates and emphasizes large landscape vistas—whether of urban skylines, hills covered by trees, landmark buildings, bridges, or lakes or rivers—these vistas are perceived as highly attractive. Where something in the right-of-way blocks these vistas, it is seen as unattractive. The effect of vistas is so powerful that one might think of highway design as an opportunity to construct vistas of the larger landscape and to design an appropriate foreground for these vistas.

Good design within the right-of-way. Good design within the right-of-way accounted for what viewers saw as attractive for the entire range of landscape attractiveness. Across all mean attractiveness ratings (see column 1 in Table 4.3), good design ranked first or second in explaining what people found attractive about the landscape. The very most attractive views in which good design accounted for attractiveness (above 4.6) tended to be within the collective image zones of the AIMS study areas. For example, planting design and design of architectural details, such as railings, and wall and bridge materials and form were associated with highway views that were perceived as highly attractive. Skillful design decisions created landscape attractiveness that was valued as highly as were broad landscape vistas.

Good design also created attractive aspects of less attractive landscapes. Within landscape views that were rated 3.0 or lower, the most attractive aspect was likely to be good design. For example, in the least attractive highway segments of the three study areas (see Tables A.2, B.2, and C.2 in Appendices A, B, and C, respectively), planting design that screened or softened unattractive aspects of the view and well-designed bridges, walls, and railings created aesthetic value in an otherwise unattractive landscape.

Functional aspects of good design. Particularly within the collective image zones, where the AIMS process directed people to pay attention to the architectural character of highway structures, planting design, and vistas, functional aspects of good design contributed to what people noticed as attractive. For example, people noticed some signs within CIZs in Duluth and the Twin Cities Metro area that were informative and well placed to enhance the legibility of the highway landscape experience. Another functional aspect that contributed to perceived attractiveness was safety. In some cases, pedestrian overpasses were described as attractive because they made highways safe for pedestrians.

Nature. Viewers were far more likely to mention "wildlife, green, environmental, natural" to explain what made a *very* attractive landscape (with ratings between 4.3 and 4.9) attractive. If a landscape was less attractive, these "nature" characteristics were unlikely to be mentioned. Some of these characteristics

were created by design (e.g., wildflowers that attract birds and butterflies), some were the result of design that emphasized inherent characteristics of the landscape (e.g., rock outcroppings or views of rolling hills). Where these natural characteristics are either introduced or emphasized by design, they are associated with very high attractiveness.

However, nature was occasionally associated with unattractive aspects of the landscape. For example, in the Rochester CIZ a wetland was described as unattractive, while the wildlife associated with the wetland was described as attractive. In another view, a lake was described as attractive, but one unattractive aspect of the lake was described as "bugs."

Good maintenance. People saw good maintenance as attractive wherever they saw it—in attractive landscapes and in less attractive landscapes. In that way, good maintenance is highly influential in supporting perceptions of highway attractiveness. While maintenance alone cannot create the perception that a landscape is very attractive, poor maintenance can make an otherwise attractive landscape look less attractive, and good maintenance can add value to a landscape that might otherwise be ordinary or unattractive (see Table 4.4). Among the landscapes rated between 3 and 4.9 (see column 1 in Table 4.3), good maintenance was an important reason why people saw those landscapes as attractive.

Overall, attractive aspects of the highway experience were strongly related to highway design taking advantage of opportunities to create and respect vistas of the surrounding landscape and to emphasize natural features of the surrounding landscape (such as geology, hills, and forests). This effect is apparent in all three study areas, including some CIZs, like in the Rochester route, where in mile 50.6 to mile 51.4 the use of design within the right-of-way to screen less attractive land uses and keep the viewers' focus on the attractive landscape vista contributed to one of the most attractive segments along the highway (see Table A.1). In addition and equally important, good design of features within the highway right-of-way, especially where good design is consistently carried out in a continuous area, as in mile 52.6 to mile 60.5 of the Twin Cities Metro CIZ (see Table B.1), where the planting design and architectural treatment of walls, overpasses, and bridges creates a highly unified urban character, or in mile 62.9 to mile 65.1 of the Duluth CIZ (see Table C.1), where the tunnel, walls, and planting design create a very attractive area. Good design in the right-of-way can create highly attractive landscape experiences even where vistas to surrounding attractive landscapes are not possible.

Table 4.4 Trends and Locations in All Study Areas: Unattractive Aspects of Highway Landscapes

Mean Rating*	N of Raters	What People Noticed**	What People Found Unattractive**	Where to See It (by Study Area 0.1 mile)
4.00–5.00	19	Vistas and v'sheds Architec. character Condition of h'way	**Poor design** or lack of design (e.g., no plantings) **One element is "ugly"** in an attractive landscape (e.g., a sculpture) **Poor fit** with landscape context (e.g., attractive vistas blocked) **Not natural** (e.g., no wildflowers) **Poor maintenance** (e.g., unmown, weedy)	**Duluth**: 17.8, 54.1 **Metro:** 13.1, 17.0, 21.5, 38.7, 53.2, 58.0 **Rochester**: 59.8, 60.2
3.00–3.99	90	Vistas and v'sheds Structures in v'shed Architec. character Planting design Condition of hwy Signs	**Poor maintenance** (e.g., unmown, trash, rusty) **Poor design** **Poor fit** with landscape context (attractive characteristics blocked OR incompatible land uses, like excavation or junkyard dominate) **Just unattractive**	
2.00–3.00	137	Architec. character Structures in v'shed Signs Condition of hwy Vistas and v'sheds Maintenance Planting design	**Poor design** (e.g., no plantings, looks harsh, monotonous, looks confusing) **Poor maintenance** (e.g., unmown, trash, weedy, rusty, rough road) **Just unattractive** **Poor fit with context** (e.g., blocks vista or too large)	**Duluth:** 0.0, .1, .2, .5, .9,2.3,3.5, 4., 4.7, 4.9,5.4,6.4, 6.9, 8.9, 14.0, 18.4, 23.6, 23.7, 27.4, 43.4, 48, 48.4, 49., 53.2,54.4, 57.1,58.1, 58.8, 63.5, 66.5 **Metro:** 0.7,.8,1.7, 4.5, 6.5, 6.8, 7.,9.1, 9.4, 9.5, 10., 11.6,12.3,15.5, 15.7, 15.9, 16.1, 16.4, 17.2,17.7,19.4, 19.6, 20.4 , 20.5, 20.7, 20.8, 22.8,23.3, 23.9, 24.4, 24.6, 24.8, 25.5, 25.9, 27.8, 28.5, 36.3, 36.8, 37.8, 38.5, 38.9, 39.2, 40.2, 41.2, 41.9, 43.0, 43.3, 44.3, 53.6 **Rochester:** 0.2, .4, 1.1,1.3, 3.2, 3.8, 4.5, 6.9,7.2, 8.4, 9., 9.4, 10., 11., 12.7, 13.3,14.8,15.4, 15.6,16.5, 16.6, 16.8,16.9, 17.5, 17.8, 18.1,18.9, 22., 23.2, 24.6,25.2,26.2, 27.5, 29.2, 29.3, 47., 47.5, 51, 61, 62
1.00–2.00	153	Structures in v'shed Architec. character Signs Condition of hwy Maintenance Planting design Vistas and viewsheds	**Poor maintenance** (e.g., unmown, weedy, trash, rough road, rusty, deteriorated – including poor maintenance of bldgs. or landscape beyond r-o-w) **Poor design** (e.g., no plantings, materials like: painted concrete, chain link fence) **Just unattractive** (e.g., signs) **Poor fit with context** (e.g., signs too close or too many, incompatible land uses like antennae farm, junkyard)	**Duluth:** .3, .6, .7, .8, 1.3, 1.4. 1.5,1.6, 1.7, 2.2, 2.9, 3.7, 3.9, 4.2, 4.8, 5.1, 5.9, 6.1, 6.3, 6.6, 7.0, 8.4, 9.4, 9.7, 9.8, 13.5, 13.8, 13.9, 15.1, 18.6, 18.6, 18.9, 19.2, 19.3, 19.5, 19.7, 20.2, 24.5, 34.8, 37.3, 42.1, 52.0, 53.0 **Metro:** 0.2, .4, 1.8, 2.3, 2.9, 3.9, 4.1, 4.6, 5.0, 5.4, 5.8, 6.3, 6.7, 7.3, 7.7,8.0, 8.4, 8.6, 9.0, 11.2, 11.8, 12.8, 13.0, 13.5, 13.6, 13.8, 14.8, 15.1, 15.3, 15.6, 16.0, 16.6, 16.8, 18.0, 18.2, 18.7, 20.1, 20.6, 21.0, 22.0, 22.1, 22.3, 26.0, 35.7, 36.5, 37.3, 40.5, 42.5, 42.6, 43.6, 54.3 **Rochester:** 0.8, 1.5, 2.6, 2.8, 3.3, 3.4, 4.1, 4.2, 5.0, 7.3, 9.1, 9.9, 10.9, 14.7, 15.1, 15.3, 15.7, 15.8, 16.0, 16.7, 17.7, 21.4, 21.6, 21.9, 25.4, 30.6, 50.3, 50.5, 52.9, 58.8

*5 = most attractive.

**Listed by order of relative frequency with which characteristics were mentioned by viewers. Minimum frequency = 6.

Reviewing attractive aspects of the highway experience. To get a good idea of what people see as attractive, both in and out the CIZs, use the three AIMS reference manuals (see Appendices A, B, and C) to drive the three study areas of AIMS 1999. The most attractive segments of each study area have been identified in Tables A.1, B.1, and C.1 in the route reference manuals by the trip-meter setting at the beginning and end of the segment.

4.2.2 Unattractive Aspects of the Highway Landscapes

Results of analysis of AIMS data suggested three main reasons for perceived unattractiveness of highway landscapes:

1. inadequate maintenance
2. unattractive aspects of the design within the right-of-way
3. poor fit with the surrounding landscape context

Results of the data analysis related to unattractive aspects of highway landscapes are summarized in Table 4.4. The table lists mean attractiveness ratings (5 being most attractive) for all landscapes noted as unattractive in some way by travelers who participated in AIMS, along with what people noticed and what they found unattractive in the landscape. Note that Table 4.4 focuses on only what makes landscapes unattractive, so it lists only a portion of the views noted in each study area, those that were most and least attractive overall. For a full listing of views noted and their mean ratings, see Tables A.5, B.5, and C.5.

Inadequate maintenance. The more unattractive a highway landscape is to travelers, the more likely that the highway landscape is perceived as poorly maintained. Notice in Table 4.4 that poor maintenance is a leading description of what people found unattractive only for landscapes with mean attractiveness ratings lower than 4. This includes maintenance of lawn areas (looks unmown or weedy), maintenance of plantings (looks weedy), or the presence of trash. It also includes lack of maintenance of structures, either in the right-of-way (rust or peeling paint on bridges or walls, or a rough road surface) or outside the right of way (signs, buildings, or larger land uses, such as a housing area, that look poorly maintained). When viewers perceive a landscape as particularly unattractive, there is a good chance they see it as poorly maintained in some way.

Design within the right-of-way. Even if a landscape is well maintained, people may see it as very unattractive if they see it as poorly designed. This can be related to choice of materials that people see as

inherently unattractive: chain link fence and painted concrete were mentioned. An unattractive perception also may relate to a lack of trees, shrubs, or planting beyond a simple mown lawn. People perceived that even areas of the highway that did not have a particularly attractive landscape context would benefit from a clearly planned planting design. In areas of a more attractive, more natural context (see first row, the most attractive views, in Tables 4.3 and 4.4), people had heightened expectations for the planting design. They cared more that the design be consistent with its context—for example, that the planting looked natural. But even for views where the context was not perceived as attractive, a good planting design was seen as important to increase attractiveness.

Functional aspects of design within the right-of-way. People perceived some segments of the highway as dangerous, and that contributed to their unattractiveness. For, example, in the Twin Cities Metro CIZ, the highway was perceived as congested and therefore dangerous and unattractive (at miles 22.1 and 37.3). In Rochester, a median railing was perceived as dangerous at mile 3.4, the railroad was perceived as dangerous at mile 50.3, and the highway was perceived as dangerous at mile 52.9 by those participating in the focus group. This result, perception of danger or safety as contributing to unattractiveness, could be related to the demographics of focus group participants, most of whom were 56 or older. It is possible that older travelers are more aware of perceived safety than younger travelers would be.

Fit of right-of-way with its context. Poor fit with context often was associated with what viewers saw as unattractive within a landscape that they saw as attractive overall (see Tables A.1, B.1, and C.1 in Appendices A, B, and C, respectively). For example, people might find a sign unattractive in an attractive landscape, or they might object to the positioning and size of a bridge as it relates to the overall vista of a river. Poor fit less frequently suggested why people find a view very unattractive overall (see mean ratings of 3.00 or lower in column 1 of Table 4.4). Where the view is very unattractive for reasons of context, there may be many signs close to the road, or there may be large land uses like an antennae farm or a junkyard that is perceived as incompatible with its surroundings or simply inherently unattractive. Even in such cases, people tended to describe what was unattractive about such views as “needs screening” or “needs planting”—aspects that could be changed by design within the right-of-way or design of the land use itself.

Overall, aspects of the landscape that people saw as most unattractive were those that could be addressed by improved maintenance, more planting design, or different choices of structural materials. For those who want to further increase the aesthetic quality of Minnesota highways, the good news is that nearly

every aspect perceived as unattractive could be dramatically improved by increased investment in design or maintenance. Qualifying the good news is that even good design requires consistent attention to maintenance (e.g., keeping grass mown or picking up trash) in order to sustain attractiveness.

Reviewing unattractive aspects of the highway experience. To get a good idea of what people see as unattractive, both in and out the CIZs, use the three AIMS route manuals (see Appendices A, B, and C) to drive the three study areas of AIMS. The least attractive segments of each study area have been identified in Tables A.2, B.2, and C.2 in the route reference manuals by the trip-meter setting at the beginning and end of the segment. Even within generally unattractive segments of the highway, particular views sometimes were seen as attractive.

4.3 COMPARISON OF COLLECTIVE IMAGE ZONES WITH OTHER HIGHWAY SEGMENTS

For AIMS, three characteristics of design and maintenance were chosen for focused feedback from travelers:

1. architectural character (e.g., the materials and form of bridges, walls, and overpasses—including railing details or color)
2. planting design
3. vistas of the surrounding landscapes

In order to test how successful recent design and maintenance initiatives have been in creating aesthetic value for Minnesota travelers and to consider whether ideas that have been employed in collective image zone highway segments might be productively applied to other locations, CIZs selected for 1999 data gathering exposed travelers to some of the best of Mn/DOT's recent design work related to the three characteristics above. These CIZs then, could be compared to other highway segments for which data were collected.

Collective image zones were perceived as more attractive on the average than other segments of the AIMS routes. As can be seen in Table 4.5, the average group perception in the collective image zone is higher (above the midpoint of 3.0) compared with the standard zone in all of the three sites. Duluth has the highest mean of 4.0, compared with 3.5 in the standard zone, followed by Rochester (3.86 for collective image zone and 3.30 for the standard zone) and Twin Cities Metro (3.76 versus 2.9). The *t*-test shows that they are all statistically significant at the 0.05 level. The Twin Cities Metro route had least

mean value perception of less than the midpoint for the standard zone.

Table 4.5 Average Group Perception on View Notes by Zone Type

	Rochester			Twin Cities Metro			Duluth		
	M	**SD**	**N**	**M**	**SD**	**N**	**M**	**SD**	**N**
Standard zone	3.30	1.24	160	2.9	1.27	161	3.5	1.19	228
CIZ	3.86	0.84	64	3.76	1.18	85	4.0	1.00	31
Difference	0.56			–0.86			–0.50		
t-test (*df*)	*t*(222) = -3.298*			*t*(244) = -5.23*			*t*(257) = -2.226**		

*$p < 0.01$.
**$p < 0.05$.

For the Rochester and Twin Cities Metro AIMS routes, CIZ landscapes noted by travelers were more likely to be seen as very attractive (mean ratings 4.0 or higher) than were non-CIZ landscapes (see Table 4.6). Of the 346 landscapes rated very attractive in all three study areas, 112 were in CIZs. For all three study areas, landscapes were far less likely to be seen as unattractive (mean ratings less than 2.0) in the CIZs. Of the 127 landscapes rated unattractive in all three study areas, only 12 were in CIZs.

Table 4.6 Comparison of Collective Image Zone Attractiveness with Other Segments

	Collective Image Zone Number of Views Recorded	**Other Highway Segments in Study Area Number of views recorded**
Duluth Study Area	Total = 31 (12% of all views)	Total = 228 (88% of all views)
Average rating greater than 4	18 (58% of all views in CIZs)	124 (54% of all views in other segments)
Average rating less than 2	0 (0% in CIZs)	43 (19% of all views in other segments)
Twin Cities Metro Study Area	Total = 85 (35% of all views)	Total = 161 (65% of all views)
Average rating greater than 4	55 (65% of all views in CIZs)	45 (28% of all views in other segments)
Average rating less than 2	8 (9% of all views in CIZs)	43 (27% of all views in other segments)
Rochester Study Area	Total = 64 (29% of all views)	Total = 160 (71% of all views)
Average rating greater than 4	39 (61% of all views in CIZs)	65 (41% of all views in other segments)
Average rating less than 2	4 (6% of all views in CIZs)	29 (18% of all views in other segments)

In Duluth, architectural character and planting design described the most important characteristics of the very attractive views in the CIZ (see Tables C.1 and C.3 in Appendix C). The tunnel, the character of the walls leading to and in the tunnel, the bridge, and railings all were noticed and found very attractive. The historic nature of the building and railroad seen from the highway helped to make these landscape views

very attractive as well. The good fit of the bridge and the pedestrian overpass with an attractive landscape context also created some very attractive landscape views within the Duluth CIZ.

Duluth was the only study area where the proportion of very attractive views was equally high within the overall AIMS route as it was within the CIZ. While mean ratings for views across all three study areas were greater than 3 (which was the midpoint between the most attractive and most unattractive ratings), the Duluth AIMS route had the highest proportion of very attractive landscapes along highway segments outside of CIZs: 54 percent (see Table 4.6). Overall, the Duluth route tended to include more very attractive views.

In the Twin Cities Metro area, more of the very attractive views in the CIZ (see Tables B.1 and B.3 in Appendix B) were related to vistas. Good fit of the highway design with its context contributed importantly to the attractiveness of Twin Cities Metro CIZs. Architectural details of railings, walls, and bridges within the CIZs also were noticed and were found very attractive by Metro travelers. The planting design and its maintenance in the median and along the right-of-way within the CIZ also earned very attractive ratings. Pedestrian overpasses were rated attractive or less attractive depending, in part, on their materials and their level of maintenance. Overpasses that looked rusty or appeared to need paint were seen as less attractive.

Rochester. Like the Twin Cities Metro area, the Rochester CIZs included many very attractive views that were related to vistas (see Tables A.1 and A.3 in Appendix A). More than in the Twin Cities Metro, however, the aesthetic value of the Rochester CIZs seemed to be related to the way that planting design screened less attractive elements of the surrounding landscape. Beyond its own aesthetic characteristics, planting design of the right-of-way served the important aesthetic function of emphasizing the most attractive aspects of the surrounding landscape context. These attractive aspects included the river, hills, and landmark buildings.

Overall, of the three landscape characteristics that were the focus of AIMS CIZs, architectural character of the Duluth and Twin Cities Metro CIZs proved to be very attractive. Vistas in all three study areas proved to be very attractive as well—whether they were of an historic building and railroad or rolling hills and lakes. This result in the CIZs is convincingly reinforced by the strong relationship between vistas and very attractive ratings in all highway segments of all the study areas—even outside of the CIZs. Planting design was related to very attractive landscapes in the Twin Cities Metro and Rochester CIZs, but in somewhat different ways. In the Metro CIZ, planting design contributed to creating a strongly

unified aesthetic character throughout entire segments of the CIZ (see the mile 52.6 to mile 54.7 segment and the mile 58.0 to mile 60.5 segment in Table B.1). In the Rochester CIZ, thoughtful planting design emphasized the attractive characteristics of the surrounding landscape within the CIZ (see the mile 50.6 to mile 51.4 segment and the mile 54.1 to mile 56.6 segment in Table A.1).

Signs were noticed by travelers within the CIZs and had a mixed relationship to landscape attractiveness. Signs were not among the most frequently mentioned characteristics mentioned by travelers in any of the very most attractive segments of the CIZs in any of the three study areas (see Tables A.1, B.1, and C.1). While signs were mentioned by some travelers as contributing to attractiveness of some highway segments because the signs provided useful information and were not too obtrusive (see, e.g., Table 4.3), signs do not create attractive landscapes. In fact, within the collective image zones, signs were more typically seen as ugly or obtrusive, tending to lower perceived attractiveness of the landscape. Signs and billboards were not distinguished, and other variables that might affect the attractiveness of signs were not noted in 1999 data gathering. A future AIMS day might include an investigation of the variation in travelers' perceptions of different types of signs in different locations.

The higher attractiveness of landscapes within the CIZ in each study area compared with other highway landscapes in the study area may suggest opportunities for applying some of the design and maintenance successes of the CIZ more broadly. The planting design and architectural character approaches applied within the Twin Cities Metro CIZ and the architectural character approach applied within the Duluth CIZ demonstrate how a concentration of design resources can *create* a distinctive landscape character that is immediately perceived as very attractive by travelers. The planting design approach applied within the Rochester CIZ demonstrates how planting design can help to preserve the aesthetic value of an attractive landscape context by screening views that do not contribute to aesthetic value. The Twin Cities Metro CIZs in particular and all three study areas CIZs to some degree reinforce the strong conclusion from the entire AIMS data set: design that emphasizes the best of an attractive landscape surrounding the highway has immediate, high-aesthetic value.

4.4 LOCATION OF FEATURES RELATIVE TO THE RIGHT-OF-WAY

Does the object of the view lie within the right-of-way? Does Mn/DOT have control over what is seen and have a greater probability of affecting change? Or is the object of visual attention located outside the right-of-way on private land or is it controlled by another jurisdiction? Identifying what is visually attractive or unattractive by its location on or off the right-of-way should be able to assist Mn/DOT in

assessing both design and cost variables in planning to visually enhance transportation corridors.

To analyze the location of what was being viewed by the respondents, noticed features were categorized into three types: (1) in the right-of-way, (2) outside of the right-of-way, and (3) unclear of location. Tables A.5, B.5, and C.5 contain a list of each feature and how it was categorized. The view notes recorded were then charted by both mileage location in each transportation corridor studied and by the number of views indicated as attractive or unattractive.

Figures A.3, B.3, and C.3 are mileage charts for each corridor by the right-of-way location of each view. The Rochester respondents tended to notice views more outside of the right-of-way than inside. In only three locations, mileage sections 3.1 to 6, 12.1 to 15, and 51.2 to 64, were unattractive views within the right-of-way by five or more respondents. Only two locations, mileage 0 to 3 and mileage 15.1 to 18, attracted the notice of five or more passengers of an attractive view within the right-of-way. In general, the focus of the passengers in the Rochester corridor was outside of the right-of-way and not within it.

In contrast, passengers viewing the selected Twin Cities Metro transportation corridor tended to be focused upon what was inside the right-of-way. In nine three-mile segments, five or more passengers viewed something in the right-of-way that was found to be unattractive. Concurrently, five or more passengers viewed something in the right-of-way that was found to be attractive in nine three-mile segments as well. Unlike the Rochester passengers, Twin Cities Metro passengers appeared to be much more focused upon what was in the right-of-way.

In comparing and contrasting the Duluth findings with those of Rochester and the Twin Cities Metro routes, it becomes apparent that passengers in Duluth were very focused on views outside of the right-of-way. In only four segments, five or more passengers noted views inside of the right-of-way. In contrast, five or more passengers indicated attractive or unattractive views outside of the right-of-way in 18 of the three-mile segments.

These findings do underscore that each of the three urban AIMS routes had different inherent landscape characteristics and design opportunities. Patterns of visual focus within each of the corridors varied accordingly.

4.5 DESIGN AND MAINTENANCE RECOMMENDATIONS TO ENHANCE AESTHETICS AND VISUAL QUALITY

Results of the 1999 AIMS data analysis suggest some productive directions for design and maintenance initiatives to achieve aesthetic benefits for Minnesota highway users.

4.5.1 Maintenance

Maintenance initiatives yield aesthetic benefits across the entire range of landscapes. AIMS showed that travelers appreciate the attractiveness of good maintenance even if the overall landscape is not stunningly attractive. At the same time, the aesthetic value of an attractive landscape is noticeably undermined by poor maintenance. Regular, rigorous maintenance programs that keep turf mown, keep plantings healthy, prevent structures from looking rusty or deteriorating, and remove trash yield immediate aesthetic benefits.

4.5.2 Good Fit with Landscape Context

Views from the highway have the most dramatic effect upon perceived attractiveness. Even along an otherwise less attractive highway segment, a single vista increases view ratings for the viewpoint. Aesthetic initiatives work with an existing resource, the surrounding landscape, when they take advantage of attractive vistas. Since very attractive views tend to encompass broad vistas or distant landmarks, the highway does not need to be immediately adjacent to a beautiful landscape for travelers to enjoy the view. Particularly for natural features that are highly valued, designs that provide and protect visual access to a vista also can be attentive to protecting the landscape resource when it is seen from a distance.

Planning for focal vistas and then protecting those vistas in any way practical, including careful planting design as was demonstrated in the Rochester CIZ, yields dramatically noticeable aesthetic benefits. There may be as yet unrealized opportunities along existing highways and, certainly there are enormous opportunities in selecting highway corridors, to design good fit with landscape context.

4.5.3 Design within the Right-of-Way

AIMS data show that travelers are particularly sensitive to what they perceive as a lack of design or poor design within the right-of-way. For example, they perceived some areas as harsh and uninviting where there was no planting of perennial herbaceous plants or shrubs or trees. Similarly, they consistently reacted negatively to certain materials, such as a chain link fence and painted concrete. This result suggests that virtually all segments of urban highways need to be part of a larger planting design strategy and all structures need to employ a minimum aesthetic quality of materials.

AIMS also demonstrates the dramatic effect that a concentration of design resources, including planting design and architectural character, can have in essentially creating a very attractive landscape along an otherwise undistinguished highway right-of-way. Such concentrations of design resources, as in the Duluth and Twin Cities Metro CIZs, have aesthetic values comparable to dramatic views of beautiful natural landscapes seen from the highway. For urban areas, these highway segments of created landscape beauty may be especially important where they are strategically located to enhance the identity and character of downtown areas, as they do in St. Paul and Duluth.

Combining aesthetic opportunities to create and maintain vistas of surrounding landscapes with opportunities to enhance the identity and character of particular urban locales may be one way to prioritize future aesthetic initiative opportunities. The Rochester CIZ, in which planting design creates selective views of the surrounding landscape, may be an example of an area where such a concentration of design resources could further increase overall perceived attractiveness of the AIMS route.

4.5.4 Mn/DOT Can Learn from Mn/DOT

The best way to learn about specific design and maintenance activities that may benefit Minnesota roadways may be to look at what Mn/DOT has done well already—as judged by travelers who participated in AIMS. The three AIMS reference manuals (see Appendices A, B, and C) can be used to drive the routes with specific attention to the most attractive segment of each route and what made them attractive, or to study the least attractive segments of each route and what made them unattractive. For users of this report who wish to know the most specific details about what travelers found attractive and unattractive about what they saw, Tables A.5, B.5, and C.5 provide comprehensive tables listing all descriptive words used by AIMS participants by 0.1 mile increments.

4.5.5 Overall Results

The 1999 AIMS results suggest that design within the right-of-way approaches that are being taken by Mn/DOT have high aesthetic value. Results further suggest that Mn/DOT should take every opportunity to protect the vistas from the highway that Minnesota travelers now enjoy and look for ways to increase vista experiences of the sort noted along the AIMS routes. Finally, the results underscore the power of the activities that can and must be done everywhere to demonstrate a high standard of maintenance. Exceptions to these high standards are noticed and undermine the overall very high attractiveness ratings that Minnesota travelers gave AIMS routes.

5 CONCLUSIONS: LEARNING FROM THE 1999 AIMS RESULTS

5.1 GOALS FOR AIMS: A TWO-PHASE PROCESS

AIMS produced results that can inform Mn/DOT aesthetic initiatives now and in the future. This section discusses how AIMS can be used immediately to inform Mn/DOT initiatives to enhance aesthetic benefits. It also discusses how AIMS can be used to inform the complete AIMS method for future applications by Mn/DOT.

AIMS objectives were are follows:

- to develop and test instruments and protocols that Mn/DOT can use to understand and document how travelers perceive the attractiveness of Minnesota's transportation corridors.
- to document how highway design and maintenance initiatives contribute to public perceptions of Minnesota highways
- to suggest how future design and maintenance plans might enhance the aesthetics and visual quality of Minnesota's highways in the most efficient manner
- to produce ongoing objective information about how design decisions are working to enhance the visual experience of Minnesota motorists
- to be focused on producing information that can immediately inform design decisions

AIMS was broadly conceived in working sessions that Joan Iverson Nassauer conducted with Mn/DOT staff in 1995–1996. This broad conception included a two-phase AIMS process, which is discussed throughout this section.

5.1.1 Phase I: Focus-Group Travelers' Response to Many Views

Phase I, which was conducted in 1999 and is the topic of this report, is intended to scope aesthetic characteristics that are noticeable to Minnesota highway travelers. This phase has high construct validity (it truly represents the experience of highway travelers included in AIMS) because data were gathered holistically in an open-ended format while people were traveling the highway. Care was taken not to bias travelers' responses by the responses of other travelers or by the leading aesthetic issues as seen by

Mn/DOT staff. Focus group travelers were simply instructed to note anything they saw that was attractive or unattractive to them (see Appendix E for facilitators notebook) and to rate each noted view on an electronically scannable form.

Phase I is intended to produce a great deal of data along the entire route selected, but it is not intended to produce a great deal of data about any specific landscape view or element in that view. Rather, it is intended to scope what landscape views or elements in the views are of aesthetic importance to the public so that these can be examined in greater detail by a larger, more representative sample of travelers in Phase II. AIMS Phase I looks holistically at the highway landscape. This guides AIMS Phase II to look specifically at selected types of highway landscapes.

However, while Phase II protocols do produce unbiased holistic data, they also are intended to produce more detailed data about aesthetic themes that are of particular interest to Mn/DOT. These themes might change in any given AIMS data-gathering year. They are the foci of the collective image zones selected within the AIMS routes. In 1999, for example, AIMS routes were limited to primarily urban highway segments, and CIZ segments were focused on the following themes: vistas and viewsheds, architectural characteristics, and planting design. Future AIMS CIZs could be further focused. For example, to examine how different types of planting designs or mowing regimes are perceived, a future CIZ that displayed a useful variety of these could be selected. Frequent data gathering stops at listening posts throughout that CIZ could focus questions on differences among the types of planting design.

After baseline data were collected in the first part of the route, focus-group travelers were instructed to pay particular attention to these themes as they traveled the CIZ segments of the route. With these instructions, holistic data of the same sort collected elsewhere on the route were collected for the CIZs. These CIZ data are intended to provide the basis for Phase II.

5.1.2 Phase II: Large Population Sample of Minnesota Travelers' Response to Specific Views

Phase II, as conceived in 1995–1996, would use the results of AIMS Phase I focus groups in vans to guide Mn/DOT in selecting a limited set of views or detailed landscape characteristics for feedback from more respondents. These characteristics would be the basis for a very brief forced-answer questionnaire to be distributed to a population sample of Minnesota travelers. In contrast with Phase I, which gathered a small number of traveler responses to a very large number of landscape views (all possible views along the selected AIMS routes), Phase II would gather a very large number of traveler responses to a small

number of landscape views. These views would be chosen because they are broadly representative of larger themes as seen by AIMS travelers in Phase I.

5.2 USING AIMS RESULTS TO MAKE AESTHETIC DECISIONS NOW

The 1999 AIMS results demonstrate that four key areas of Mn/DOT resource investments are producing highly noticeable aesthetic effects. These key areas are (1) maintenance, (2) planting design, (3) structural design, and (4) vistas from the highway.

While the thematic topics are broad, the specific elements and strategies that produce aesthetic benefits can be reviewed in detail by following the AIMS routes that were selected for 1999 focus groups in vans. Accompanying this report are three AIMS reference manuals, one for each study route (Rochester, Twin Cities Metro, and Duluth; see Appendices A, B, and C, respectively) that can be used to drive all of the route or key segments of the route to inspect specific characteristics that produced aesthetic effects. One way to use the route reference manuals would be to drive the segments identified in the reference manuals in order to observe and discuss specific characteristics that affect aesthetic benefits. Another complementary approach would be to examine Mn/DOT video log records for those segments. A third approach that would produce useful images for future AIMS applications would be to make slides or digital images of the specific characteristics that drew the attention of AIMS focus group participants along selected segments of the route.

Additional recommendations about how the results can be used now are found in section 4.5.

5.2.1 Future Use of AIMS Travelers in Vans (Phase I Protocol)

The Improved AIMS Phase I Protocol. Appendices E and F are the improved AIMS facilitators workbook and research protocol, respectively. The workbook and protocol are set up to allow Mn/DOT to conduct AIMS days to collect data to establish new baseline data or to collect more dense, detailed data about Mn/DOT selected aesthetic themes that could be compared with baseline data.

In addition, Mn/DOT could gather data more efficiently by moving to a data-gathering format that allows both note takers in each van and individual focus group participants to record data directly on tailored electronically scannable forms. While AIMS allowed individual focus group participants to record data

directly on to standardized scannable forms, the standardized forms were somewhat confusing to some participants. By working with a form designed specifically for focus group participant use, Mn/DOT can reduce the possibility of user error. By designing a different tailored scannable form for note-taker use, Mn/DOT may be able to save time and money by nearly eliminating a separate qualitative data entry step. This note-taker scannable form would be based on the baseline descriptive terms generated by AIMS and would allow note takers to simply fill in circles for any terms mentioned for each landscape view described in future AIMS days.

Areas for Further Protocol Improvement. AIMS instruments and protocol worked very well in most respects. At the same time, lessons learned from AIMS allow the AIMS Phase I instruments and protocol to be improved. Three main areas for improvement are as follows:

1. Recruit more participants from a wider demographic pool.

Future AIMS days can include more participants from a wider range of age groups and travel experiences. The most important change to achieve this goal will be to begin recruiting focus group members at least three and desirably four to six months in advance of the AIMS day. Another way recruitment success can be improved is to work with one or two community members who regularly work with community groups in each study area. For example, the University of Minnesota Extension Service or the chamber of commerce in each study area may be helpful.

Recruitment of focus group participants is made more challenging by data gathering in the summer, when many people are away from home. However, it is desirable to continue to collect data in the summer. It is important to data validity that all AIMS data be gathered in the same season, ideally within a month's time, to control for seasonal effects across study area groups and to allow for AIMS data to be compared from year to year. Summer during full leaf-on is the most desirable season for data gathering. A cross-seasonal comparison, perhaps focusing on winter landscape perceptions, could be useful as a complementary study. However, consistently gathering data during the same season will allow AIMS to be used for monitoring change over time.

2. Use the 1999 AIMS results as a baseline to allow future AIMS routes to be shorter and to produce more detailed data about landscape characteristics of specific interest to Mn/DOT.

Lessons learned and data gathered during AIMS will allow future AIMS travelers in vans to use shorter routes. While AIMS routes were shortened twice during pretesting of the 1999 protocol, the 1999 data-gathering experience suggests that participant fatigue can be eliminated as a factor in future AIMS days. Both participant recruitment and data quality will be improved by shortening routes considerably in future applications—ideally to a maximum three hours travel time.

The longer 1999 AIMS routes can support selection of these shorter future routes by serving as an urban baseline for future applications. 1999 data were highly consistent with what previous studies of landscape perception suggested would be important to Minnesota highway travelers. While these studies have not focused on the Minnesota highway experience, they do suggest that maintenance (1, 2, 3, 4, 5), vistas and viewsheds (1, 6, 7, 8, 9), and planting design in urban settings (2, 10, 11, 12) are important to landscape perception. This consistency of AIMS results with previous studies of other landscape settings suggests that AIMS did have high construct validity and could be used in the future to describe Minnesota travelers' overall perceptions of similar urban highway routes. With this baseline, future AIMS days can focus on the following:

- Establishing baseline data for other types of routes, for example, rural highways. 1999 results provided data on both "control" segments of the highway, where traveler response was completely unbiased by aesthetic objectives of interest to Mn/DOT, and on CIZ segments, where traveler response was directed to give feedback on landscape characteristics of interest to Mn/DOT. These two types of data allowed the two types of segments to be compared. Ideally, when baseline routes are established for other types of highway segments in the future, gathering baseline data would be the sole objective for one AIMS day. This would mean not attempting to collect CIZ data and baseline data on the same AIMS day in the future. For baseline routes, the leading objective in route selection would be to measure traveler perceptions along a "control" route that presents travelers with a representative range of landscape experiences for that type (say, a rural secondary highway route). Results from this typical control route then can be compared with CIZ segment data gathered on other AIMS days on future occasions.

- Using baseline data from 1999 for comparison with shorter urban routes that focus on highway landscape characteristics that are of particular interest to Mn/DOT in any given year. In this way, future urban AIMS routes can be comparable to the collective image zone segments of the 1999 routes. The baseline will supply control data, but may not be complete as a control for all

characteristics that could conceivably arise in the future. In such cases, it can be supplemented selectively, by targeting short control segments to augment the 1999 baseline route.

3. Gather more detailed data on each theme of interest to Mn/DOT.

By using the 1999 AIMS as a baseline, future urban AIMS days can increase the frequency of data-gathering stops (or listening posts) along highway segments that present highway characteristics that relate to leading aesthetic initiatives of interest to Mn/DOT. For example, by having six rather than two listening posts along the two Twin Cities Metro CIZ highway segments, Mn/DOT could explicitly query focus group travelers about their perceptions of a particular bridge or particular aspect of planting design at one listening post, and then inquire about a different bridge or different aspect of planting design at another listening post.

The overall effect will be to produce more dense and more detailed data about characteristics that Mn/DOT wants to know about in a particular year. These data then can be compared with the baseline established in 1999. For example, mowing did surface as a characteristic of interest in the baseline data, but the length of the route did not make it possible for different mowing patterns, different turf lengths (different mowing regimes), and different associated planting designs to be compared in detail. The 1999 baseline suggests that this is one, among many, valid aesthetic issues for future inquiry.

Using the Improved AIMS Protocol. AIMS has several uses:

1. To explore and document aesthetic benefits to Minnesota highway travelers. Because AIMS gathers data in a focus group–like format, it allows aesthetic themes to surface in a way that is natural to the highway experience—people are encouraged to talk about what they notice. These data provide a useful baseline for comparison with other AIMS data over time or across locations. This can provide useful surprises when issues surface that might have otherwise gone unnoticed. It also can provide useful confirmation when issues surface that are of current interest to Mn/DOT. For example, AIMS results clearly demonstrated that vistas and viewsheds were not only of aesthetic interest to Mn/DOT staff but also of aesthetic importance to Minnesota highway travelers.

2. To explore and document aesthetic benefits of themes that are of particular interest for Mn/DOT

initiatives. Once a baseline of landscape characteristics and attractiveness ratings that are suggested by focus group travelers has been established, Mn/DOT may want to use that baseline:

- as a holistic unbiased landscape sample from which to draw aesthetic themes for more detailed examination in future AIMS days collective image zones
- as a control highway segment to compare with landscape samples and attractiveness ratings within collective image zones
- as a control highway segment to serve as a baseline against which to monitor the aesthetic performance of similar highway segments in other locations or in future times

3. To suggest focal themes and detailed questions for AIMS Phase I population samples of Minnesota highway travelers. Either baseline or CIZ data can be used to help Mn/DOT select particular detailed images to be rated for their aesthetic benefits by a population sample of Minnesota highway travelers. Phase II should be a brief questionnaire that could be completed in less than 10 minutes. It should focus on rating of detailed landscape characteristics (including architectural and engineering characteristics) that are relevant to aesthetic choices that Mn/DOT plans to make in the near future. A web-based survey may lend itself extremely well to this kind of image-based survey. Images for the web-based survey could be either photographs that focus on specific landscape characteristics or simulations that show landscape characteristics that do not yet exist along Minnesota highways.

4. To establish a quantitative and qualitative baseline of Minnesota highway aesthetic benefits. Terms generated by Minnesota focus group travelers' reports of what they notice and find attractive or unattractive about highway landscapes form an evolving qualitative baseline of aesthetic benefits. Both the Phase I ratings associated with landscape views described by those terms and Phase II ratings of a few specific landscape characteristics by a population sample of travelers can serve as a quantitative baseline against which to measure the performance of other Minnesota highway initiatives.

5. To monitor the aesthetic benefits of highway initiatives over time and across locations. AIMS will produce the greatest benefit if it is employed as part of a highway aesthetics monitoring system. This would entail a systematic approach to selecting highway segments for AIMS data gathering at regular intervals over a period of years. Highway segments would be selected to document changes in aesthetic benefits, to allow Mn/DOT to inquire further into what initiatives

are producing the greatest aesthetic benefits, and to measure the effects of new initiatives. Objectives for such a monitoring system might include

- to establish baselines of typical aesthetic performance for a complete range of Minnesota highway types
- to establish baselines for typical aesthetic performance for the highest travel volume Minnesota highway segments
- to compare the aesthetic performance of similar specific design initiatives across different locales and highway types around Minnesota
- to compare aesthetic benefits of selected Minnesota highway routes as perceived by tourists and Minnesota resident travelers
- to assure maintenance or improvement of Minnesota highways' aesthetic performance over time

5.2.2 Mn/DOT's AIMS

AIMS (focus groups in vans) is intended to be a tool for use by Mn/DOT staff to inform future Mn/DOT initiatives. This report points out how the 1999 AIMS results can be used to assist in decisions that Mn/DOT is making now. It also suggests how AIMS can be improved for future application. Mn/DOT staff were essential to the conception and application of the 1999 AIMS. Their concerns for continual improvement of the aesthetic performance of Minnesota highways, astute insights about the AIMS process could work, and their energetic and thorough participation in implementing AIMS are the most important foundation for future use of AIMS. AIMS should continue to evolve as Mn/DOT's tool. As Mn/DOT employees see opportunities for making the AIMS process more closely fit Mn/DOT needs, as they see opportunities for improving the efficiency of the AIMS process, as they see ways in which AIMS could be more integral to other Mn/DOT procedures, AIMS should be adapted. By Mn/DOT employees continual engagement with the process, AIMS can become an critical part of Mn/DOT's institutional memory and its active service to Minnesotans.

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APPENDIX A

AIMS REFERENCE MANUAL: ROCHESTER ROUTE

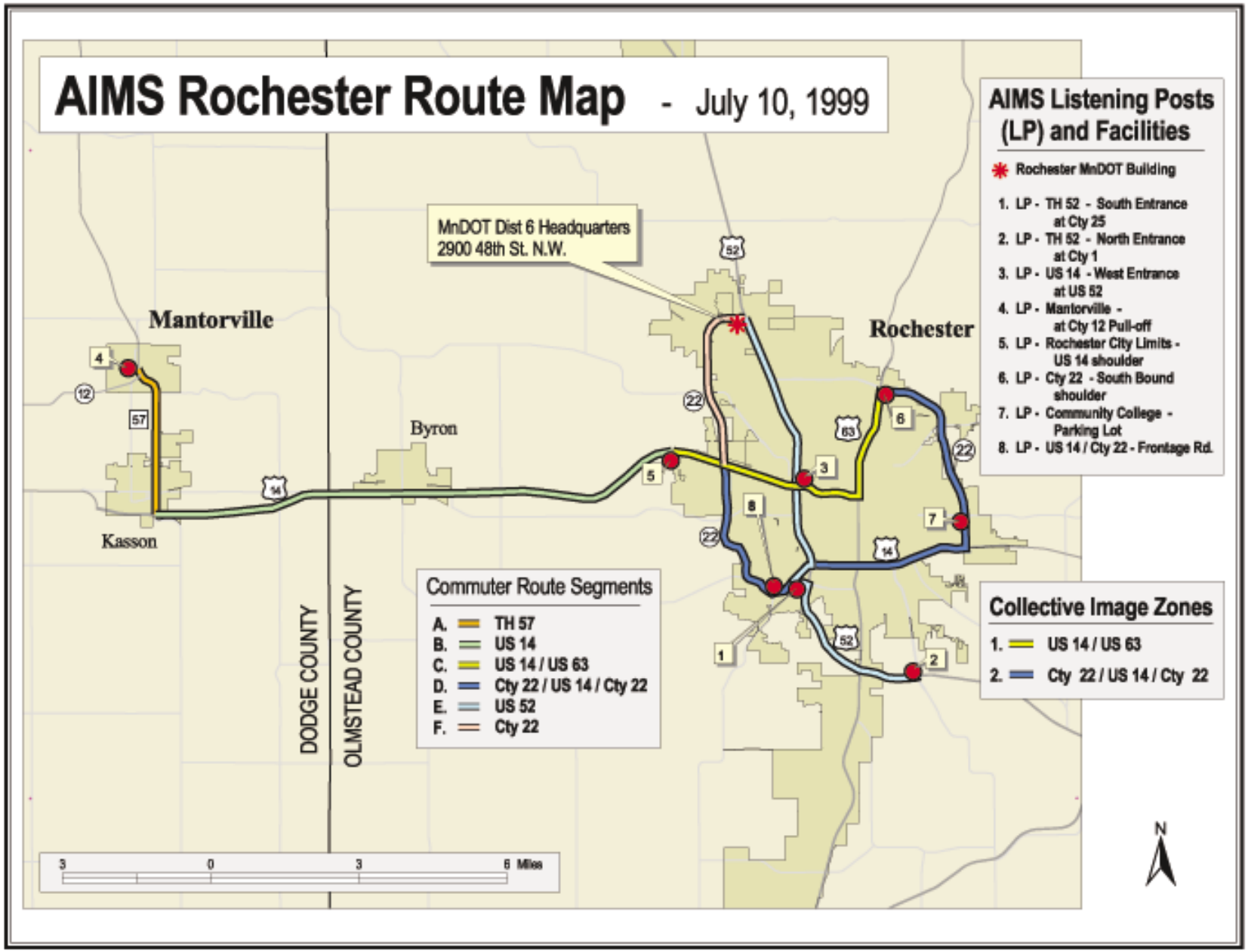


Figure A.1 Rochester Route Map

Table A.1 Most Attractive Highway Segments in Rochester Study Area*

Segment	What People Noticed	What People Found Attractive
Mile 6.8 to mile 8.3	Vistas of hills with trees Rock outcroppings The river, a pond The highway The planting design Treatment of the median	The vista: good relationship of the highway with its context Aesthetic characteristics of the natural landforms, trees, geology Planting design relates well to structures: median and buildings Nearly everything looked well-maintained What people found unattractive in this segment: weedy looking farm field at mile 7.2
Mile 13.6 to mile 14.1	An historic house Hills and trees	Historic character of the house Aesthetic characteristics of the natural landforms and trees
Mile 19.4 to mile 19.7	The planting design and the trees Hills and trees	Flowers in the planting design Aesthetic characteristics of the natural landforms and trees
Mile 29.4 to mile 32.3	Vistas of hills with trees Rock outcroppings The river, and the bridge Design of walls, railings, lights The planting design and berm Older homes and landmark bldg.	The vista: good relationship of the highway with its context The design of highway structures and planting design related to the context Everything looked well-maintained Effectiveness of planting design and berm for screening Historic character of the neighborhood What people found unattractive in this segment: area around a development looked weedy at mile 30.4
Mile 50.6 to mile 51.4	The lake and the island The river, dam, and the bridge Planting design and trees Walls Utility line Housing	The vista: good relationship of the highway with its context Well-designed planting are attractive and make an effective screen. What people found unattractive in this segment: **t**he railroad
Mile 54.1 to mile 56.6	Landmark building Urban skyline Hills and trees Planting design Lake Housing and businesses	The vista: good relationship of the highway with its context Look of nature

*Rochester CIZs were located at 47.4 to 62.5 miles.

Table A.2 Least Attractive Highway Segments in Rochester Study Area

Segment	What People Noticed	What People Found Unattractive
Mile 9.0 to mile 10.0	Construction going on Excavation Pumping station Weeds The lake	Land uses are ugly, incompatible with the surrounding landscape Unkempt, lacks care What people found attractive in this segment: the vista at mile 9.6–0.7
Mile 15.1 to mile 16.8	Trailers Signs Railroad Construction going on Storage garages Housing Tanks Trees Pond	Land uses are ugly; look deteriorated Too many trailers Too many signs Unkempt, lacks care No planting to screen ugly land uses Lack of good planning or design What people found attractive in this segment: The vista of landmark bldg. at mile 15.5–0.6 Pond and well-designed screen at mile 16.2
Mile 17.5 to mile 19.2	Excavation Junkyard Signs Trees	No planting to screen ugly land uses Lack of good planning or design Too many signs Unkempt, lacks care Lack of good planning or design
Mile 21.4 to mile 22.0	Junkyard Trees Median	Unkempt, lacks care Land use is ugly

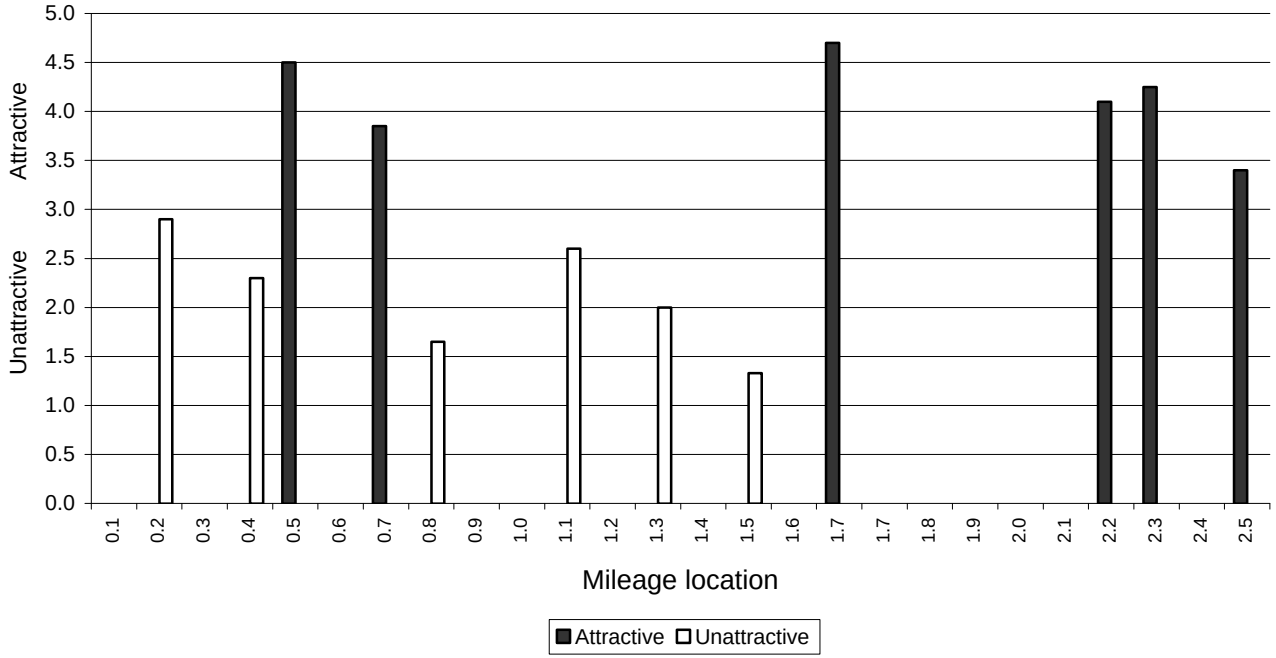
Table A.3 Rochester CIZ: Attractive Variable by Mean Perception and Mileage Location

Mean Group Perception	Mileage Location	N within Group Perception	N of Items Noticed	Notice Variable	Description
1.00-1.49					
1.50-1.99					
2.00-2.49	51	11	1	wetland(1)	wildlife(1)
2.50-2.99	62	16	2	trees(1) urban skyline(1)	big(1) natural(1)
3.00-3.49	47.4, 48.0, 49.4, 51.7, 51.8, 52.0, 54.4, 59.7, 60.1	20	19	plantings(4) golf course(2) bypass(1) berm(1) ditch(1) interchange(1) hills(1) dam(1) wall(1) vista(1) businesses(1) railing(1) pond(1) Park(1) landmark bld(1) lake(1) housing(1) lot(1) bridge(1)	architecture(1) parkway(1) planned or well designed(1) plantings(1) scenery(1) screened(1) wonderful(1) isolation(1) plantings(1) vista(1) unique(1) compatible(1) unique(1)
3.50-3.99	49.2, 49.8, 51.3, 52.1, 53.4, 57.1, 58.2, 59.3, 59.4	19	17	businesses(4) bridge(3) plantings(3) trees(3) urban skyline(3) Park(2) river(2) hills(2) development(1) lake(1) building(1) landmark bld(1) railing(1) trailer(1) vista(1) interchange(1) flag(1)	planned or well designed(2) plantings(2) vista(2) rock(1) stewardship(1) trees(1) trees(1) unity(1) variety(1) traffic(1) no plantings(1) too many(1) attractive or beautiful(1) neat(1)
4.00-4.29	49.5, 50.1, 51.9, 52.5, 54.2, 55.3, 55.9, 56.4, 57.3, 58.4, 59.2, 59.8, 59.9, 60.2, 60.5	19	112	river(3) trees(2) plantings(2) wall(1) utility line(1) trailer(1) businesses(1) rock(1) lights(1) landmark bld(1) highway(1) bridge(1)	attractive or beautiful(2) screened(2) nice(1) does not obstruct view color(1) well-maintained(1) vista(1) uphill(1) river(1) planned or well designed(1)
4.30-4.59	50.6, 50.8, 51.4, 53.0, 54.1, 54.6, 54.9, 55.2, 58.6, 59.0, 62.2	18	12	landmark bld(4) hills(3) urban skyline(1) hills(1) downtown(1) vista(1) trees(1) river(1) lake(1) housing(1) pedestrian overpass(1) sidewalk(1)	natural(4) vista(3) scenery(2) old(1) nice(1) attractive or beautiful(1) flood control(1) not natural(1) urban skyline(1) unique(1) undeveloped(1)
4.60-4.89	48.7, 53.7, 54.8, 56.1, 56.3, 56.5, 56.6, 57.5, 57.8, 60.6	14	17	lake(3) landmark bld(1) Park(2) plantings(1) trees(1) vista(1) island(1)	trees(3) screened(1) uphill(1) geese(1) green(1) inviting(1) isolation(1)
4.90-5.00	50.9, 51.1, 61.7				

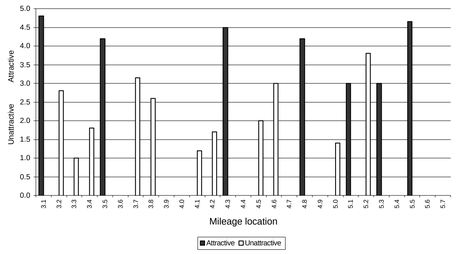
Table A.4 Commuter Route Mileage for Rochester

Segment	Commuter Route	Segment Mileage	Mileage Location
Mn/DOT building to LP1	TH 52 south	5.75	0.00–5.75
LP1 to LP2	TH 52 south	3.75	5.75–9.50
LP2 to LP3	TH 52 north	6.25	9.50–15.75
LP3 to LP4	US 14 west	14.00	15.75–29.75
	TH 57 north	3.00	29.75–32.75
LP4 to LP5	TH 57 south	3.00	32.75–35.75
	US 14 east	11.25	35.75–47.00
LP5 to LP6	US 14 east	4.50	47.00–51.50
	US 63 north	2.50	51.50–54.00
LP6 to LP7	Cty 22 south	3.50	54.00–57.50
LP7 to LP8	Cty 22 south	0.75	57.50–58.25
	US 14 west	4.25	58.25–62.50

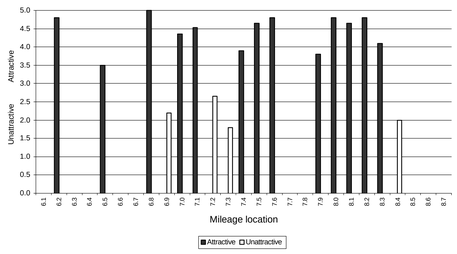
Rochester- Mean Attractiveness Rating
by Mileage Location
(0-3 miles)

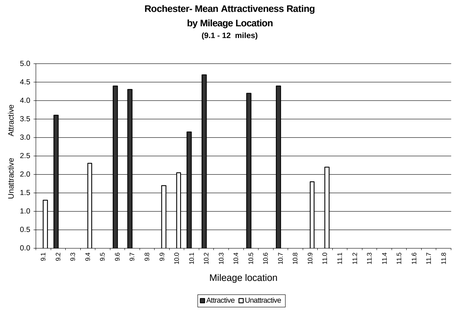


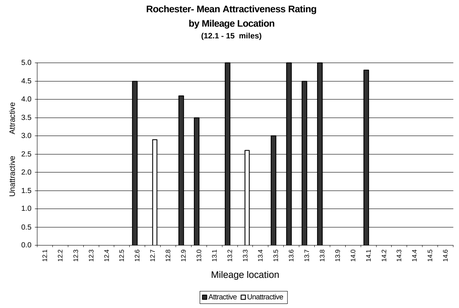
Rochester- Mean Attractiveness Rating
by Mileage Location
(3.1 - 6 miles)



Rochester- Mean Attractiveness Rating
by Mileage Location
(6.1 - 9 miles)




Rochester- Mean Attractiveness Rating
by Mileage Location
(9.1 - 12 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
9.1
9.2
9.3
9.4
9.5
9.6
9.7
9.8
9.9
10.0
10.1
10.2
10.3
10.4
10.5
10.6
10.7
10.8
10.9
11.0
11.1
11.2
11.3
11.4
11.5
11.6
11.7
11.8
Mileage location
Attractive
Unattractive


Rochester- Mean Attractiveness Rating
by Mileage Location
(12.1 - 15 miles)
Attractive
Unattractive
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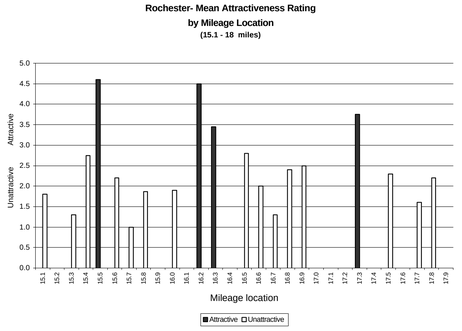
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
12.1
12.2
12.3
12.3
12.4
12.5
12.6
12.7
12.8
12.9
13.0
13.1
13.2
13.3
13.4
13.5
13.6
13.7
13.8
13.9
14.0
14.1
14.2
14.3
14.4
14.5
14.6
Mileage location
Attractive
Unattractive


Rochester- Mean Attractiveness Rating
by Mileage Location
(15.1 - 18 miles)
Attractive
Unattractive
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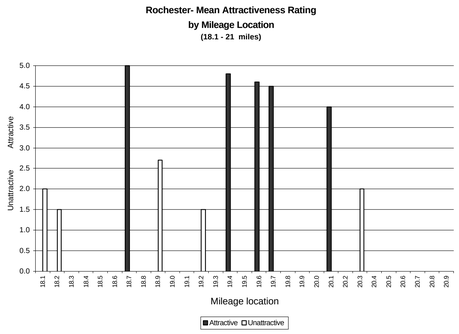
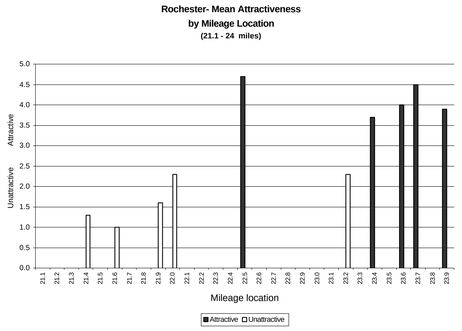
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
15.1
15.2
15.3
15.4
15.5
15.6
15.7
15.8
15.9
16.0
16.1
16.2
16.3
16.4
16.5
16.6
16.7
16.8
16.9
17.0
17.1
17.2
17.3
17.4
17.5
17.6
17.7
17.8
17.9
Mileage location
Attractive
Unattractive


Rochester- Mean Attractiveness Rating
by Mileage Location
(18.1 - 21 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
18.1
18.2
18.3
18.4
18.5
18.6
18.7
18.8
18.9
19.0
19.1
19.2
19.3
19.4
19.5
19.6
19.7
19.8
19.9
20.0
20.1
20.2
20.3
20.4
20.5
20.6
20.7
20.8
20.9
Mileage location
Attractive
Unattractive


Rochester- Mean Attractiveness
by Mileage Location
(21.1 - 24 miles)
Attractive
Unattractive
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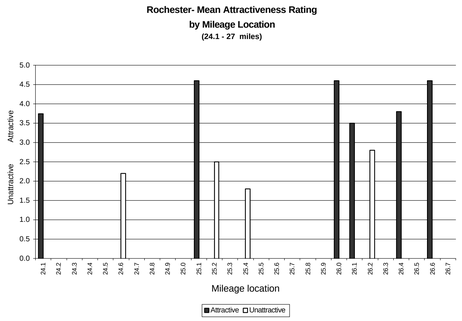
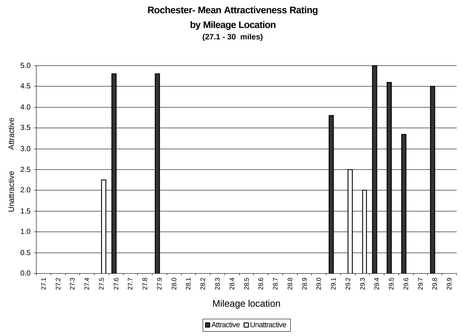
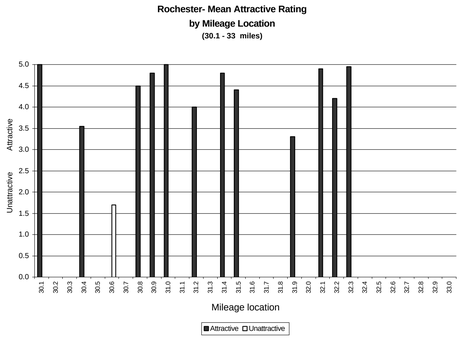
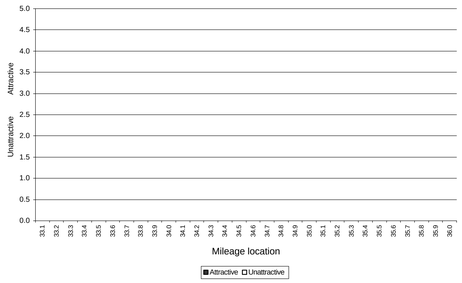
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
21.1
21.2
21.3
21.4
21.5
21.6
21.7
21.8
21.9
22.0
22.1
22.2
22.3
22.4
22.5
22.6
22.7
22.8
22.9
23.0
23.1
23.2
23.3
23.4
23.5
23.6
23.7
23.8
23.9
Mileage location
Attractive
Unattractive


Rochester- Mean Attractiveness Rating
by Mileage Location
(24.1 - 27 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
24.1
24.2
24.3
24.4
24.5
24.6
24.7
24.8
24.9
25.0
25.1
25.2
25.3
25.4
25.5
25.6
25.7
25.8
25.9
26.0
26.1
26.2
26.3
26.4
26.5
26.6
26.7
Mileage location
Attractive
Unattractive

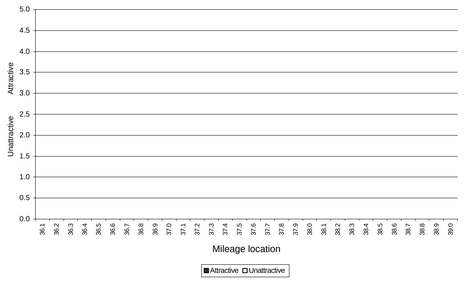

Rochester- Mean Attractiveness Rating
by Mileage Location
(27.1 - 30 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
27.1
27.2
27.3
27.4
27.5
27.6
27.7
27.8
27.9
28.0
28.1
28.2
28.3
28.4
28.5
28.6
28.7
28.8
28.9
29.0
29.1
29.2
29.3
29.4
29.5
29.6
29.7
29.8
29.9
Mileage location
Attractive
Unattractive

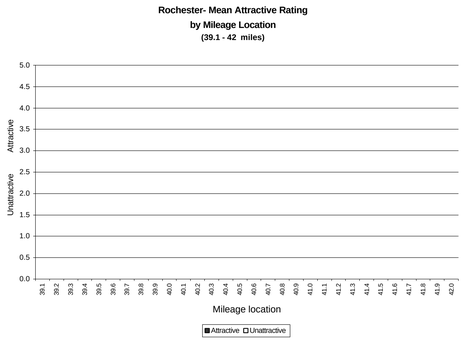

Rochester- Mean Attractive Rating
by Mileage Location
(30.1 - 33 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
Mileage location
Attractive
Unattractive

Rochester- Mean Attractive Rating
by Mileage Location
(33.1 - 36 miles)

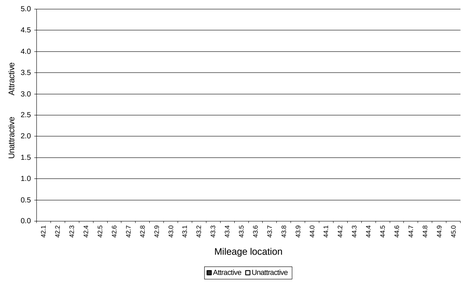


Rochester- Mean Attractive Rating
by Mileage Location
(36.1 - 39 miles)

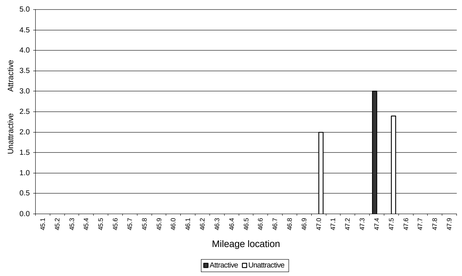


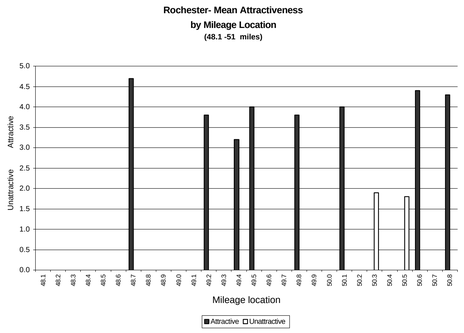

Rochester- Mean Attractive Rating
by Mileage Location
(39.1 - 42 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
Mileage location
Attractive
Unattractive

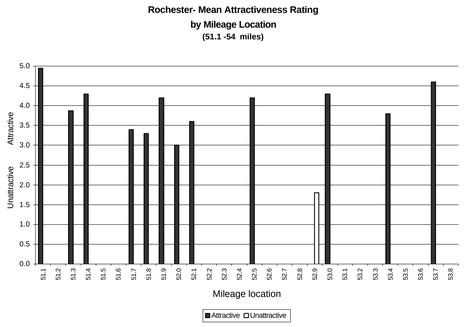
Rochester- Mean Attractive Rating
by Mileage Location
(42.1 - 45 miles)

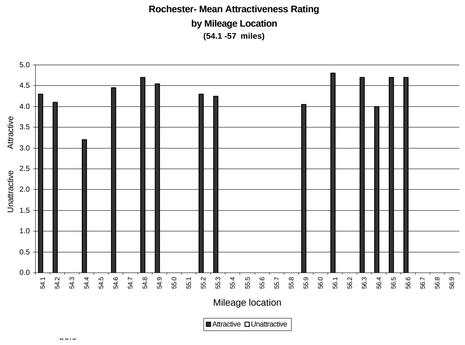


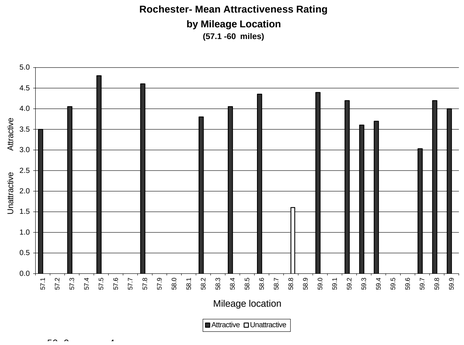
Rochester- Mean Attractiveness Rating
by Mileage Location
(45.1 -48 miles)




Rochester- Mean Attractiveness
by Mileage Location
(48.1 -91 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
48.1
48.2
48.3
48.4
48.5
48.6
48.7
48.8
48.9
49.0
49.1
49.2
49.3
49.4
49.5
49.6
49.7
49.8
49.9
50.0
50.1
50.2
50.3
50.4
50.5
50.6
50.7
50.8
Mileage location
Attractive
Unattractive


Rochester- Mean Attractiveness Rating
by Mileage Location
(51.1 -54 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
51.1
51.2
51.3
51.4
51.5
51.6
51.7
51.8
51.9
52.0
52.1
52.2
52.3
52.4
52.5
52.6
52.7
52.8
52.9
53.0
53.1
53.2
53.3
53.4
53.5
53.6
53.7
53.8
Mileage location
Attractive
Unattractive


Rochester- Mean Attractiveness Rating
by Mileage Location
(54.1 -57 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
54.1
54.2
54.3
54.4
54.5
54.6
54.7
54.8
54.9
55.0
55.1
55.2
55.3
55.4
55.5
55.6
55.7
55.8
55.9
56.0
56.1
56.2
56.3
56.4
56.5
56.6
56.7
56.8
56.9
Mileage location
Attractive
Unattractive


Rochester- Mean Attractiveness Rating
by Mileage Location
(57.1 -60 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
57.1
57.2
57.3
57.4
57.5
57.6
57.7
57.8
57.9
58.0
58.1
58.2
58.3
58.4
58.5
58.6
58.7
58.8
58.9
59.0
59.1
59.2
59.3
59.4
59.5
59.6
59.7
59.8
59.9
Mileage location
Attractive
Unattractive

Rochester- Mean Attractiveness Rating
by Mileage Location
(60.1 -62.5 miles)

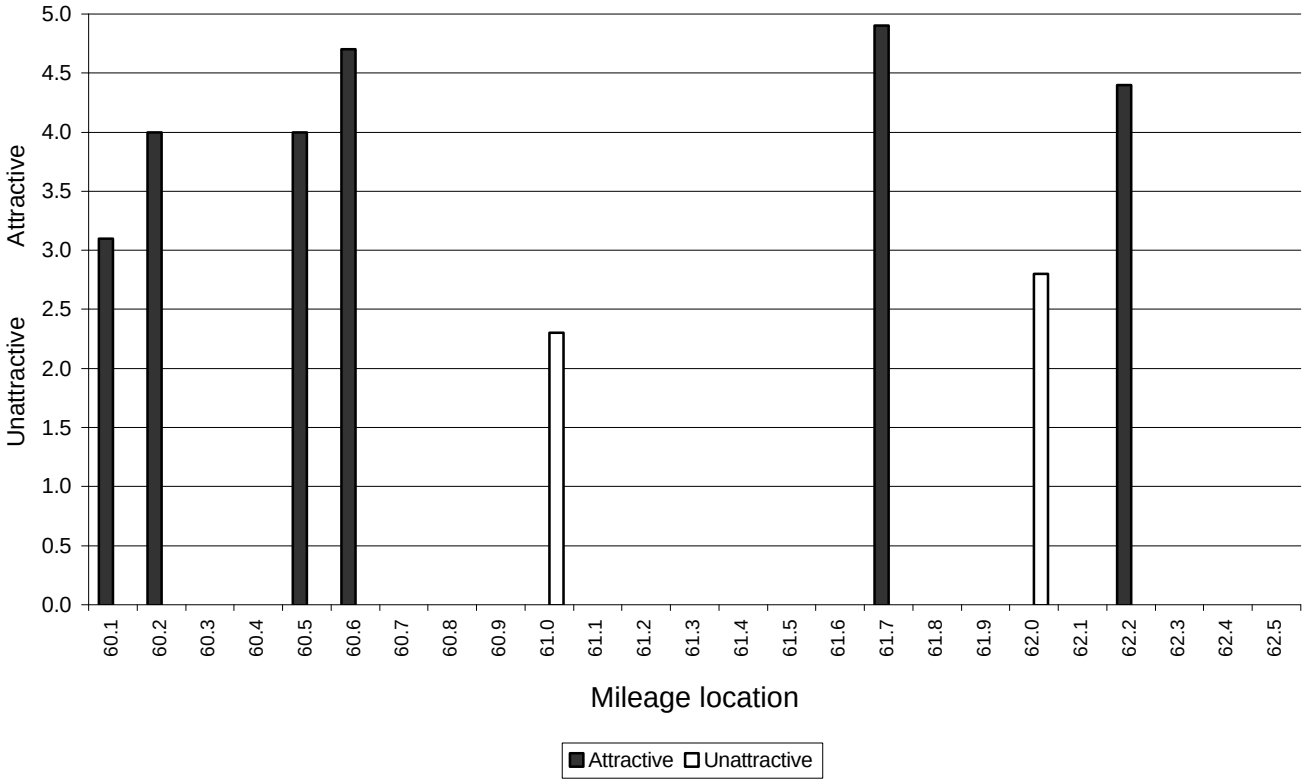


Table A.5 Rochester Data Set

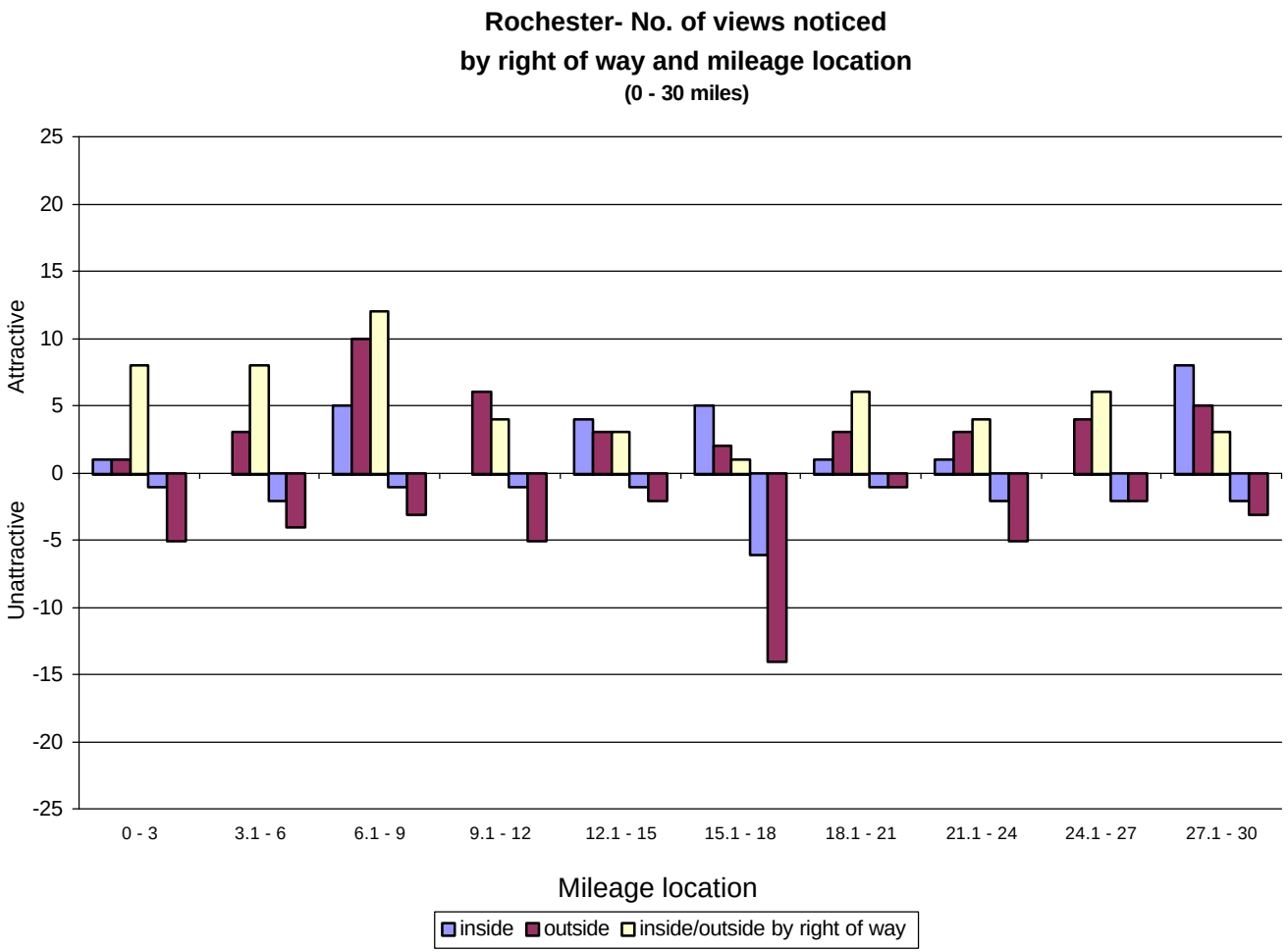
Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
0.2	unattractive	2.9	businesses	sign	.	.	.	not natural	.	.
0.4	unattractive	2.3	businesses	.	.	.	.	no plantings	.	.
0.5	attractive	4.5	trees	.	.	.	.	unique	.	.
0.7	attractive	3.85	trees	plantings	.	.	.	nice	vista	.
0.8	unattractive	1.65	trees	excavation	.	.	.	deteriorated	not green	.
1.1	unattractive	2.6	businesses	.	.	.	.	harsh	.	.
1.3	unattractive	2	sign	.	.	.	.	confusing	.	.
1.5	unattractive	1.33	weeds	trash	.	.	.	unmown	ugly or unattractive	unkept
1.7	attractive	4.7	plantings	.	.	.	.	softens building	.	.
2.2	attractive	4.1	prairie	.	.	.	.	variety	.	.
2.3	attractive	4.25	Park	trees	.	.	.	scenery	open	.
2.5	unattractive	3.4	railing	atletic field	.	.	.	incompatible	.	.
2.6	unattractive	1.8	businesses	.	.	.	.	unkept	.	.
2.7	attractive	4	cattails	.	.	.	.	natural	.	.
2.8	unattractive	1.3	businesses	.	.	.	.	ugly or unattractive	.	.
3	attractive	4.3	plantings	.	.	.	.	trees	.	.
3.1	attractive	4.8	trees	.	.	.	.	screened	.	.
3.2	unattractive	2.8	sign	.	.	.	.	ugly or unattractive	.	.
3.3	unattractive	1	businesses	.	.	.	.	trash	.	.
3.4	unattractive	1.8	railing	median	.	.	.	dangerous	incomplete	.
3.5	attractive	4.2	cattails	.	.	.	.	natural	.	.
3.7	attractive	3.15	landmark bld	businesses	.	.	.	attractive or beautiful	.	.
3.8	unattractive	2.6	sign	.	.	.	.	dangerous	.	.
4.1	unattractive	1.2	sign	congestion	.	.	.	disorienting	.	.
4.2	unattractive	1.7	sign	.	.	.	.	too many	.	.
4.3	attractive	4.5	vista	.	.	.	.	inviting	.	.
4.5	unattractive	2	sign	junk	.	.	.	too many	old	.
4.6	unattractive	3	sign	.	.	.	.	unkept	.	.
4.8	attractive	4.2	plantings	.	.	.	.	natural	.	.
5	unattractive	1.4	weeds	.	.	.	.	needs care	.	.
5.1	attractive	3	buffer	.	.	.	.	natural	.	.
5.2	attractive	3.8	unmown area	.	.	.	.	natural	.	.
5.3	unattractive	3	weeds	.	.	.	.	unmown	.	.
5.5	attractive	4.65	trees	wall	.	.	.	green	.	.
6	attractive	4.4	plantings	.	.	.	.	trees	.	.
6.2	attractive	4.8	trees	plantings	.	.	.	attractive or beautiful	screened	.
6.5	attractive	3.5	trees	ditch	.	.	.	planned or well designed	weeds	.
6.8	attractive	5	hills	trees	.	.	.	hills	.	.
6.9	unattractive	2.2	weeds	.	.	.	.	bad	.	.
7	attractive	4.35	pond	river	vista	.	.	scenery	nice	.
7.1	attractive	4.53	highway	trees	river	.	.	nice	river	natural
7.2	unattractive	2.65	weeds	farm	.	.	.	weeds	variety	.
7.3	unattractive	1.8	excavation	.	.	.	.	unkept	.	.
7.4	attractive	3.9	rock	hills	.	.	.	geological	.	.
7.5	attractive	4.65	rock	river	trees	.	.	uphill	well-maintained	.
7.6	attractive	4.8	hills	.	.	.	.	geological	.	.
7.9	attractive	3.8	rock	.	.	.	.	variety	.	.
8	attractive	4.8	hills	.	.	.	.	vista	.	.
8.1	attractive	4.65	highway	plantings	median	.	.	nice	softens building	.

Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
8.2	attractive	4.8	trees	.	.	.	.	variety	.	.
8.3	attractive	4.1	trees	.	.	.	.	useful	.	.
8.4	unattractive	2	mudhole	.	.	.	.	unkept	.	.
8.8	unattractive	3.3	businesses	.	.	.	.	no plantings	.	.
8.9	attractive	4.5	vista	.	.	.	.	vista	.	.
9	unattractive	2.4	businesses	.	.	.	.	incompatible	.	.
9.1	unattractive	1.3	railing	.	.	.	.	ugly or unattractive	.	.
9.2	unattractive	3.6	construction	lake	.	.	.	ugly or unattractive	.	.
9.4	unattractive	2.3	excavation	.	.	.	.	needs care	.	.
9.6	attractive	4.4	vista	.	.	.	.	uphill	.	.
9.7	attractive	4.3	vista	.	.	.	.	rustic	.	.
9.9	unattractive	1.7	trailer	.	.	.	.	weeds	.	.
10	unattractive	2.05	weeds	pumping station	.	.	.	unkept	incompatible	.
10.1	attractive	3.15	shade	hills	weeds	.	.	nice	not green	.
10.2	attractive	4.7	natives	.	.	.	.	colors	.	.
10.5	attractive	4.2	sign	crown vetch	.	.	.	legible	variety	.
10.7	attractive	4.4	vista	.	.	.	.	vista	.	.
10.9	unattractive	1.8	businesses	.	.	.	.	ugly or unattractive	.	.
11	unattractive	2.2	vehicle	.	.	.	.	speeding	.	.
12.6	attractive	4.5	rock	.	.	.	.	variety	.	.
12.7	unattractive	2.9	sign	.	.	.	.	incompatible	.	.
12.9	attractive	4.1	vista	.	.	.	.	wonderful	.	.
13	attractive	3.5	hills	sign	.	.	.	plantings	too large	.
13.2	attractive	5	historic house	.	.	.	.	uphill	.	.
13.3	unattractive	2.6	sign	.	.	.	.	incompatible	.	.
13.5	unattractive	3	interchange	.	.	.	.	wasted	.	.
13.6	attractive	5	historic house	.	.	.	.	traffic	.	.
13.7	attractive	4.5	hills	trees	.	.	.	natural	.	.
13.8	attractive	5	historic house	.	.	.	.	uphill	.	.
14.1	attractive	4.8	historic house	.	.	.	.	historic	.	.
14.7	unattractive	1.6	sign	.	.	.	.	ugly or unattractive	.	.
14.8	unattractive	2.5	businesses	.	.	.	.	ugly or unattractive	.	.
14.9	unattractive	1.5	weeds	.	.	.	.	weeds	.	.
15.1	unattractive	1.8	trailer	.	.	.	.	ugly or unattractive	.	.
15.3	unattractive	1.3	sign	.	.	.	.	too many	.	.
15.4	unattractive	2.75	trailer	sign	.	.	.	ugly or unattractive	too many	.
15.5	attractive	4.6	landmark bld	.	.	.	.	vista	landmark	.
15.6	attractive	2.2	landmark bld	tanks	utility line	.	.	restful	.	.
15.7	unattractive	1	railroad	.	.	.	.	poor stewardship	.	.
15.8	unattractive	1.87	trees	railroad	.	.	.	deteriorated	ugly or unattractive	trash
16	unattractive	1.9	building	.	.	.	.	not screened	.	.
16.2	attractive	4.5	pond	.	.	.	.	screened	.	.
16.3	attractive	3.45	pond	storage garages	.	.	.	variety	.	.
16.5	unattractive	2.8	housing	hills	.	.	.	no plantings	.	.
16.6	unattractive	2	construction	.	.	.	.	ugly or unattractive	.	.
16.7	unattractive	1.3	businesses	.	.	.	.	unplanned	.	.
16.8	unattractive	2.4	businesses	.	.	.	.	ugly or unattractive	.	.
16.9	unattractive	2.5	businesses	.	.	.	.	no plantings	.	.
17.3	attractive	3.75	pedestrian overpass	.	.	.	.	landmark	plantings	good
17.5	unattractive	2.3	excavation	.	.	.	.	offensive	.	.

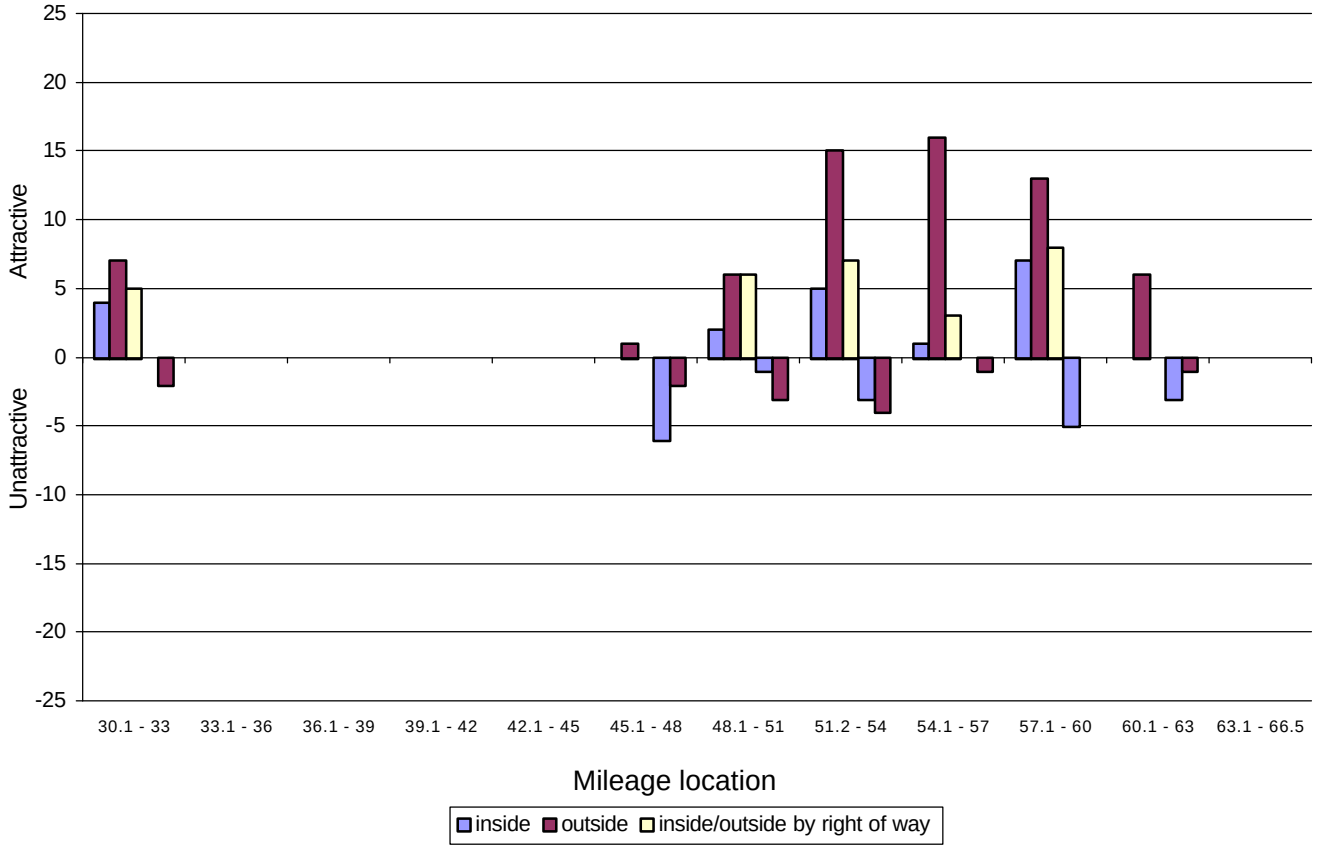
Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
17.7	unattractive	1.6	excavation	.	.	.	.	unplanned	.	.
17.8	unattractive	2.2	hills	junkyard	.	.	.	disturbance	not screened	.
18.1	unattractive	2	building	.	.	.	.	not screened	.	.
18.2	unattractive	1.5	trees	.	.	.	.	unkept	.	.
18.7	attractive	5	farm	.	.	.	.	wonderful	.	.
18.9	unattractive	2.7	sign	.	.	.	.	too many	.	.
19.2	unattractive	1.5	trees	.	.	.	.	unkept	.	.
19.4	attractive	4.8	hills	.	.	.	.	scenery	.	.
19.6	attractive	4.6	development	.	.	.	.	attractive or beautiful	.	.
19.7	attractive	4.5	plantings	.	.	.	.	flowers	.	.
20.1	attractive	4	trees	.	.	.	.	variety	.	.
20.3	unattractive	2	highway	.	.	.	.	rough	.	.
21	attractive	3.07	plantings	hills	sign	.	.	screened	trees	old
21.4	unattractive	1.3	junkyard	.	.	.	.	needs care	.	.
21.6	unattractive	1	trees	.	.	.	.	poor stewardship	.	.
21.9	unattractive	1.6	junkyard	.	.	.	.	ugly or unattractive	.	.
22	unattractive	2.3	median	.	.	.	.	trash	.	.
22.5	attractive	4.7	countryside	.	.	.	.	vista	.	.
23.2	unattractive	2.3	building	.	.	.	.	old	.	.
23.4	unattractive	3.7	businesses	berm	.	.	.	not screened	.	.
23.6	attractive	4	sign	.	.	.	.	legible	.	.
23.7	attractive	4.5	trees	.	.	.	.	nice	.	.
23.9	unattractive	3.9	golf course	plantings	.	.	.	unkept	softens building	screened
24	attractive	3.55	plantings	netting	.	.	.	ugly or unattractive	.	.
24.1	attractive	3.75	plantings	netting	.	.	.	screened	dangerous	.
24.6	unattractive	2.2	businesses	.	.	.	.	not screened	.	.
25.1	attractive	4.6	businesses	vista	.	.	.	good setback	vista	.
25.2	unattractive	2.5	tanks	.	.	.	.	rusty	.	.
25.4	unattractive	1.8	mowing	.	.	.	.	no wildflower	.	.
26	attractive	4.6	vista	.	.	.	.	sky	.	.
26.1	attractive	3.5	trees	mowing	.	.	.	good care	.	.
26.2	unattractive	2.8	building	.	.	.	.	incompatible	.	.
26.4	attractive	3.8	trees	.	.	.	.	shading	.	.
26.6	attractive	4.6	trees	.	.	.	.	old	.	.
27	attractive	5	cattails	.	.	.	.	.	.	.
27.5	unattractive	2.25	sign	.	.	.	.	ugly or unattractive	too open	.
27.6	attractive	4.8	fields	countryside	.	.	.	rows	open	.
27.9	attractive	4.8	fields	countryside	.	.	.	open	.	.
29.1	attractive	3.8	businesses	.	.	.	.	compatible	.	.
29.2	unattractive	2.5	storage garages	.	.	.	.	not screened	.	.
29.3	unattractive	2	junkyard	hills	.	.	.	no plantings	.	.
29.4	attractive	5	trees	.	.	.	.	inviting	.	.
29.5	attractive	4.6	river	rock	.	.	.	restful	.	.
29.6	attractive	3.35	town	downtown	.	.	.	variety	.	.
29.8	attractive	4.5	older homes	housing	garden	building	.	well-maintained	good care	attractive or beautiful
30	attractive	4.5	highway	older homes	.	.	.	smooth	small town atmosphere	.
30.1	attractive	5	plantings	.	.	.	.	well-maintained	.	.
30.4	unattractive	3.55	development	trees	.	.	.	weeds	.	.
30.6	unattractive	1.7	businesses	.	.	.	.	old	.	.
30.8	attractive	4.5	landmark bld	.	.	.	.	plantings	.	.

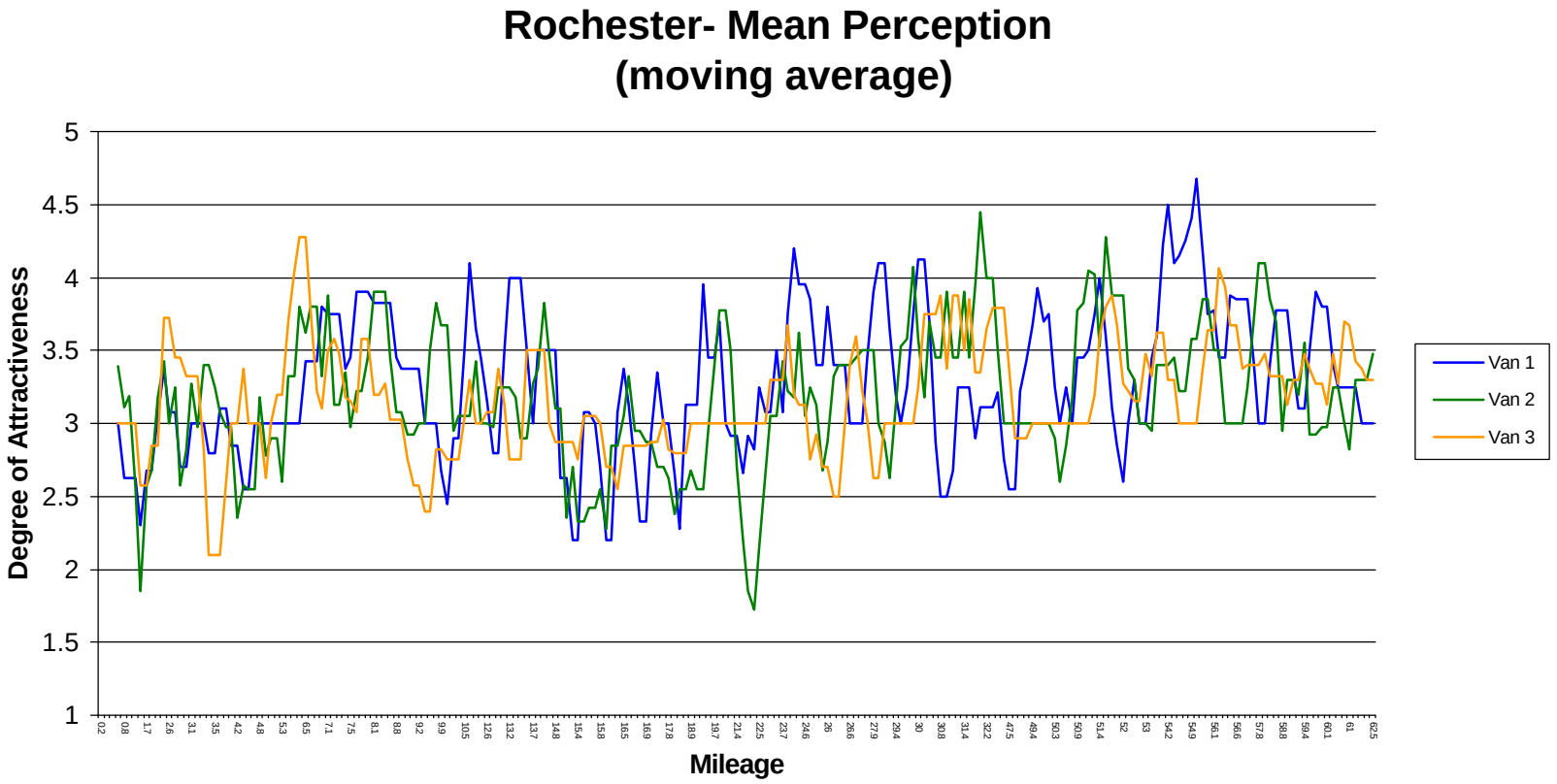
Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
30.9	attractive	4.8	vista	.	.	.	.	trees	.	.
31	attractive	5	landmark bld	building	wall	.	.	well-maintained	.	.
31.2	attractive	4	scenery	.	.	.	.	variety	.	.
31.4	attractive	4.8	vista	.	.	.	.	trees	.	.
31.5	attractive	4.4	berm	.	.	.	.	screened	.	.
31.9	unattractive	3.3	trail	trees	.	.	.	no plantings	uphill	.
32.1	attractive	4.9	bridge	river	Park	design	.	lights	planned or well designed	.
32.2	attractive	4.2	plantings	.	.	.	.	.	.	.
32.3	attractive	4.95	railing	lights	.	.	.	historic	.	.
47	unattractive	2	sign	vista	.	.	.	blocks view	.	.
47.4	unattractive	3	utility line	.	.	.	.	no plantings	.	.
47.5	unattractive	2.4	pedestrian overpass	interchange	.	.	.	no plantings	.	.
48	unattractive	3	businesses	.	.	.	.	not natural	.	.
48.7	attractive	4.7	urban skyline	.	.	.	.	vista	.	.
49.2	attractive	3.8	urban skyline	flag	.	.	.	attractive or beautiful	too many	.
49.4	attractive	3.2	trees	.	.	.	.	.	.	.
49.5	attractive	4	building	.	.	.	.	planned or well designed	.	.
49.8	attractive	3.8	bridge	lights	river	.	.	river	planned or well designed	.
50.1	attractive	4	plantings	.	.	.	.	screened	.	.
50.3	unattractive	1.9	railroad	weeds	.	.	.	dangerous	weeds	.
50.5	unattractive	1.8	railroad	.	.	.	.	not screened	.	.
50.6	attractive	4.4	utility line	river	wall	.	.	screened	attractive or beautiful	vista
50.8	attractive	4.3	plantings	.	.	.	.	screened	.	.
50.9	attractive	5	lake	.	.	.	.	trees	.	.
51	unattractive	2	railroad bri	.	.	.	.	ugly or unattractive	.	.
51.1	attractive	4.95	Park	lake	island	.	.	trees	geese	.
51.3	attractive	3.87	dam	berm	plantings	lake	.	architecture	plantings	unique
51.4	attractive	4.3	bridge	housing	.	.	.	planned or well designed	isolation	.
51.7	unattractive	3.4	ditch	plantings	pond	wall	.	unmown	poor growth	compatible
51.8	unattractive	3.3	golf course	railing	interchange	landmark bld	.	trash	no plantings	unique
51.9	attractive	4.2	river	rock	trees	trailer	.	screened	.	.
52	attractive	3	businesses	.	.	.	.	plantings	.	.
52.1	attractive	3.6	plantings	.	.	.	.	does not obstruct view color	.	.
52.5	attractive	4.2	hills	.	.	.	.	natural	.	.
52.9	unattractive	1.8	highway	.	.	.	.	dangerous	.	.
53	attractive	4.3	Park	.	.	.	.	inviting	.	.
53.4	attractive	3.8	hills	businesses	.	.	.	no plantings	.	.
53.7	attractive	4.6	vista	hills	trees	.	.	urban skyline	old	natural
54.1	attractive	4.3	housing	hills	.	.	.	natural	.	.
54.2	attractive	4.1	sidewalk	.	.	.	.	.	.	.
54.4	attractive	3.2	landmark bld	.	.	.	.	attractive or beautiful	.	.
54.6	attractive	4.45	urban skyline	development	.	.	.	vista	trees	.
54.8	attractive	4.7	landmark bld	.	.	.	.	vista	.	.
54.9	attractive	4.55	landmark bld	pedestrian overpass	.	.	.	vista	unique	.
55.2	attractive	4.3	hills	.	.	.	.	.	.	.
55.3	attractive	4.25	urban skyline	hills	landmark bld	.	.	scenery	vista	.
55.9	attractive	4.05	plantings	Park	.	.	.	parkway	vista	.
56.1	attractive	4.8	urban skyline	.	.	.	.	big	.	.
56.3	attractive	4.7	plantings	.	.	.	.	trees	.	.
56.4	attractive	4	businesses	.	.	.	.	.	.	.

Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
56.5	attractive	4.7	lake	.	.	.	.	natural	.	.
56.6	attractive	4.7	lake	.	.	.	.	isolation	.	.
57.1	attractive	3.5	businesses	.	.	.	.	rock	.	.
57.3	attractive	4.05	lake	bridge	river	Park	vista	stewardship	neat	.
57.5	attractive	4.8	landmark bld	.	.	.	.	trees	.	.
57.8	attractive	4.6	trees	.	.	.	.	green	.	.
58.2	attractive	3.8	highway	trees	.	.	.	well-maintained	.	.
58.4	attractive	4.05	businesses	Park	river	bridge	.	plantings	.	.
58.6	attractive	4.35	landmark bld	trailer	railing	plantings	trees	planned or well designed	plantings	.
58.8	unattractive	1.6	median	.	.	.	.	painted concrete	.	.
59	attractive	4.4	river	.	.	.	.	nice	.	.
59.2	attractive	4.2	trees	.	.	.	.	natural	.	.
59.3	unattractive	3.6	interchange	bridge	plantings	trees	.	traffic	unity	variety
59.4	attractive	3.7	landmark bld	.	.	.	.	scenery	.	.
59.7	attractive	3.03	golf course	lot	bypass	.	.	wonderful	.	too much access
59.8	unattractive	4.2	flood control protectio	bypass	.	.	.	not natural	.	undeveloped
59.9	attractive	4	plantings	.	.	.	.	nice	.	.
60.1	unattractive	3.1	pedestrian overpass	.	.	.	.	too far away	.	.
60.2	unattractive	4	pedestrian overpass	.	.	.	.	too far away	.	.
60.5	attractive	4	businesses	.	.	.	.	uphill	.	.
60.6	attractive	4.7	vista	hills	.	.	.	scenery	.	.
61	unattractive	2.3	bridge	.	.	.	.	ugly or unattractive	.	.
61.7	attractive	4.9	vista	.	.	.	.	uphill	.	.
62	unattractive	2.8	hills	.	.	.	.	no plantings	.	.
62.2	attractive	4.4	downtown	.	.	.	.	attractive or beautiful	.	.
62.5	attractive	999	wetland	.	.	.	.	wildlife	.	.


Rochester- No. of views noticed
by right of way and mileage location
(0 - 30 miles)
25
20
15
10
5
0
-5
-10
-15
-20
-25
Attractive
Unattractive
0 - 3
3.1 - 6
6.1 - 9
9.1 - 12
12.1 - 15
15.1 - 18
18.1 - 21
21.1 - 24
24.1 - 27
27.1 - 30
Mileage location
inside
outside
inside/outside by right of way

Rochester- No. of views noticed
by right of way and mileage location
(30.1 - 66.5 miles)




Rochester- Mean Perception
(moving average)
Degree of Attractiveness
5
4.5
4
3.5
3
2.5
2
1.5
1
Mileage
Van 1
Van 2
Van 3

APPENDIX B

AIMS REFERENCE MANUAL: TWIN CITIES METRO ROUTE

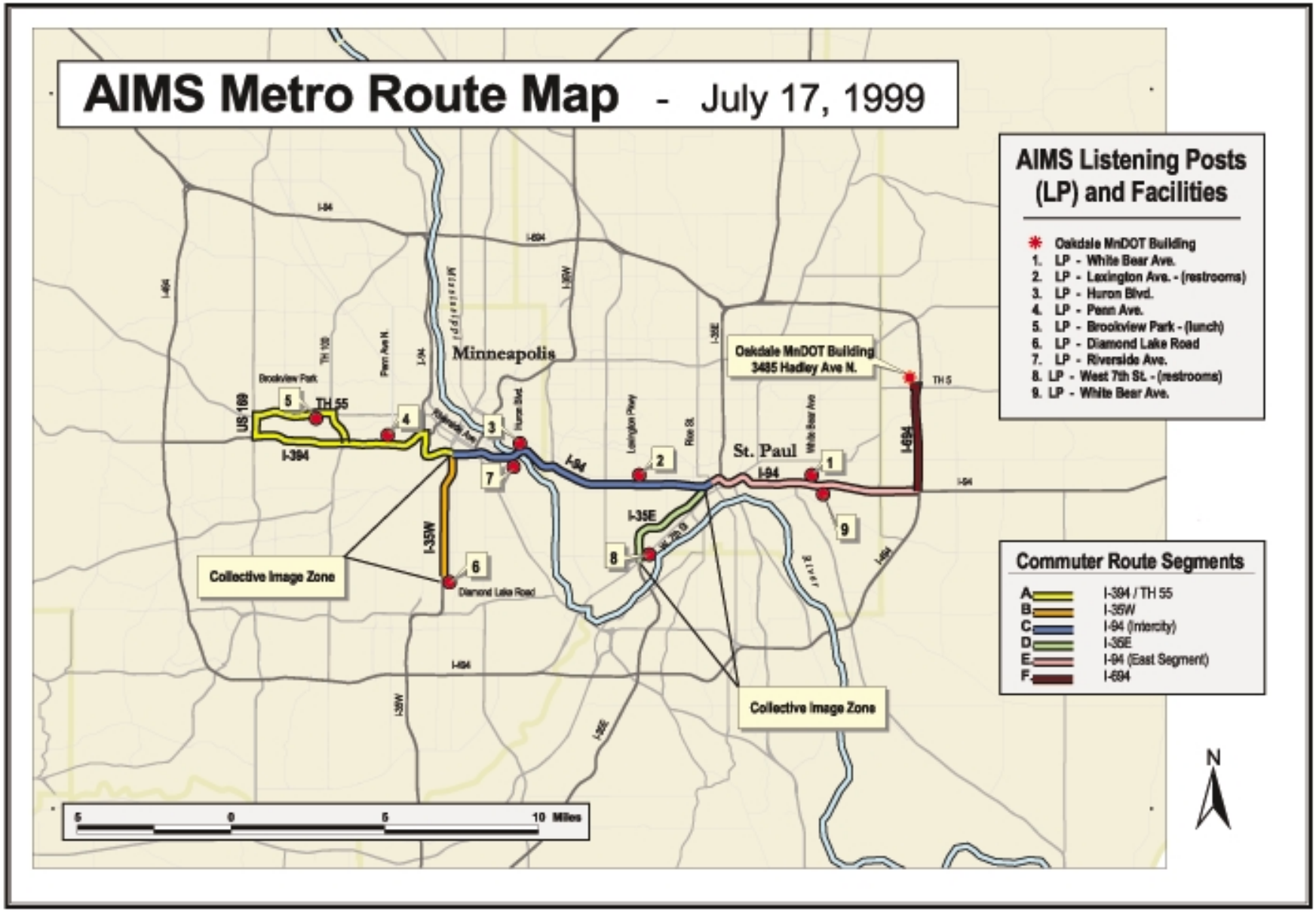


Figure B.1 Twin Cities Metro Route Map

Table B.1 Most Attractive Highway Segments in Twin Cities Metro Study Area*

Segment	What People Noticed	What People Found Attractive
Mile 16.9 to mile 17.5	The bridge, the river	The vista: good relationship of the highway with its context The design of highway structures and planting design related to the context Everything looked well-maintained
Mile 52.6 to mile 54.7	The planting design and the trees Walls and railings, including materials: stone The pedestrian overpass Treatment of the median	Aesthetic characteristics of the planting design Use of stone as a building material Choice of materials for railings and walls Overall distinct aesthetic character of the right-of-way along the entire segment Everything look well-maintained What people found unattractive in this segment: a sign at mile 53.6
Mile 58.0 to mile 60.5	The planting design and the trees Railings Treatment of the median	Aesthetic characteristics of the planting design Overall distinct aesthetic character of the right-of-way along the entire segment

*Twin Cities Metro CIZs were located at 35.4 to 60.5 miles.

Table B.2 Least Attractive Highway Segments in Twin Cities Metro Study Area

Segment	What People Noticed	What People Found Unattractive
Mile 5.4 to mile 8.0	Signs Trash on the median	Signs were too close together and too large Trash looked unkempt Segment looked monotonous, poorly designed What people found attractive in this segment: The appearance of the wall Vista of the river
Mile 12.8 to mile 13.8	Signs Construction Bridge Pedestrian overpass Railings	Signs were ugly, too many and too large Construction was ugly Bridge and pedestrian overpass were rusty What people found attractive in this segment: detail in bridge railing
Mile 14.8 to mile 15.3	Signs Railings Wall	Signs were incompatible with the surrounding landscape Weeds looked unkempt What people found attractive in this segment: vista of the skyline with trees and plantings in foreground
Mile 15.9 to mile 16.8	Construction Pedestrian overpass Bridge Wall as it related to the skyline Railroad	Construction was ugly Pedestrian overpass was ugly Bridge was rusty Bridge needs care Wall is too large in relationship to the skyline. What people found attractive in this segment: bridge
Mile 22.0 to mile 23.3	Wall Plantings around bridge, use of stone Utility line Excavation Congestion	Walls are ugly Plantings are too many, too much variety Utility line is rusty. Excavation is too large, ugly Congestion is dangerous What people found attractive in this segment: pedestrian overpass looks safe

Table B.3 Metro CIZ: Attractive Variable by Mean Perception and Mileage Location

Mean Group Perception	Mileage Location	N within Group Perception	N of Items Noticed	Notice Variable	Description
1.00-1.49					
1.50-1.99					
2.00-2.49	53.6	3	2	sign(2) pedestrian overpass(1)	trees(1) too large(1) weeds(1) information(1)
2.50-2.99	43.9	5	1	sign(1)	information(1)
3.00-3.49	36.1, 37.9	10	4	lights(1)landscape(1)housing(1)pedestrian overpass(1)	nice(1) trees(1)
3.50-3.99	36.4, 39.3, 40.1, 56.5	8	8	wall(1) utility line(1) trees(1) plantings(1) bus stop(1) building(1) pedestrian overpass(1) bridge(1)	not screened(1) vista(1) variety(1) trees(1) safe(1)
4.00-4.29	38.4, 39.9, 42.7, 43.5, 53.4, 54.5, 54.9, 55.1, 55.5, 57.0, 60.3	12	14	wall(1) vista(4) skyline(2) sign(1) rock(1) railing(2) plantings(1) landmark bld(1) building(2) housing(1) highway(2) pedestrian overpass(1) grass(1) bridge(1)	not chainlink(1) nice(1) new paint(1) natural(2) interesting(1) homes(1) good(1) charming(1) variety(1) trees(2) softens building(1) scenery(1) safe(1)
4.30-4.59	36.0, 36.7, 40.0, 40.9, 43.7, 52.7, 53.3, 53.8, 53.9, 54.1, 54.7, 54.8, 55.6, 56.3, 56.6, 57.4, 58.0, 59.1, 59.2, 60.5	12	15	wall(3) concrete(1) vista(3) trees(1) skyline(3) sign(1) rock(1) river(1) railing(4) plantings(5) median(5) lights(1) landscape(1) pedestrian overpass(1) bridge(1)	nice(2) natural(1) interesting(1) well-maintained(2) vista(2) variety(1) unity(3) unique(2) trees(1) hills(1) rock(2) pleasant(1) plantings(3)
4.60-4.89	36.9, 37.5, 39.7, 52.6, 53.0, 53.7, 54.4, 56.2, 56.9, 58.1, 58.2	10	10	plantings(5) vista(2) highway(2) trees(1) rock(1) railing(1) landmark bld(1) pedestrian overpass(1) grass(1) bridge(1)	variety(5) vista(2) attractive or beautiful(1) interesting(1) softens building(1) unity(1) new(1) nice(1) open(1) safe(1)
4.90-5.00	35.4, 36.2, 37.2, 38.7, 53.1, 53.5, 56.1, 56.8, 58.5, 59.6, 59.7, 59.9	7	10	bridge(3) trees(3) median(2) building(1) highway(1) landscape(1) vista(1) rock(1) vista(1) trees1)	variety(3) unique(2) parking(1) open(1) historic(1) attractive or beautiful(1) cool(1) no wildflower(1) trees(1) plantings(1)

Table B.4 Commuter Route Mileage for Twin Cities Metro

Segment	Commuter Route	Segment Mileage	Mileage Location
Mn/DOT building to LP1	I-694 south	3.50	0.00–3.50
	I-94 west	3.50	3.50–7.00
LP1 to LP2	I-94 west	5.75	7.00–12.75
LP2 to LP3	I-94 west	4.00	12.75–16.75
LP3 to LP4	I-94 west	2.25	16.75–19.00
	I-394 west	3.00	19.00–22.00
LP4 to LP5	I-394 west	3.75	22.00–25.75
	US 169 north	1.00	25.75–26.75
	TH 55 east	2.00	26.75–28.75
LP5 to LP6	TH 55 east	0.25	28.75–29.00
	TH 100 south	1.00	29.00–30.00
	I-394 east	3.75	30.00–33.75
	I-94 east	0.25	33.75–34.00
	I-35W south	4.00	34.00–38.00
LP6 to LP7	I-35W north	4.00	38.00–42.00
	I-94 east	2.00	42.00–44.00
LP7 to LP8	I-94 east	6.75	44.00–50.75
	I-35E south	3.00	50.75–53.75
LP8 to LP9	I-35E north	3.00	53.75–56.75
	I-94 east	3.75	56.75–60.50

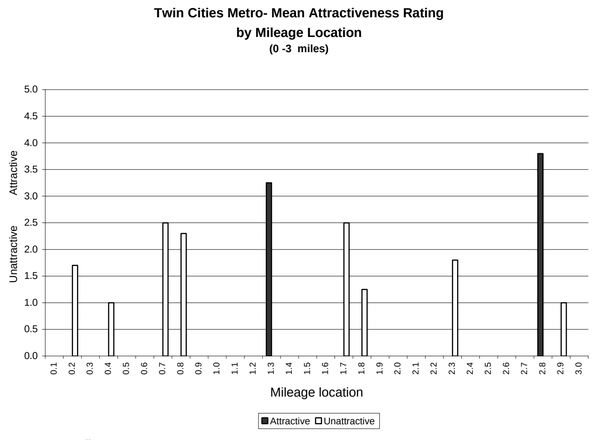
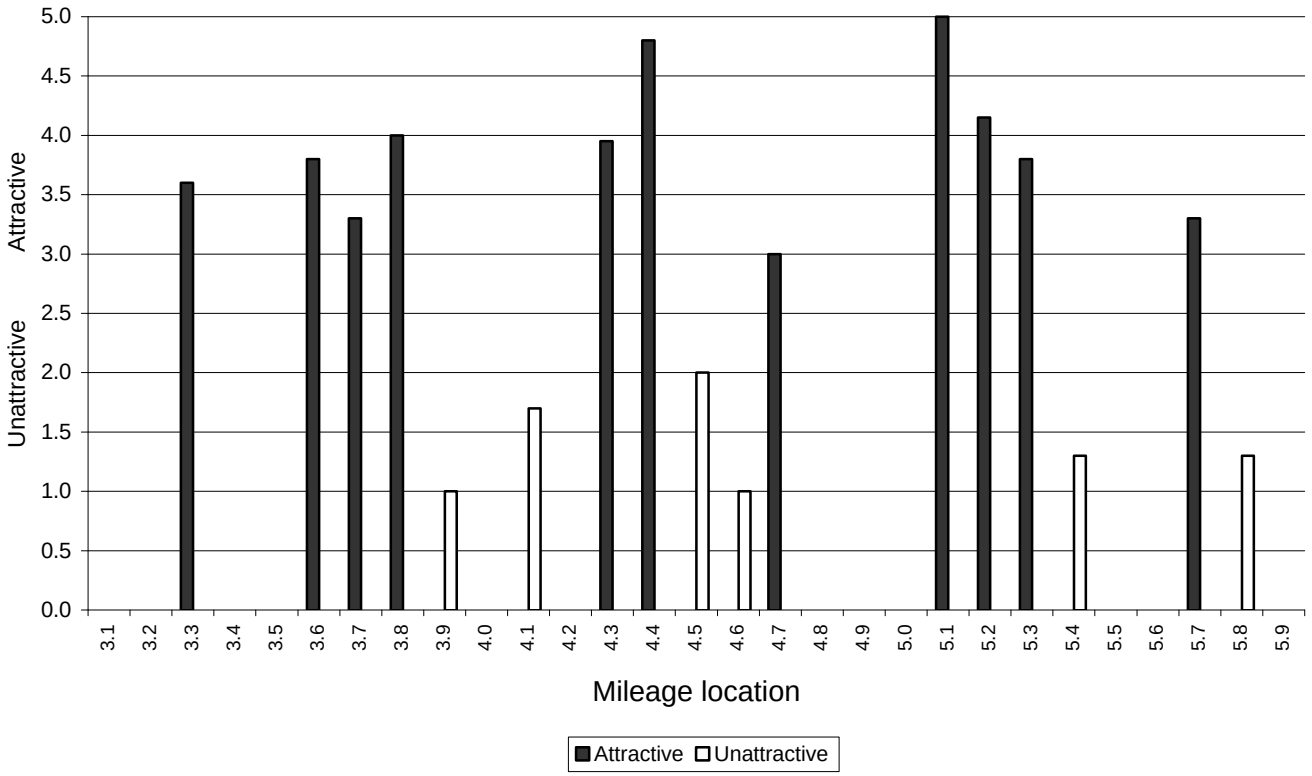

Twin Cities Metro- Mean Attractiveness Rating
by Mileage Location
(0 -3 miles)
Attractive
Unattractive
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0
Mileage location
Attractive
Unattractive

Figure C.2

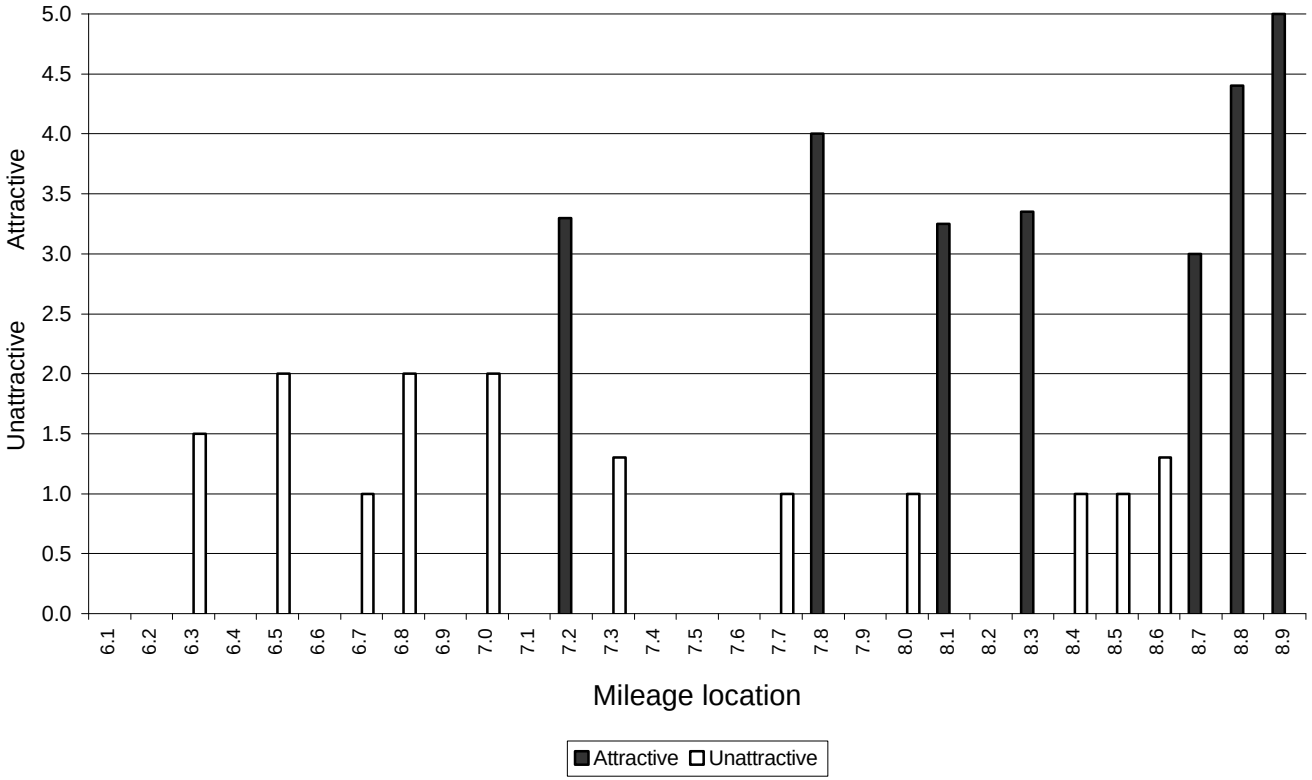
Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

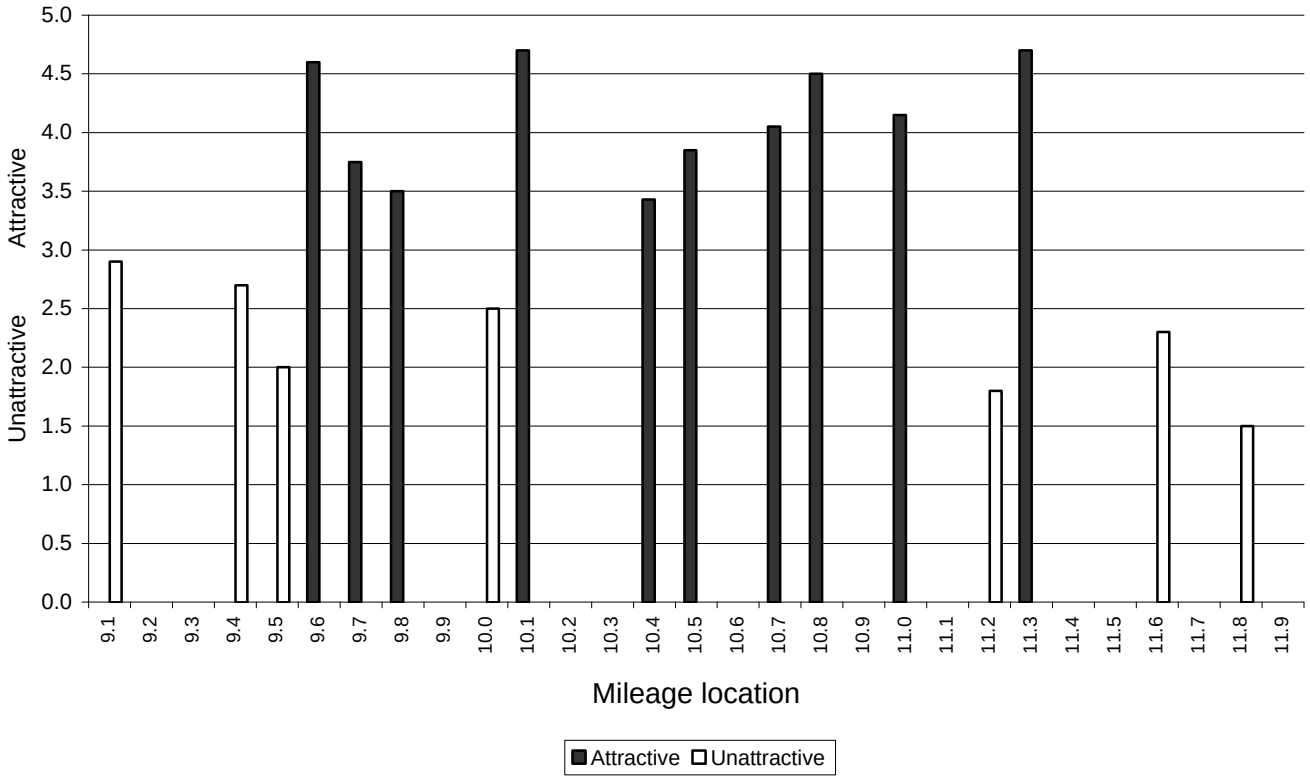
(3.1 -6 miles)



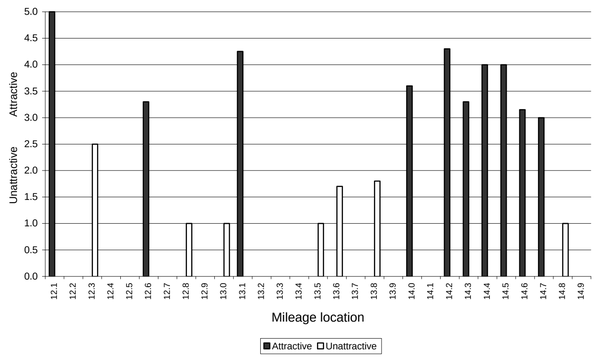
Twin Cities Metro- Mean Attractiveness Rating
by Mileage Location
(6.1 -9 miles)



Twin Cities Metro- Mean Attractiveness Rating
by Mileage Location
(9.1 -12 miles)



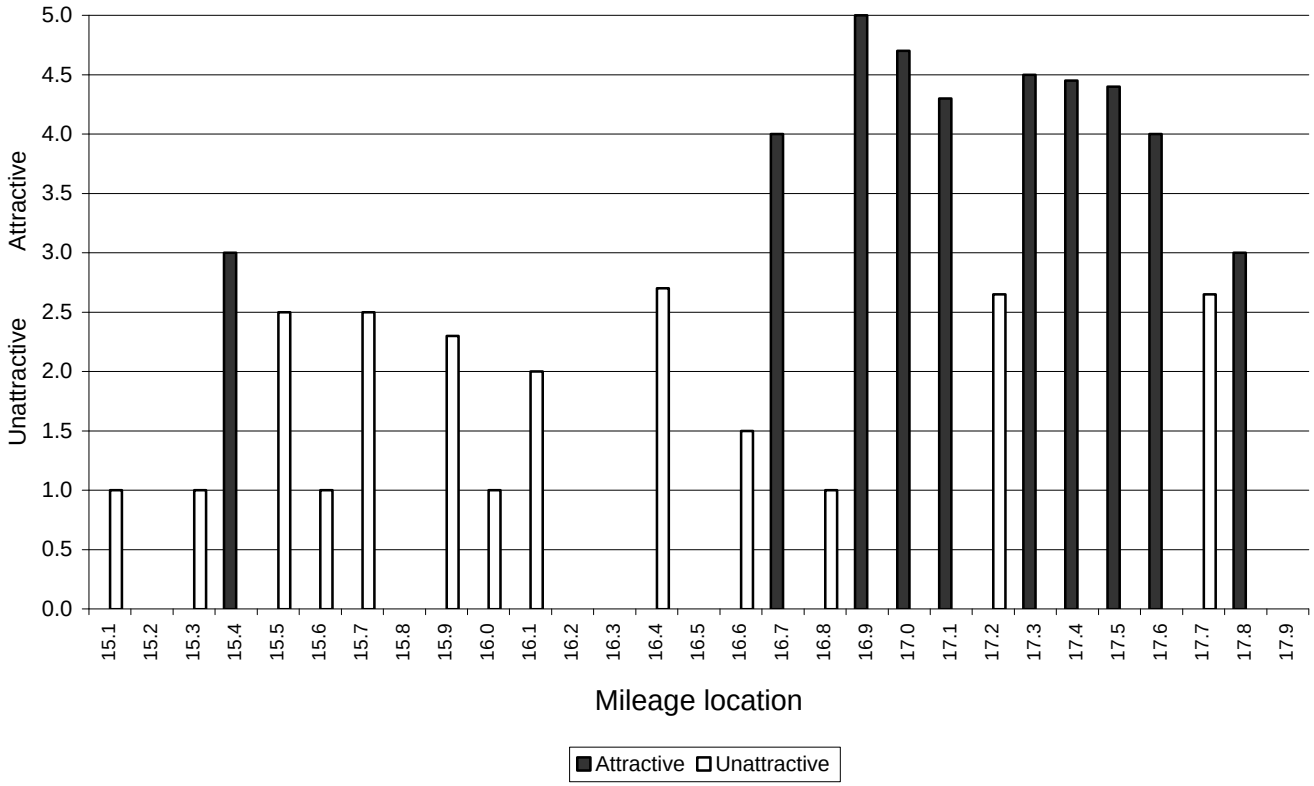
Twin Cities Metro- Mean Attractiveness Rating
by Mileage Location
(12.1 -15 miles)



Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

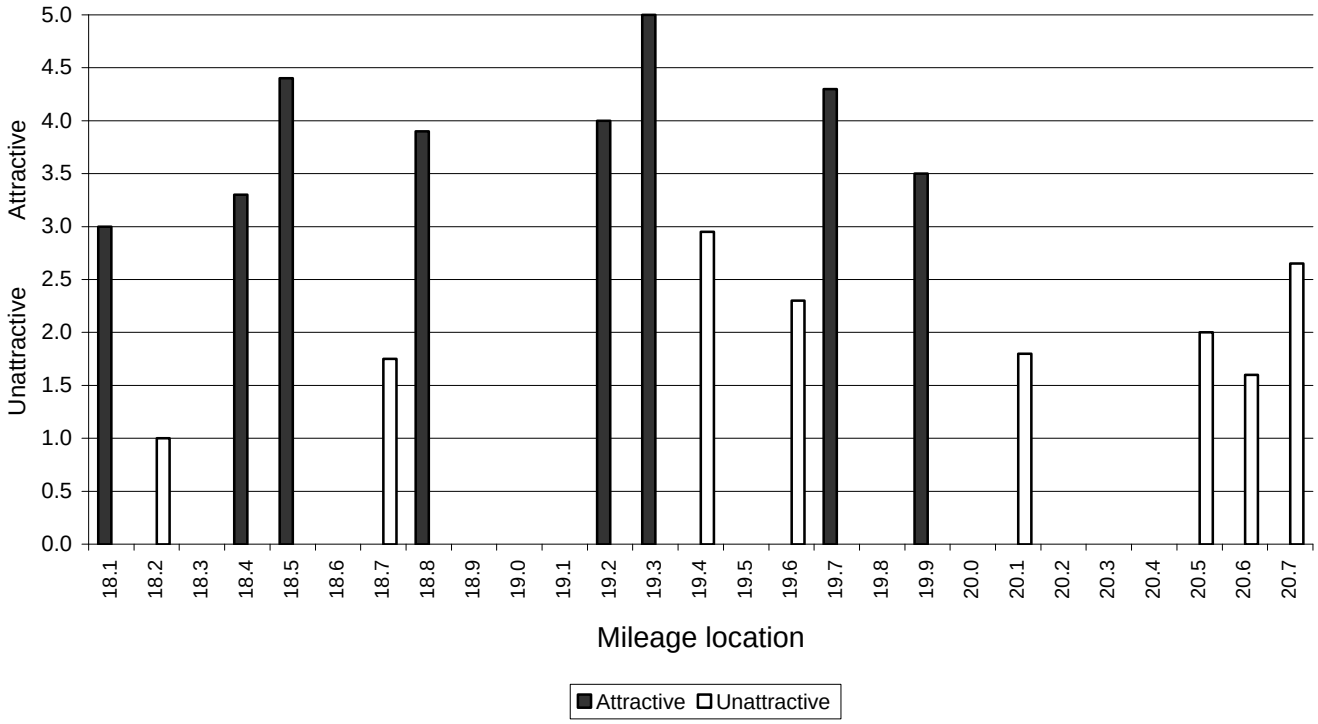
(15.1 -18 miles)



Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

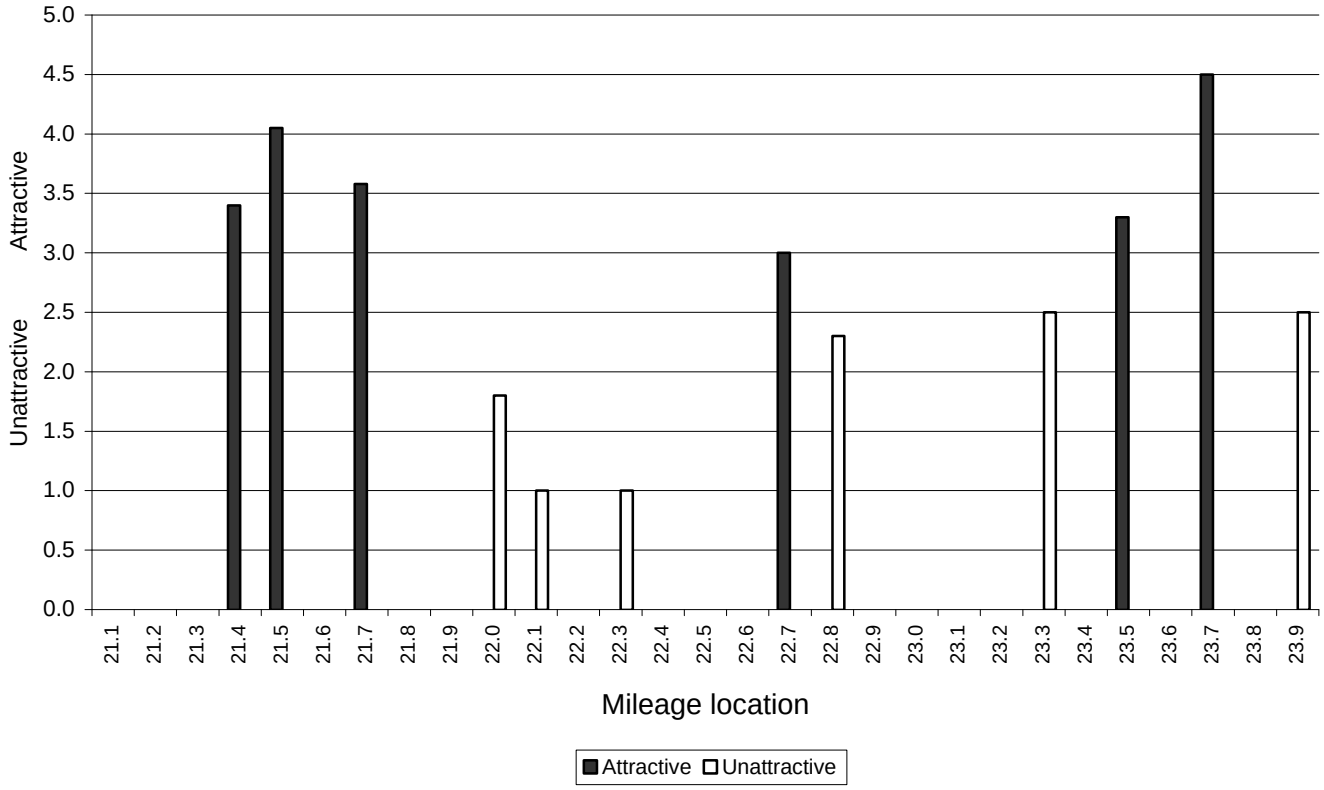
(18.1 -21 miles)



Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

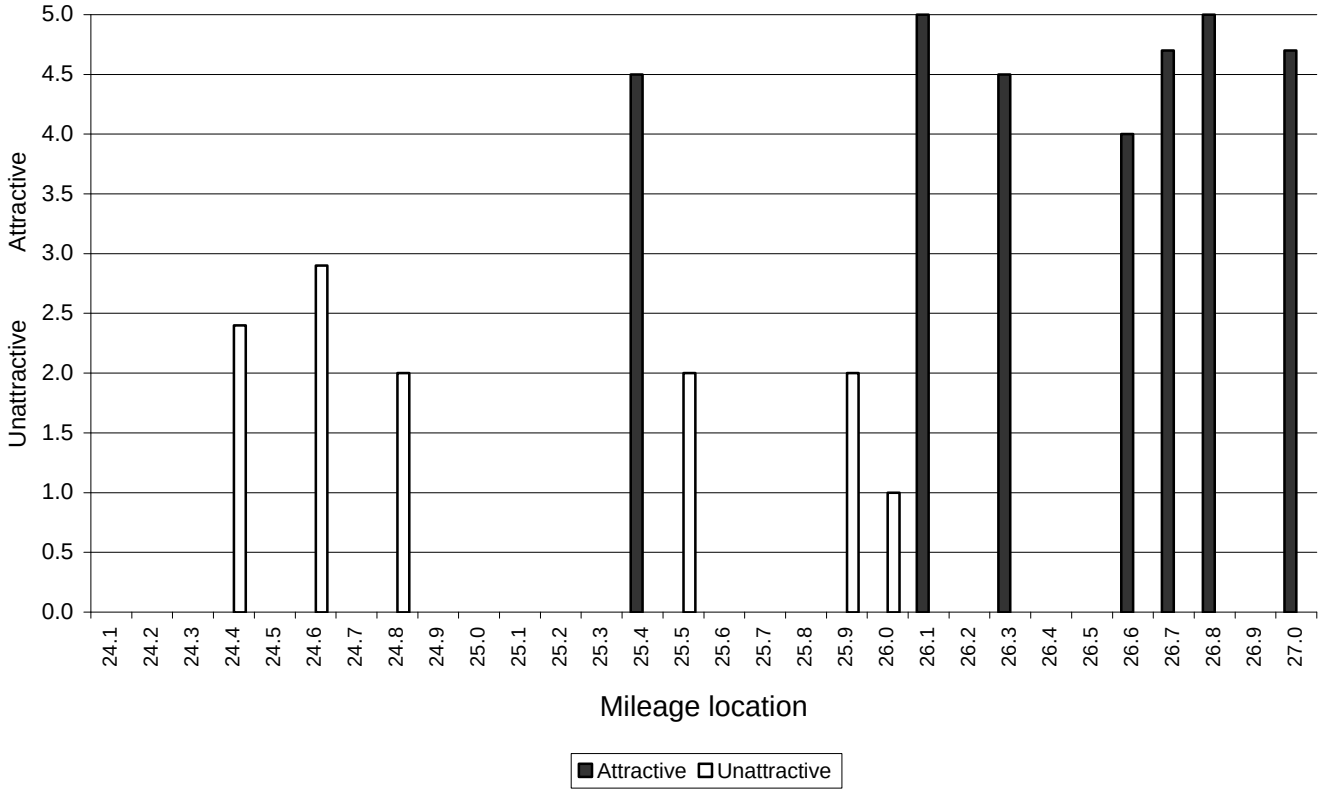
(21.1 -24 miles)



Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

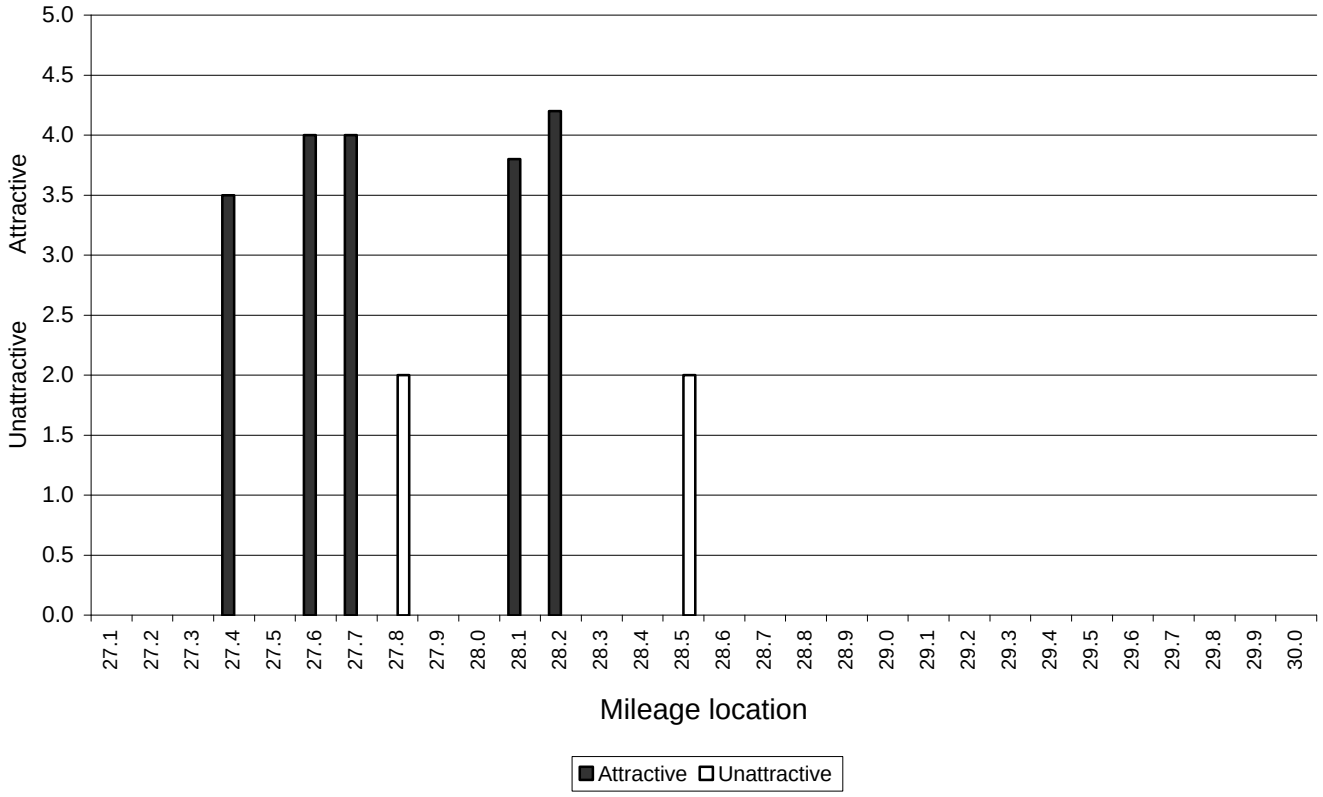
(24.1 -27 miles)



Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

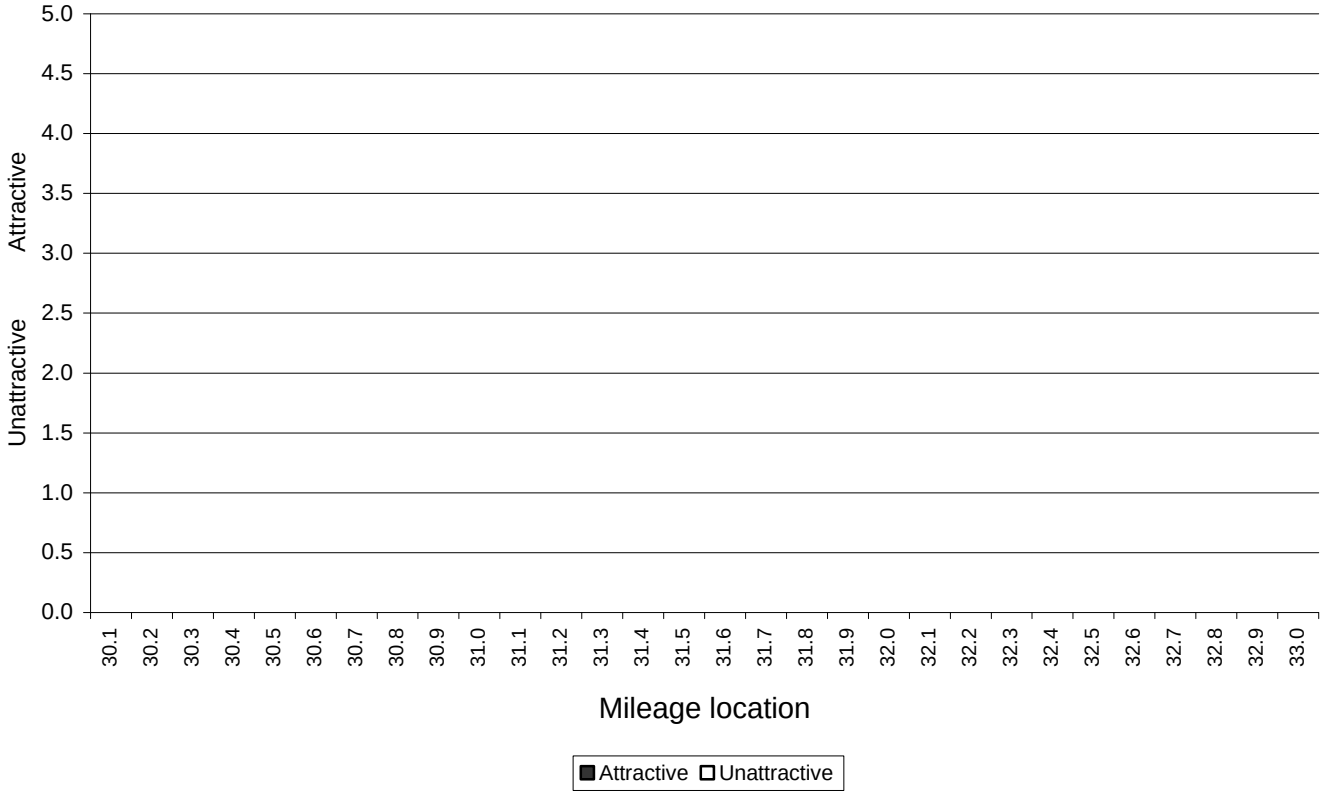
(27.1 -30 miles)



Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

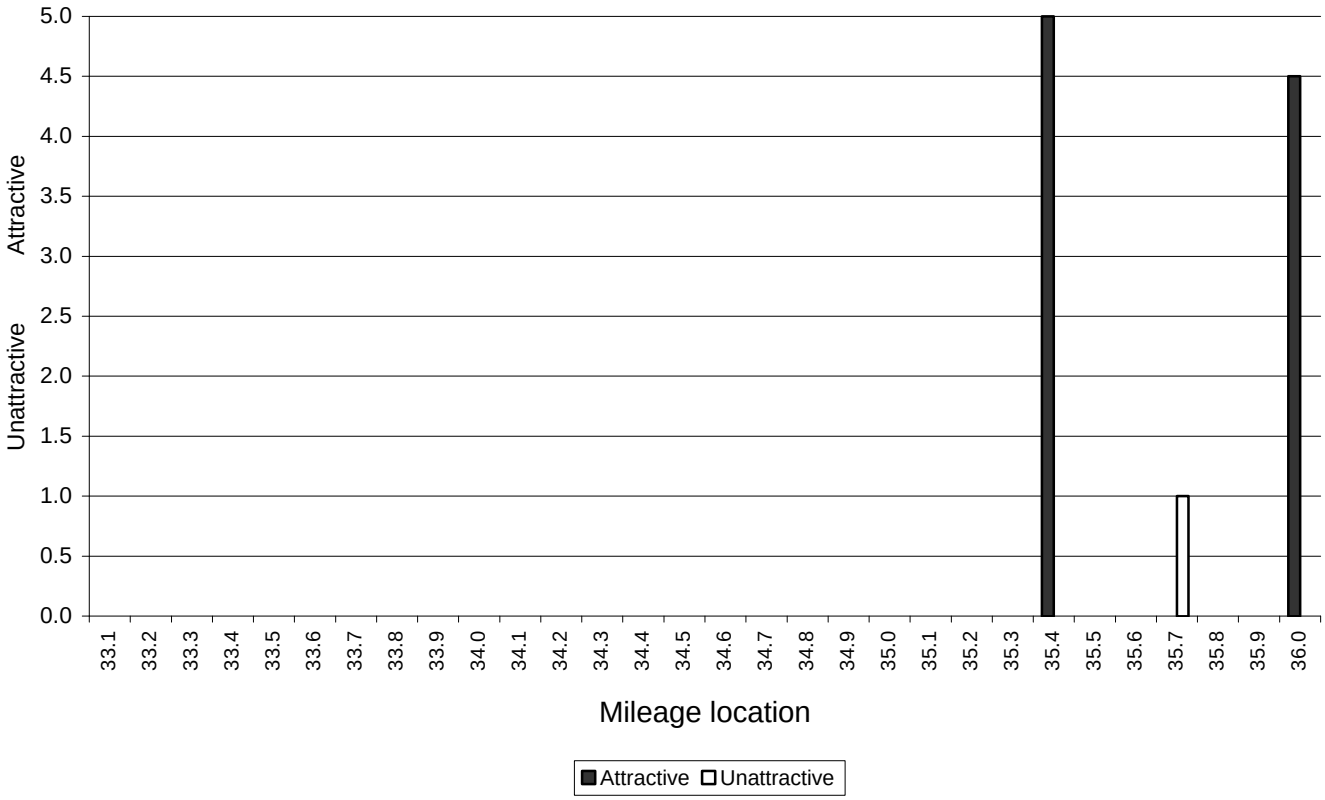
(30.1 -33 miles)



Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

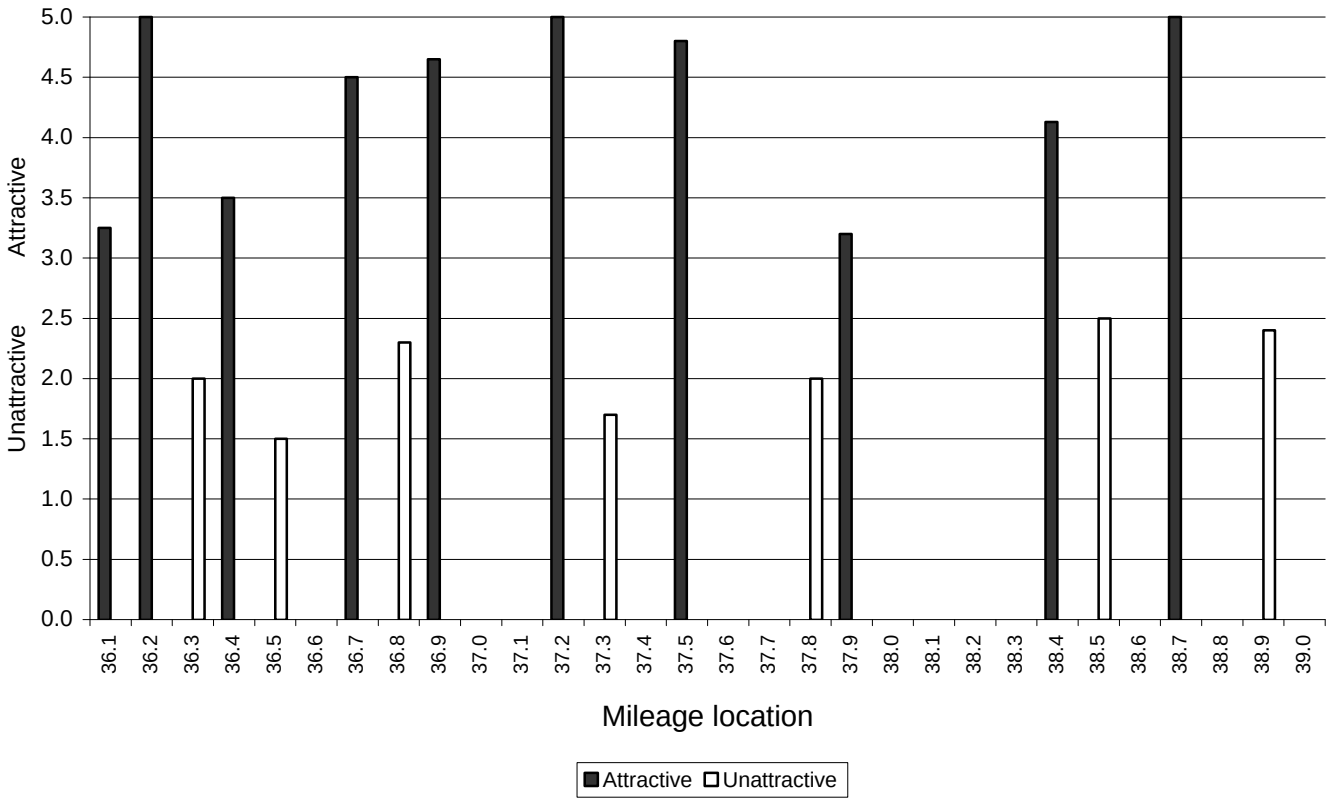
(33.1 -36 miles)



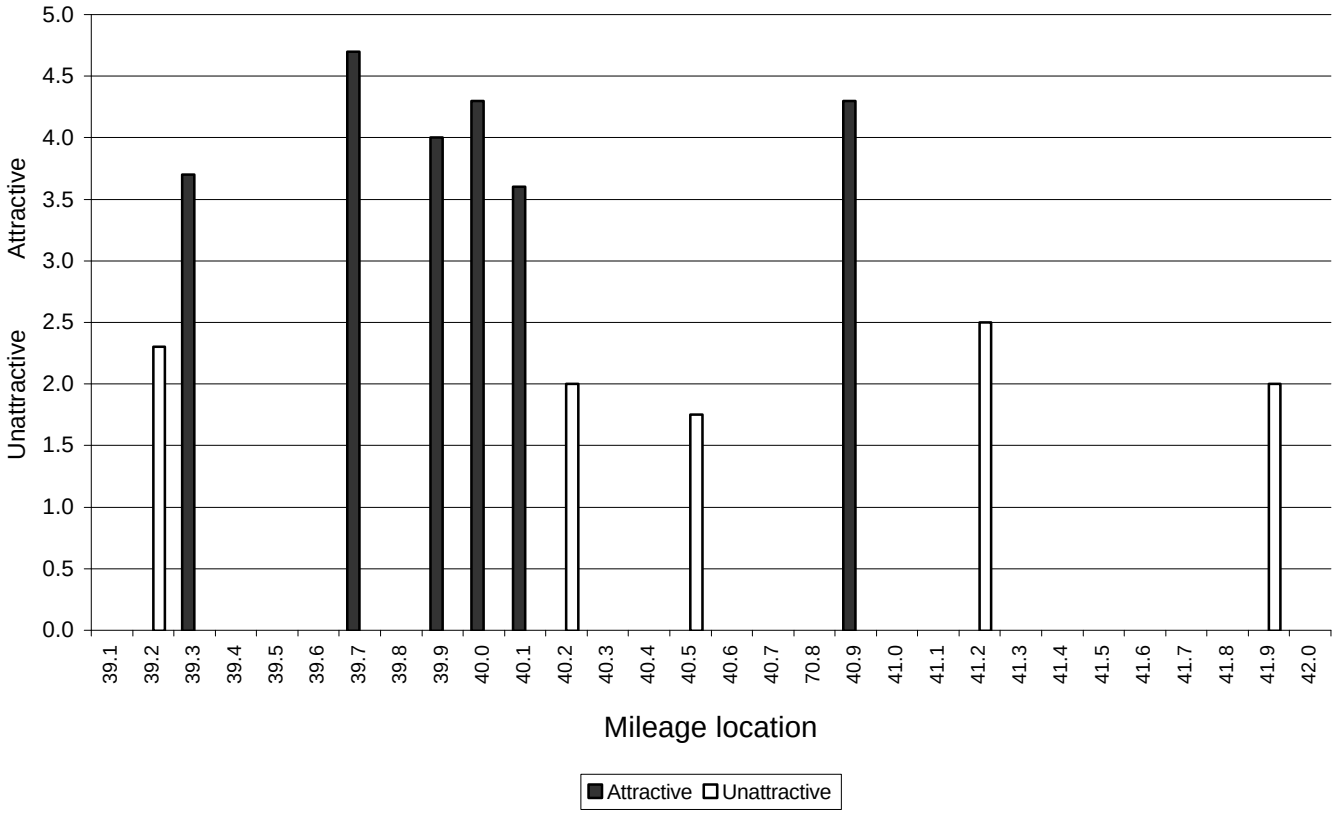
Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

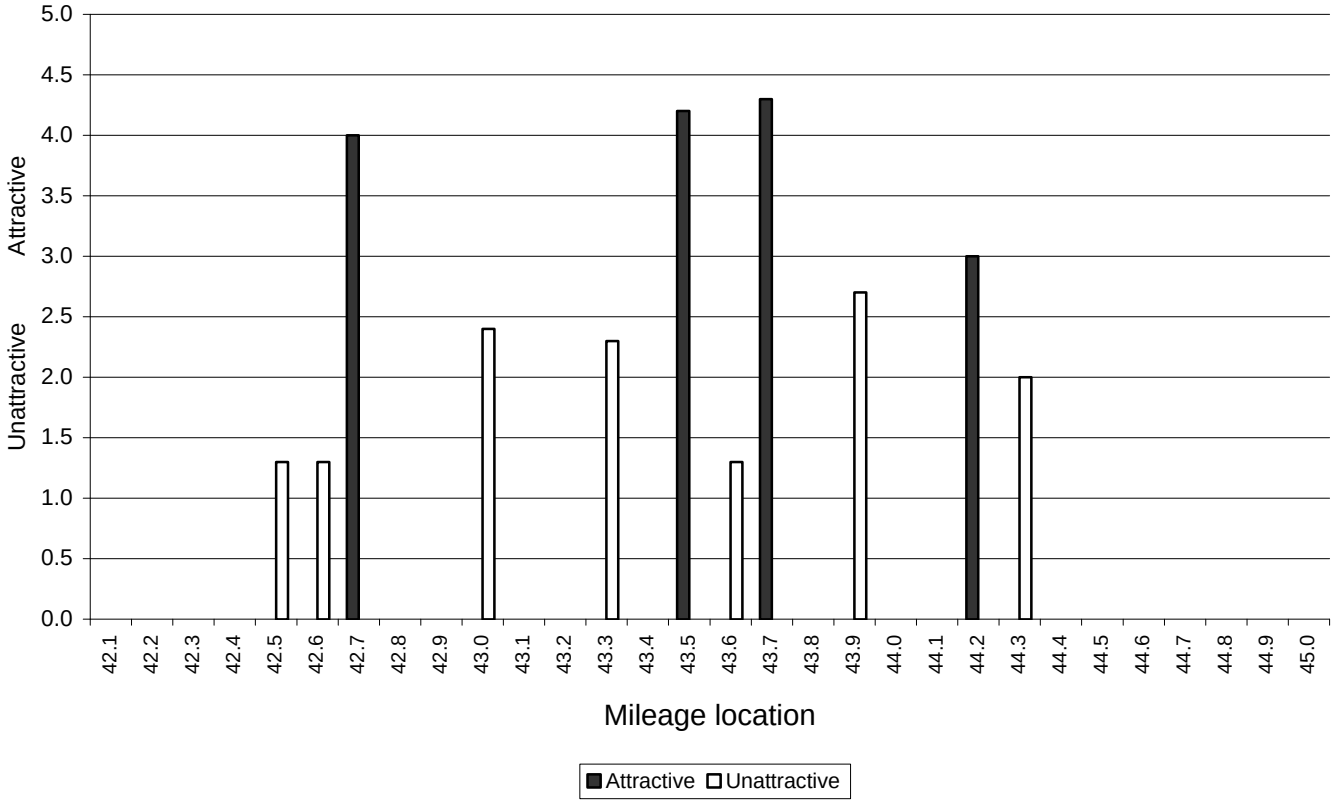
(36.1 -39 miles)



Twin Cities Metro- Mean Attractiveness Rating
by Mileage Location
(39.1 - 42 miles)



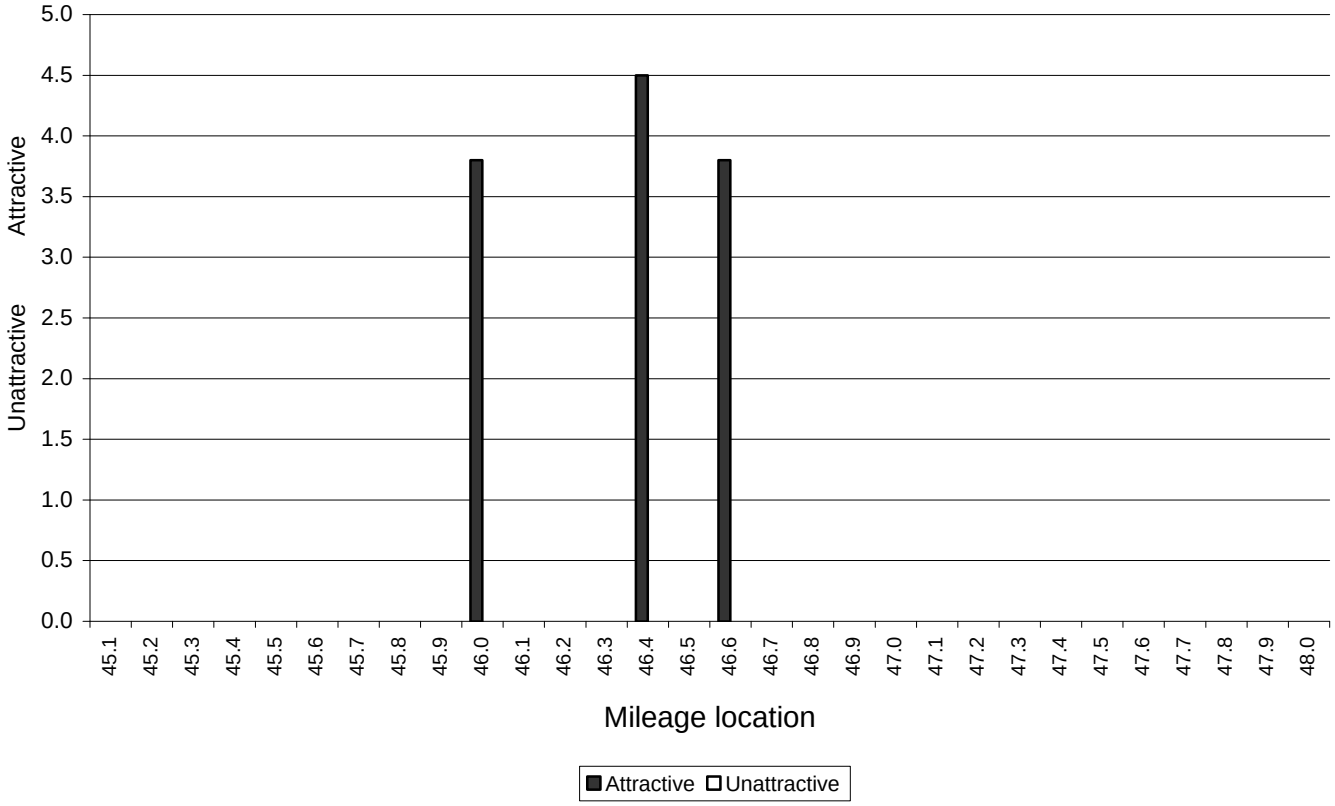
Twin Cities Metro- Mean Attractiveness Rating
by Mileage Location
(42.1 - 45 miles)



Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

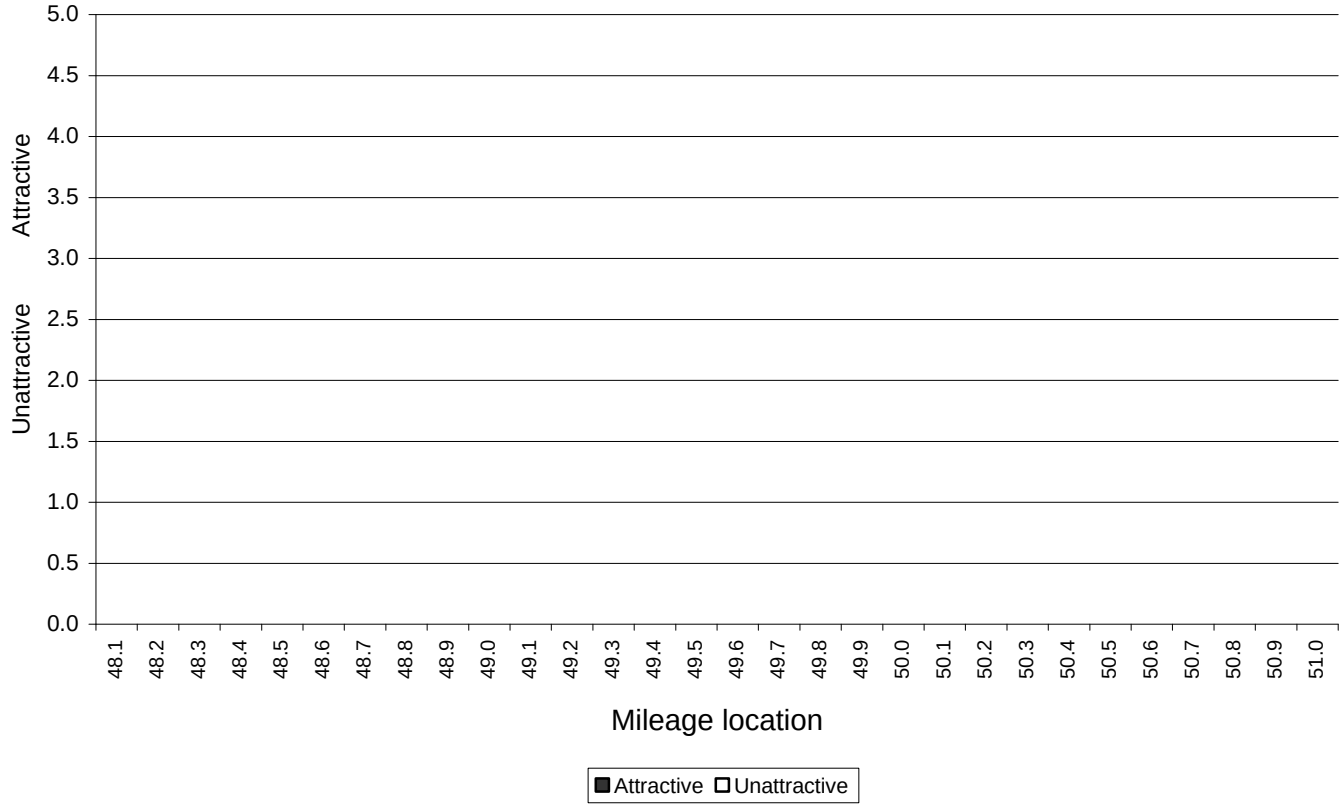
(45.1 - 48 miles)



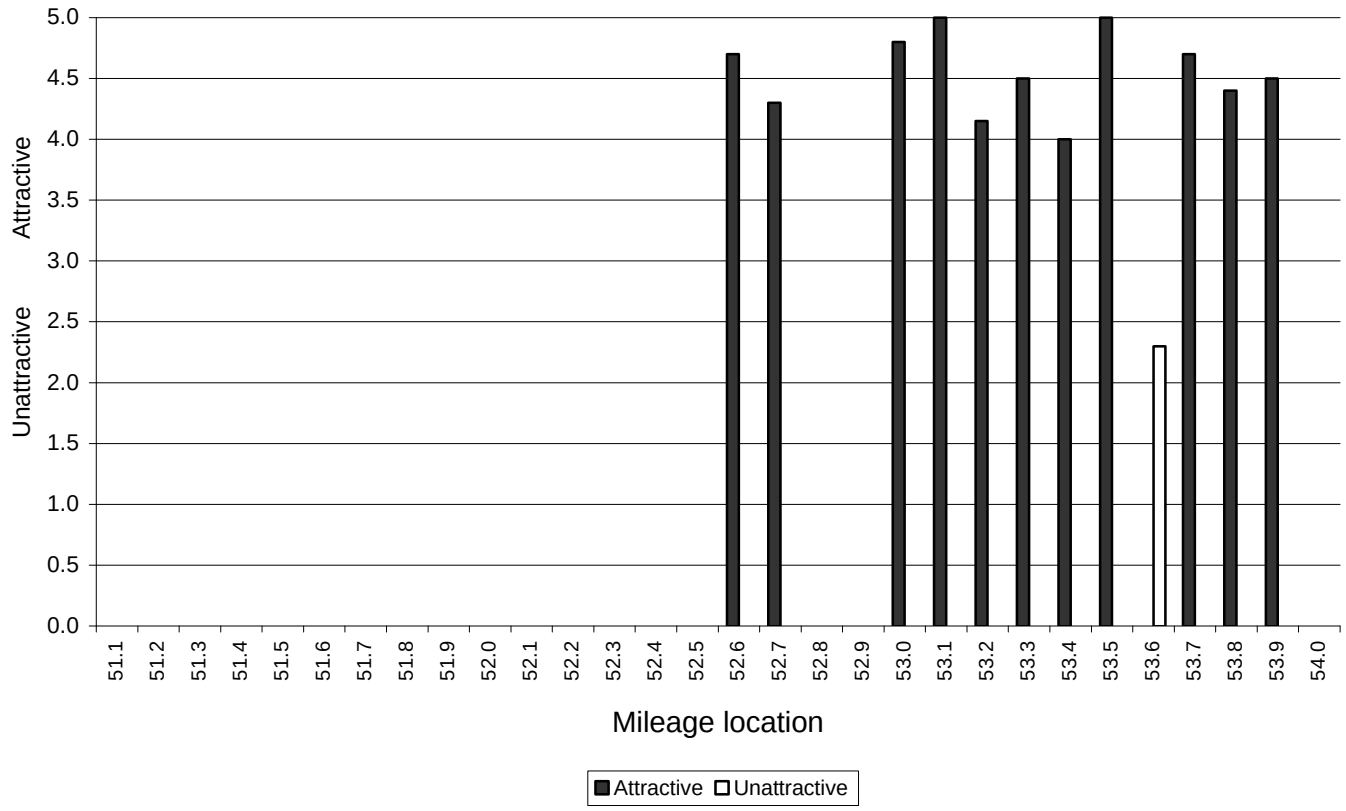
Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

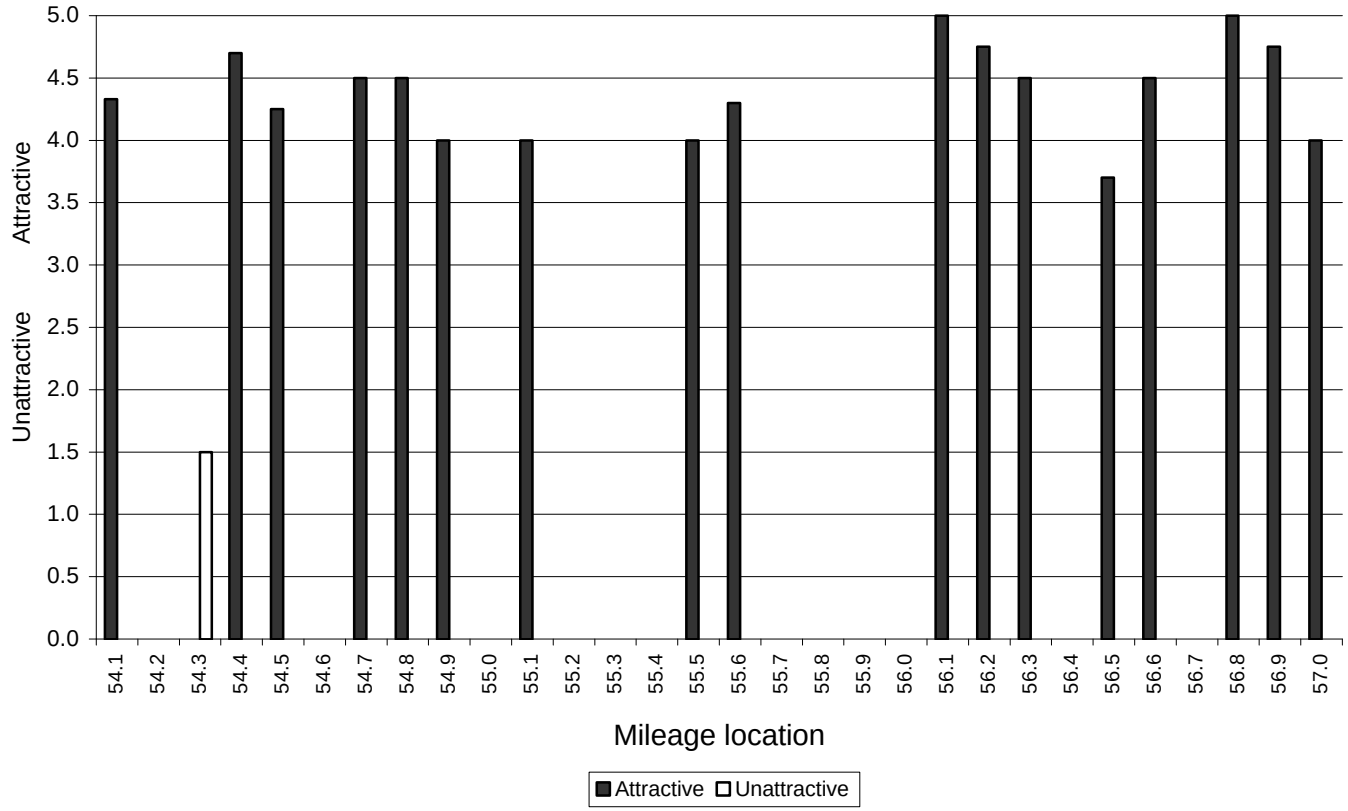
(48.1 - 51 miles)



Twin Cities Metro- Mean Attractiveness Rating
by Mileage Location
(51.1 - 54 miles)



Twin Cities Metro- Mean Attractiveness Rating
by Mileage Location
(54.1 - 57 miles)



Twin Cities Metro- Mean Attractiveness Rating

by Mileage Location

(57.1 - 60.5 miles)

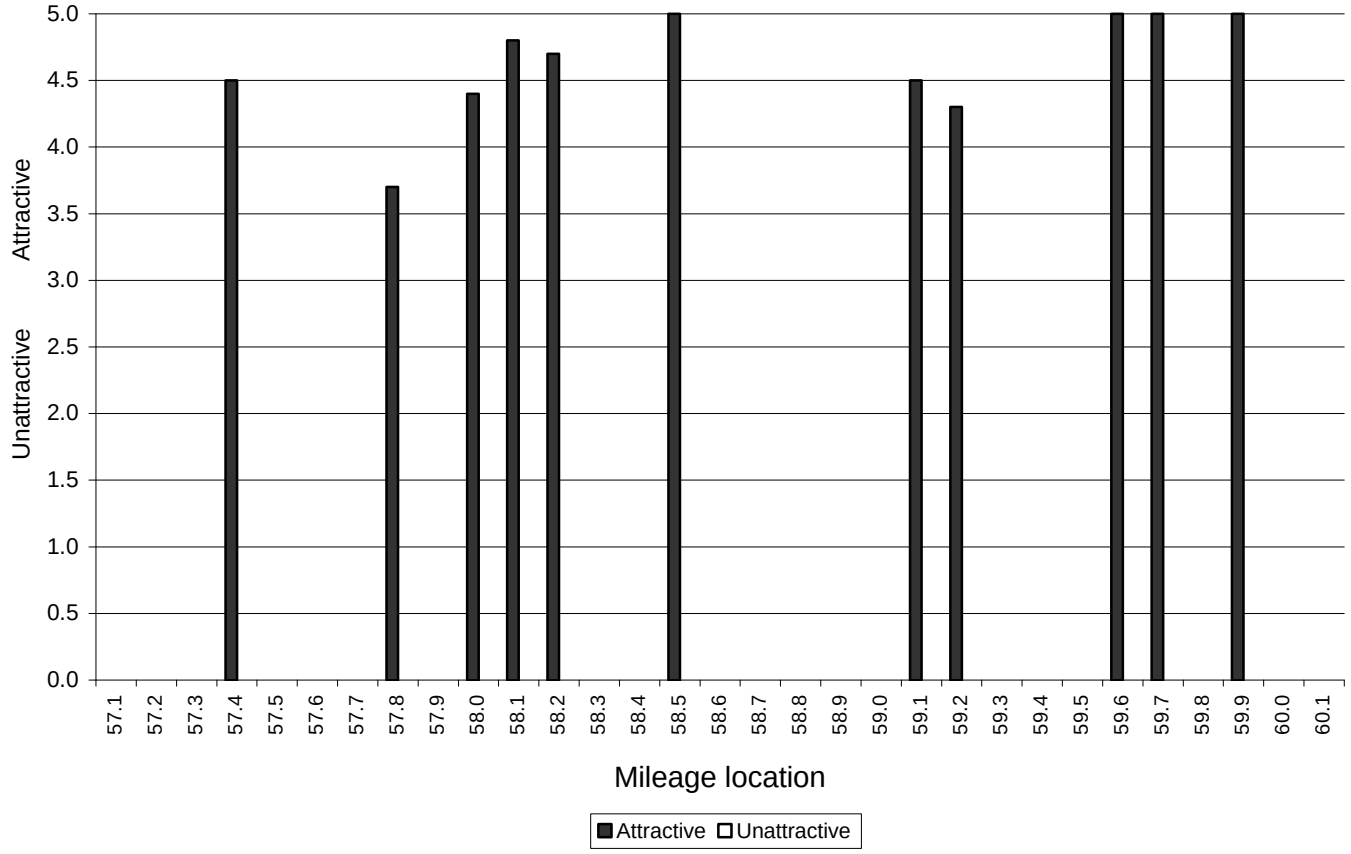


Table B.5 Twin Cities Metro Data Set

Mileage location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3	Attractive Descriptor 4
0.2	unattractive	1.7	sign	.	.	.	.	ugly or unattractive	.	.	.
0.4	unattractive	1	railing	.	.	.	.	incompatible	.	.	.
0.7	unattractive	2.5	bridge	.	.	.	.	ugly or unattractive	.	.	.
0.8	unattractive	2.3	median	.	.	.	.	dirty	.	.	.
1.3	unattractive	3.25	elevator	housing	.	.	.	ugly or unattractive	smooth	.	.
1.7	unattractive	2.5	grass	.	.	.	.	not natural	.	.	.
1.8	unattractive	1.25	bridge	sign	.	.	.	poor design	incompatible	.	.
2.3	unattractive	1.8	trailer	.	.	.	.	unkept	.	.	.
2.8	attractive	3.8	pedestrian overpass	.	.	.	.	trees	.	.	.
2.9	unattractive	1	building	.	.	.	.	too open	.	.	.
3.3	attractive	3.6	vista	bridge	.	.	.	vista	.	.	.
3.6	attractive	3.8	pedestrian overpass	.	.	.	.	trees	.	.	.
3.7	unattractive	3.3	pedestrian overpass	.	.	.	.	unkept	.	.	.
3.8	attractive	4	pedestrian overpass	.	.	.	.	safe	.	.	.
3.9	unattractive	1	sign	.	.	.	.	vegetation	.	.	.
4.1	unattractive	1.7	businesses	parking lot	.	.	.	unkept	.	.	.
4.3	attractive	3.95	lake	pond	.	.	.	rustic	plantings	.	.
4.4	attractive	4.8	lake	.	.	.	.	scenery	.	.	.
4.5	unattractive	2	trash	.	.	.	.	ugly or unattractive	.	.	.
4.6	unattractive	1	railing	.	.	.	.	incompatible	.	.	.
4.7	unattractive	3	railing	building	lake	.	.	poor design	well-maintained	.	.
5.1	attractive	5	trees	.	.	.	.	well-maintained	.	.	.
5.2	attractive	4.15	businesses	.	.	.	.	well-maintained	natural	.	.
5.3	attractive	3.8	fountain	.	.	.	.	inviting	.	.	.
5.4	unattractive	1.3	sign	.	.	.	.	too close	.	.	.
5.7	attractive	3.3	vista	.	.	.	.	vista	.	.	.
5.8	unattractive	1.3	median	.	.	.	.	urban	.	.	.
6.3	unattractive	1.5	sign	.	.	.	.	too large	.	.	.
6.5	unattractive	2	sign	.	.	.	.	too close	.	.	.
6.7	unattractive	1	sign	.	.	.	.	ugly or unattractive	.	.	.
6.8	unattractive	2	highway	trash	.	.	.	trash	.	.	.
7	.	2	.	.	.	.	.	.	.	.	.
7.2	unattractive	3.3	wall	.	.	.	.	unkept	.	.	.
7.3	unattractive	1.3	median	trash	.	.	.	poor design	.	.	.
7.7	unattractive	1	trees	.	.	.	.	unkept	.	.	.
7.8	attractive	4	sign	.	.	.	.	picture on billboard	.	.	.
8	unattractive	1	median	.	.	.	.	monotonous	.	.	.
8.1	attractive	3.25	skyline	railing		.	.	trees			
8.3	unattractive	3.35	wall	skyline	urban	.	.	old	vista	.	.
8.4	unattractive	1	sign	.	.	.	.	too large	.		
8.5	attractive	1	bridge	.	.	.	.	efficient	.	.	.
8.6	unattractive	1.3	sign			.	.	blocks view			
8.7	unattractive	3	sign	skyline	pedestrian overpass	.	.	incompatible	sentimental	unkept	.
8.8	attractive	4.4	skyline	.	.	.	.	nice	.		
8.9	attractive	5	plantings	trees	.	.	.	variety	.	.	.
9	unattractive	1	sign	.		.	.	incompatible			
9.1	unattractive	2.9	sign	landmark bld	skyline	.	.	incompatible	shape	architecture	.
9.4	unattractive	2.7	sign	.	.	.	.	too large	.		
9.5	unattractive	2	highway	.	.	.	.	no plantings	.	.	.

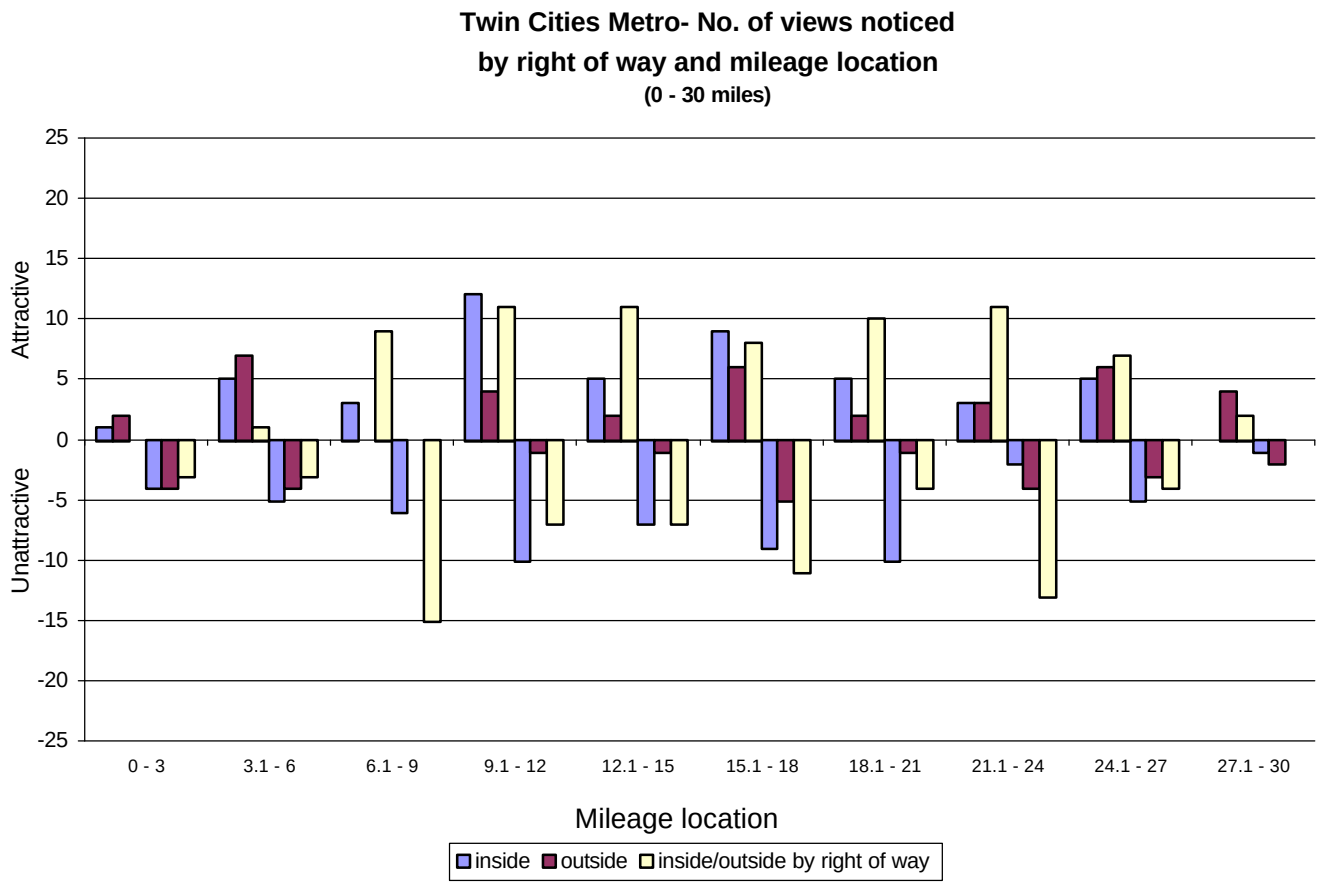
Mileage location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3	Attractive Descriptor 4
9.6	attractive	4.6	bridge	pedestrian overpass	.	.	.	detail	lights	.	.
9.7	attractive	3.75	median	highway	.	.	.	efficient	.	.	.
9.8	attractive	3.5	pedestrian overpass	.	.	.	.	inviting	.	.	.
10	attractive	2.5	plantings	wall	pedestrian overpass	33	.	softens building	plantings	.	.
10.1	attractive	4.7	wall	plantings	.	.	.	plantings	.	.	.
10.4	attractive	3.43	bridge	wall	walks	.	.	pleasant	.	lights	.
10.5	attractive	3.85	highway	median	wetland	.	.	curving	nice	.	.
10.7	attractive	4.05	bridge	wall	trees	.	.	wonderful	concrete	unity	.
10.8	attractive	4.5	landmark bld	.	.	.	.	old	.	.	.
11	attractive	4.15	building	.	.	.	.	nice	.	.	.
11.2	unattractive	1.8	highway	.	.	.	.	trash	.	.	.
11.3	attractive	4.7	wall	.	.	.	.	nice	.	.	.
11.6	unattractive	2.3	junk	.	.	.	.	unkept	.	.	.
11.8	unattractive	1.5	bridge	pedestrian overpass	.	.	.	chain link	rusty	.	.
12	attractive	3.3	sign	.	.	.	.	information	.	.	.
12.1	attractive	5	trees	.	.	.	.	variety	.	.	.
12.3	unattractive	2.5	pedestrian overpass	.	.	.	.	rusty	.	.	.
12.6	attractive	3.3	pedestrian overpass	people	.	.	.	efficient	.	.	.
12.8	unattractive	1	railing	.	.	.	.	ugly or unattractive	.	.	.
13	unattractive	1	bridge	pedestrian overpass	.	.	.	ugly or unattractive	.	.	.
13.1	attractive	4.25	bridge	railing	.	.	.	detail	rusty	.	.
13.5	unattractive	1	sign	.	.	.	.	too large	.	.	.
13.6	unattractive	1.7	sign	.	.	.	.	too many	.	.	.
13.8	unattractive	1.8	construction	.	.	.	.	ugly or unattractive	.	.	.
14	attractive	3.6	grass	trees	sign	.	.	wonderful	softens building	.	.
14.2	attractive	4.3	vista	.	.	.	.	nice	.	.	.
14.3	attractive	3.3	trees	.	.	.	.	shape	.	.	.
14.4	attractive	4	flowers	.	.	.	.	colors	.	.	.
14.5	attractive	4	plantings	.	.	.	.	softens building	.	.	.
14.6	unattractive	3.15	railroad bri	trees	.	.	.	dreary	character	too few	.
14.7	attractive	3	railroad bri	.	.	.	.	shape	.	.	.
14.8	unattractive	1	sign	.	.	.	.	incompatible	.	.	.
15	attractive	3.95	skyline	plantings	trees	.	.	trees	softens building	.	.
15.1	unattractive	1	railing	sign	.	.	.	incompatible	.	.	.
15.3	unattractive	1	wall	railing	sign	.	.	weeds	incompatible	.	.
15.4	unattractive	3	housing	.	.	.	.	no noise barrier	.	.	.
15.5	unattractive	2.5	bridge	.	.	.	.	rusty	.	.	.
15.6	unattractive	1	sign	.	.	.	.	ugly or unattractive	.	.	.
15.7	unattractive	2.5	concrete	weeds	.	.	.	weeds	unkept	.	.
15.9	unattractive	2.3	construction	.	.	.	.	ugly or unattractive	.	.	.
16	unattractive	1	pedestrian overpass	.	.	.	.	rusty	.	.	.
16.1	unattractive	2	construction	pedestrian overpass	.	.	.	needs care	ugly or unattractive	.	.
16.4	unattractive	2.7	wall	skyline	.	.	.	too large	near	.	.
16.6	unattractive	1.5	railroad	.	.	.	.	rusty	.	.	.
16.7	attractive	4	bridge	.	.	.	.	ornamental	.	.	.
16.8	attractive	1	bridge	.	.	.	.	efficient	.	.	.
16.9	attractive	5	bridge	.	.	.	.	vista	.	.	.
17	attractive	4.7	skyline	.	.	.	.	wonderful	emphasize	.	.
17.1	attractive	4.3	skyline	.	.	.	.	vista	.	.	.
17.2	attractive	2.65	bridge	building	wall	.	.	well-maintained	harsh	.	.

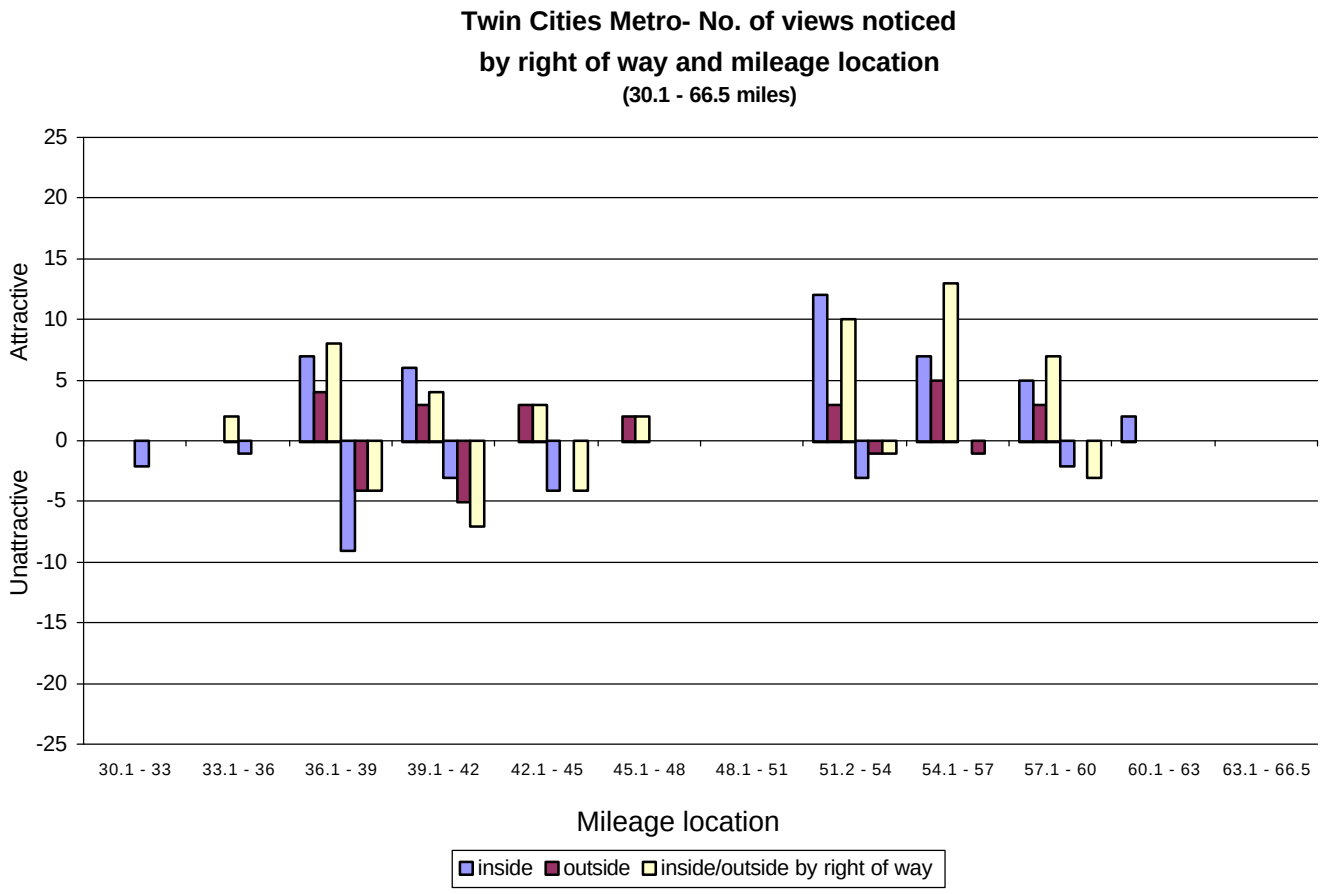
Mileage location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3	Attractive Descriptor 4
17.3	attractive	4.5	bridge	river	vista	.	.	well-maintained	vista	river	.
17.4	attractive	4.45	bridge	river	.	.	.	pleasant	shape	.	.
17.5	attractive	4.4	river	trees	.	.	.	unity	shape	.	.
17.6	attractive	4	river	walks	.	.	.	well-maintained	.	.	.
17.7	unattractive	2.65	pedestrian overpass	wall	.	.	.	rusty	well-maintained	.	.
17.8	attractive	3	highway	wall	.	.	.	pattern	.	.	.
18	unattractive	1.7	sign	.	.	.	.	blocks view	.	.	.
18.1	unattractive	3	trees	.	.	.	.	ugly or unattractive	.	.	.
18.2	unattractive	1	wall	.	.	.	.	too large	.	.	.
18.4	attractive	3.3	plantings	trees	.	.	.	vista	.	.	.
18.5	attractive	4.4	skyline	.	.	.	.	vista	.	.	.
18.7	unattractive	1.75	guardrail	roadside	.	.	.	rusty	dirty	.	.
18.8	attractive	3.9	landmark bld	skyline	.	.	.	interesting	landmark	.	.
19.2	attractive	4	housing	.	.	.	.	shape	.	.	.
19.3	attractive	5	wall	plantings	.	.	.	pleasant	.	.	.
19.4	unattractive	2.95	bridge	railing	plantings	.	.	rusty	softens building	.	.
19.6	unattractive	2.3	pedestrian overpass	.	.	.	.	dangerous	.	.	.
19.7	attractive	4.3	grass	plantings	.	.	.	natural	.	.	.
19.9	attractive	3.5	wall	.	.	.	.	good	.	.	.
20.1	unattractive	1.8	tunnel	.	.	.	.	unkept	.	.	.
20.5	unattractive	2	tunnel	.	.	.	.	needs care	.	.	.
20.6	unattractive	1.6	tunnel	.	.	.	.	dirty	.	.	.
20.7	unattractive	2.65	highway	tunnel	.	.	.	needs care	dirty	.	.
20.8	unattractive	2.9	highway	pedestrian overpass	.	.	.	dreary	unique	.	.
20.9	attractive	4.3	pedestrian overpass	.	.	.	.	well-maintained	.	.	.
21	unattractive	1	construction	.	.	.	.	industrial	.	.	.
21.4	attractive	3.4	landscape	businesses	.	.	.	nice	.	.	.
21.5	unattractive	4.05	homeless people	parking lot	junkyard	122	38	dreary	no plantings	ugly or unattractive	unkept
21.7	attractive	3.58	skyline	Park	wall	.	.	variety	nice	.	.
22	unattractive	1.8	excavation	.	.	.	.	too large	.	.	.
22.1	unattractive	1	congestion	.	.	.	.	dangerous	.	.	.
22.3	unattractive	1	utility line	.	.	.	.	rusty	.	.	.
22.7	attractive	3	pedestrian overpass	.	.	.	.	safe	.	.	.
22.8	unattractive	2.3	wall	.	.	.	.	ugly or unattractive	.	.	.
23.3	attractive	2.5	plantings	bridge	sign	51	.	variety	too many	.	.
23.5	attractive	3.3	wall	.	.	.	.	variety	.	.	.
23.7	attractive	4.5	ditch	.	.	.	.	pleasant	.	.	.
23.9	unattractive	2.5	wall	plantings	utility line	.	.	unkept	screened	.	.
24	attractive	4	pedestrian overpass	plantings	.	.	.	variety	.	.	.
24.4	unattractive	2.4	sign	concrete	trash	53	.	incompatible	weeds	.	.
24.6	attractive	2.9	railing	median	.	.	.	softens building	weeds	.	.
24.8	unattractive	2	building	.	.	.	.	monotonous	.	.	.
25.4	attractive	4.5	wall	trees	.	.	.	nice	.	.	.
25.5	unattractive	2	building	.	.	.	.	too close	.	.	.
25.9	attractive	2	pedestrian overpass	building	highway	25	.	shape	.	.	.
26	unattractive	1	guardrail	.	.	.	.	blocks view	.	.	.
26.1	attractive	5	landscape	pond	.	.	.	nice	.	.	.
26.3	attractive	4.5	businesses	plantings	.	.	.	orderly	.	.	.
26.6	attractive	4	businesses	.	.	.	.	well-maintained	.	.	.
26.7	attractive	4.7	businesses	plantings	.	.	.	trees	well-maintained	.	.

Mileage location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3	Attractive Descriptor 4
26.8	attractive	5	businesses	plantings	pond	.	.	wonderful	.	.	.
27	attractive	4.7	lake	pedestrian overpass	trees	.	.	rock	natural	.	.
27.4	attractive	3.5	businesses	housing	.	.	.	location	rural	.	.
27.6	attractive	4	Park	.	.	.	.	flowers	.	.	.
27.7	attractive	4	trees	.	.	.	.	shape	.	.	.
27.8	unattractive	2	businesses	parking lot	.	.	.	urban	.	.	.
28.1	attractive	3.8	flag	.	.	.	.	sky	.	.	.
28.2	attractive	4.2	Park	.	.	.	.	sentimental	variety	.	.
28.5	unattractive	2	businesses	.	.	.	.	old	.	.	.
35.4	attractive	5	landscape	.	.	.	.	variety	.	.	.
35.7	unattractive	1	median	railing	.	.	.	ugly or unattractive	.	.	.
36	attractive	4.5	landscape	.	.	.	.	natural	.	.	.
36.1	attractive	3.25	lights	pedestrian overpass	.	.	.	nice	.	.	.
36.2	attractive	5	building	vista	.	.	.	historic	.	.	.
36.3	unattractive	2	pedestrian overpass	.	.	.	.	old	.	.	.
36.4	attractive	3.5	building	bridge	.	.	.	deteriorated	.	.	.
36.5	unattractive	1.5	bridge	.	.	.	.	deteriorated	.	.	.
36.7	attractive	4.5	plantings	wall	.	.	.	trees	.	.	.
36.8	unattractive	2.3	concrete	median	wall	.	.	typical	.	.	.
36.9	attractive	4.65	highway	.	.	.	.	softens building	.	.	.
37.2	attractive	5	trees	.	.	.	.	variety	.	.	.
37.3	unattractive	1.7	congestion	.	.	.	.	dangerous	.	.	.
37.5	attractive	4.8	pedestrian overpass	.	.	.	.	variety	.	.	.
37.8	unattractive	2	bridge	vista	.	.	.	incompatible	.	.	.
37.9	attractive	3.2	housing	landscape	trash	.	.	trees	.	.	.
38.4	attractive	4.13	plantings	wall	.	.	.	natural	variety	.	.
38.5	unattractive	2.5	pedestrian overpass	.	.	.	.	dirty	.	.	.
38.7	attractive	5	bridge	.	.	.	.	trees	no wildflower	.	.
38.9	unattractive	2.4	sign	pedestrian overpass	.	.	.	too large	trees	weeds	.
39.2	unattractive	2.3	bridge	river	.	.	.	poor design	.	.	.
39.3	attractive	3.7	wall	.	.	.	.	trees	.	.	.
39.7	attractive	4.7	bridge	railing	.	.	.	interesting	.	.	.
39.9	attractive	4	housing	vista	.	.	.	scenery	.	.	.
40	attractive	4.3	bridge	railing	.	.	.	unique	.	.	.
40.1	attractive	3.6	trees	bus stop	utility line	122	49	vista	safe	.	well-maintained
40.2	unattractive	2	trash	.	.	.	.	trash	.	.	.
40.5	unattractive	1.75	sign	vista	.	.	.	poor design	too large	.	.
40.9	attractive	4.3	skyline	.	.	.	.	vista	.	.	.
41.2	unattractive	2.5	sign	vista	.	.	.	blocks view	.	.	.
41.9	unattractive	2	sign	vista	.	.	.	too large	.	.	.
42.5	unattractive	1.3	sign	.	.	.	.	location	.	.	.
42.6	unattractive	1.3	sign	.	.	.	.	ugly or unattractive	.	.	.
42.7	attractive	4	landmark bld	.	.	.	.	homes	.	.	.
43	unattractive	2.4	wall	grass	highway	.	.	poor design	unmown	.	.
43.3	unattractive	2.3	wall	.	.	.	.	poor design	.	.	.
43.5	attractive	4.2	skyline	vista	.	.	.	softens building	.	.	.
43.6	unattractive	1.3	bridge	.	.	.	.	rusty	.	.	.
43.7	attractive	4.3	skyline	vista	.	.	.	pleasant	.	.	.
43.9	attractive	2.7	sign	.	.	.	.	information	.	.	.
44.2	unattractive	3	pedestrian overpass	.	.	.	.	poor design	.	.	.

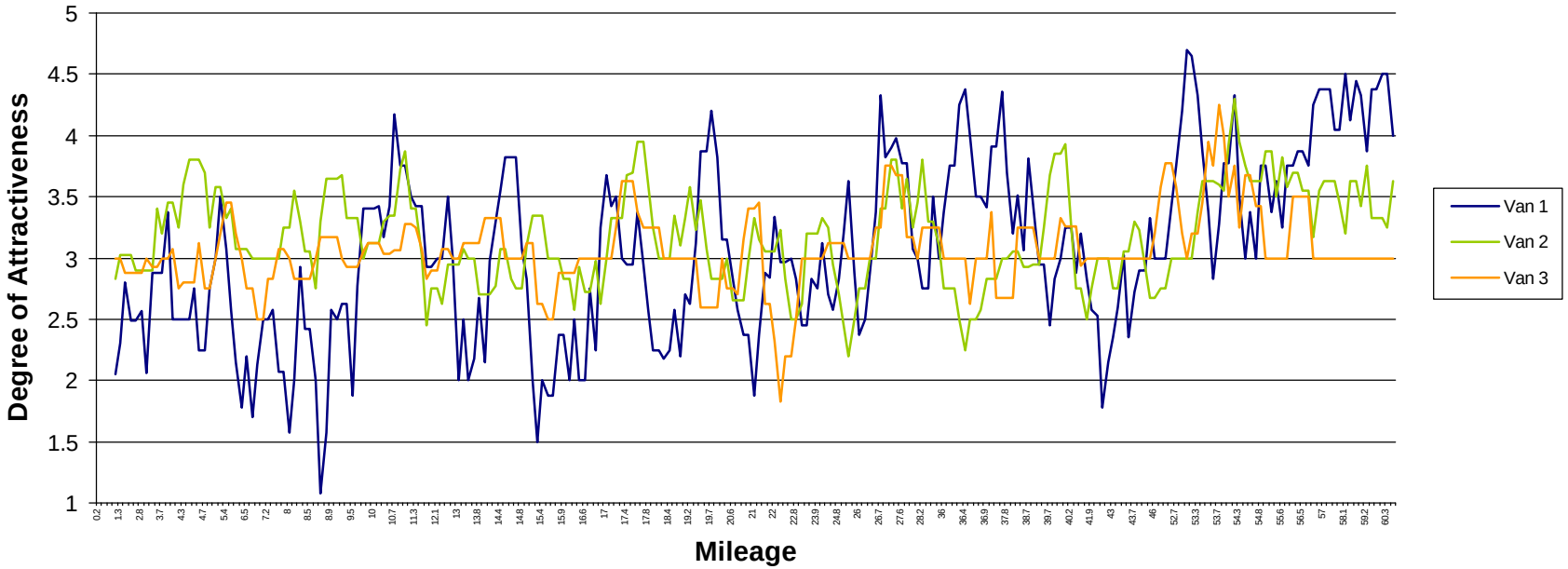
Mileage location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3	Attractive Descriptor 4
44.3	unattractive	2	pedestrian overpass	.	.	.	.	deteriorated	.	.	.
46	attractive	3.8	river	vista	.	.	.	vista	river	.	.
46.4	attractive	4.5	wall	.	.	.	.	unity	.	.	.
46.6	attractive	3.8	plantings	.	.	.	.	nice	.	.	.
52.6	attractive	4.7	plantings	.	.	.	.	variety	.	.	.
52.7	attractive	4.3	railing	.	.	.	.	well-maintained	.	.	.
53	attractive	4.8	plantings	.	.	.	.	attractive or beautiful	.	.	.
53.1	attractive	5	median	.	.	.	.	plantings	.	.	.
53.2	unattractive	4.15	vista	highway	railing	.	.	blocks view	.	not chainlink	.
53.3	attractive	4.5	pedestrian overpass	plantings	.	.	.	well-maintained	.	.	.
53.4	attractive	4	building	pedestrian overpass	bridge	33	.	trees	.	.	.
53.5	attractive	5	median	rock	trees	.	.	unique	.	.	.
53.6	attractive	2.3	sign	.	.	.	.	information	.	.	.
53.7	attractive	4.7	vista	plantings	rock	23	44	vista	open	safe	.
53.8	attractive	4.4	wall	concrete	.	.	.	plantings	.	.	.
53.9	attractive	4.5	median	.	.	.	.	rock	.	.	.
54.1	attractive	4.33	median	wall	plantings	.	.	rock	unity	plantings	.
54.3	unattractive	1.5	building	.	.	.	.	ugly or unattractive	.	.	.
54.4	attractive	4.7	plantings	.	.	.	.	unity	.	.	.
54.5	attractive	4.25	building	grass	.	.	.	trees	nice	.	.
54.7	attractive	4.5	plantings	.	.	.	.	variety	.	.	.
54.8	attractive	4.5	vista	.	.	.	.	hills	.	.	.
54.9	attractive	4	highway	.	.	.	.	safe	.	.	.
55.1	attractive	4	skyline	vista	.	.	.	interesting	.	.	.
55.5	attractive	4	sign	.	.	.	.	new paint	.	.	.
55.6	attractive	4.3	median	.	.	.	.	plantings	.	.	.
56.1	attractive	5	highway	.	.	.	.	parking	.	.	.
56.2	attractive	4.75	plantings	highway	.	.	.	variety	new	.	.
56.3	attractive	4.5	rock	.	.	.	.	nice	.	.	.
56.5	attractive	3.7	pedestrian overpass	plantings	.	.	.	variety	.	.	.
56.6	attractive	4.5	median	plantings	.	.	.	nice	.	.	.
56.8	attractive	5	vista	.	.	.	.	open	.	.	.
56.9	attractive	4.75	grass	vista	.	.	.	variety	nice	.	.
57	attractive	4	rock	.	.	.	.	natural	.	.	.
57.4	attractive	4.5	river	vista	.	.	.	vista	.	.	.
57.8	unattractive	3.7	trees	.	.	.	.	deteriorated	.	.	.
58	attractive	4.4	lights	sign	median	30	.	unity	.	.	.
58.1	attractive	4.8	trees	.	.	.	.	variety	.	.	.
58.2	attractive	4.7	landmark bld	.	.	.	.	vista	.	.	.
58.5	attractive	5	trees	.	.	.	.	attractive or beautiful	.	.	.
59.1	attractive	4.5	railing	trees	.	.	.	unity	.	.	.
59.2	attractive	4.3	skyline	.	.	.	.	interesting	.	.	.
59.6	attractive	5	bridge	.	.	.	.	variety	.	.	.
59.7	attractive	5	trees	.	.	.	.	cool	.	.	.
59.9	attractive	5	bridge	.	.	.	.	unique	.	.	.
60.3	attractive	4	railing	.	.	.	.	charming	.	.	.
60.5	attractive	4.5	railing	.	.	.	.	unique	.	.	.

Mileage location	inside
0 - 3	1
3.1 - 6	5
6.1 - 9	3
9.1 - 12	12
12.1 - 15	5
15.1 - 18	9
18.1 - 21	5
21.1 - 24	3
24.1 - 27	5
27.1 - 30	0
30.1 - 33	0
33.1 - 36	0
36.1 - 39	7
39.1 - 42	6
42.1 - 45	0
45.1 - 48	0
48.1 - 51	0
51.2 - 54	12
54.1 - 57	7
57.1 - 60	5
60.1 - 63	2
63.1 - 66.5	0




Twin Cities Metro- No. of views noticed
by right of way and mileage location
(30.1 - 66.5 miles)
25
20
15
10
5
0
-5
-10
-15
-20
-25
Attractive
Unattractive
30.1 - 33
33.1 - 36
36.1 - 39
39.1 - 42
42.1 - 45
45.1 - 48
48.1 - 51
51.2 - 54
54.1 - 57
57.1 - 60
60.1 - 63
63.1 - 66.5
Mileage location
inside
outside
inside/outside by right of way

Twin Cities Metro- Mean Perception (moving average)



APPENDIX C

AIMS REFERENCE MANUAL: DULUTH ROUTE

Table C.1 Most Attractive Highway Segments in Duluth Study Area*

Segment	What People Noticed	What People Found Attractive
Mile 7.2 to mile 8.3	The bridge, the lake The vista Ships and elevators Hills A park	The vista: good relationship of the highway with its context Vegetation and wildlife
Mile 11.7 to mile 12.7	The bridge, the lake, and the river Hills Vista The highway The railroad bridge Ski run	The vista: good relationship of the highway with its context Historic character The design of highway structures
Mile 16.3 to mile 17.8	Streets Yards The zoo The highway and the median Trees and planting design Forest Businesses and landmark building	Everything looked well-maintained Good relationship of the highway with its context The design of highway structures and planting design An improvement over the way this area looked in the past
Mile 24.7 to mile 26.7	Streets Lake and river Park	Good relationship of the highway with its context Aesthetic characteristics of the water bodies No signs What people found unattractive in this segment: a sign at mile 26.2—too close to the highway
Mile 27.6 to mile 30.6	Vista River and lake Hills Trees Park Wildflowers Historic building	The vista: Good relationship of the highway with its context Aesthetic characteristics of the natural landforms, water bodies, and trees Naturalness
Mile 45.1 to mile 46.0	River Hills Landmark building Businesses	Aesthetic characteristics of the natural landforms and river Good relationship of the highway with its context
Mile 53.3 to mile 55.0	Vista Lake and river Hills Urban skyline Rest area Bridge Sculpture	The vista: Good relationship of the highway with its context The design of highway structures and rest area What people found unattractive in this segment: the sculpture in the rest area. Even when people found the vista or the rest area itself very attractive, most characterized the sculpture as “ugly”
Mile 62.9 to mile 65.1	Tunnel Bridge Wall Plantings Ship	The unique design of highway structures and planting design The vista: Good relationship of the highway with its context Everything looked well-maintained What people found unattractive in this segment: Businesses at mile 63.5 look unkempt Concrete median and no plantings at mile 64.0

*Duluth CIZs were located at 54.9 to 66.5 miles.

Table C.2 Least Attractive Highway Segments in Duluth Study Area

Segment	What People Noticed	What People Found Unattractive
Mile 0.0 to mile 0.8	Housing Businesses Grass in the median Satellite disc Sign	Unkempt, lacks care No plantings Weeds, unmown Not screened, ugly Offensive, too close
Mile 1.3 to mile 1.7	Housing Businesses Highway Plantings	Unkempt, lacks care Ugly colors Rough What people found attractive in this segment: trees soften the appearance of buildings at mile 1.7
Mile 5.9 to mile 7.0	Highway roadside Bridge Pedestrian overpass Highway shoulders	Unkempt, lacks care overall Weeds Design is incompatible with the surrounding landscape—too large Deteriorated Rough What people found attractive in this segment: landmark building is unique
Mile 18.4 to mile 19.7	Trailer housing Businesses Utility line Graffiti on bridge	Too close, No plantings, not screened Unkempt, lacks care overall Unmown Too large Offensive

Table C.3 Duluth CIZ: Attractive Variable by Mean Perception and Mileage Location

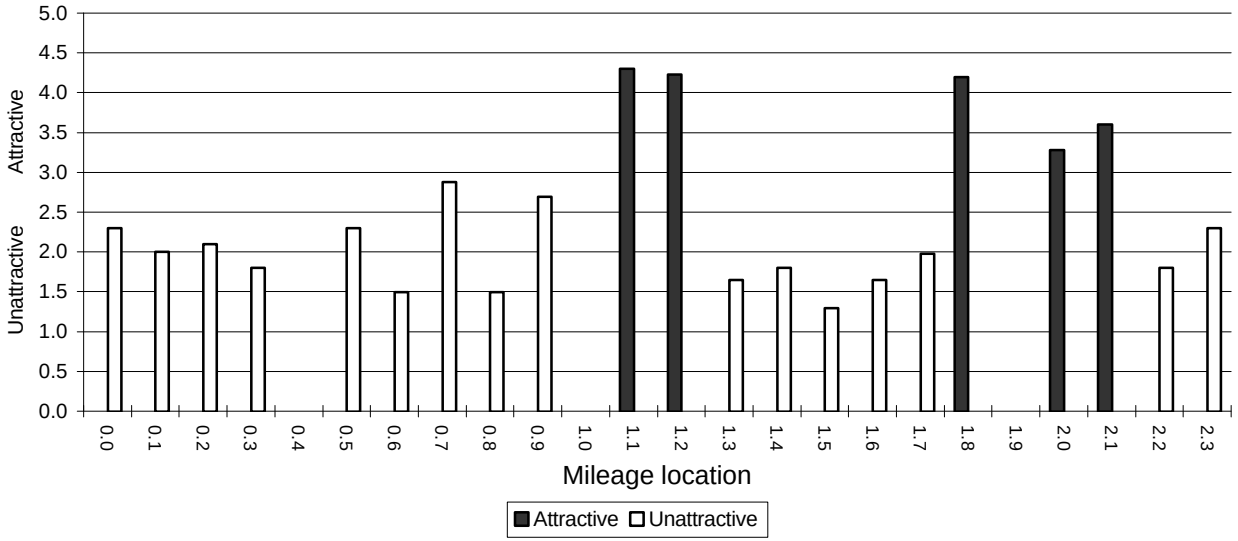
Mean Group Perception	Mileage Location	N within Group Perception	N of Items Noticed	Notice Variable	Description
1.00-1.49					
1.50-1.99					
2.00-2.49	66.5	1	1	lake(1)	vista(1)
2.50-2.99					
3.00-3.49	55.4, 60.6, 62.6	12	9	dock(2) hills(1) businesses(1) rock(1) median(1) landmark bld(1) housing(1) highway(1) grass(1)	not natural(1) wonderful(1) useful(1) urban skyline(1) structure(1)
3.50-3.99	61.3, 62.3, 63.7	14	7	businesses(2) interchange(1) concrete(1) trees(1) plantings(1) median(1) landmark bld(1)	nice(1) efficient(1) well-maintained(1) unique(1)
4.00-4.29	56.2, 65.4	5	4	railroad(1) railing(1) landmark bld(1) building(1)	nice(1) inviting(1) historic(1)
4.30-4.59	54.9, 65.3	8	4	hills(1) river(1) lake(1) pedestrian overpass(1)	efficient(1)
4.60-4.89	59.2, 61.5, 63.6, 63.8, 64.5, 65.0	15	6	wall(3) tunnel(2) ship(1) sign(1) plantings(1) landmark bld(1)	attractive or beautiful(2) pleasant(2) colors(1) wonderful(1) well-maintained(1) variety(1)
4.90-5.00	62.9, 63.1, 63.2, 63.9, 64.2, 64.4, 64.7, 65.1	10	5	tunnel(4) bridge(4) plantings(3) wall(2) sculpture(1)	vista(2) variety(2) shape(2) nice(1) landmark(1) unique(1)

Table C.4 Commuter Route Mileage for Duluth

Segment	Commuter Route	Segment Mileage	Mileage Location
Mn/DOT building to LP1	TH 194 west	2.50	0.00–2.50
	US 53 south	4.00	2.50–6.50
	I-535 south	2.50	6.50–9.00
LP1 to LP2	I-535 south	1.25	9.00–10.25
	US 2 west	3.50	10.25–13.75
	I-35 south	1.00	13.75–14.75
	TH 23 south	1.00	14.75–15.75
LP2 to LP3	TH 23 south	6.25	15.75–22.00
LP3 to LP4	TH 210 west	8.00	22.00–30.00
LP4 to LP5	TH 210 west	4.00	30.00–34.00
	TH 45 north	6.25	34.00–40.25
	TH 45 south	3.25	40.25–43.50
	Cty 61 east	6.00	43.50–49.50
	I-35 north	5.00	49.50–54.50
LP5 to LP6	I-35 north	6.00	54.50–60.50
LP6 to LP7	I-35 north	6.00	60.50–66.50

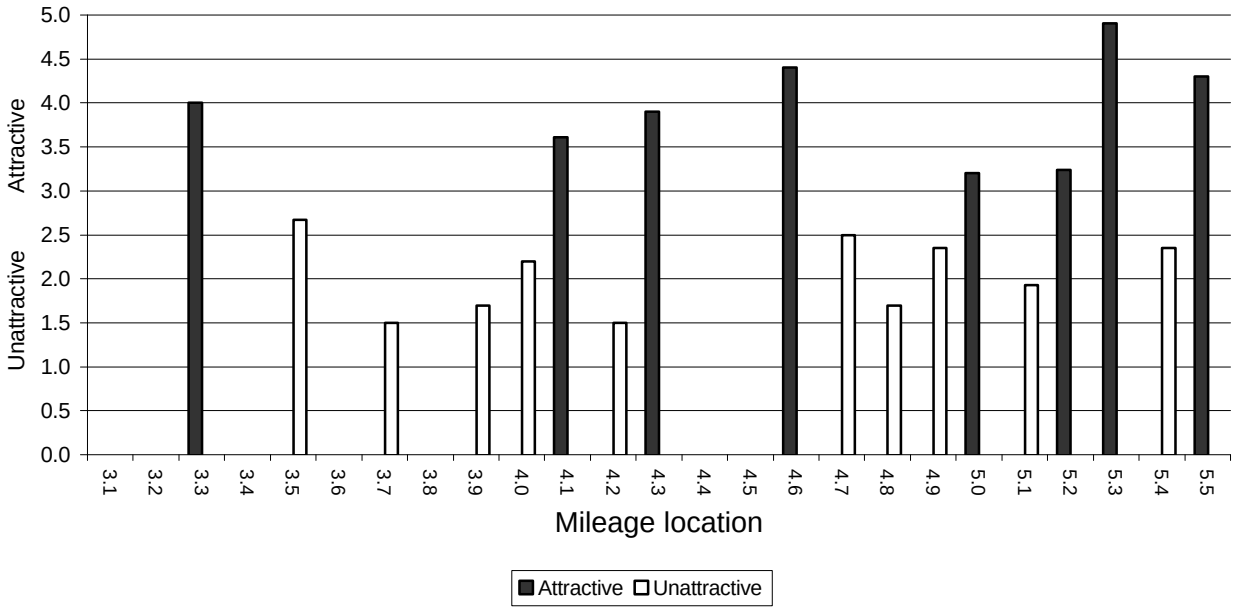
Duluth- Mean Attractiveness Rating by Mileage Location

(0 - 3 miles)



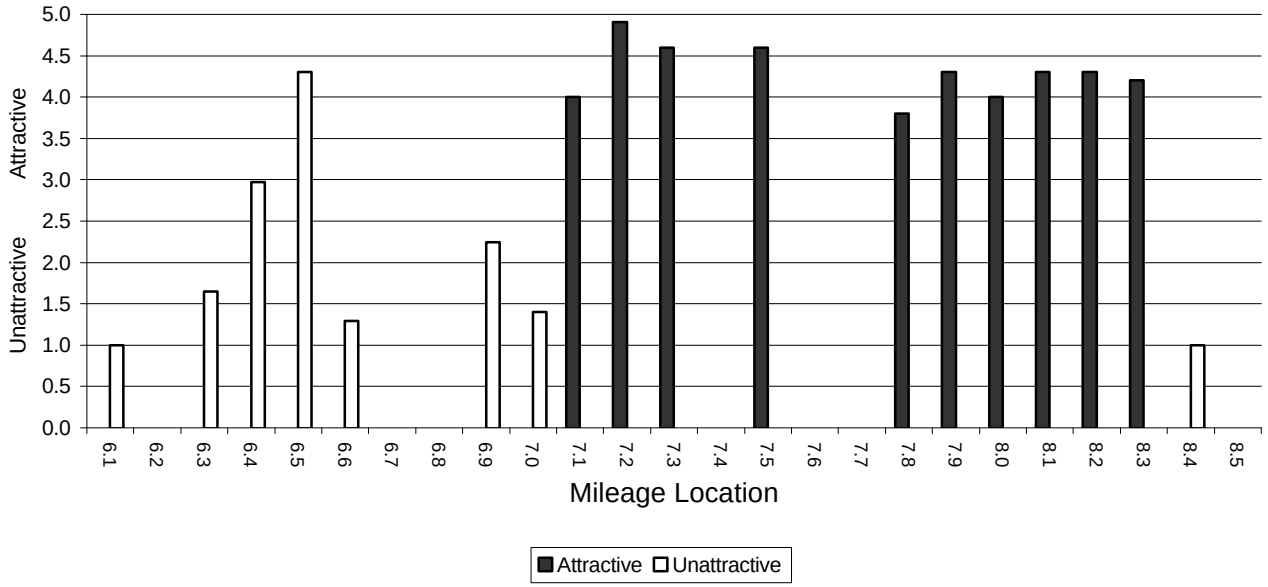
Duluth- Mean Attractiveness Rating by Mileage Location

(3.1 - 6 miles)



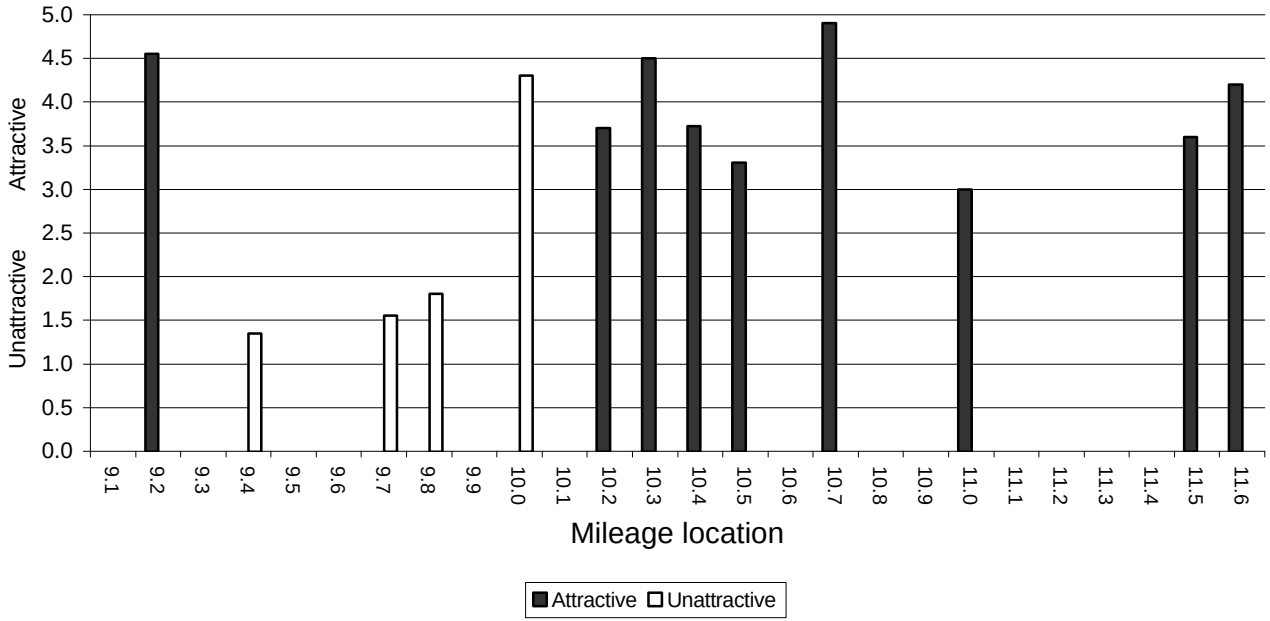
Duluth- Mean Attractiveness Rating by Mileage Location

(6.1 - 9 miles)



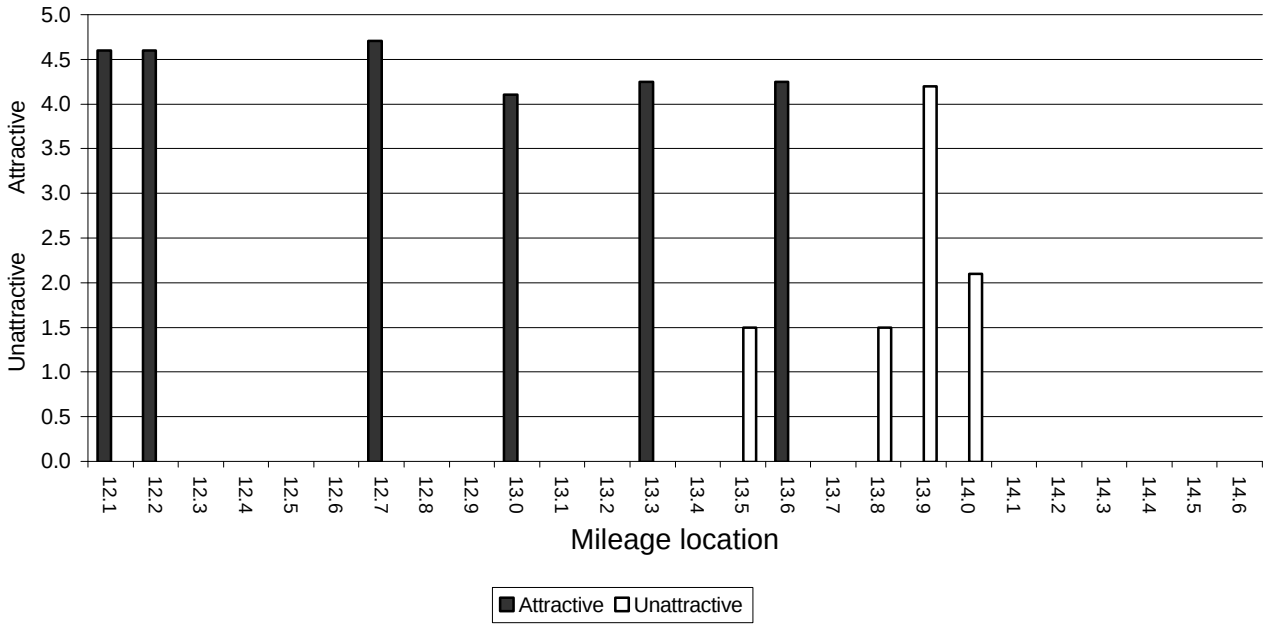
Duluth- Mean Attarctiveness Rating by Mileage Location

(9.1 - 12 miles)



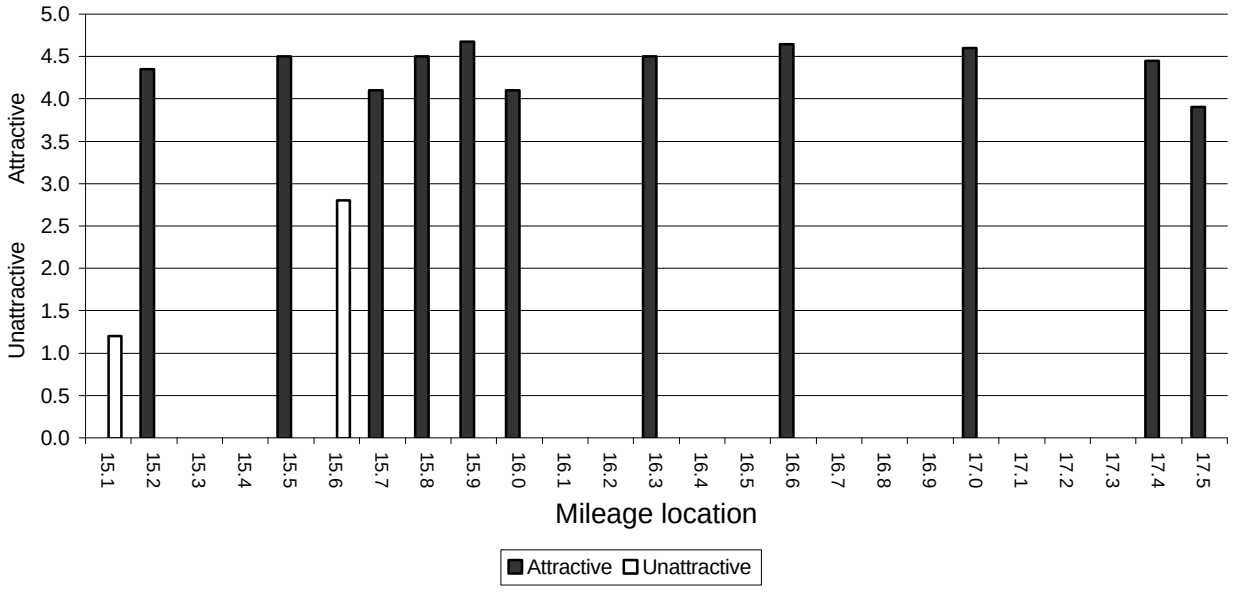
Duluth- Mean Attractiveness Rating by Mileage Location

(12.1 - 15 miles)



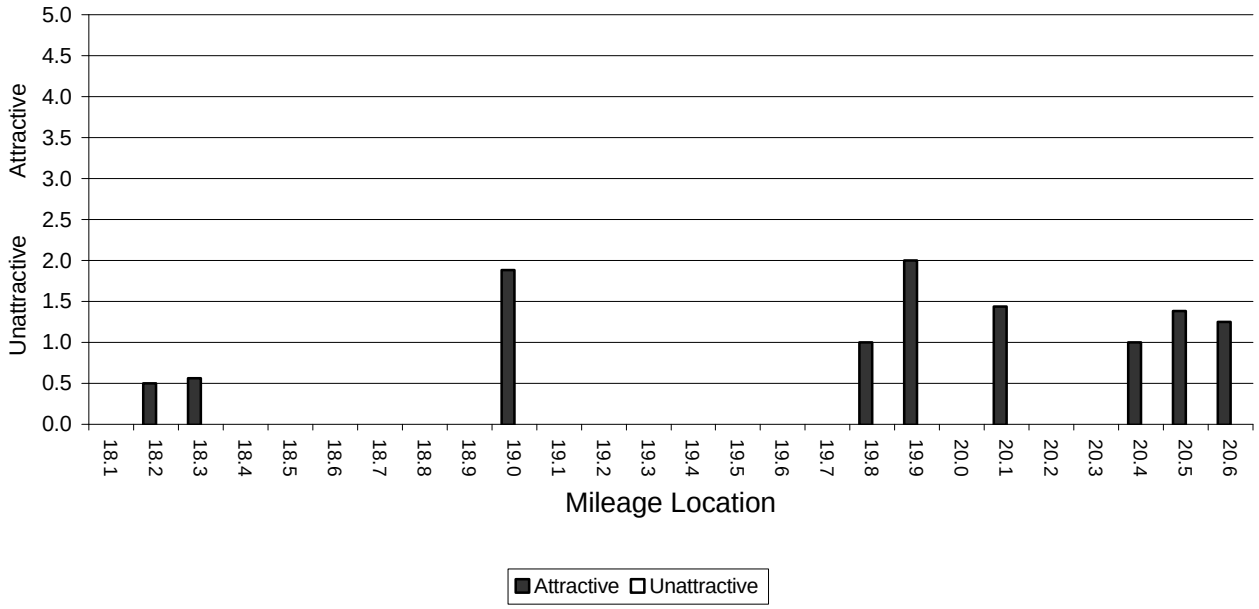
Duluth- Mean Attractiveness Rating by Mileage Location

(15.1 - 18 miles)



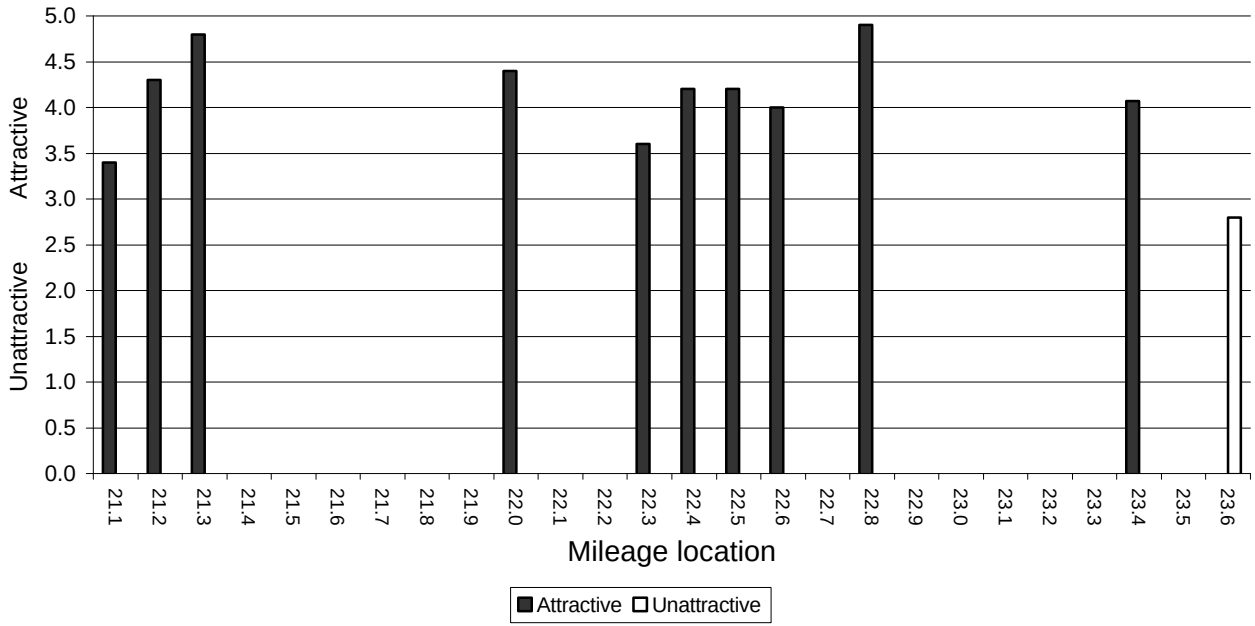
Duluth- Mean Attractiveness Rating by Mileage Location

(18.1 - 21 miles)



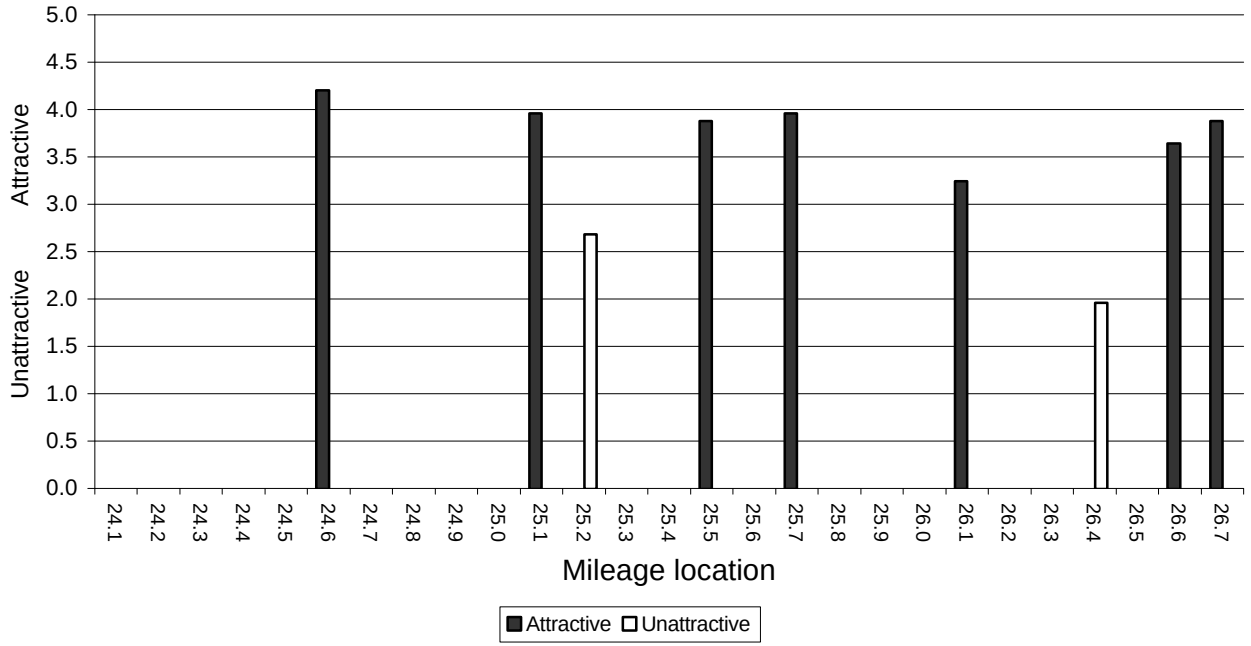
Duluth- Mean Attractiveness Rating by Mileage Location

(21.1 - 24 miles)



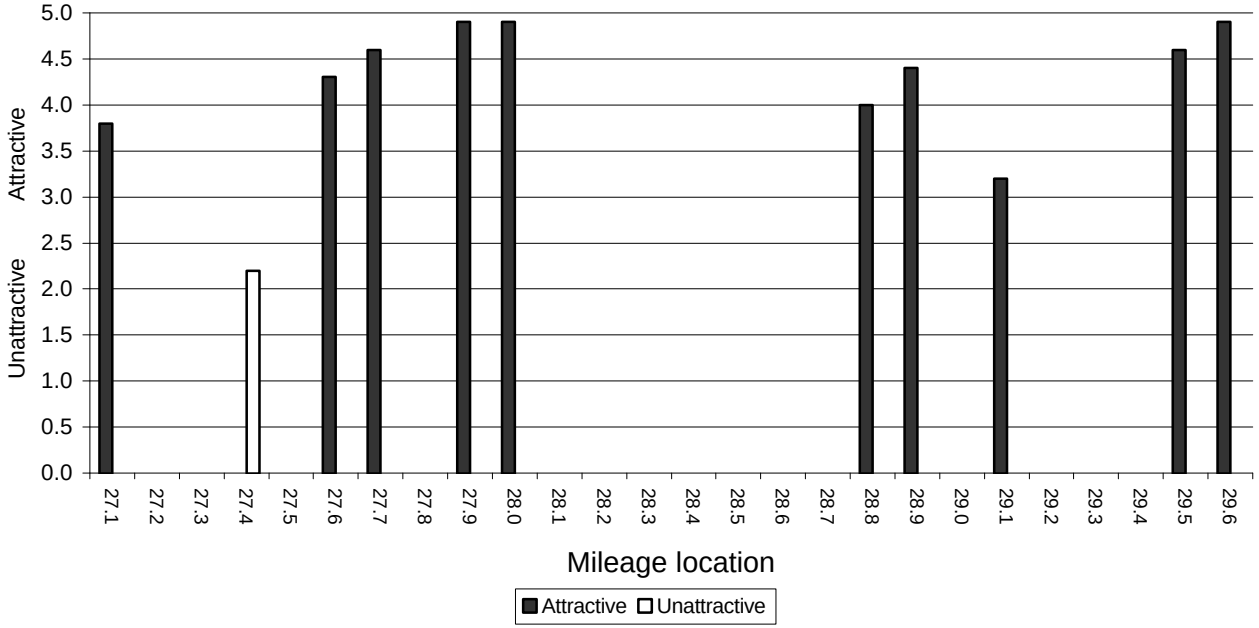
Duluth- Mean Attractiveness Rating by Mileage Location

(24.1 - 27 miles)



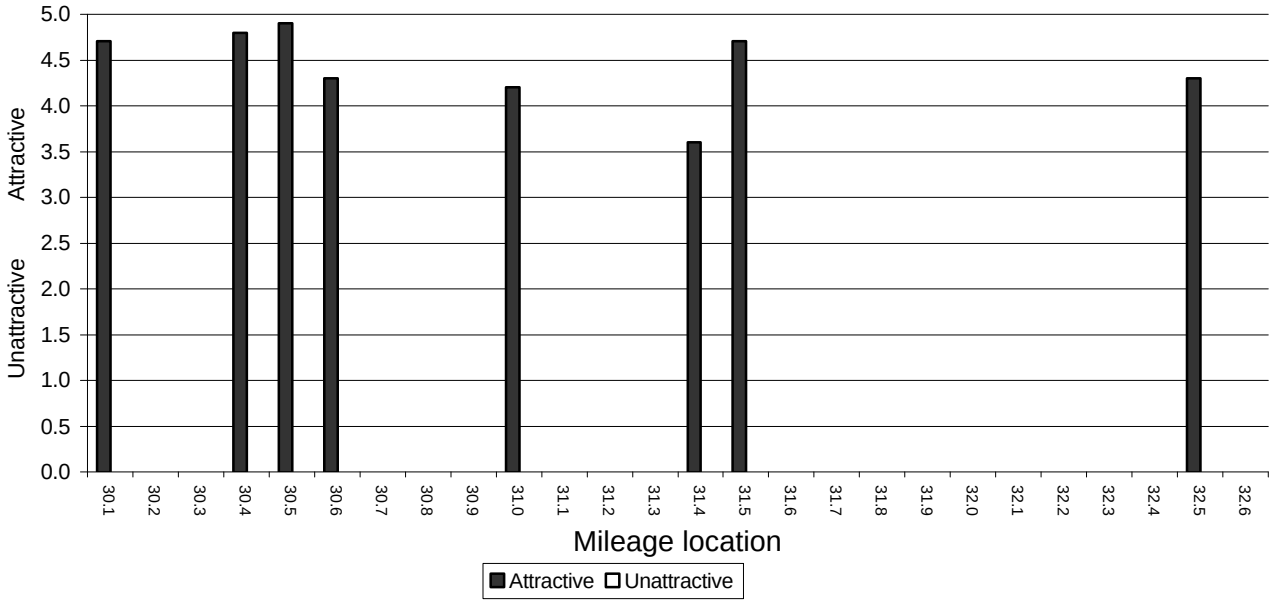
Duluth- Mean Attracttiveness Rating by Mileage Location

(27.1 - 30 miles)



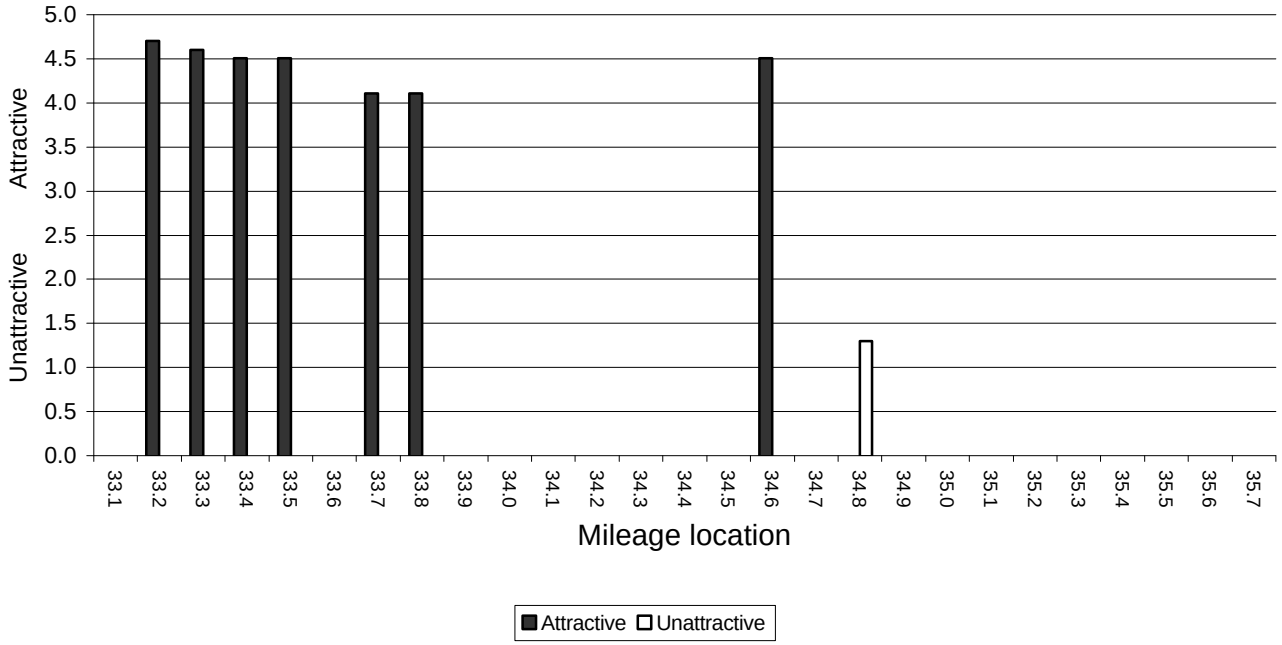
Duluth- Mean Attractiveness Rating by Mileage Location

(30.1 - 33 miles)



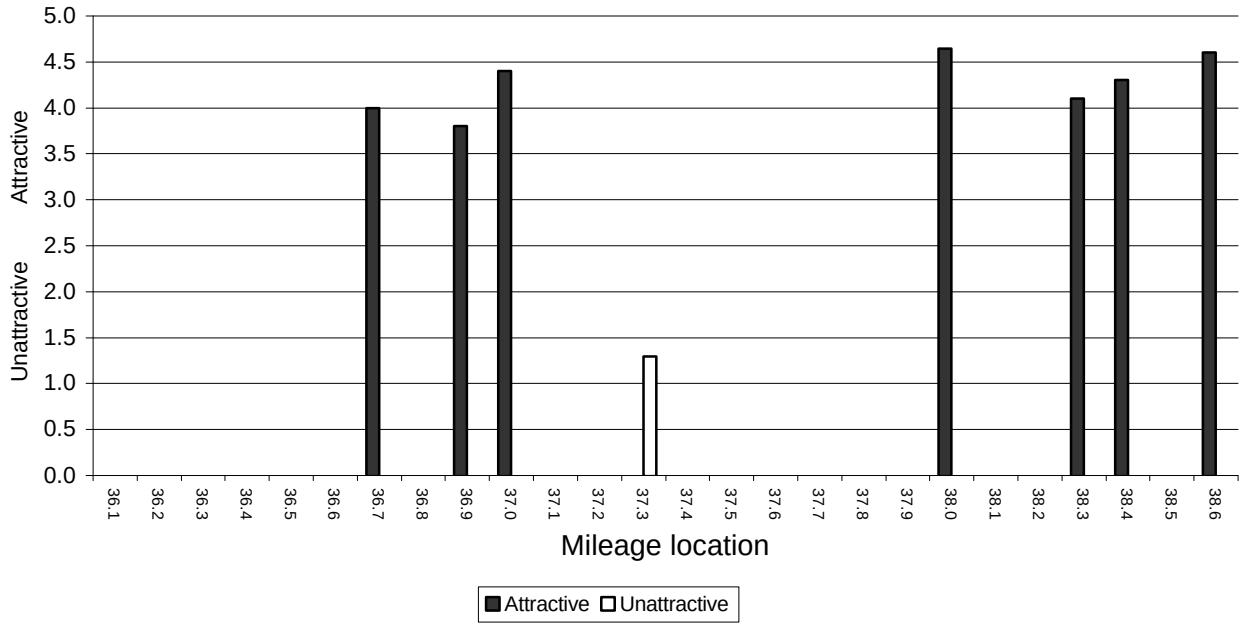
Duluth- Mean Attractiveness Rating by Mileage Location

(33.1 - 36 miles)



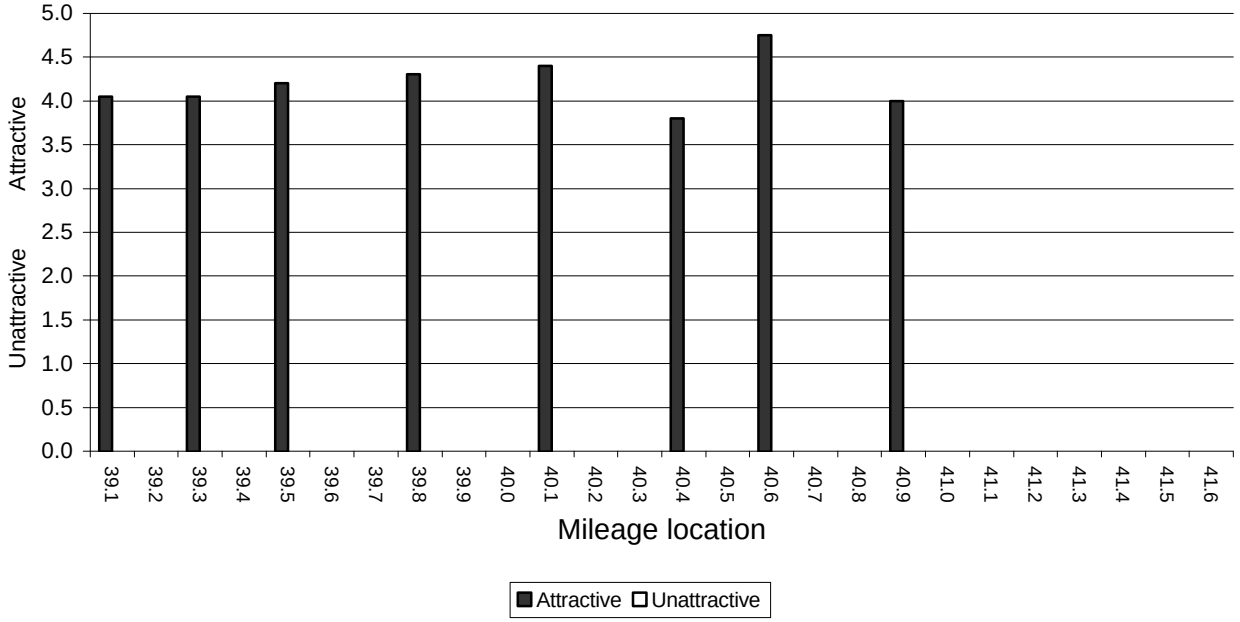
Duluth- Mean Attractiveness Rating by Mileage Location

(36.1 - 39 miles)



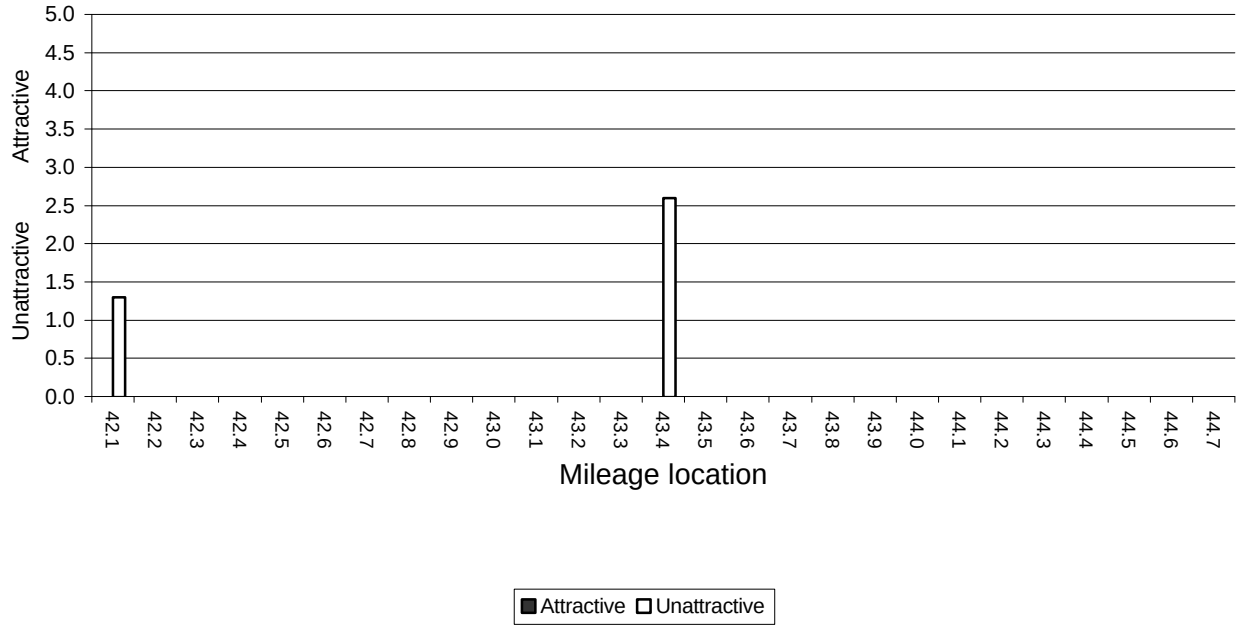
Duluth- Mean Attractiveness Rating by Milage Location

(39.1 - 42 miles)



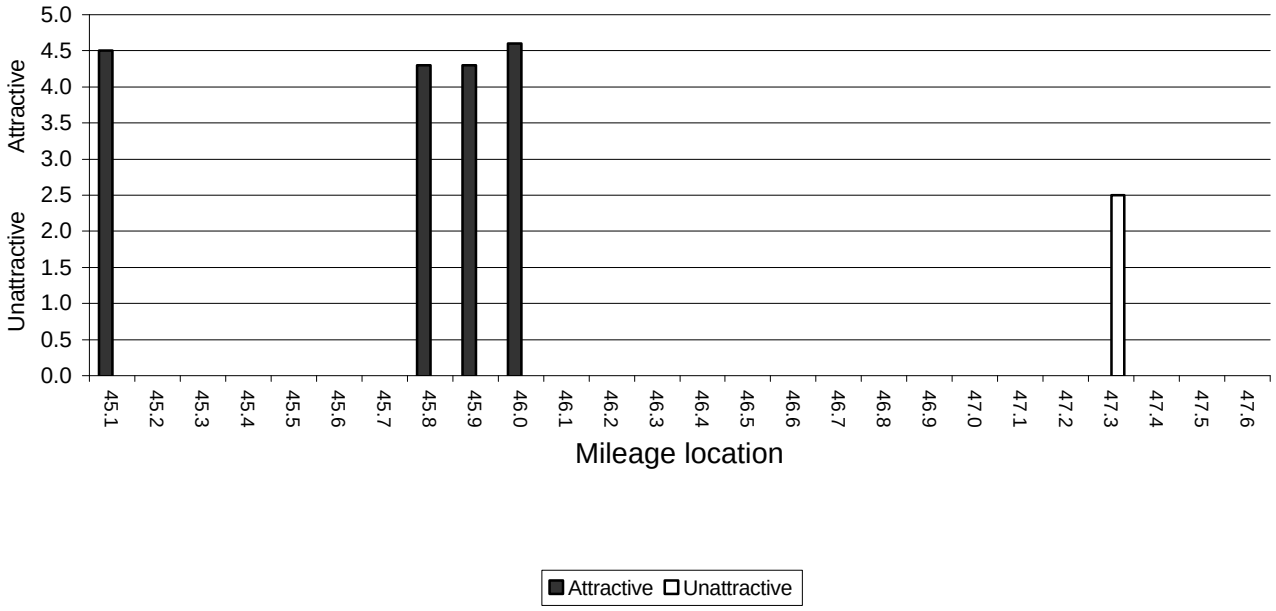
Duluth- Mean Attractiveness Rating by Milage Location

(42.1 - 45 miles)



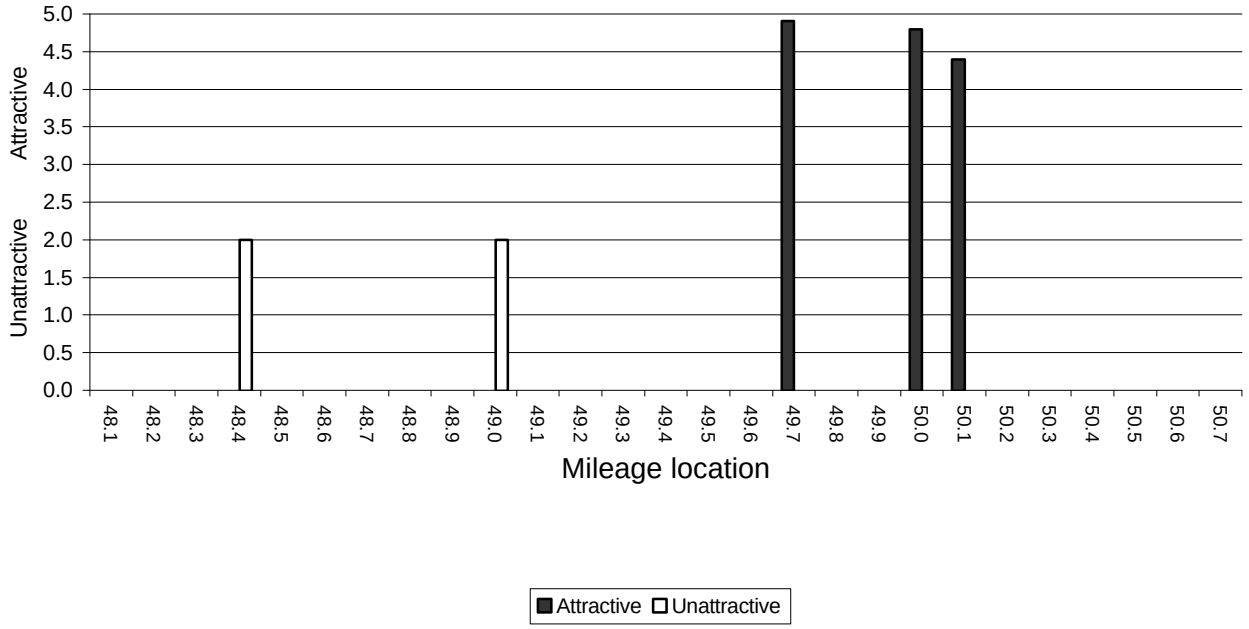
Duluth- Mean Attractiveness Rating by Milage Location

(45.1 - 48 miles)



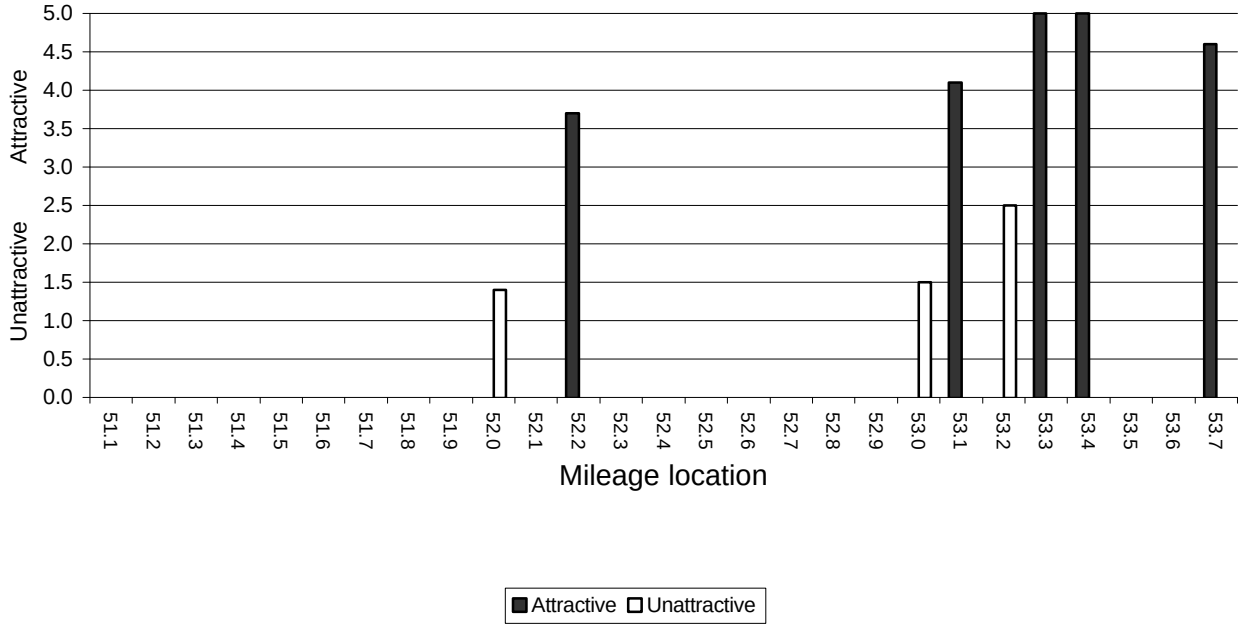
Duluth- Mean Attractiveness Rating by Milage Location

(48.1 - 51 miles)



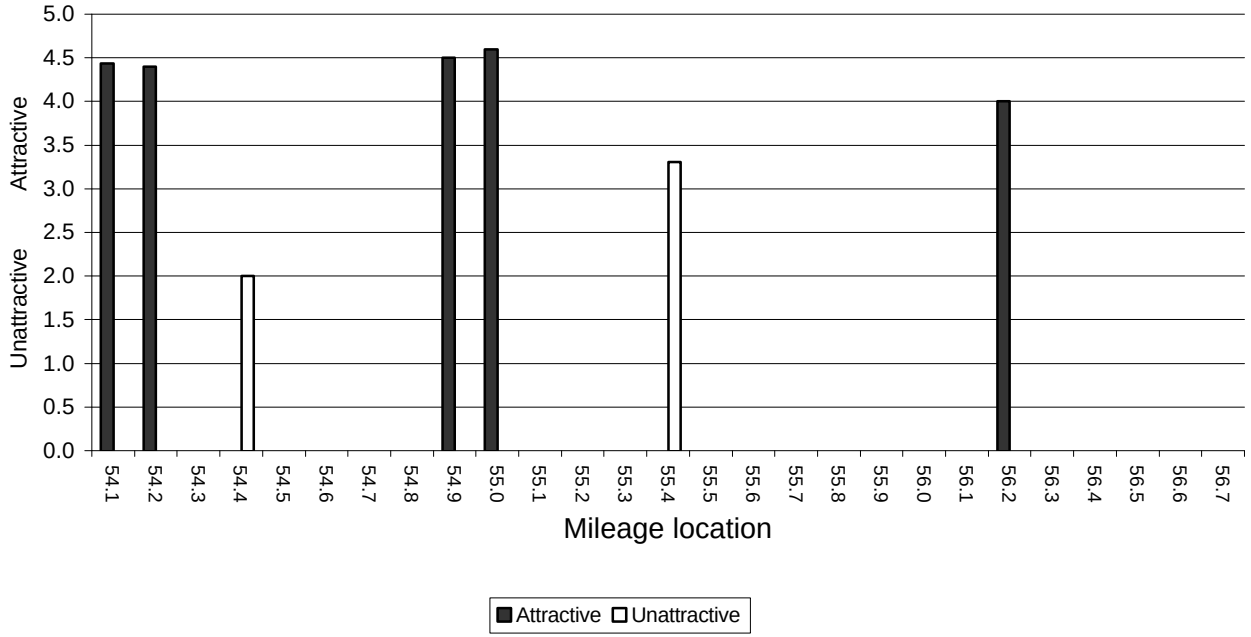
Duluth- Mean Attractiveness Rating by Milage Location

(51.1 - 54 miles)



Duluth- Mean Attractiveness Rating by Milage Location

(54.1 - 57 miles)

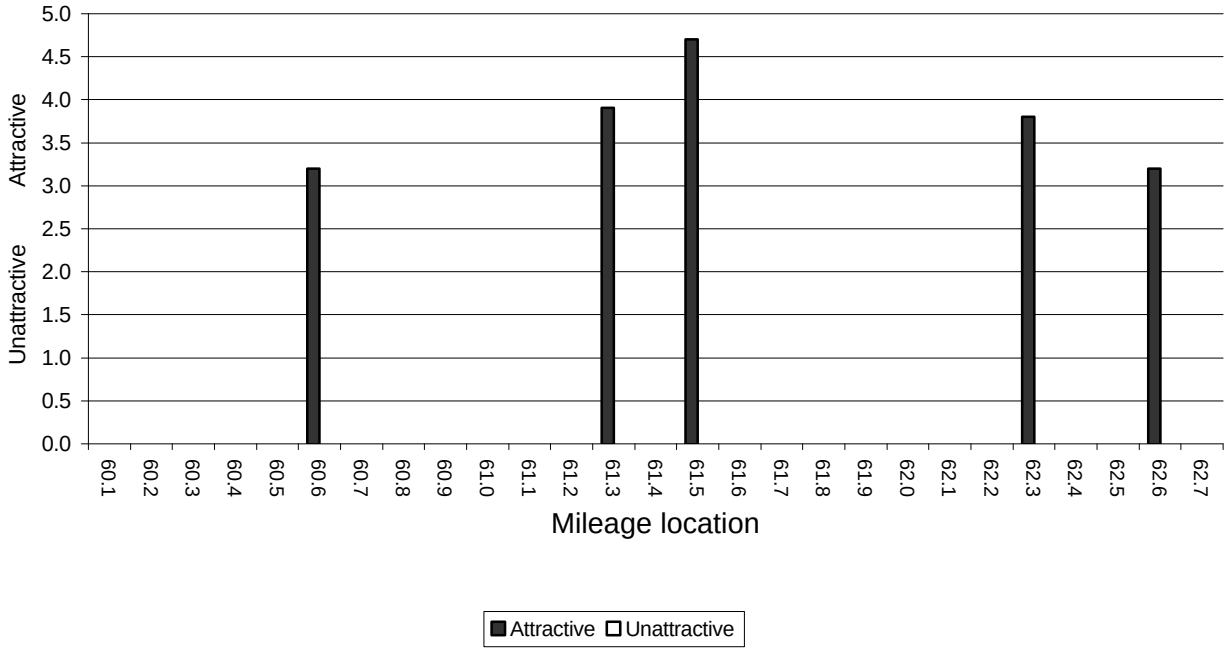


Duluth- Mean Attractiveness Rating by Milage Location

(57.1 - 60 miles)

Duluth- Mean Attractiveness Rating by Milage Location

(60.1 - 63 miles)



Duluth- Mean Attractiveness Rating by Milage Location

(63.1 - 66.5 miles)

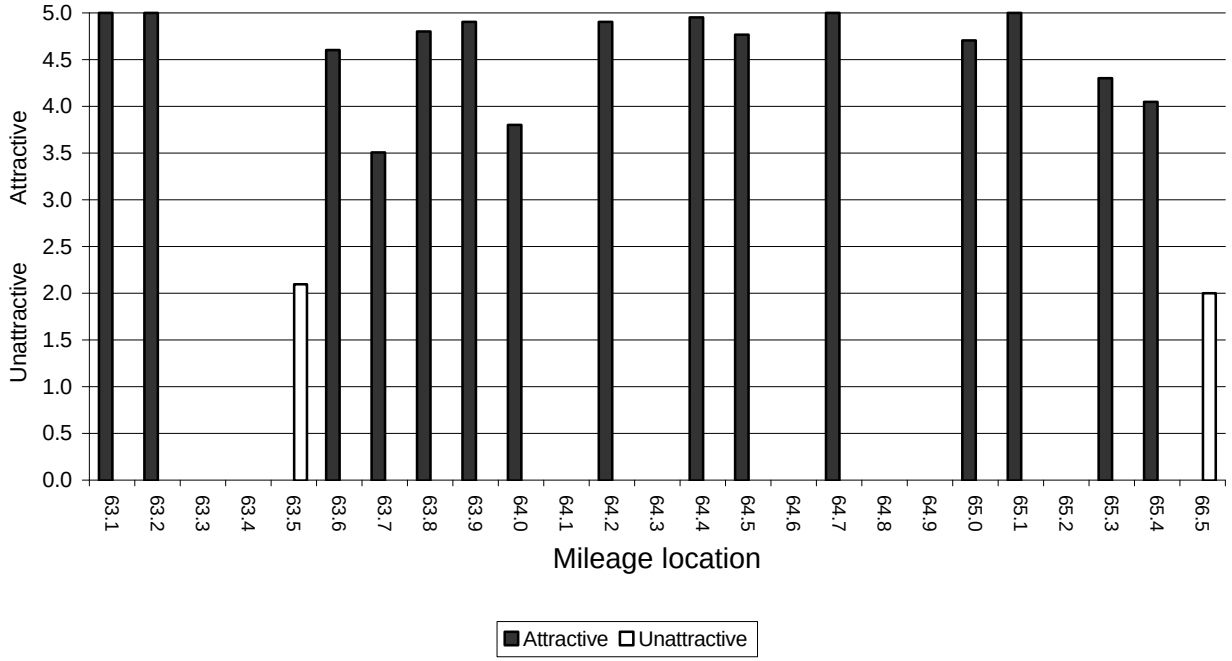


Table C.5 Duluth Data Set

Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
0	unattractive	2.3	housing	.	.	.	.	poor	.	.
0.1	unattractive	2	businesses	.	.	.	.	unkept	.	.
0.2	unattractive	2.1	grass	.	.	.	.	unmown	.	.
0.3	unattractive	1.8	median	landmark bld	.	.	.	no plantings	weeds	.
0.5	unattractive	2.3	satelite disc	.	.	.	.	not screened	.	.
0.6	unattractive	1.5	businesses	.	.	.	.	ugly or unattractive	.	.
0.7	unattractive	1.8	sign	.	.	.	.	offensive	too close	ugly or unattractive
0.8	unattractive	1.5	businesses	.	.	.	.	unkept	.	.
0.9	unattractive	2.7	turn lane	.	.	.	.	ugly or unattractive	.	.
1.1	attractive	4.3	trees	.	.	.	.	planned or well designed	.	.
1.2	attractive	4.23	dock	garden	Park	plantings	benches	scenery	good care	nice
1.3	unattractive	1.65	businesses	.	.	.	.	colors	ugly or unattractive	.
1.4	unattractive	1.8	housing	.	.	.	.	needs care	.	.
1.5	unattractive	1.3	walks	.	.	.	.	rough	.	.
1.6	unattractive	1.65	rough	concrete	.	.	.	rough	unkept	.
1.7	attractive	1.98	plantings	railing	wall	.	.	softens building	trees	.
1.8	attractive	4.2	businesses	.	.	.	.	trees	.	.
2	attractive	3.28	flowers	ditch	natives	businesses	.	nice	rock	.
2.1	attractive	3.6	forest	.	.	.	.	variety	.	.
2.2	unattractive	1.8	weeds	.	.	.	.	weeds	.	.
2.3	unattractive	2.3	interchange	.	.	.	.	poor design	.	.
2.4	attractive	3.7	forest	.	.	.	.	trees	.	.
2.7	attractive	3.4	trees	.	.	.	.	screened	.	.
2.9	unattractive	1.6	yard	mailbox	.	.	.	unmown	.	.
3.3	attractive	4	housing	.	.	.	.	good care	.	.
3.5	unattractive	2.67	sign	lake	trees	utility line	.	incompatible	ugly or unattractive	utility lines
3.7	unattractive	1.5	utility line	.	.	.	.	deteriorated	.	.
3.9	unattractive	1.7	sign	.	.	.	.	ugly or unattractive	incompatible	.
4	unattractive	2.2	housing	.	.	.	.	incompatible	.	.
4.1	attractive	3.6	antennae farm	.	.	.	.	variety	.	.
4.2	unattractive	1.5	vehicle	.	.	.	.	trash	.	.
4.3	attractive	3.9	landmark bld	.	.	.	.	safe	.	.
4.6	attractive	4.4	housing	vista	.	.	.	well-maintained	.	.
4.7	unattractive	2.5	trees	.	.	.	.	deteriorated	.	.
4.8	unattractive	1.7	businesses	.	.	.	.	trash	.	.
4.9	unattractive	2.35	businesses	.	.	.	.	unkept	traffic	.
5	attractive	3.2	lake	excavation	.	.	.	vista	.	.
5.1	unattractive	1.93	highway	housing	.	.	.	rough	unmown	too close
5.2	attractive	3.24	river	bridge	lake	housing	median	vista	walk	.
5.3	attractive	4.9	lake	.	.	.	.	attractive or beautiful	.	.
5.4	attractive	2.35	sign	housing	.	.	.	useful	.	.

Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
5.5	attractive	4.3	lake	.	.	.	.	rock	.	.
5.6	attractive	4.2	sign	bridge	lake	.	.	vista	.	.
5.8	attractive	3	bridge	lake	weeds	.	.	vista	.	.
5.9	unattractive	1	railing	weeds	.	.	.	unkept	weeds	.
6.1	unattractive	1	walks	.	.	.	.	unkept	.	.
6.3	unattractive	1.65	sign	highway	.	.	.	ugly or unattractive	deteriorated	.
6.4	attractive	2.98	bridge	pedestrian overpass	.	.	.	vista	too large	.
6.5	attractive	4.3	landmark bld	.	.	.	.	unique	.	.
6.6	unattractive	1.3	shoulders	.	.	.	.	rough	.	.
6.9	unattractive	2.25	railroad	.	.	.	.	unkept	ugly or unattractive	.
7	unattractive	1.4	businesses	.	.	.	.	deteriorated	.	.
7.1	attractive	4	dock	bridge	.	.	.	historic	vista	.
7.2	attractive	4.9	bridge	vista	.	.	.	colors	.	.
7.3	attractive	4.6	lake	elevator	.	.	.	vista	.	.
7.5	attractive	4.6	bridge	.	.	.	.	vista	.	.
7.8	attractive	3.8	bridge	railing	.	.	.	vista	.	.
7.9	attractive	4.3	ship	.	.	.	.	wonderful	.	.
8	attractive	4	ship	island	lake	bridge	vista	bird butterflies	vegetation	colors
8.1	attractive	4.3	hills	lake	vista	.	.	vista	.	.
8.2	attractive	4.3	Park	.	.	.	.	vista	.	.
8.3	attractive	4.2	elevator	ship	.	.	.	interesting	.	.
8.4	unattractive	1	trash	.	.	.	.	needs care	.	.
8.7	attractive	3	sign	.	.	.	.	sentimental	.	.
8.9	unattractive	2.3	businesses	.	.	.	.	weeds	.	.
9	attractive	4.4	interchange	grass	trees	.	.	well-maintained	planned or well designed	.
9.2	.	4.55	.	.	.	.	.	.	.	.
9.4	unattractive	1.35	highway	median	.	.	.	ugly or unattractive	no plantings	.
9.7	unattractive	1.55	businesses	parking lot	.	.	.	needs care	unkept	.
9.8	unattractive	1.8	businesses	.	.	.	.	ugly or unattractive	.	.
10	attractive	4.3	flowers	businesses	grass	plantings	.	good care	attractive or beautiful	.
10.2	attractive	3.7	street	.	.	.	.	walk	.	.
10.3	attractive	4.5	plantings	.	.	.	.	attractive or beautiful	.	.
10.4	attractive	3.73	Park	downtown	.	.	.	nice	green	.
10.5	attractive	3.3	urban skyline	sign	.	.	.	wonderful	trash	.
10.7	attractive	4.9	bridge	hills	vista	.	.	.	.	.
11	attractive	3	street	grass	.	.	.	trees	unmown	.
11.5	attractive	3.6	businesses	.	.	.	.	clean	.	.
11.6	attractive	4.2	street	.	.	.	.	safe	.	.
11.7	attractive	4.3	bridge	.	.	.	.	.	.	.
11.9	attractive	4.9	highway	vista	.	.	.	road	.	.
12	.	4.6	hills	ski run	.	.	.	.	.	.

Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
12.1	attractive	4.6	railroad bri	bridge	lake	railroad bri	vista	interesting	vista	historic
12.2	attractive	4.6	hills	.	.	.	.	vista	.	.
12.7	attractive	4.7	bridge	hills	river	.	.	variety	.	.
13	attractive	4.1	dock	.	.	.	.	sentimental	.	.
13.3	attractive	4.25	flowers	natives	businesses	hills	lake	vast	vista	.
13.5	unattractive	1.5	median	.	.	.	.	weeds	.	.
13.6	attractive	4.25	landmark bld	sign	.	.	.	well-maintained	location	.
13.8	unattractive	1.5	sign	.	.	.	.	too many	.	.
13.9	unattractive	1.8	businesses	.	.	.	.	old	.	.
14	unattractive	2.1	sign	.	.	.	.	ugly or unattractive	.	.
14.7	attractive	3.75	Park	.	.	.	.	green	well-maintained	.
14.8	unattractive	3.5	utility line	Park	.	.	.	incompatible	well-maintained	.
14.9	attractive	4.7	Park	.	.	.	.	pleasant	.	.
15.1	unattractive	1.2	median	.	.	.	.	incompatible	.	.
15.3	attractive	4.35	street	landmark bld	housing	.	.	trees	well-maintained	.
15.5	attractive	4.5	lady	landmark bld	.	.	.	inviting	.	.
15.6	attractive	2.8	Park	building	.	.	.	open	old	.
15.7	attractive	4.1	zoo	bus stop	.	.	.	well-maintained	.	.
15.8	attractive	4.5	railroad	.	.	.	.	well-maintained	.	.
15.9	attractive	4.67	plantings	zoo	bus stop	.	.	open	.	.
16	attractive	4.1	zoo	businesses	.	.	.	vista	new	well-maintained
16.3	attractive	4.5	zoo	street	yard	.	.	pleasant	good care	.
16.6	attractive	4.65	street	zoo	hills	ski run	vista	trees	forest	.
17	attractive	4.6	highway	.	.	.	.	pleasant	.	.
17.4	attractive	4.45	vegetation	businesses	.	.	.	attractive or beautiful	improvement	.
17.5	attractive	3.9	highway	forest	sign	.	.	well-maintained	.	.
17.6	attractive	4.4	street	landmark bld	.	.	.	nice	.	.
17.8	unattractive	4	grass	median	.	.	.	bugs	.	.
18	unattractive	1.5	antennae farm	.	.	.	.	ugly or unattractive	.	.
18.2	attractive	3.4	flowers	garden	Park	.	.	work hard	.	.
18.3	attractive	3.45	highway	utility line	trees	.	.	good	screened	.
18.4	unattractive	2	housing	trailer	.	.	.	no plantings	.	.
18.6	unattractive	1.3	trailer	housing	.	.	.	ugly or unattractive	.	.
18.9	unattractive	1.35	housing	trailer	businesses	.	.	not screened	needs care	.
19	attractive	4.5	Park	.	.	.	.	rock	.	.
19.2	unattractive	1.65	businesses	utility line	.	.	.	unmown	not screened	.
19.3	unattractive	1.3	highway	.	.	.	.	too large	.	.
19.5	unattractive	1.3	utility line	graffiti	.	.	.	ugly or unattractive	offensive	.
19.7	unattractive	1.63	graffiti	bridge	railroad bri	.	.	ugly or unattractive	.	.
19.8	attractive	3.8	flag	.	.	.	.	sentimental	.	.
19.9	attractive	4.6	flag	street	.	.	.	sentimental	.	.
20.1	attractive	4.15	flowers	garden	building	.	.	well-maintained	historic	.

Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
20.2	unattractive	1.8	downtown	.	.	.	.	old	.	.
20.4	attractive	3.8	building	.	.	.	.	interesting	.	.
20.5	attractive	4.1	landmark bld	.	.	.	.	playground	colors	improvement
20.6	attractive	4	landmark bld	.	.	.	.	environmental	.	.
20.7	attractive	4.3	building	.	.	.	.	nice	.	.
21.1	attractive	3.4	hills	dock	.	.	.	rock	vista	.
21.2	attractive	4.3	dock	road	.	.	.	safe	.	.
21.3	attractive	4.8	river	vista	.	.	.	cool	.	.
22	attractive	4.4	landmark bld	.	.	.	.	well-maintained	.	.
22.3	attractive	3.6	trees	.	.	.	.	scenery	.	.
22.4	attractive	4.2	street	.	.	.	.	wide	.	.
22.5	attractive	4.2	housing	lake	.	.	.	well-maintained	.	.
22.6	attractive	4	lake	.	.	.	.	trees	.	.
22.8	attractive	4.9	river	.	.	.	.	trees	.	.
23.4	attractive	4.07	street	Park	median	trees	.	curving	well-maintained	natural
23.6	attractive	2.8	street	highway	.	.	.	scenery	too large	.
23.7	attractive	2.8	Park	building	.	.	.	nice	needs care	.
23.9	attractive	4.8	Park	.	.	.	.	well-maintained	.	.
24	attractive	4.2	Park	.	.	.	.	useful	.	.
24.1	attractive	4.56	river	structure	walks	.	.	river	natural	.
24.2	attractive	4.4	stump	.	.	.	.	character	.	.
24.3	attractive	4.25	Park	street	.	.	.	vista	safe	.
24.5	unattractive	1.75	highway	.	.	.	.	rough	narrow	.
24.7	attractive	4.1	street	.	.	.	.	scenery	.	.
24.8	attractive	4.3	street	.	.	.	.	attractive or beautiful	.	.
25	attractive	4.7	no signs	.	.	.	.	attractive or beautiful	.	.
25.6	.	5	.	.	.	.	.	.	.	.
26.1	attractive	4.7	lake	.	.	.	.	green	.	.
26.2	unattractive	3.1	sign	.	.	.	.	too close	.	.
26.5	attractive	4.6	Park	sign	.	.	.	unity	.	.
26.7	attractive	4.7	river	.	.	.	.	vista	.	.
27.1	attractive	3.8	trash	.	.	.	.	clean	.	.
27.4	unattractive	2.2	highway	.	.	.	.	rough	.	.
27.6	attractive	4.3	natives	weeds	.	.	.	natural	.	.
27.7	attractive	4.6	flowers	hills	.	.	.	vista	.	.
27.9	attractive	4.9	river	vista	.	.	.	natural	.	.
28	attractive	4.9	lake	vista	.	.	.	walk	.	.
28.8	attractive	4	river	vista	.	.	.	natural	.	.
28.9	attractive	4.4	hills	trees	vista	.	.	vista	.	.
29.1	attractive	3.2	dam	grass	utility line	.	.	historic	variety	.
29.5	attractive	4.6	Park	sign	structure	.	.	unity	.	.
29.6	attractive	4.9	river	vista	.	.	.	wonderful	vista	.

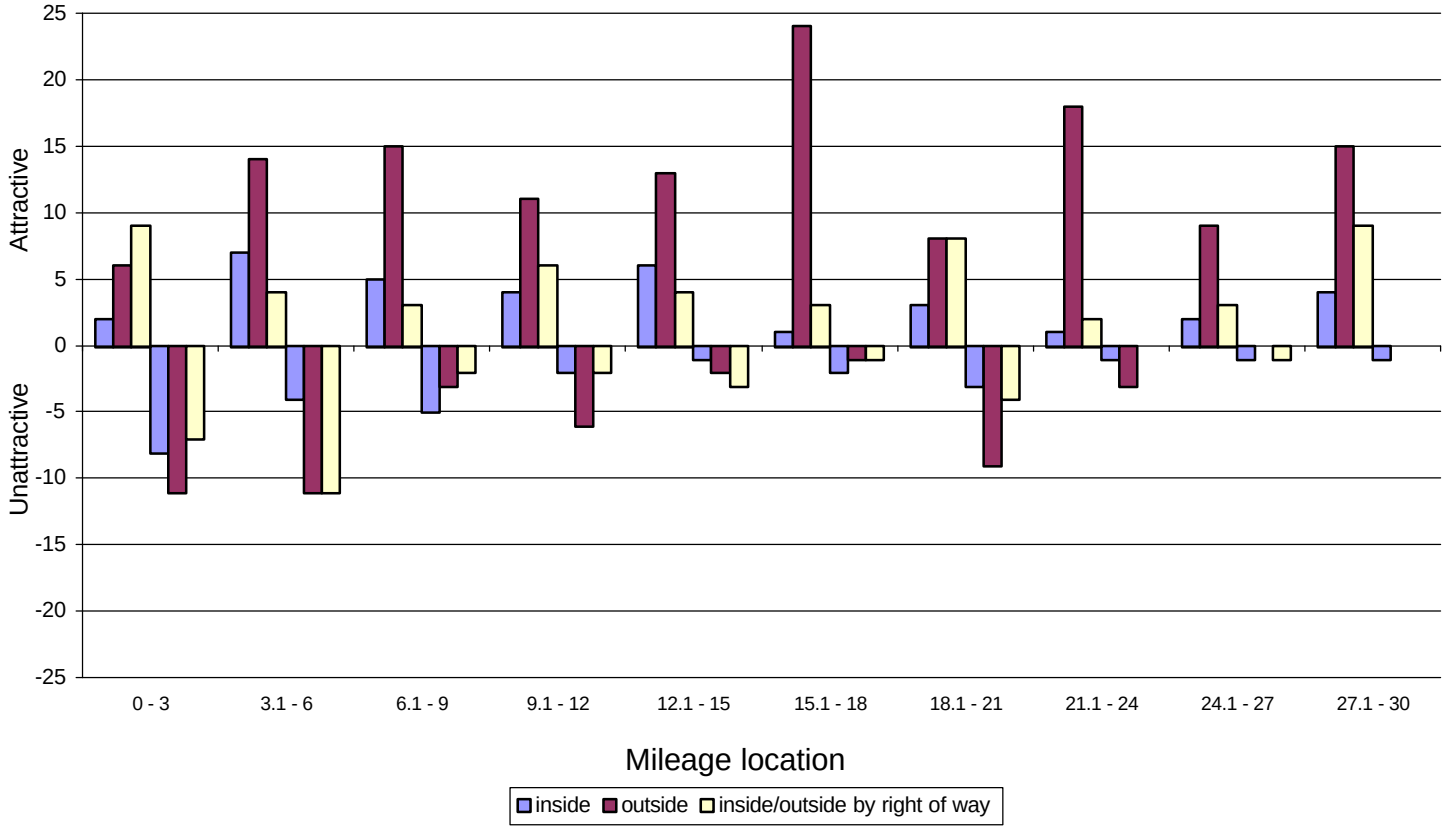
Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
29.8	attractive	3.6	wetland	.	.	.	.	variety	.	.
29.9	attractive	4.2	sign	.	.	.	.	safe	.	.
30.1	attractive	4.7	river	.	.	.	.	.	.	.
30.4	attractive	4.8	Park	sign	.	.	.	unity	.	.
30.5	attractive	4.9	Park	.	.	.	.	parking	unity	.
30.6	attractive	4.3	building	.	.	.	.	unity	.	.
31	attractive	4.2	trees	.	.	.	.	unique	.	.
31.4	attractive	3.6	river	vista	trees	.	.	scenery	blocks view	.
31.5	attractive	4.7	parkway	river	.	.	.	wonderful	.	.
32.5	attractive	4.3	rock	.	.	.	.	cool	.	.
32.7	attractive	4.6	falls	dam	Park	.	.	wonderful	rock	.
32.8	attractive	4.8	dam	hills	river	.	.	unique	.	.
33.2	attractive	4.7	housing	.	.	.	.	yard	.	.
33.3	attractive	4.6	railing	housing	.	.	.	rock	.	.
33.4	attractive	4.5	housing	.	.	.	.	well-maintained	.	.
33.5	attractive	4.5	landmark bld	.	.	.	.	grass	.	.
33.7	attractive	4.1	rock	.	.	.	.	natural	.	.
33.8	attractive	4.1	landmark bld	.	.	.	.	pleasant	.	.
34.6	attractive	4.5	trees	.	.	.	.	unique	.	.
34.8	unattractive	1.3	junkyard	.	.	.	.	unmown	.	.
36.7	attractive	4	lake	.	.	.	.	green	.	.
36.9	unattractive	3.8	bridge	pedestrian overpass	.	.	.	ugly or unattractive	.	.
37	attractive	4.4	highway	.	.	.	.	new paint	.	.
37.3	unattractive	1.3	junk	.	.	.	.	ugly or unattractive	.	.
38	attractive	4.65	highway	sign	plantings	.	.	signs	planned or well designed	natural
38.3	attractive	4.1	businesses	.	.	.	.	nice	.	.
38.4	attractive	4.3	street	flag	walks	.	.	well-maintained	.	.
38.6	attractive	4.6	street	.	.	.	.	wide	.	.
38.8	attractive	4.55	median	downtown	.	.	.	wide	well-maintained	.
38.9	attractive	4	building	.	.	.	.	nice	.	.
39	attractive	3.55	landmark bld	.	.	.	.	historic	needs care	unique
39.1	attractive	4.05	businesses	landmark bld	.	.	.	small town atmosphere	unique	.
39.3	attractive	4.05	sculpture	Park	bridge	railing	.	location	ornamental	.
39.5	attractive	4.2	lights	benches	flowers	.	.	nice	.	.
39.8	attractive	4.3	bridge	river	.	.	.	wide	.	.
40.1	attractive	4.4	Park	.	.	.	.	river	.	.
40.4	attractive	3.8	Park	.	.	.	.	river	.	.
40.6	.	4.75	.	.	.	.	.	.	.	.
40.9	attractive	4	sculpture	.	.	.	.	trees	.	.
42.1	unattractive	1.3	junk	.	.	.	.	ugly or unattractive	.	.
43.4	unattractive	2.6	people	river	.	.	.	monotonous	.	.

Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
45.1	attractive	4.5	landmark bld	hills	.	.	.	unique	.	.
45.8	attractive	4.3	river	.	.	.	.	open	.	.
45.9	attractive	4.3	businesses	.	.	.	.	unique	.	.
46	attractive	4.6	river	.	.	.	.	scenery	.	.
47.3	attractive	2.5	highway	.	.	.	.	.	.	.
48	unattractive	2.5	trash	.	.	.	.	.	.	.
48.4	unattractive	2	highway	.	.	.	.	rough	.	.
49	unattractive	2	pedestrian overpass	.	.	.	.	not natural	.	.
49.7	attractive	4.9	river	vista	.	.	.	vista	.	.
50	attractive	4.8	no signs	.	.	.	.	location	.	.
50.1	attractive	4.4	hills	vista	.	.	.	wonderful	.	.
52	unattractive	1.4	sign	.	.	.	.	too large	.	.
52.2	attractive	3.7	sign	.	.	.	.	.	.	.
53	unattractive	1.5	sign	.	.	.	.	ugly or unattractive	.	.
53.1	attractive	4.1	sign	.	.	.	.	location	.	.
53.2	unattractive	2.5	sign	.	.	.	.	ugly or unattractive	.	.
53.3	attractive	5	lake	vista	.	.	.	vista	.	.
53.4	attractive	5	urban skyline	.	.	.	.	vista	.	.
53.7	attractive	4.6	vista	.	.	.	.	nice	.	.
53.8	attractive	4.1	lake	vista	sculpture	.	.	vista	.	.
54.1	attractive	4.43	rest area	sculpture	lake	vista	.	wonderful	.	nice
54.2	attractive	4.4	rest area	sign	.	.	.	planned or well designed	.	.
54.4	unattractive	2	rest area	sculpture	.	.	.	ugly or unattractive	.	.
54.9	attractive	4.5	river	hills	.	.	.	.	.	.
55	attractive	4.6	bridge	vista	.	.	.	vista	.	.
55.4	attractive	3.3	businesses	.	.	.	.	urban skyline	.	.
56.2	attractive	4	landmark bld	.	.	.	.	historic	.	.
57.1	unattractive	2	mowing	grass	.	.	.	not natural	.	.
58.1	unattractive	2.6	dock	bridge	.	.	.	rusty	.	.
58.8	unattractive	2.3	dock	plantings	.	.	.	too large	.	.
59	unattractive	3.35	grass	median	landmark bld	.	.	not natural	structure	.
59.2	attractive	4.8	landmark bld	.	.	.	.	wonderful	.	.
60.6	attractive	3.2	dock	dock	highway	.	.	useful	.	.
61.3	attractive	3.9	landmark bld	.	.	.	.	unique	.	.
61.5	attractive	4.7	sign	.	.	.	.	attractive or beautiful	.	.
62.3	attractive	3.8	interchange	.	.	.	.	efficient	.	.
62.6	attractive	3.2	housing	hills	rock	.	.	wonderful	.	.
62.9	attractive	5	bridge	.	.	.	.	landmark	.	.
63.1	attractive	5	bridge	.	.	.	.	unique	.	.
63.2	attractive	5	bridge	.	.	.	.	vista	.	.
63.5	unattractive	2.1	businesses	.	.	.	.	unkept	.	.
63.6	attractive	4.6	ship	.	.	.	.	well-maintained	.	.

Mileage Location	Perception	Group Mean Perception	Notice Variable 1	Notice Variable 2	Notice Variable 3	Notice Variable 4	Notice Variable 5	Attractive Descriptor 1	Attractive Descriptor 2	Attractive Descriptor 3
63.7	attractive	3.5	businesses	.	.	.	.	well-maintained	.	.
63.8	attractive	4.8	wall	.	.	.	.	colors	.	.
63.9	attractive	4.9	tunnel	.	.	.	.	nice	.	.
64	unattractive	3.8	concrete	median	businesses	plantings	trees	no plantings	.	.
64.2	attractive	4.9	plantings	tunnel	.	.	.	shape	.	.
64.4	attractive	4.95	plantings	tunnel	wall	bridge	.	shape	variety	.
64.5	attractive	4.77	tunnel	wall	plantings	.	.	pleasant	variety	.
64.7	attractive	5	sculpture	tunnel	.	.	.	variety	.	.
65	attractive	4.7	tunnel	wall	.	.	.	pleasant	attractive or beautiful	.
65.1	attractive	5	plantings	wall	.	.	.	vista	.	.
65.3	attractive	4.3	lake	pedestrian overpass	.	.	.	efficient	.	.
65.4	attractive	4.05	building	railing	railroad	.	.	inviting	nice	.
66.5	attractive	2	lake	vista	.	.	.	vista	.	.

ht of way

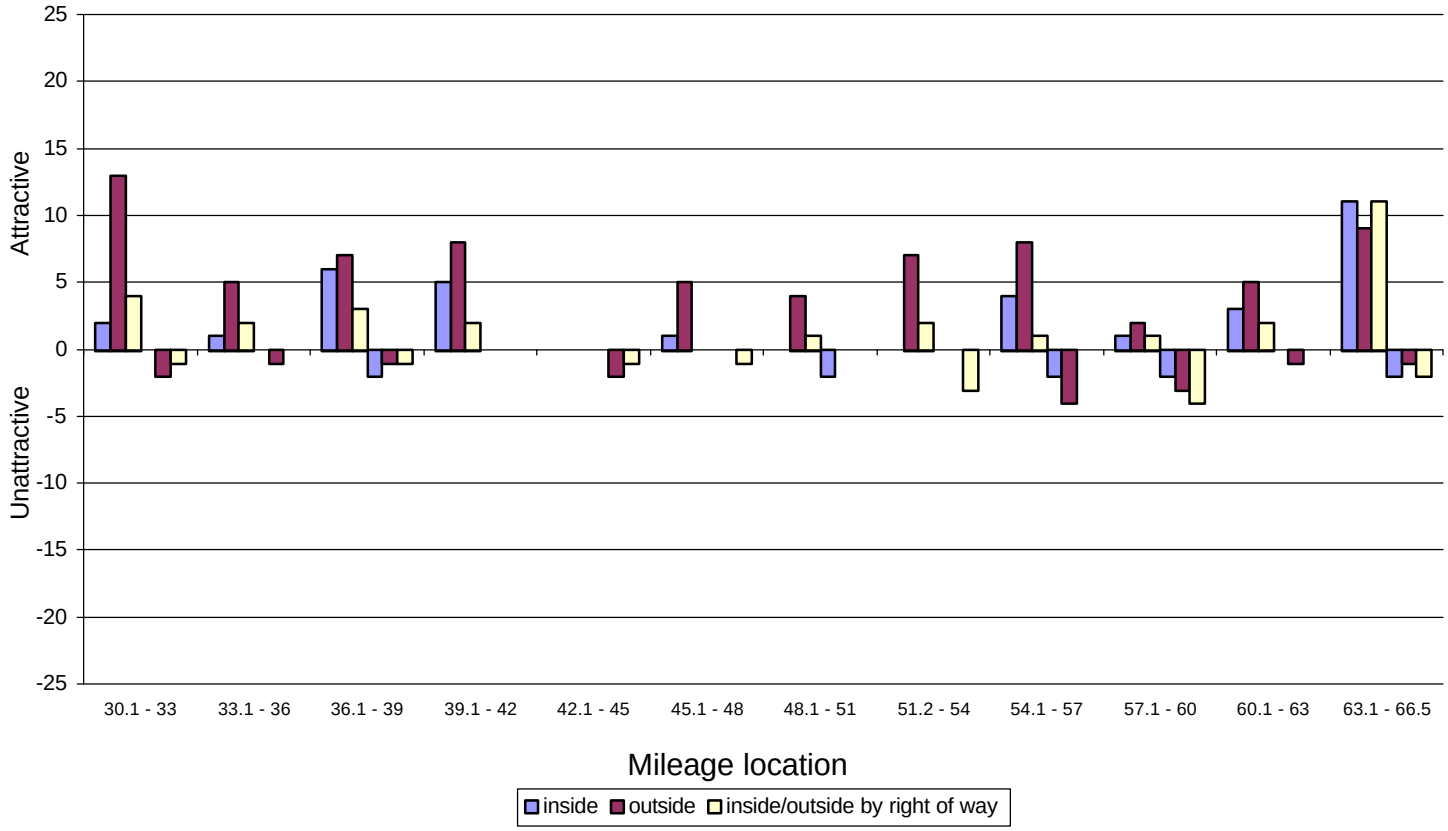
Duluth- No. of views noticed
by right of way and mileage location
(0 - 30 miles)

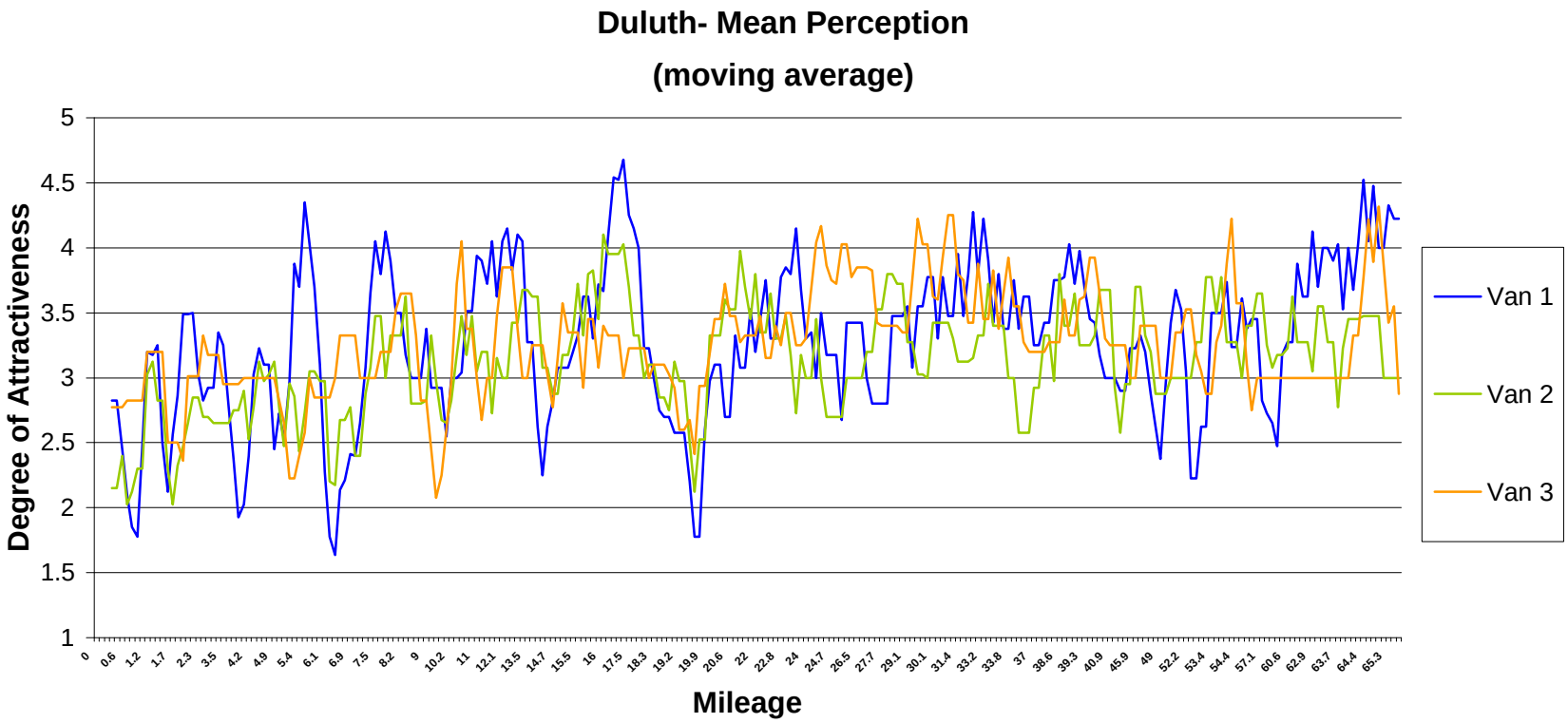


Duluth- No. of views noticed

by right of way and mileage location

(30.1 - 66.5 miles)




Duluth- Mean Perception
(moving average)
Degree of Attractiveness
5
4.5
4
3.5
3
2.5
2
1.5
1
0
0.6
1.2
1.7
2.3
3.5
4.2
4.9
5.4
6.1
6.9
7.5
8.2
9
10.2
11
12.1
13.5
14.7
15.5
16
17.5
18.3
19.2
19.9
20.6
22
22.8
24
24.7
26.5
27.7
29.1
30.1
31.4
33.2
33.8
37
38.6
39.3
40.9
45.9
49
52.2
53.4
54.4
57.1
60.6
62.9
63.7
64.4
65.3
Mileage
Van 1
Van 2
Van 3

APPENDIX D

TRAINING PROTOCOL

APPENDIX D: TRAINING PROTOCOL

D.1 INTRODUCTION

This training protocol is designed to be used in training Mn/DOT staff in the role of facilitating the Aesthetic Initiative Measurement System process. The program for training facilitators lasts approximately four to five hours depending upon the length of the routes that are to be studied.

D.2 AGENDA

The recommended agenda for the training is as follows:

Introductions and Welcome ..... 10:00 a.m.
The Purpose and Definition of AIMS ..... 10:10 a.m.
Who is Involved ..... 10:20 a.m.
What is Involved ..... 10:30 a.m.
Facilitation Guidelines and Facilitators' Roles ..... 10:40 a.m.
The AIMS Day and Getting Ready as the AIMS Day Begins ..... 11:00 a.m.
Training Role Play Simulation 1: Recording View Notes Demo ..... 11:10 a.m.
Training Role Play Simulation 2: Listening Post Process Demo ..... 11: 20 a.m.
Training Role Play Simulation 3: Collective Image Zone Demo ..... 11:30 a.m.
Trainees' Simulation A: Recording View Notes and Listening Post Process ..... 11:40 a.m.
Lunch Break ..... 12:10 p.m.
Questions and Answers ..... 12:50 p.m.
Trainees' Simulation B: The Road Test ..... 1:10 p.m.
Final Briefing and Questions ..... 2:15 p.m.
Adjourn ..... 2:30 p.m.

D.3 THE PURPOSE AND DEFINITION OF AIMS

The purpose of AIMS is to gather information on the aesthetic perceptions of motorists regarding the highways they drive and ride on. The four fundamental dimensions of AIMS are the (1) aesthetic, (2) initiative, (3) measurement, (4) system.

D.3.1 Aesthetic

"Aesthetic" refers to the experience of the road and from the road. Minnesota travelers notice and know what Mn/DOT is providing them. It is not like going to a museum or the opera. Travelers may not use words like aesthetic, beautiful, and scenic. It is an everyday experience. Travelers may think in terms like attractive, nice, pleasant, and pretty.

D.3.2 Initiative

Mn/DOT's intention is to accomplish goals related to design and visual quality. These initiatives can be integrated with broader highway design and engineering goals or can be specific to managing what people see from the road. An initiative is sometimes a general goal—for example, to manage for visual quality and to create a pleasant highway experience. Sometimes an initiative is more specific—for example, to create the feeling of welcome and entry to an urban center. As Mn/DOT learns more about what travelers perceive, Mn/DOT will be better able to develop new or more targeted initiatives.

D.3.3 Measurement

Measurement is to make comparisons among different elements of Minnesota roads at one time—for example, one segment of road compared with another, or one pattern of mowing compared with another. Also, it is a comparison across time—as a segment of road is improved, how do perceptions change and which improvements do travelers notice and appreciate? Mn/DOT can use comparisons to monitor accomplishments and improvements or to prioritize for future improvements.

D.3.4 System

A system is an organized set of activities, methods, and instruments that can be used repeatedly—not a one-time research event. AIMS is a learning system—one that keeps the best parts constant to allow comparisons over time, but changes in the parts that we learn by experience can be improved. It is a system that is already integral to the Mn/DOT organization.

Participant groups in vans will also yield a lot of information that Mn/DOT can use immediately. Participant groups in vans have been designed to yield both quantitative and qualitative data—numbers and words. The words, what people in the vans notice, and what they find attractive or unattractive about what they're seeing along the road, will tell Mn/DOT what matters aesthetically to travelers. The numbers, scaled measurements for each view, will tell us how much people like or dislike what they're seeing.

D.4 WHO IS INVOLVED

AIMS is designed to be part of Mn/DOT. It is an activity that you do, from which you determine the take-home message, what you can learn from the activity. AIMS is also designed to represent the perceptions of everyday travelers, people who know a lot less about the design and management of Minnesota roads than Mn/DOT staff do.

MN/DOT staff will operate and facilitate the participant groups—that's what the training is all about. We hope those who are learning to be AIMS facilitators will be leaders in implementing AIMS in future years. There will be six to eight participants in each participant group. The groups typically are recruited from their communities for AIMS with the following target types:

- people not from the geographic area that is being viewed (representing tourists)
- commuters through this area
- people who have lived in the geographic area more than five years
- people who own or manage businesses in the geographic area, preferably near the road of interest

- people who grew up in a rural area and some who did not

Essentially, you'll be driving down the road on a route selected to expose group participants to elements of the highway experience that you have selected as priorities for this year (another year you might select a different route to learn about travelers' experiences of different elements). The routes are selected by Mn/DOT, according to the priorities of what Mn/DOT staff wants to learn that year.

You'll be asking participants to tell you what they notice. AIMS is just a systematic way for you to have this conversation and record it so that the entire agency gets to "listen" and "learn" from what you hear.

The products of the AIMS trial in the year 1999 produced about 7,000–9,000 data points gathered from 70 group participants distributed across three urban areas: Rochester, the Twin Cities Metro, and Duluth. The collected data informs Mn/DOT about the visual quality of Minnesota roads qualitatively, by the words recorded, and quantitatively, by the numbers that participants record on the scantron forms.

D.5 ROUTES AND COLLECTIVE IMAGE ZONES

The AIMS system is versatile in relation to sites. Although applied primarily on four-lane, limited access highways, early tests of the system have demonstrated that AIMS can be used on virtually any highway in the state. Application in areas of recent enhancement programs or where significant enhancement programs may occur should receive special consideration. Points of aesthetic interest can be documented both within and outside the right-of-way.

Routes should be planned with participants in mind. Early tests of the AIMS system indicate that participants begin to demonstrate fatigue after a total of three hours. These same tests indicate that on average a van can be expected to cover approximately 15 miles per hour. This allows for normal highway driving speed and on average stops every five miles to allow facilitators (interviewers) to collect view note data from the participants.

On routes where specific attention is needed to draw the attention of participants to recent roadside enhancements (e.g., tree plantings, special sound barriers, landscaping, or bridge design), collective image zones (CIZs) are utilized. In planning routes, more data is collected at listening posts within this variant of the AIMS methodology, therefore more time for data collection needs to be allowed when planning routes of collective image zones.

Collective image zones also need to be placed last when planning AIMS routes whenever possible. Data analyses of past AIMS studies indicate that directing participants' attention to specific enhancements tends to solicit a more positive response as to the attractiveness of a highway. Note, as part of the collective image zone method, interviewers are pointing out specific enhancements to the highway. This in turn may create a bias in the control or standard viewing areas as participants become more "trained" to look for specific enhancements. Although route planning may vary by location, the typical AIMS schedule begins with forty-five minutes of registration and participant orientation. This is followed by two hours of standard view note data collection. Next is a break where participants are informed of the collective image zone modifications, and then a one-hour period with further data collection using the CIZ method. When in doubt, create shorter routes with more frequent listening posts.

D.6 WHAT IS INVOLVED

AIMS participant groups will be looking at a different route in each region. Each year new routes will be selected with the following objectives in mind:

- To capture landscape elements of interest to Mn/DOT in light of current and anticipated priorities. The collective image zones (*point to the route map*) are specifically selected to display these elements.
- To represent the variety of Mn/DOT designs and design challenges around the state and to allow comparisons of design elements by sticking to a few landscape elements of interest each year. For example, one year might focus mainly on typical rural elements, and another year on elements more typical of urban areas.

- To allow comparisons among those elements, from segment to segment or across time. At least one CIZ will be a control segment, allowing Mn/DOT to compare innovative treatments of these elements with the standard treatment.
- To avoid bias by going both directions on most segments of the route and by locating CIZs on the return trip, after undirected data are taken.
- To maintain the interest of participant group participants by avoiding fatigue.

D.7 FACILITATION GUIDELINES

Good facilitators can create a productive atmosphere in a small group setting while allowing participants to feel at ease in stating opinions and observations. Some basic ground rules to establish with participants during the orientation/introduction meeting are given below:

- Statements and observations should be made while covering the route. They should be kept in confidence by others in the van.
- Everyone has the option to pass; pressure should not be asserted on individuals who are not declaring view notes with regularity.
- Everyone's ideas and observations are valuable.
- Participants should only speak for themselves and not for others. Don't put words in the mouths of others.
- Avoid "put-downs" or criticisms of others.
- Be responsible for your own participation.
- Expect some conversations and observations to go unfinished and remain unclear. Everybody will not see the same things the same way.

These guidelines should be reinforced by the Mn/DOT facilitators during the course of soliciting and recording observations. Introduce yourself to participants and help get the group acquainted. Show genuine concern for individuals and their observations. Help people clarify their statements and respect differing views, including those with which you may disagree.

These guidelines were taken in part from "Facilitating the Group Process" in *Hometown Health*, Iowa State University Extension: Ames, Iowa, 1998.

D.8 FACILITATORS' ROLES

Mn/DOT employees have served as AIMS drivers and interviewers. Facilitators should be absent of personal or vested interests in the results of the AIMS process. Furthermore, drivers and interviewers should be advised not to express opinions either during the orientation meeting with participants or during the data-collection phase. Bias or perceived bias by drivers and interviewers needs to be avoided as it greatly affects the responses of AIMS passengers and greatly detracts from the validity of the process.

Everyone will have a different role on the AIMS day. It's important to know how it all fits together. Roles will include (1) registration coordinator, (2) interviewer, and (3) recorder/driver.

A *registration coordinator* is designated to organize participant registration, provide for participant orientation, and organize and distribute the need forms and materials to conduct data collection. Facilitators should be provided with standard view note forms, collective image view note forms, a route summary form, a view note log form, a dozen sharpened pencils, a tape recorder with three one-hour tapes, and a clipboard. Each participant should be provided with a small note pad, a clipboard, two No. 2 pencils, and a scantron sheet.

The *interviewers* will be responsible for facilitating the actual data-collection process within the vans. Interviewers should prompt the passengers to describe the sites they see as the vans follow predetermined routes. To a void bias and allow for orderly collection of data, interviewers should follow the detailed script provided. One or more of the interviewers may be called upon to facilitate the introduction/orientation meeting with the participants prior to the boarding of the vans.

The *driver/recorder* will be in charge of driving the van, calling out the mileage at points where view notes are sited, assisting the registration coordinator in preparing for the

introduction/orientation meeting, completing the route summary form, and changing and marking recording tapes at listening posts.

D.9 THE AIMS DAY

A typical AIMS day might look like this:

Registration .....8:30 a.m.–8:45 a.m.

Introduction and Orientation .....8:45 a.m.–9:15 a.m.

Begin AIMS Survey .....9:15 a.m.–11:15 a.m.

Break .....11:15 a.m.–11:30 a.m.

AIMS Survey / Collective Image Zones ..... 11:30 a.m.–12:30 p.m.

Completion of Route..... 12:30 p.m.

It is important to have fun, take breaks, and engage people. Like having a conversation, stay on script to avoid bias, but also improvise to prompt. Let people know you're really interested in what they think.

D.10 GETTING READY AS THE AIMS DAY BEGINS

The necessary equipment that should be ready for distribution and use includes slides for the introduction, photos of the slides for use in the vans, route maps, tape recorder, tapes, spare batteries, workbooks, and participant scantrons and notebooks.

The day should begin with the explanation of the consent forms. Participants should sign it and return it to the registration coordinator. The following materials have to be distributed: steno pad, pencils, map, and scantrons sheets. Identification numbers assigned to the participants should be checked and indicated on the nametags. Van assignments should be given to each participant.

The next step is to follow the interviewer script given in the facilitators workbook This script states that Mn/DOT is interested in what they find as attractive or unattractive in the highway corridor. The definition of attractive and unattractive is explained, and examples are given in the script. Be sure to use the definitions contained in the interviewer script.

Questionnaires for the scantrons have to be distributed to the participants. It is necessary that scantron demonstrations be done to have a common understanding about how to fill them out. Identification numbers have to be indicated on both scantrons. Be sure to start at number 1 on the scantron. Participants should complete part 1.

To give directions on how to complete part 2 of the scantron, briefly describe the route while pointing to the segments named on the questionnaire as they appear on the map. It is advisable that an overhead of the description of the route be presented to the participants. Likewise, each participant should have a hard copy of the map.

The next step is to lead the participants in baseline description of attractive and unattractive. Use the attractiveness scale prop and the overhead of the scantron to explain and demonstrate the scale. The purpose of the baseline description is to establish the aesthetic range—a “5” means the most attractive view for this type of highway route in this location, and a “1” means the least attractive for this type of highway route in this location. It is also important to read the definitions of attractive and unattractive with special emphasis on what you notice and what you think. Ask for questions.

Trainer: Have the facilitators in training actually do this part of the data gathering while looking at some slides, and discuss their answers as they might relate to participant groups answers or questions they might get from participant group participants.

D.11 ON THE ROAD

It is important to pay special attention to participants' needs, including their comforts and concerns. Repeat the attractiveness scale explanation as needed. Routes are planned with participants in mind. Early tests of the AIMS system indicated that participants begin to demonstrate fatigue after a total of three hours. These same tests indicated that on average a van can be expected to cover approximately 15 miles per hour. This allows for normal highway driving speed and on average stops every five miles to allow facilitators (interviewers) to collect view note data from the participants.

Some definitions will help to keep the system organized:

- *View*—use slides
- *View note*—use maps, refer to interviewer, note taker, and driver
- *Listening post*—use maps, refer to driver
- *Collective image zone*—use maps, refer to interviewer and note taker

D.12 DATA-GATHERING PROCESS INSTRUCTIONS

It is very important that each of the facilitators know their roles and have answers to any questions asked by participants to have consistency in the data-gathering procedure. There is no wrong answer. Consistency and clarity of the procedure are the most important concepts that the facilitators should adhere to.

The following are the important things that have to be checked:

- ID numbers on everything
- ID numbers for your group recorded in your workbook
- Be sure everyone is on the correct scantron number (different scantron numbers for different van groups)
- Double check that you have a good tape—bring extra tapes, batteries, etc.

Always reflect on Mn/DOT priorities for getting aesthetic information this year. It could be something you have just completed, an area you think needs attention, or something you just want to establish a baseline on. The route is selected especially to provide opportunities to view these elements.

D.12.1 Recording View Notes

Sometimes the notable landscape views will come very quickly. To help keep track of these and remember them until we arrive at a listening post, we ask participants to call out "view note" at any point along the way. The interviewer will then record the location of your note. When the participant calls out "view note," the interviewer will call back a number to the participant. The participant will then write a few words in his or her notebook to help remember what was seen. The notes will also help the participant to remember what was found attractive or unattractive until the next listening post. At the listening post, the recorder will ask participants their impressions of what made each specific view attractive or unattractive in greater detail by calling out the view note number.

To demonstrate how view notes are initially recorded, use the training role play simulation in Figure D. 1. The purpose of the role play simulation is to guide Mn/DOT facilitators on how to go about the data-gathering process.

RECORDING VIEW NOTES DEMO

Arrange four chairs in the front of the room. Have a trainer sit in each; they will simulate the role of participant/note taker. Have a fifth standing trainer act as recorder. Have a sixth person act as a commentator with a recorder form on the overhead. Simulate the action in the van by having the mock participants call out "view note" at intermittent times. Show how the recorder calls back a number and demonstrate how each view note is recorded on the overhead. Have the mock participants make notes in their notebooks. Point out that the pace of view notes can vary dramatically over the routes selected and that the recorders should not prompt or promote the calling of view notes. Pause here for questions and training group analysis of the process just simulated. What just happened? Why? How were the materials used?

Figure D.1 Training Role Play Simulation 1

D.12.2 Listening Post Process

To demonstrate the listening post process, use the training role play simulation in Figure D.2. The purpose of the role play simulation is to guide Mn/DOT facilitators on how to go about the data-gathering process.

LISTENING POST PROCESS DEMO

Arrange four chairs in the front of the room. Have a trainer sit in each; they will simulate the role of participant/note taker. Have a fifth standing trainer act as recorder. Have a sixth person act as a commentator with a recorder form on the overhead. Select three views one might see on the proposed route. Demonstrate how the recorder questions the participants as to the views seen by citing the view notes recorded. The recorder should then proceed through the three mock view notes, as the commentator demonstrates to the trainees how data are recorded on an overhead projector. Pause here for questions and training group analysis of the process just simulated. What just happened? Why? How were the materials used?

Figure D.2 Training Role Play Simulation 2

D.12.3 Collective Image Zone Instructions

This information should be given to survey participants at listening post *n* (just before entering the first collective image zone).

The language that follows should be read to participants. Please follow the text closely to avoid the introduction of bias and to ensure uniformity among presentations. A trainer should review the following introduction to the CIZ areas that are given to participants prior to entering the zones.

Now, let's talk about what we're about to see as we continue driving. We're going to drive along a part of the road where we are asking you to pay special attention to particular aspects of what you see. As we drive this next segment, in the *x* direction, please pay special attention to the plantings *(show photo example again here),* the character of the structures, like walls, bridges, and so on *(show photo example again here),* and the vistas from the road as well *(show photo example again here)*.

We don't expect everyone to see everything. Along this segment, call out "view note" whenever you notice anything attractive or unattractive—just as you have been doing all day. But please think especially about what you like or don't like about the plantings, structures, and vistas that you see on this segment. Also, I may call out "view note" on your left or "view note" on your right occasionally when we are passing something that we want to be sure that you notice. We'll talk about your perceptions when we get to the next listening post at the end of this segment of the road.

The interviewer//recorder should administer the collective image zone view note form in the collective image zone segments of the route.

To demonstrate the use of collective image zones, use the training role play simulation in Figure D. 3. The purpose of the role play simulation is to guide Mn/DOT facilitators on how to go about the data-gathering process.

COLLECTIVE IMAGE ZONE DEMO

Repeat training role play simulations 1 and 2, but use the CIZ forms instead. Have one of the trainers take on the role of the interviewer, and demonstrate how instructions are given to the participants prior to entering the CIZ area. Demonstrate how view notes are called out and recorded in the CIZ using the same trainers and the overhead. Next, demonstrate how participants are interviewed at the listening posts within CIZs. Show how both the questions and recording procedures will slightly vary the from "ordinary" portions of the routes. Pause here for questions and training group analysis of the process just simulated. What just happened? Why? How were the materials used?

Figure D.3 Training Role Play Simulation 3

D.13 TRAINEES' SIMULATIONS

The simulation process should be given special attention for it will affect how the actual data gathering procedure will be done. Before beginning each simulation, talk about possible challenges that could come up. See Figures D.4 and D.5 for the two trainees' simulations.

RECORDING VIEW NOTES AND LISTENING POST PROCESS

Divide the trainees into four groups: two pairs of two teams. Have one team observe and ask questions as the other team simulates both CIZ and "ordinary" listening post processes. Use slides to simulate views. Make suggestions as they go along. Stop and ask questions and make observations before the two teams switch places. If possible, run the two rounds of simulations twice. The second time around have the driver/recorder and interviewer switch places with the participants. Have the participants note difficulties and challenges (number of view notes, difficulty thinking of anything to say, no view notes, etc.).

Figure D.4 Trainees' Simulation A

THE ROAD TEST

Break into groups with two instructors and at least three trainees per group. Each group will be in a separate vehicle for the road test. The trainees should take the roles of participant note taker(s), interviewer, and simulating driver. One instructor should drive. The "simulating driver" should ride directly behind the driver and simulate all but the driving duties of the driver. Discuss the timing and fine tuning options again while in the vehicle. Discuss what challenges might occur at each listening post. Conduct CIZ and ordinary listening post processes in the vehicle. The instructor who is not driving should take notes on challenges or what needs further clarification for the participant note taker(s), interviewer, and simulating driver.

Figure D.5 Trainees' Simulation B

D.14 BREAK

The following points are important to remember at the break:

- Staying on schedule is important.
- Let people know about restrooms, etc.
- Have participants check scantrons to make sure they're on the right number.
- Encourage people to stretch, etc.
- Let them know "how much longer."
- Be enthusiastic; let them know how much you've learned from what they've already said. Encourage them to continue to express their own perceptions—it doesn't matter if we have many different perceptions, that's what we want to hear.

Note that it is recommended that AIMS days with shorter routes be scheduled. If a longer route is necessary to establish a new baseline, a lunch break should be scheduled.

D.15 POTENTIAL QUESTIONS DURING THE TEST DRIVE

D.15.1 Timing

You should reach the break location by *x*. If you are running short of time, skip segment *y* before the break. Skip segment *z* after the break. Do not skip *a*, *b,* or *c* (the CIZs). Point to the "optional" segments and the CIZ segments again on the route map.

D.15.2 Redundancy

Encourage participants to note view notes even if similar views have been noted. Quantity of view notes of certain types will help us understand how much this experience is widely shared. To save time, once an element has been described a few times, the note taker might ask: Do you find anything different in what makes this (element *x*) attractive or unattractive compared with the last one we talked about? Is it about the same? Be sure to note that on your sheet. Remember, it's good to note everything that you see.

D.15.3 Participant Air Time

If one participant tends to dominate, taking much of the air time, try starting with another participant in asking what is attractive or unattractive.

D.15.4 Rain Day Decisions and Process

A little drizzle or intermittent showers are OK. Just note in note takers book if it was overcast or when the showers occurred relative to listening posts, so we can check for correlations with participant group data.

D.16 COMPLETION OF THE ROUTE

After completing the route, certain housekeeping has to be done. Survey participants will be asked some closing questions. These are as follows (these responses should be recorded in each participant's steno book):

1. Looking back on all the views you have seen and rated in this journey, is there any view that you immediately recall as most attractive compared with all the rest?
2. Do you remember where it was? (Record each participant's attractive view by listening post number and, if possible, view note number, with their ID.***)***
3. What made it seem that way to you? (Record key words and ID.***)***
4. Is there any view that you immediately recall as most unattractive compared with all the rest?
5. Do you remember where it was? (Record each participant's unattractive view by listening post number and, if possible, view note number, with their ID.)
6. What made it seem that way to you? (Record key words and ID.)

In closing, address the participants as follows: **All participants may receive a copy of the results of this survey if they wish. We are very grateful for your time today. We will use the information that you have provided to us to help us set priorities for what to consider in future improvements to the Minnesota highway system. Look for more of what you liked today as you drive down Minnesota highways in the future! Again, thank you very much for your time and assistance.**

Note: All completed route summary forms, standard view note forms, collective image view forms, recorded tapes, and scantrons should be returned to the registration coordinator or a designated form collector upon completion of the route.

D.17 FINISH THE TRAINING

The training should be completed with an overview of the following points:

- a reprise of AIMS goals
- what we hope to learn
- different years, different elements for CIZs, different routes or segments
- how we hope AIMS works for Mn/DOT

APPENDIX E

FACILITATORS WORKBOOK

APPENDIX E: FACILITATORS WORKBOOK

E.1 KEY FACILITATORS' ROLES

E.1.1 Registration Coordinator

This person is responsible for the orientation and introduction meeting of the participants. This includes preparing audio/visual equipment, ensuring nametags are complete with ID numbers, displaying signage to mark the meeting site for participants, and ensuring form packets are available to participants for distribution.

E.1.2 Interviewers

This set of facilitators are responsible for facilitating the actual data collection process within the vans. Interviewers prompt the passengers to describe the sites they see as the vans follow predetermined routes. To a void bias and allow for orderly collection of data, interviewers are given a detailed script to follow. One or more of the interviewers may be called upon to facilitate the introduction/orientation meeting with the participants prior to the boarding of the vans.

E.1.3 Recorder/Driver

This final set of facilitators are charged with driving the van, calling out the mileage at points where view notes are sited, assist the registration coordinator in preparing for the introduction/orientation meeting, calling out the mileage location as view notes are called out, complete the route summary form, and be responsible for changing and marking recording tapes at listening posts.

E.2 INSTRUCTIONS TO FACILITATORS

The instructions for workbooks sections are in italics and are for the benefit of facilitators. Segments meant to be read aloud for survey participants are in bold. These bold segments may be paraphrased as long as the content remains the same. Areas where questions occur regarding the meaning or content should be read as written in order to ensure that no bias is accidentally introduced into the survey process.

E.2.1 Prior to the Start of the Event

- *Arrive at the meeting facility by 8:00 a.m. to prepare for the 9:00 a.m. session to begin.*
- *Drivers/recorders and interviewers will assist the registration coordinator in preparing for the day's events.*
- *Registration coordinators should have overhead and slide projectors ready for use.*
- *Break out groups based on demographic information and group dynamics.*
- *Ensure that nametags are complete with names and ID numbers.*
- *Ensure all handouts are ready for distribution.*
- *Restrooms are clearly marked.*
- *"Creature comforts" are arranged in the meeting room (coffee, etc.)*
- *Vans are prepared for immediate departure after the introduction / registration (van teams are assigned, participants are assigned to vans, materials are stocked, tape recorders are ready, odometers are reset, props are ready . . .)*
- *Communications systems are checked out.*
- *The process for determining whether to shorten the route has been reviewed with the facilitation team.*
- *Display signage inside the building to ensure participants reach the meeting room easily and comfortably.*
- *Have someone at the entrance to the building to greet people and direct them to the meeting room.*
- *Have someone at the entrance to the meeting room to greet people as they enter.*

- *Interviewers and drivers/recorders should introduce themselves and mingle with participants as they arrive to ensure that they are comfortable with their surroundings and the day's events, PROJECT A POSITIVE AND FUN ATTITUDE.*

E.2.2 During the Registration / Introduction Process

- *Assist participants in filling out questionnaires on the small scantrons (personal data, van number, ID number, etc.; see Figures E.1 and E.2) while the registration coordinator demonstrates in the front of the room.*
- *Assist the registration coordinator in demonstrating the view note process.*

E.2.3 After the Registration/Introduction Process

- *See that van teams are directed to vans as divided.*
- *Get people in the van based on their size.*
- *Get boisterous /loud people in the back of the van.*
- *Make sure all passengers have clear views to both sides of the van.*

E.2.4 Complete Route Summary Form

Prior to the participants boarding the vans, driver/recorders should complete the route summary form (see Figure E.3).

Section 1. About You

Before we get started, we'll take 15 minutes for you to give us some information about yourself. Please answer the questions on this sheet. (*Hand out scantrons, questionnaires, and demonstrate how to fill out first line of small scantron).*

1. How long have you lived in Minnesota?
    a) Don't live in Minnesota
    b) Less than 1 year
    c) 1-5 years
    d) More than 5-10 years
    e) More than 10 years

2. I live near:
    a) Duluth
    b) Mpls/St. Paul
    c) Rochester
    d) Not near any of these cities

3. I travel ___ miles one way to my office each day
    a) Less than 2
    b) 2-5
    c) More than 5-10
    d) More than 10-20
    e) More than 20

4. Until I was 16, I lived mostly in:
    a) Rural area not in town
    b) Small town (town less than 10,000)
    c) Town or suburbs (a town less than 10,000 near a city of at least 100,000)
    d) A city of least 100,000

5. My age is:
    a) 25 or younger
    b) 26-40
    c) 41-55
    d) 56-70
    e) 71 or older

6.I am:
    a) Female
    b) Male

7.I own or manage a business in one of towns that the route will pass through today.
    f) Yes
    g) No

Figure E.1 Small Scantron Questionnaire

Section 2. About Your past Experience on this Route

Here is a map of the route we will drive today. (One map for each person and project map on overhead). **Together we'll go through the next several questions about your experiences with this route.**

8. I have driven some part of the route that we are going to drive today.
   a) Yes (Go to question 8, please).
   b) No (Do not answer any more questions in this section. Wait until the group has completed this section).

9. I drive
   a) All or some of part A on the map several times a week
   b) All or some of part A on the map occasionally
   c) All or some of part A on the map less than once a month
   d) None of part A on the map.

10. . I drive
   a) All or some of part B on the map several times a week
   b) All or some of part B on the map occasionally
   c) All or some of part B on the map less than once a month
   d) None of part B on the map.

11. I drive
   a) All or some of part C on the map several times a week
   b) All or some of part C on the map occasionally
   c) All or some of part C on the map less than once a month
   d) None of part C on the map.

12. I drive
   a) All or some of part D on the map several times a week
   b) All or some of part D on the map occasionally
   c) All or some of part D on the map less than once a month
   d) None of part D on the map.

13. I drive
   a) All or some of part E on the map several times a week
   b) All or some of part E on the map occasionally
   c) All or some of part E on the map less than once a month
   d) None of part E on the map.

14. I drive
   a) All or some of part F on the map several times a week
   b) All or some of part F on the map occasionally
   c) All or some of part F on the map less than once a month
   d) None of part F on the map.

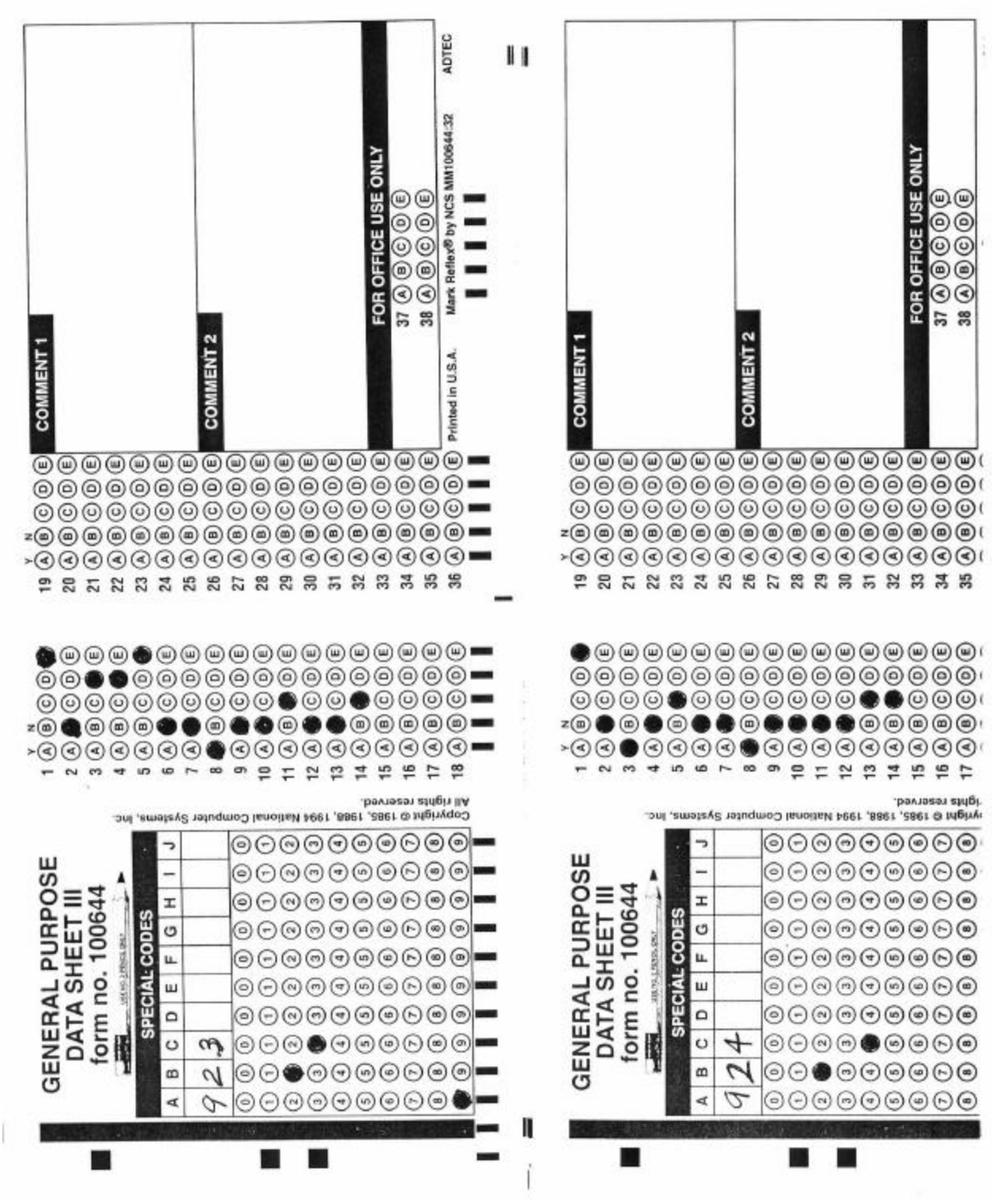


Figure E.2 Example of Small Scantron

ROUTE SUMMARY FORM

AIMS Route: _____

Date: _____

Van #: _____

Van Driver / Recorder: _____

Interviewer: _____

Participants: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Figure E.3 Route Summary Form

E.3 AIMS DAY SCHEDULE

The following schedule approximates the day's events and their timing. This may be modified as needed based on the administration of the survey instrument. Please remember to remind people of the schedule and provide comforts as needed.

Registration .....8:30 a.m.–8:45 a.m.

Introduction and Orientation .....8:45 a.m.–9:15 a.m.

Begin AIMS Survey .....9:15 a.m.–11:15 a.m.

Break.....11:15 a.m.–11:30 a.m.

AIMS Survey / Collective Image Zones ..... 11:30 a.m.–12:30 p.m.

Completion of Route..... 12:30 p.m.

E.4 VIEW NOTE/LISTENING POST PROCESS

This is the same information reviewed in the introduction / registration session. This information need only be mentioned if participants have questions concerning the process.

Sometimes the notable landscape views will come very quickly. To help us keep track of these and remember them until we arrive at the next LISTENING POST, we ask you to call out "VIEW NOTE" at any point along the way. The interviewer will then record the location of your note on view note number/location sheet (see Figure E.4). When you call "VIEW NOTE," record the view number that the interviewer will call back to you and then write a few words in your notebook to help you remember what you saw and what you found attractive or unattractive about it until we reach the next LISTENING POST. At the LISTENING POST, we'll want to hear your impressions of what made the view attractive or unattractive in greater detail.

At the LISTENING POST, we'll discuss the view notes in sequence as we saw them, and rate them on these large scantron sheets (see Figure E.5). The interviewer will ask you what you noticed when you called "VIEW NOTE," and what you found attractive or unattractive about what you saw. The interviewer will ask each person in the van to rate that element on a 5-point scale from 1, representing the most unattractive view you have seen, to 5, representing the most attractive view you have seen. If you didn't see the view, you'll just leave that view number blank on your sheet, and move on to the next number on the sheet to record your perceptions of the next view. (*Registration coordinator demonstrates on the overhead the scantron***).**

Of course, there are no right or wrong answers and no list of what might make something attractive or unattractive. We want to know how you see it and what you find attractive in your own words.

This information could be reviewed with participants to illustrate the types of views that may be seen from the vans as they drive the highways if necessary.

View Note #	Mileage Location	View Note #	Mileage Location	View Note #	Mileage Location
181		211		241	
182		212		242	
183		213		243	
184		214		244	
185		215		245	
186		216		246	
187		217		247	
188		218		248	
189		219		249	
190		220		250	
191		221		251	
192		222		252	
193		223		253	
194		224		254	
195		225		255	
196		226		256	
197		227		257	
198		228		258	
199		229		259	
200		230		260	
201		231		261	
202		232		262	
203		233		263	
204		234		264	
205		235		265	
206		236		266	
207		237		267	
208		238		268	
209		239		269	
210		240		270	

Figure E.4 Example of View Note Number/Location Sheet

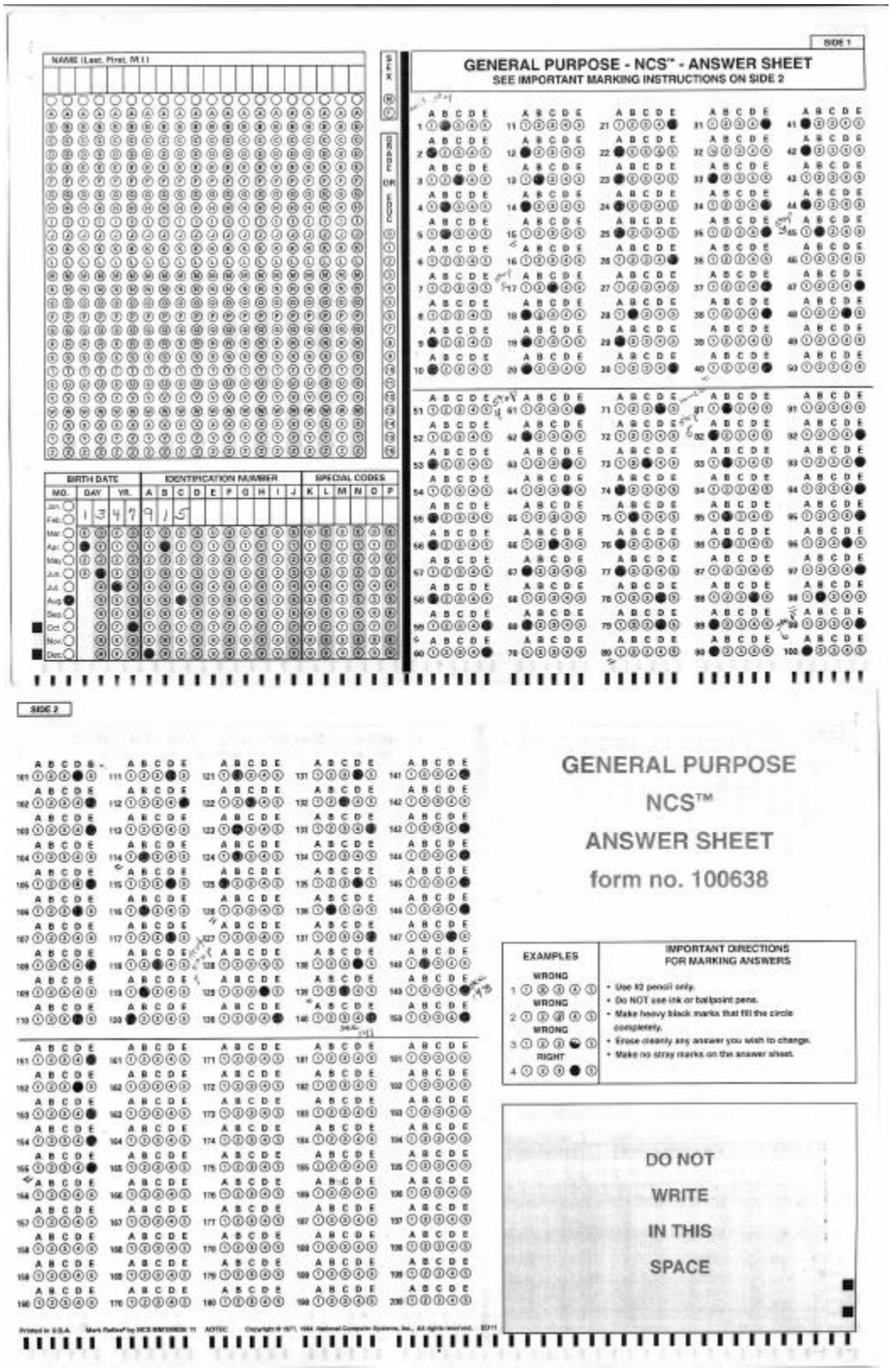


Figure E.5 Example of Large Scantron

Just to give you an idea, here are some things that a test group noticed, and the kinds of words they used to describe what made the landscape views attractive or unattractive.

Some of the things you remember seeing along this route might have been broad landscape views like this . . .

(SHOW SKYLINE VISTA EXAMPLE with adjectives like attractive, striking, something to look forward to)

Some of the things you noticed could have been very specific elements along the roadside like this . . .

(SHOW VEGETATION EXAMPLE with words like pretty, natural, colorful)

Or this

(SHOW BRIDGE EXAMPLE with words like attractive, refined, urban, clean)

Or perhaps you always notice something like this that you may find attractive or unattractive

(BUILDING OR SIGN ALONG THE ROAD EXAMPLE with words like clutter, unattractive)

Any of these types of landscape views, at any scale, could be something that you might notice and want to comment on along the way.

Occasionally, the interviewer will ask you to pay special attention to something that you are about to see along the highway. When that landscape view appears, the recorder will call out "VIEW NOTE," and that view will be discussed when you segment the LISTENING POST. Otherwise, don't worry if you didn't notice anything at a point where someone else

called out "VIEW NOTE." Many of these view notes may be seen by only a few people. Think more about what happens to strike you personally.

Now we'll just pause to be sure that everyone has entered his or her ID number on this large scantron sheet, and we'll be ready to begin.

(Example: At the first listening post)

This is the actual language that will be used to gather information at the listening posts. Use standard view note form s (see Figure E.6) to gather data at this listening post. At the end of this listening post, interviewer should double check that the tape recorder is working. As each tape is completed, label it with the interviewers' name, the city and date, and a consecutive number (from 1 to n).

(VIEW NOTE 1)

Who called out view note 1?
(To the viewer who identified the view)

What did you notice?
(Potential prompt: Describe what you saw. What did it look like?)

Now, will everyone who noticed view note n please rate it on your SCANTRON?
(Point to prop when needed: The rating scale is here: 1 is the most unattractive, 5 is the most attractive).

If you didn't see view note n, leave no. n blank.

(To the viewer who identified the view)
Did you find it attractive or unattractive? *(Circle one)*

Standard View Note Form

Listening Post:_____ View Note #_____
(Call this out loud so that everyone stays on correct View Note #)

*Mileage location:*_____

Who called out view note n? *(Record ID #)* _____

(To the viewer who identified the view)

What did you notice?

(Potential prompt: Describe what you saw. What did it look like?)

_____

_____

Now, will everyone who noticed view note n please rate it on your SCANTRON? (point to prop when needed: The rating scale is here: 1 is the most unattractive, 5 is the most attractive). **If you didn't see view note n, leave no. n blank.**

(To the viewer who identified the view)

Did you find it ATTRACTIVE or UNATTRACTIVE? *(Circle one*).

What made it look that way? *(Record key descriptive words) (Potential prompt*)

What did you find **attractive**?	OR	What did you find **unattractive**?
_____		_____
_____		_____
_____		_____
_____		_____
_____		_____
_____		_____

Figure E.6 Standard View Note Form

What made it look that way?

(Record key descriptive words)

(Potential prompt: What did you find attractive? OR What did you find unattractive?)

At approximately LISTENING POST 5 a determination should be made as to the progress along the route and the amount of time remaining in the day. Consult with other van drivers and the site manager. Note what time it should be when the vans arrive at this listening post. If they are behind more than 20 minutes, identify the segments still ahead that can be skipped. No collective image zone segments can be skipped.

E.5 BREAK

Stop at the predetermined facility for a break.
Facilitators should gauge the fatigue level of participants. At the end of the break, introduce the collective image zone process.

Note who is responsible for getting the break, creature comforts, checking to see that all participants are back in place in time and they are in the correct location.

Before leaving the break location give this information to participants:
We'll be asking you to continue to note anything that you see as attractive or unattractive, AND we'll be asking you to be particularly aware of the appearance of certain segments of the road. We'll stop before we get to the first of those segments and talk about some of the questions we want to ask after you've seen this segment. Now, please continue to call out "view note" when you notice something that you find attractive or unattractive.

Remember that facilitators will have to use props when introducing the collective image zones. Please have all necessary materials available for use when needed.

Make sure all participants use the restrooms before departing.

Continue to use the standard image zone forms until the first collective image zone is reached.

E.6 COLLECTIVE IMAGE ZONES

This information should be given to survey participants at LISTENING POST n, (just before entering the first collective image zone). Conduct the standard view note process at this listening post and upon completion introduce the collective image zone view note process again.

First, let's talk about what you noticed along the road just before we stopped here:

Use standard forms to gather data for standard view segments.

The language that follows should be read to survey participants. Please follow the text closely to avoid the introduction of bias and to ensure uniformity among presentations.

Now, let's talk about what we're about to see as we continue driving.

Now we're going to drive along a part of the road where we are asking you to pay special attention to particular aspects of what you see. As we drive this next segment, along *x* **going** *direction,* **please pay special attention to the plantings** *(show photo example again here),* **the character of the structures, like walls, bridges, and so on** *(show photo example again here),* **and the long vistas from the road as well** *(show photo example again here).* **We don't expect everyone to see everything. Along this segment, call out "view note" whenever you notice anything attractive or unattractive—just as you have been doing all day. But please think especially about what you like or don't like about the plantings, structures, and long vistas that you see on this segment. Also, I may call out "view note" occasionally when we are passing something that we want to be sure that you notice. We'll talk about your perceptions when we get to the next listening post at the end of this segment of the road.**

The interviewer and driver/recorder should administer the collective image zone view note form (see Figure E.7) in the collective image zone segments of the route.

Collective Image Zone View Form

Page 1 of 2

Listening Post:_____ View Note #_____
(Call this out loud so that everyone stays on correct View Note #)

*Mileage location:*_____

Who called out view note n? *(Record ID #)* _____

(To the viewer who identified the view)

What did you notice?

(Potential prompt: Describe what you saw. What did it look like?)

_____

_____

Now, will everyone who noticed view note n please rate it on your SCANTRON? (point to prop when needed: The rating scale is here: 1 is the most unattractive, 5 is the most attractive). **If you didn't see view note n, leave no. n blank.**

(To the viewer who identified the view)

Did you find it ATTRACTIVE or UNATTRACTIVE? *(Circle one*).

What made it look that way? *(Record key descriptive words) (Potential prompt*)

What did you find **attractive**?	OR	What did you find **unattractive**?
_____		_____
_____		_____
_____		_____
_____		_____
_____		_____
_____		_____

Figure E.7 Collective Image Zone View Note Form

Collective Image Zone View Note Form
Page 2 of 2

(To all viewers)

How many of the rest of you also saw the *(repeat description of view note provided by viewer above*) **OR you saw something very similar to it in approximately the same location? If you did see something similar in approximately the same location, be sure that you have rated what you saw on the scantron at no. n.**

(Don't need to actually record the number of people who saw this—we can get it from scantrons).

If you saw it, did you find it ATTRACTIVE or UNATTRACTIVE? Why? What did you notice about it that made it look that way? (Conduct a discussion on these questions among all focus group participants. Keep them on task – what made it look attractive or unattractive to you?)

(Record all "attractive" terms used by anyone in the van)

_____

_____

_____

_____

_____

_____

_____

(Record all "unattractive" terms used by anyone in the van)

_____

_____

_____

_____

E.7 AT THE END OF EACH COLLECTIVE IMAGE ZONE

In addition to the collective image zone view note form, a discussion should be conducted at the end of each listening post within the collective image zone areas. (Note: the interviewer conducts this discussion with the results recorded by the driver/recorder. This discussion could be brief if it repeats what has already been said about each view, or it could get into more depth. You don't need to draw it out, if it is only repeating what has been said at the listening posts).

To all viewers in the van:

As you recall all the structures that you saw in this last segment, overall, what made them attractive or unattractive to you?

First, if you found them attractive, let's talk about what made them look that way? (*Record descriptive attractiveness words).*

If they found the structures attractive, ask:

Were they more or less attractive than other structures we have seen today? What made them seem that way to you? (*Record words used to compare with other structures).*

If you found the structures unattractive overall, what made them look that way?
(Record descriptive attractiveness words).

If they found the structures unattractive, ask:

Were they more or less unattractive than other structures we have seen today? What made them seem that way to you? (*Record words used to compare with other structures).*

To all viewers in the van**:**

As you recall all the plantings and mowing that you saw in this last segment, overall, what made them attractive or unattractive to you? First, if you found them attractive, let's talk about what made them look that way? (*Record descriptive attractiveness words).*

If they found them attractive, ask:

Were they more or less attractive than other plantings or mowing we have seen today? What made them seem that way to you? (*Record words used to compare with other planting).*

If you found the plantings or mowing unattractive overall, what made them look that way? *(Record descriptive unattractiveness words).*

If they found them unattractive, ask:

Were they more or less unattractive than other structures we have seen today? What made them seem that way to you? (*Record words used to compare with other planting).*

To all viewers in the van:

As you recall all the vistas that you saw in this last segment, overall, what made them attractive or unattractive to you?

First, if you found them attractive, let's talk about what made them look that way? (*Record descriptive attractiveness words).*

If they found them attractive, ask:

Were they more or less attractive than other vistas we have seen today? What made them seem that way to you? (*Record words used to compare with other vistas).*

If you found the vistas unattractive overall, what made them look that way? *(Record descriptive attractiveness words).*

If they found them unattractive, ask:

Were they more or less unattractive than other vistas we have seen today? What made them seem that way to you? (*Record words used to compare with other vistas).*

This information should be read to participants after the first collective image zone listening post.

Now, let's talk about what we're about to see as we continue driving. We're going to turn around here and drive the same segment we just completed, but this time we'll be going in the opposite direction. This is another part of the road where we are asking you to pay special attention to particular aspects of what you see. As we drive this next segment please pay special attention to the long vistas from the road *(show photo example 1 again here).*

Along this segment, call out "view note" whenever you notice anything attractive or unattractive—just as you have been doing all day. But please think especially about what you like or don't like about long vistas that you see on this segment. We'll call out "view note" occasionally when we are passing something that we want to be sure that you notice. We'll talk about your perceptions when we get to the next listening post at the end of this segment of the road.

E.8 COMPLETION OF THE ROUTE

At the completion of the route the survey participants will be asked some closing questions. These are as follows . . . (These responses should be recorded in each participant's steno book).

Looking back on all the views you have seen and rated in this journey, is there any view that you immediately recall as most attractive compared with all the rest?

Do you remember where it was? *(Record each participant's attractive view by listening post number and, if possible, view note number, with their ID)*

What made it seem that way to you? *(Record key words and ID)*

Is there any view that you immediately recall as most unattractive compared with all the rest?

Do you remember where it was? *(Record each participants' unattractive view by listening post number and, if possible, view note number with their ID)*

What made it seem that way to you? *(Record key words and ID)*

In closing, address the participants as follows . . .
All participants may receive a copy of the results of this survey if they wish. We are very grateful for your time today. We will use the information that you have provided to us to help us set priorities for investing in future improvements to the Minnesota highway system. Look for more of what you liked today as you drive down Minnesota highways in the future! Again, thank you very much for your time and assistance.

NOTE: All completed route summary forms, standard view note forms, collective image view forms, and recorded tapes and scantrons should be returned to the registration coordinator or a designated form collector upon completion of the route.

APPENDIX F

RESEARCH PROTOCOL

APPENDIX F: RESEARCH PROTOCOL

F.1 RESEARCH OBJECTIVE

The purpose of the Aesthetic Initiative Measurement System (AIMS) is to gather information on the aesthetic perceptions of motorists of the highways they drive and ride. Specific segments of Minnesota's transportation corridors can be tested for their overall attractiveness. Furthermore, the AIMS system allows transportation officials to test in descriptive terms if specific views are pleasing, unpleasing, or even noticed by motorists on Minnesota's highways. The AIMS system allows to gather information on how enhancements and visual improvements to roadways and highways are perceived.

F.2 TIME OF YEAR

To be reliable with the initial tests of the AIMS methodology, it is desirable to have data collected in the summer during the full leaf-on period. From a methodological standpoint, collecting data during the same period allows for both longitudinal analysis (comparisons over time) and cross-site analysis (comparing results from different sites).

One exception to the above standard relates to locations where analysis may be needed on enhancements during different seasons. It is suggested, however, that such studies be used to complement the base summer study.

F.3 SITE AND ROUTE SELECTION

The AIMS system is versatile in relation to sites. Although applied primarily on four-lane, limited access highways, early tests of the system have demonstrated that AIMS can be used on virtually any highway in the state. Application in areas of recent enhancement programs or where significant enhancement programs may occur should receive special consideration. Points of aesthetic interest can be documented both within and outside the right-of-way.

Routes should be planned with participants in mind. Early tests of the AIMS system indicate that participants begin to demonstrate fatigue after a total of three hours. These same tests indicate that on average a van can be expected to cover approximately 15 miles per hour. This allows for normal highway driving speed and on average stops every five miles to allow facilitators (interviewers) to collect view note data from the participants.

On routes where specific attention is needed to draw the attention of participants to recent roadside enhancements (e.g., tree plantings, special sound barriers, landscaping, or bridge design), collective image zones (CIZs) are utilized. In planning routes, more data is collected at listening posts within this variant of the AIMS methodology, therefore more time for data collection needs to be allowed when planning routes of collective image zones.

Collective image zones also need to be placed last when planning AIMS routes whenever possible. Data analyses of past AIMS studies indicate that directing participants' attention to specific enhancements tends to solicit a more positive response as to the attractiveness of a highway. Note, as part of the collective image zone method, interviewers are pointing out specific enhancements to the highway. This in turn may create a bias in the control or standard viewing areas as participants become more "trained" to look for specific enhancements. Although route planning may vary by location, the typical AIMS schedule begins with an hour of registration and participant orientation. This is followed by two hours of standard view note data collection. Next, is lunch or a break where participants are informed of the collective image zone modifications, and then a one-hour period with further data collection using the CIZ method. When in doubt, create shorter routes with more frequent listening posts.

F.4 RECRUITING PARTICIPANTS

Recruiting participants in the summer can be especially problematic in a cold climate. What makes for good research methodology can be a frustrating process for participant recruitment. It is highly recommended, therefore that at least three months be allowed to initiate the recruitment process prior to the data collection date.

Figuring eight participants per van with three vans, it is suggested that 27 participants be recruited for each site. This procedure allows for three alternates that may be used if needed. One combination of participants would include the example in Table F.1.

Table F.1 A Combination of Participants

Number	Description
3	Tourists or visitors unfamiliar with the area
5	Commuters familiar with routes traveled
6	Business owners/ managers
6	Long-time residents familiar with the location
4	Short-term or other residents

Diversity among the participants by age, gender, residence, occupation, and commuting patterns should also be considered in the recruitment process. Communities and regions do vary in their demographic structure, and some variation in the representativeness of participants to the overall population can be expected.

It is suggested that recruitment be organized through a local sponsoring organization such as the Chamber of Commerce, local economic development organization, or city government or planning organization. Utilize a local organization that is widely networked with both individuals and other organizations. Under the best circumstances, the AIMS study should be viewed as not only benefiting potential enhancements by the Minnesota Department of Transportation (Mn/DOT), but as a means of developing the local community as well. With a goal of community development, the sponsoring agency will be asked to solicit involvement of participants either by phone or in person. The total time commitment for volunteers should be four or five hours, and include a break. Copies of the results should be made available to volunteers as well. A letter of confirmation on the site, date and time should be sent within at least two following an oral commitment (see permission form in Figure F.1).

Thank you for agreeing to participate in this van ride. The survey will last about 4 hours including a break. If at anytime you need an additional break, and would like to stop along the way, please don't hesitate to let us know.

You will be asked to tell us what you notice and what you find attractive or unattractive about the roadside and landscape you see as we drive down the road today. We are conducting this focus group to get a better understanding of how we can make Minnesota highways and their immediate surroundings even more attractive in coming years. Iowa State University (ISU) and the Minnesota Department of Transportation (Mn/DOT) are working together to conduct this research.

Everything you say will be anonymous and confidential. When we report the results of this focus group, no individual will be identified or identifiable. If you wish, you can choose not to answer any question. You may withdraw your permission to participate in the focus group at any time. Your answers and your decision to participate will not affect your relationship with ISU or Mn/DOT.

We will take written notes and tape record our conversation today. All data will be kept in secure storage at Mn/DOT, ISU, and /or with the research contractor. The data will be used only for the purposes of understanding what Minnesota travelers find attractive or unattractive about the view from Minnesota roads.

If you have any questions after you have participated in this focus group, you may call or write: David Larson at Mn/DOT's office of Environmental Services. David's business card is included in each of your packets.

If you agree to participate in this focus group, please sign and date below.

Name: _____ Date: _____

If you would like a copy of the focus group results mailed to you later this winter, please print your name, mailing address, and phone below.

Name: _____
Address: _____
_____
Phone #: _____

Figure F.1 Permission Form

F.5 PROCURING VANS

Mn/DOT has provided vehicles, drivers, and facilitators for the AIMS process. Vans used should hold at least 11 passengers including the driver. Three vans are used with each site replicating the same designated routes. This replication helps to insure validity of the data collected and allows comparisons to be made between vans if the participants are grouped according to discriminating variables (e.g., age, length of residence, and commuting patterns).

F.6 SELECTING FACILITATORS

Mn/DOT employees have served as AIMS drivers and facilitators. No matter who is used, the facilitators and drivers should be chosen with some caution. Chosen facilitators should be absent of personal or vested interests in the results of the AIMS process. Furthermore, drivers and facilitators should be advised not to express opinions either during the orientation meeting with participants or during the data collection phase. Bias or perceived bias by facilitators and drivers needs to be avoided.

F.7 FACILITATION GUIDELINES

Good facilitators can create a productive atmosphere in a small group setting, while allowing participants to feel at ease in stating opinions and observations. Some basic ground rules to establish with participants during the orientation/introduction meeting include the following:

1. Statements and observations made while covering the route should be kept in confidence by others in the van.
2. Everyone has a the option to pass, pressure should not be asserted on individuals who are not declaring view notes with regularity.
3. Everyone's ideas and observations are valuable.
4. Participants should only speak for themselves and not for others… don't put words in mouths of others.
5. Avoid "put-downs" or criticisms of others.
6. Be responsible for your own participation.

7. Expect some conversations and observations to go unfinished and remain unclear… everybody will not see the same things the same way.

These "ground rules" should be reinforced by the facilitators during the course of soliciting and recording observations.

Introduce yourself to participants and help get the group acquainted. Show genuine concern for individuals and their observations. Help people clarify their statements and respect differing views, including those with which you may not agree. Remain neutral and objective. Ask questions and probe for answers if the information given by participants is unclear. Don't use body language that suggests negative reactions, intimidation, or disapproval. Use an informal approach and maintain eye contact with group members. The facilitator should not be on stage; they are there to guide not perform. Finally, recognize your limitations and don't be someone you're not. Respond with respect for others in the group, but don't say or do things you don't believe in or feel uncomfortable about.

While the AIMS process focuses discussion upon what has been observed, some people may to try to dominate the group and its discussion. Facilitators may have to direct questions to get other people to talk. When asking a question under these circumstances, do not look at the person who is trying to dominate, so he or she cannot easily get you attention. Some people may want to argue. These people often irritate the group and obstruct progress. Directing conversation and questions away from these individuals can help curtail this obstruction.

These guidelines were taken in part from "Facilitating the Group Process" in *Hometown Health,* Iowa State University Extension, Ames, Iowa, 1998.

F.8 ORGANIZING PARTICIPANT ORIENTATION

A registration coordinator needs to be designated to organize participant registration, provide for participant orientation, and organize and distribute the needed forms and materials to conduct data collection. Facilitators should be provided with 80 standard view note forms, 30 collective image view note forms, one route summary form, a view note log form, a sharpened dozen

pencils, a tape recorder with three one-hour tapes, and a clipboard. Each participant should be provided with a small note pad, a clipboard, two #2 pencils, and a scantron sheet.

The registration coordinator is responsible for arranging for a meeting room/place of origin for conducting the AIMS study. The meeting room should have comfortable seating for at least 35 people and be well lighted. At least two tables should be set up for distribution of materials and supplies. Nametags should also be provided for both participants and facilitators. The registration coordinator is also responsible for the arranging of either slides or overhead visuals of examples of what participants may define as view notes.

F.9 ADMINISTERING THE METHODOLOGY

The procedures for conducting participant orientation and administering the AIMS methodology can be found in the facilitators workbook. Roles of facilitators, drivers and registration coordinators are defined, and examples of the instruments used are provided.

Upon completion of the data collection phase, it is the responsibility of the registration coordinator to make sure all completed forms are turned in by the facilitators and drivers.

F.10 DATA ENTRY

The desired software for data analysis of AIMS data is the Statistical Package for the Social Sciences (SPSS). Large and small scantron sheets should be scanned and data converted to the SPSS format.

Since the data is a combination of both quantitative and qualitative data, it is important that the qualitative data be coded first in the questionnaire. The items to be coded are the views that the participants noticed (referred as notice variable in the study), and the descriptive words that describe the why those views are perceived as attractive or unattractive. Highlight the words that describe the notice variables and their descriptors in each of the questionnaire. All words highlighted beneath the questions “What did you notice?” or “What did it look like?” should be coded as “notice” variables except those circled with arrows pointing to the “attractive” or

“unattractive” columns. All words highlighted beneath the “attractive” column should be coded as “attractive” variables. All words highlighted beneath the “unattractive” column should be coded as “unattractive” variables.

Once the notice and descriptive variables are identified, they can be either entered into the computer using either Excel or SPSS program. Demographic data from the scantron will be combined with the qualitative data using the participant’s identification number and view note number.

The suggested format for the data setup should include all the data from three sources: (1) qualitative data from coded questionnaire, (2) demographic information from the small scantron, and (3) degree of attractiveness as rated by rest of the participants from the large scantron. To create the qualitative variable row for each view note, a matrix of 350–500 columns (100–150 notice columns, 150–200 attractive columns, and 100–150 unattractive columns) should be set up.

Enter a “1” in each column that is highlighted on the coded questionnaire. Do not encode any word that is not highlighted or any word that has been crossed out. Code a “0” in all remaining columns. This translates the qualitative data into a binomial variable (1 means it was mentioned, and 0 means it is not mentioned).

After the qualitative data row for each view note is created, combine these data with the scanned data for each view note with the following columns:

View note number
Location
Route ID
Van number
Viewer ID number
Interviewer
Recorder

Listening Post No.
Notice variables 1-119 (identified by 1 word labels not numbers)
Attractive variables 1-159 (identified by 1 word labels not numbers)
Unattractive variables 1-103 (identified by 1 word labels not numbers)
Rating of this view note by each viewer (5 as very attractive, 1 as unattractive)
How long lived in MN
Live near (site or city)
No. of miles travel from office each day
Until 16, lived mostly in (rural area, small town, town or suburb or city)
Age
Own business in town (yes or no)
Driven some parts of the route (yes or no)
Drove part a (several times a week, occasionally, less than a month or none)
Drove part b (several times a week, occasionally, less than a month or none)
Drove part c (several times a week, occasionally, less than a month or none)
Drove part d (several times a week, occasionally, less than a month or none)
Drove part e (several times a week, occasionally, less than a month or none)
Drove part f (several times a week, occasionally, less than a month or none)
Rating of this view note by the person who called it out (attractive or unattractive)

See Table F.2 and F.3 for samples of the data set and code book, respectively.

For each focus group, there are a few collective image zone forms. Code the front of the questionnaire in the same manner as the standard image zone form. For the back of the forms, code a “3” in the column of any variable used by the focus group but not by the viewer (on the front of the form). Code a “5” if the variable on the back of the form was previously used by the viewer. So, for CIZ view notes, you will have a matrix of 0, 1, 3, 5.

Create the entire data row for each view note by combining the scanned data with the qualitative data for each view note (same listing of variables as standard image zone data as shown above).

Table F.2 Sample Data Set

Table F.3 Sample Code Book

Variable Name	Variable Label	Value Label	Column #
SITE	city name	1=Rochester 2=Duluth 3=Metro	1
VIEWNOTE	view note #		2
MILEAGE	mileage location		3
FORM	form used	1= standard form 2=CIZ form	4
VAN#	van no.		5
WHOCALL	who called out the view note		6
INTERVIE	name of the interviewer		7
RECORDER	name of the recorder		8
LISTPOST	listening post no.		9
PERCEPT	perception by the person who called out	1=attractive 2=unattractive	10
NBRIDGE	notice - bride	0=not mentioned 1=mentioned	11
NBUILDG	notice - building	0=not mentioned 1=mentioned	12
NBUSI	notice - business	0=not mentioned 1=mentioned	14
NRARCHI	recoded notice - architectural character	0=not mentioned 1=mentioned	16
NRSIGNS	recoded notice - signs	0=not mentioned 1=mentioned	17
NRHWY	recoded notice - highway character or condition	0=not mentioned 1=mentioned	18
NRFUNCT	recoded notice – function	0=not mentioned 1=mentioned	19
NRPLANT	recoded notice - planting design	0=not mentioned 1=mentioned	20
NRMAINT	recoded notice – maintenance	0=not mentioned 1=mentioned	21
NRSTRUCT	recoded notice - structures in the view shed	0=not mentioned 1=mentioned	22
NRVISTA	recoded notice - vistas and view sheds	0=not mentioned 1=mentioned	23
DAARCHIT	descriptor attractive – architecture	0=not mentioned 1=mentioned	24
DAATTRAC	descriptor attractive – attractive or beautiful	0=not mentioned 1=mentioned	25
DACLEAN	descriptor attractive – clean	0=not mentioned 1=mentioned	28
DANATUR	descriptor attractive – natural	0=not mentioned 1=mentioned	30
DAPANORA	descriptor attractive – panorama	0=not mentioned 1=mentioned	32
DAPLEAS	descriptor attractive - pleasant	0=not mentioned 1=mentioned	33
DUARCHIT	descriptor unattractive - architecture	0=not mentioned 1=mentioned	34

DUBAD	descriptor unattractive - bad	0=not mentioned 1=mentioned	35
DUBVIEW	descriptor unattractive - blocks view	0=not mentioned 1=mentioned	36
DUBROK	descriptor unattractive - broken	0=not mentioned 1=mentioned	37
DUCONFUS	descriptor unattractive - confusing	0=not mentioned 1=mentioned	38
DUDANGER	descriptor unattractive - dangerous	0=not mentioned 1=mentioned	39
DRUMAINP	recoded descriptor - maintenance poor	0=not mentioned 1=mentioned	40
DRUFPOR	recoded descriptor - function poor	0=not mentioned 1=mentioned	41
DRUNNAT	recoded descriptor – not natural	0=not mentioned 1=mentioned	42
DRAMAGOD	recoded descriptor – maintenance good	0=not mentioned 1=mentioned	43
DRADGOD	recoded descriptor – design good	0=not mentioned 1=mentioned	44
DRACPGOD	recoded descriptor – context planning good	0=not mentioned 1=mentioned	45
DRAFGOD	recoded descriptor – function good	0=not mentioned 1=mentioned	46
DRANATUR	recoded descriptor - nature	0=not mentioned 1=mentioned	47
LIVE	how long lived in MN	1.00= don't live in MN 2.00=less than 1 yr 3.00=1-5 yrs 4.00=5-10 yrs 5.00=more than 10 yrs	48
NEAR	live near	1.00=Duluth 2.00=Metro 3.00=Rochester 4.00=not near any city	49
TRAVEL	miles travel from office	1.00=less than 2 miles 2.00=2-5 miles 3.00=5-10 miles 4.00=10-20 miles 5.00=more than 20 miles	50
UNTIL16	until 16, lived mostly	1=rural not in town 2.00 =small town 3.00 =town or suburbs 4.00 =city at least 100,000	51
AGE	age	1.0 =25 or younger 2.00 =26-40 3.00 =41-55 4.00 =56-70 5.00 =71 or older	52
GENDER	gender	1=female 2=male	53
OWN	own business in town	1=yes 2=no	54
SOME	drove some parts	1=yes 2=no	55
PARTA	drove part a	1.00= several time a week	56

		2.00 = occasionally 3.00 = less than once a month 4.00 = none	
PARTB	drove part b	1.00= several time a week 2.00 = occasionally 3.00 = less than once a month 4.00 = none	57
PARTC	drove part c	1.00= several time a week 2.00 = occasionally 3.00 = less than once a month 4.00 = none	58
PARTD	drove part d	1.00= several time a week 2.00 = occasionally 3.00 = less than once a month 4.00 = none	59
PARTE	drove part e	1.00= several time a week 2.00 = occasionally 3.00 = less than once a month 4.00 = none	60
PARTF	drove part f	1.00= several time a week 2.00 = occasionally 3.00 = less than once a month 4.00 = none	61
RATER111	perception rating by mndotid#111	1.00=unattractive 5.00=very attractive	62
RATER112	perception rating by mndotid#112	1.00=unattractive 5.00=very attractive	63
RATER114	perception rating by mndotid#114	1.00=unattractive 5.00=very attractive	64
RATER115	perception rating by mndotid#115	1.00=unattractive 5.00=very attractive	65

F.11 DATA ANALYSIS

The data should prove to be rich in amount and quality. The notice variable had to be collapsed into eight general categories which were architectural character, signs, highway character or condition, function, planting design, maintenance, structure in the view sheds, and view sheds. A sample of how the notice variables were recoded could be seen in Table F.4.

Table F.4 Recoding of Notice Variables

New Variable	Old Variable
Architectural character	bridge, railing, pedestrian overpass, wall, guardrail, tunnel, concrete, railroad bridge, rest area, sculpture, sidewalk, design
Signs	sign, no signs
Highway character or condition	median, highway, parking lot, shoulders, turn lane, street, interchange, parkway, bypass, rough
Function	congestion, construction, excavation
Planting design	trees, roadside, grass, plantings, flowers, natives, berm, crown vetch, cattails, prairie
Maintenance	trash, junk, graffiti, weeds, mowing, unmown area
Structures in the view shed	building, utility line, railroad, trailer, businesses, landmark building, housing, elevator, bus stop, antennae farm, dock, dam, structure, storage garages, tanks, older homes, development, historic house, ski run, pumping station, satellite disc
Vistas and viewsheds	vista, river, skyline, landscape, lake, park, junkyard, rock, downtown, yard, urban skyline, forest, wetland, garden, ship, zoo, hills, island, vegetation, golf course, pond, town, countryside, farm, athletic field, empty lot, falls, fields, open space, scenery, urban

The respondents not only provided a series of word descriptors that articulated what they have saw, but also their general negative or positive descriptions. Records of adjectives applied to the scene were coded on the questionnaires. Like the notice variables, key words and phrases were formulated to recode these variables. Five general key words were formulated to discuss the positive and negative descriptions of the view note. These were design, context planning, function, maintenance, and nature (see Table F.5).

Table F.5 Recoding of Attractive/Unattractive Descriptors

New variable	Old Variable
Attractive Descriptors	
Design—Good	screened, trees, ornamental, trees, planned or well-designed, architecture, color, softens building, variety, legible, unity, shape, character
Context Planning—Good	vista, open, scenery, wonderful, sentimental, urban skyline, variety, historic, interesting, location, small town atmosphere, river, rock, forest, landmark, does not obstruct view, geological
Function—Good	useful, safe, efficient, walk, parking
Maintenance—Good	clean, well-maintained, good care, new, improvement, new paint, yard, neat
Nature	bird, butterflies, natural, green, environmental
Unattractive Descriptors	
Design—Poor	no plantings, not screened, too close, colors, incompatible, narrow, too many, not natural, poor design, monotonous, disorienting, unplanned, incomplete, confusing, too open, dreary, harsh, no noise barrier
Context Planning—Poor	too large, offensive, blocks view, too many, too far away, location
Function—Poor	traffic, dangerous, speeding
Maintenance—Poor	needs care, unkept, deteriorated, unmown, weeds, trash, rusty, poor stewardship, poor growth, dirty
Not Natural	no wildflower, not green, not natural

The data resulting from the AIMS process could be analyzed in several forms. Since the specific mileage location of the view note was recorded, the analyst could identify the specific tracts of the highways that were perceived as attractive or unattractive by the participants. Likewise, their corresponding notice variables (what people notice), and adjectives (descriptions of why people found a scene attractive/unattractive) could be identified by specific mileage location, and view note number (see Tables 4.2 and 4.3).

Furthermore, two measures of attractiveness are obtained. The person who called out the view note was asked if the view is attractive or unattractive. Then the rest of the passengers who observed the same view note were asked to make an assessment of the degree of attractiveness of the said view note (5 being very attractive to 1 being unattractive). This analysis not only assess the value given by one person but also the degree of attractiveness as perceived by the larger group. Aggregating the responses or getting the mean value of the responses provided by the whole group gives a holistic interpretation of the respondents' views.

The AIMS data could also address the question on domain. By categorizing responses by the likelihood of location in or out of the right-of-way, Mn/DOT would be able to determine if they have a control over a certain view that was perceived as either unattractive or otherwise. An example of categorizing the views by the right-of-way could be seen in Table 4.7.

The richness of the AIMS data could lead to an analysis that could be very specific as the corresponding mileage location, attractiveness rating, and descriptions of the views were recorded, to a general assessment of the city routes understudy. Longitudinal analysis is very possible and can be repeated. The data analysis can also be replicated in another location.

F.12 COMPLETING THE REPORT

The primary goal of AIMS is to produce information about how design decisions are working to enhance the visual experience of Minnesota motorists and to assess what drivers perceive as visually desirable. It is also the goal of this project to produce a replicable process wherein

travelers concerns and perceptions are documented in a fashion that is applicable to highway design and enhancements. In completing the report, it is important that the process be documented. The final report should include the following: methodology, which includes the routes selected and who participated; study preparation, which includes the pretest of instrument and study protocol, facilitator training, participant recruitment, and what happened on the actual AIMS day; results and analysis, which deal with how highway design and maintenance contribute to aesthetics; and conclusion. The conclusion should include the major findings and lessons learned from the process.

A separate reference manual for each city is recommended. The reference manual should be designed to allow transportation personnel, landscape architects, city planners, and others to further analyze by replicating the routes traveled. The manual should include the route map, tables on the most and least attractive highway segments, table of notice variables and descriptors by group mean perception, figure on the mean attractiveness rating by mileage location, raw data set, number of views noticed by right-of-way, and figure on the moving average of mean perception by mileage location. These separate manuals summarize all the important data referring to a specific city or location.

A summary of the findings should be sent to the participants as a sign of gratitude for participating in the study. Generally, participants of an in-depth study that takes six hours of their time are very curious of what kind of contribution they have given to help their communities.

F.13 SAYING "THANK YOU"

While there is no requirement for the completion of an AIMS study, a personal note thanking the participants is always advisable. Someone willing to give up part of their weekend during a Minnesota summer deserves written acknowledgement and a thank you. It is suggested that a thank you letter from the regional Mn/DOT office be composed and sent to the participants within a weeks time following their participation in the study. It is further advised that a summary of the findings be also sent to the participants. People are always curious as to how the study came out, and it can make recruitment go a little easier next time.

Table F.2 Sample Data Set

SITE	VIEWNOTE	MILEAGE	FORM	VAN#	WHOCALL	INTERVIE	RECORDER	LISTPOST	PERCEPT	NBRIDGE	NBUILDG	NBUSI	NRARCHI	NRSIGNS	NRHWY	NRFUNCT	NRPLANT	NRMAINT	NRSTRUCT	NRVISTA	DAARCHIT	DAATTRAC	DACLEAN	DANATUR	DAPANORA	DAPLEAS	DUARCHIT	DUBAD	DUBVIEW	DUBROK	DUCONFUS	DUDANGER	DRUMAINP	DRUFPOR	DRUNNAT
2		29	1	2	125	2	2	4	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2		30	1	3	139	3	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	1	2	124	2	2	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	1	3	134	3	3	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	1	0	1	1	112		1	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	1	2	124	2	2	1	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	2	1	1	1	111		1	1	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	1	1	3	132				2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3	0	1	2	121	2	2	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	3	1	1	1	112		1	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3	16	1	3	132	3	3	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3	16	1	3	131	3	3	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	4	1	1	2	125	2	2	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	4	1	1	1	115		1	1	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	4	1	1	2	124				1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	5	1	1	2	124				2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	5	1	1	1	112		1	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	5	1	1	1	112					0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	5	16	1	2	121	2	2	3	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	6	1	1	2	122				2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	6	1	1	1	119		1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	6	2	1	3	131	2	3	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	7	1	1	1	112		1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	7	2	1	3	132	3	3	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2	8	1	1	1	119		1	1	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	8	1	1	2	125	2	2	1	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	8	2	1	3	133	3	3	1	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	9	1	1	2	121	2	2	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	9	2	1	1	112		1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	9	2	1	3	131	3	3	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	10	2	1	2	124	2	2	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	10	2	1	3	131	3	3	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	11	2	1	2	122	2	2	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	11	4	1	3	139	3	3	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	12	2	1	1	119		1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	12	2	1	2	122	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	12	5	1	3	134	3	3	1	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	13	2	1	1	112		1	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	13	2	1	2	126	2	2	1	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	13	5	1	3	132	3	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DRAMAGOD	DRADGOD	DRACPGOD	DRAFGOD	DRANATUR	LIVE	NEAR	TRAVEL	UNTILL6	AGE	GENDER	OWN	SOME	PARTA	PARTB	PARTC	PARTD	PARTE	PARTF	RATERI11	RATERI12	RATERI14	RATERI15
0	0	0	0	0																		
0	0	0	0	0																		
0	0	0	0	0	5	1	2	3	5	2	2	1	3	4	3	3	1	1				
0	0	0	0	0	5	1	2	2	5	1	2	1	3	4	3	3	1	1				
0	0	0	0	0																2	2	
0	0	0	0	0																		
0	0	0	0	0	5	1	3	1	4	2	2	1	3	3	1	1	2	2	2	1	2	2
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0	0	0	0	0	5	1	4	4	5	2	2	1	3	2	1	1	2	2				
0	0	0	0	0	3	1	1	2	2	2	2	1	2	3	3	2	1	1	3	1	3	2
0	0	0	0	0																		
0	0	0	0	0																		
0	0	0	0	0	5	1	4	3	4	1	2	1	2	3	3	2	1	1				
0	0	0	0	0	5	1	4	3	4	2	2	1	2	3	3	2	1	1	2	1	1	1
1	0	0	0	0																		
0	0	0	0	0																		
0	0	0	0	0															3	2	2	3
0	0	0	0	0															3	2	2	3
0	0	0	0	0																		
0	0	0	0	0																		
0	1	0	0	0	5	1	1	3	3	1	1	1	2	2	3	2	1	1		4		
0	0	0	0	0																		
0	0	1	0	0															5	4	4	
0	0	0	0	0																		
0	0	0	0	0																1		
0	0	0	0	0																		
0	0	0	0	0	5	1	1	2	5	2	2	1	2	3	3	3	3	2				
0	0	0	0	0																		
0	0	0	0	0															1	2		1
0	1	0	0	0																		
0	0	0	0	0																		
0	1	0	0	0																		
0	1	0	0	0	5	1	3	1	1	2	2	1	1	2	3	1	3	1				
0	0	0	0	0	5	1	2	2	4	2	2	1	2	2	3	2	1	1				
0	1	0	0	0															5	4	4	
0	0	1	0	0																		
0	0	0	0	0																		
0	1	0	0	0															5	2		
0	0	0	0	0	5	1	2	3	5	2	2	1	3	2	2	1	2	1				
0	0	0	0	0																		

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Research

Aesthetic Initiative Measurement System Reference Manual A: Rochester Route

Technical Report Documentation Page

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16. Abstract (Limit: 200 words)

The Aesthetic Initiative Measurement System (AIMS) project was conducted to develop and test the instruments and protocols that the Minnesota Department of Transportation uses to understand and document how travelers perceive the attractiveness of Minnesota's transportation corridors. The AIMS data-gathering days were conducted in the summer of 1999. The study was done in three cities: Rochester, Twin Cities Metro, and Duluth, Minnesota. The data gathered were both quantitative and qualitative. The four key topics that produced highly noticeable aesthetic effects to the travelers were (1) maintenance, (2) planting design, (3) structural design, and (4) vistas from the highway. The consistency of AIMS results with previous studies of other landscape settings suggested that the AIMS results are valid and could be replicated in other urban highway routes and with rural highways. The Rochester route is presented for reference.

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Aesthetic Initiative Measurement System Reference Manual A: Rochester Route

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Quality of life in our communities can be influenced by the visual quality of the highway travel experience. Since many of us spend a great deal of time each day commuting in and around metropolitan areas, the highway corridor landscape can have a significant impact on how we view the attractiveness of the places we live and work. The Aesthetic Initiative Measurement System (AIMS) project was conducted to develop and test instruments and protocols that the Minnesota Department of Transportation (Mn/DOT) can use to understand and document how travelers perceive the attractiveness of Minnesota's highway corridor landscapes.

AIMS routes selected for 1999 focused on the metropolitan highway experience. Data-gathering days, in which volunteer AIMS participants traveled in vans along selected routes while responding to the landscape views along the way, were conducted in the summer. The study was done in three cities: Rochester, Twin Cities Metro, and Duluth, Minnesota. This AIMS reference manual is for the Rochester route. The route length was 62.5 miles for the Rochester route. The route originated from an area Mn/DOT office. The trip lasted six hours, with an hour of lunch break. Twenty-three people joined the three-van tour in Rochester.

AIMS participants provided three types of data. First, they provided demographic information on a short electronically scannable form. Second, qualitative data were entered by a trained recorder in each van while participants traveled along the AIMS route. Third, individuals' recorded attractiveness ratings for each view they observed were recorded on a large scannable form. All of these forms were completed with the guidance of the interviewers and recorder/driver using the facilitators manual. Data were analyzed using content analysis and the Statistical Package for the Social Sciences (SPSS).

While they were riding in the vans along the AIMS routes, participants were instructed to call out any views along the way that attracted their attention. The specific view was assigned a view note number and a corresponding mileage location by the trained facilitator in the van. At listening posts at regular intervals along each route, each view that had been called was identified as attractive or unattractive by the person who had called it ,and the viewer described what made the view attractive or unattractive. Then, the rest of the travelers in the van were asked if they had seen this view and , if so, to rate its attractiveness on the larger scantron (5 as very attractive and 1 as unattractive).

Major highlights of the report include the following:

- The four key topics that produced highly noticeable aesthetic effects to the travelers were (1) maintenance, (2) planting design, (3) structural design, and (4) vistas from the highway.

- To have more participants of more diverse backgrounds, recruitment of focus group members should begin at least three to six months in advance of the AIMS day. The recruitment process should be highly coordinated with local community groups such as the Minnesota Extension Service and Chamber of the Commerce.

- For data validity, future data gathering should be repeated in the same season as AIMS 1999: summer during full leaf-on. Focusing on winter landscape perceptions would allow cross-seasonal comparison.

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- The consistency of AIMS results with previous studies of other landscape settings suggested that AIMS results are valid and could be replicated on other urban highway routes and that the AIMS methodology could be applied to rural highway corridors.

- Future urban AIMS projects could gather more detailed data by using the 1999 AIMS results as a baseline and by increasing the frequency of data-gathering stops (or listening posts) along highway segments that have aesthetic importance to Mn/DOT.

- Data-gathering efficiency could be improved by recording all the data directly on electronically scannable forms developed from the 1999 AIMS content analysis. This would reduce hand-writing during data gathering, and it would reduce time spent encoding data after AIMS days.

The full AIMS report—with introduction, methodology, results, and conclusions—can be found in a separate volume, *Aesthetic Initiative Measurement System: Final Report*. Specific elements (e.g., routes, mileage locations, and corresponding attractiveness data) and strategies that produce aesthetic benefits are

presented for each of the AIMS 1999 routes in three appendices to the report as well as in three AIMS route reference manuals. These reference manuals may be referenced and reviewed in the field. The present volume, the *Aesthetic Initiative Measurement System Reference Manual A,* is for the Rochester route.

Final Report 2001-04

Research

Aesthetic Initiative Measurement System Reference Manual B: Twin Cities Metro Route

Technical Report Documentation Page

1. Report No.	2.	3. Recipients Accession No.	
4. Title and Subtitle AESTHETIC INITIATIVE MEASUREMENT SYSTEM REFERENCE MANUAL B: TWIN CITIES METRO ROUTE		5. Report Date March 2001 6.	
7. Author(s) Joan Iverson Nassauer, Tim Borich, Nora Ladjahasan		8. Performing Organization Report No.	
9. Performing Organization Name and Address Center for Transportation Research and Education Iowa State University 2901 South Loop Drive, Suite 3100 Ames, Iowa 50010		10. Project/Task/Work Unit No. 11. Contract (C) or Grant (G) No. 74995	
12. Sponsoring Organization Name and Address Minnesota Department of Transportation 395 John Ireland Boulevard Mail Stop 330 St. Paul, Minnesota 55155		13. Type of Report and Period Covered Companion to Final Report 14. Sponsoring Agency Code	
15. Supplementary Notes			

16. Abstract (Limit: 200 words)

The Aesthetic Initiative Measurement System (AIMS) project was conducted to develop and test the instruments and protocols that the Minnesota Department of Transportation uses to understand and document how travelers perceive the attractiveness of Minnesota's transportation corridors. The AIMS data-gathering days were conducted in the summer of 1999. The study was done in three cities: Rochester, Twin Cities Metro, and Duluth, Minnesota. The data gathered were both quantitative and qualitative. The four key topics that produced highly noticeable aesthetic effects to the travelers were (1) maintenance, (2) planting design, (3) structural design, and (4) vistas from the highway. The consistency of AIMS results with previous studies of other landscape settings suggested that the AIMS results are valid and could be replicated in other urban highway routes and with rural highways. The Twin Cities Metro route is presented for reference.

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Aesthetic Initiative Measurement System Reference Manual B: Twin Cities Metro Route

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EXECUTIVE SUMMARY

Quality of life in our communities can be influenced by the visual quality of the highway travel experience. Since many of us spend a great deal of time each day commuting in and around metropolitan areas, the highway corridor landscape can have a significant impact on how we view the attractiveness of the places we live and work. The Aesthetic Initiative Measurement System (AIMS) project was conducted to develop and test instruments and protocols that the Minnesota Department of Transportation (Mn/DOT) can use to understand and document how travelers perceive the attractiveness of Minnesota's highway corridor landscapes.

AIMS routes selected for 1999 focused on the metropolitan highway experience. Data-gathering days, in which volunteer AIMS participants traveled in vans along selected routes while responding to the landscape views along the way, were conducted in the summer. The study was done in three cities: Rochester, Twin Cities Metro, and Duluth, Minnesota. This AIMS reference manual is for the Twin Cities Metro route. The route length was 60.5 miles for the Twin Cities Metro route. The route originated from an area Mn/DOT office. The trip lasted six hours, with an hour of lunch break. Fourteen people joined the three-van tour in the Twin Cities Metro.

AIMS participants provided three types of data. First, they provided demographic information on a short electronically scannable form. Second, qualitative data were entered by a trained recorder in each van while participants traveled along the AIMS route. Third, individuals' recorded attractiveness ratings for each view they observed were recorded on a large scannable form. All of these forms were completed with the guidance of the interviewers and recorder/driver using the facilitators manual. Data were analyzed using content analysis and the Statistical Package for the Social Sciences (SPSS).

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Final Report 2001-04

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Aesthetic Initiative Measurement System Reference Manual C: Duluth Route

Technical Report Documentation Page

1. Report No.	2.	3. Recipients Accession No.	
4. Title and Subtitle AESTHETIC INITIATIVE MEASUREMENT SYSTEM REFERENCE MANUAL C: DULUTH ROUTE		5. Report Date March 2001 6.	
7. Author(s) Joan Iverson Nassauer, Tim Borich, Nora Ladjahasan		8. Performing Organization Report No.	
9. Performing Organization Name and Address Center for Transportation Research and Education Iowa State University 2901 South Loop Drive, Suite 3100 Ames, Iowa 50010		10. Project/Task/Work Unit No. 11. Contract (C) or Grant (G) No. 74995	
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17. Document Analysis/Descriptors		18. Availability Statement	
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Aesthetic Initiative Measurement System Reference Manual C: Duluth Route

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