PERCEPTIONS OF HIGHWAY MAINTENANCE IN MONTANA IN 2008: THE RESULTS OF A TELEPHONE SURVEY

By
Scott Rickard Ph.D.

Center for Applied Economic Research

Survey Center

December 2008

Executive Summary

The 2008 Montana Department of Transportation Road Maintenance telephone survey of over 1,000 Montanans was conducted in Aug-Sept, 2008 by the MSU-Billings Center for Applied Economic Research. The results of this survey show that in each case the majority of residents are rate existing road conditions and maintenance as Good or Excellent, but differences exist in some subgroups within the state.

In comparison to 2006, it appears that residents place more importance upon roadway maintenance conditions. Based upon 2008 results, winter maintenance and road surface issues are the primary drivers of an individual's overall rating of MT road quality, and these areas should have the highest maintenance priorities.

Introduction

In the summer of 2008, the Montana Department of Transportation (MDOT) contracted with the Center for Applied Economic Research (CAER) at Montana State University – Billings to conduct a telephone survey of Montana residents concerning their views on Montana highway maintenance. This survey is conducted biannually and used in determining MDOT maintenance priorities. This project was directed by Dr. Scott Rickard, the Director of the Center, who worked with the MDOC to develop the survey. The interviews were conducted August 20th – October 1st, 2008, by the professional telephone interviewers who work for the CAER. Dr. Rickard analyzed the results and is the author of this report.

Reading the Results

In order to make this report as readable as possible, I have placed the information on the results of statistical tests in footnotes and endnotes. When you read the phrase 'statistical significance', this means that the difference that I found among the individuals surveyed, in such areas as the percentage of women vs. men who answered the survey, most likely exist in the overall population of households in the target area. I use a 95% confidence level in all tests, meaning that there is less than one chance in 20 that we could have seen this difference when in fact this difference did not exist in the overall population. I also occasionally report the statistically significant lack of any difference, which can be important when it is important to know if a sample value, such as average household income, reflects that of the overall population.

When I am comparing the characteristics of those surveyed with the overall population, the comparison is the US Census results reported for Montana. Census figures come from American Factfinder at www.factfinder.census.gov.

Not all individuals answered every question. If the respondent answered the most important question, his or her level of support or opposition to the proposed facility, this survey was included in the totals. Some individuals would answer this question but refuse to answer other questions such as household income. These refusals are the reason that there are different answer totals for some questions.

The Survey Process

The CATI Lab purchased a list of telephone numbers from a private company which generates telephone samples for survey research purposes. The selection criteria for these telephone numbers were that they must be a random sample of 'land line' (not wireless, not internet-based) telephone exchanges which are associated with the census blocks that are within 10 miles of the municipal boundaries of Kalispell Montana. A second set of filtering removed non-residential listings.

This list of telephone numbers was programmed into the CATI Lab computer network software. This software controls the telephone survey process. The software tells each CATI Lab interviewer the

number to dial and the questions to ask. If a call does not complete – such as non-working numbers – the software purges this number from the survey list. If a call completes but an interview does not take place – such as when reaching an answering machine – the telephone number is recycled for possible use at some point in the future. The software was programmed to allow a number to be attempted up to five times before it was dropped.

When a telephone call was answered, the interviewer immediately identified herself, her affiliation (Montana State University – Billings) and the purpose of the call (see the interview script for more details). Assuming the call did not end at that point, the interviewer asked to speak with the person in the household who was over age 18 and had the most recent birthday. This was to reduce the possibility that one sex or age group would be more likely to answer the telephone and, if this was the person who answered the survey, possibly skew the results. If the person answering the telephone indicated that no one else was available, the interviewer conducted the survey with this person.

Sex

Sex	Frequency	Percent
Male	510	50%
Female	518	50%

CATI Lab interviewers completed a total of 1039 telephone interviews. The survey solicited the viewpoint of slightly more women than men, but the difference is not statistically-significantly different from Montana's population age 18 or above.

Age

Range	Frequency	Percent
18-44	229	22%
45-64	459	45%
65+	331	32%

The average age of a respondent was 56, with 80% of those answering between 34 and 76 years old.

High School Graduates

Education	Frequency	Percent
Less than High-School Degree	44	4%
High-School Graduate	973	96%

College Graduates

Education	Frequency	Percent
Less that College Degree	632	62%
College Graduate	385	38%

Those answering the survey may have been more educated than the overall population. Over 95% of the respondents reported completing high school. This is higher than that of MT's general population,

which is 87-89%. Over one-third of the respondents reported holding a college degree. This is a larger percentage than the 24% of Montana residents that the Census Bureau reports hold a college degree.

County of Residence for Respondents

County	Freq	Percent	County	Freq	Percent
Beaverhead	12	1%	**Madison**	12	1%
Big Horn	10	1%	**McCone**	5	0%
Blaine	5	0%	**Meagher**	2	0%
Broadwater	3	0%	**Mineral**	4	0%
Carbon	17	2%	**Missoula**	88	9%
Carter	3	0%	**Musselshell**	8	1%
Cascade	87	8%	**Park**	21	2%
Chouteau	10	1%	**Phillips**	5	0%
Custer	20	2%	**Pondera**	9	1%
Daniels	3	0%	**Powder River**	1	0%
Dawson	13	1%	**Powell**	10	1%
Deer Lodge	11	1%	**Ravalli**	29	3%
Fallon	4	0%	**Richland**	10	1%
Fergus	16	2%	**Roosevelt**	9	1%
Flathead	81	8%	**Rosebud**	12	1%
Gallatin	76	7%	**Sanders**	23	2%
Garfield	2	0%	**Sheridan**	5	0%
Glacier	13	1%	**Silver Bow**	32	3%
Golden Valley	1	0%	**Stillwater**	9	1%
Granite	7	1%	**Sweet Grass**	7	1%
Hill	22	2%	**Teton**	8	1%
Jefferson	9	1%	**Toole**	5	0%
Judith Basin	3	0%	**Treasure**	6	1%
Lake	39	4%	**Valley**	11	1%
Lewis and Clark	74	7%	**Wheatland**	2	0%
Liberty	2	0%	**Wibaux**	2	0%
Lincoln	27	3%	**Yellowstone**	129	12%

Note. No observations from Petroleum and Prairie Counties

The distribution of those interviewed is generally consistent with the population of Montana's counties. In no cases did any county account for more than 2.5% of the observations than its population would suggest. No responses were gathered from Petroleum and Prairie counties, which are among the least populated in the state. As with Montana's population in general, one-half of the observations came from residents of five MT counties and two-thirds of the surveys came from individuals living in one of the eight most populated counties.

Administrative Regions of Respondents

Region	Name	Frequency	Percent
1	Missoula	298	29
2	Butte	188	18
3	Great Falls	235	23
4	Glendive	93	9
5	Billings	208	20

When evaluated based upon the Administrative Region of the respondents, seventy percent of those surveyed were located in the Missoula, Great Falls, or Billings region.

Length of Residence in MT

Length of Residence (Years)	Frequency	Percent
0-9	155	15%
10-19	106	11%
20-29	109	11%
30-39	141	14%
40-49	130	13%
50+	378	37%

The average respondent has lived in Montana for 39 years, with only 10% of those surveyed living in the state for 12 years or less. Forty three (43%) percent of respondents reported living in MT for their entire lives.

Willing to Participate in Follow-Up

	Frequency	Percent
Yes	707	70%
No	308	30%

Seventy percent of respondents reported a willingness to participate in follow-up discussions on their perceptions of Montana's road quality.

Survey Results

This section details and describes the survey results. The survey questions were grouped into the following categories:

- Overall Maintenance
- Winter Maintenance
- Surface Maintenance
- Roadside Maintenance
- Road Sign Maintenance
- Road Debris Maintenance
- Rest Area Maintenance
- Road Markers Maintenance
- Roadway Information
- Seat Belt Usage Attitudes
- Automobile Accident Beliefs and Attitudes
- Driving Habits

For each category, the following information is provided:

1. The survey questions
2. Tables presenting the results of the 2008 telephone survey
3. A discussion of the results, including statistically-significant difference for surveyed sub-groups

Following this, I compare the 2008 results to those from the 2006 Transportation survey. The end of this section presents suggested rankings of maintenance priorities using the 2008 survey results and based upon different ranking methodologies.

Overall Maintenance Ratings

Questions

- How important would you say interstate and state highway maintenance in Montana is to you?
- How would you rate overall interstate and state highway maintenance in Montana?
- How would you compare general roadway conditions of Montana's state maintained roadways with the general roadway conditions of state maintained roadways in other states?

Overall Results

Overall Rating		
Rating	**Frequency**	**Percent**
Poor	24	2%
Fair	242	23%
Good	640	62%
Excellent	128	12%

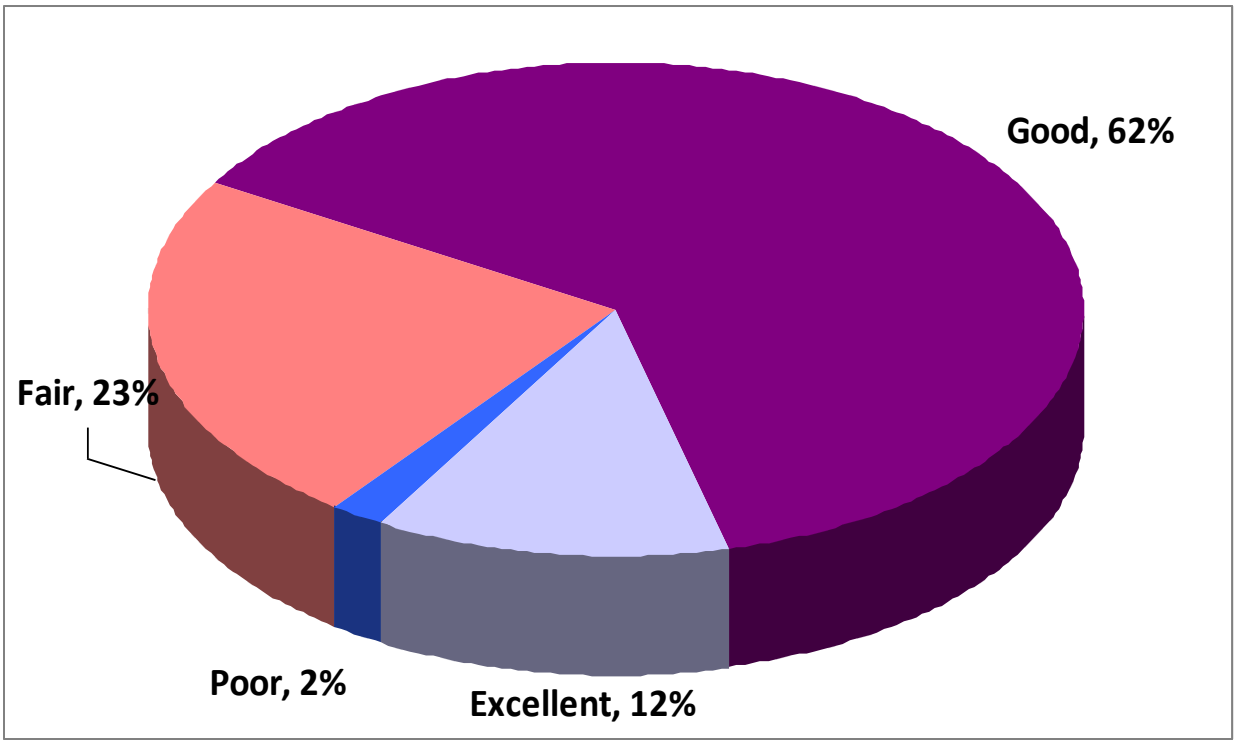
Frequency Missing = 5

Overall Importance		
Rating	**Frequency**	**Percent**
Not Important	8	1%
Somewhat Important	103	10%
Important	251	24%
Very Important	671	65%

Frequency Missing = 6

General Comparison of Roads		
	Frequency	**Percent**
MT Roads Worse	137	18%
About the Same	406	55%
MT Roads Better	199	27%

Discussion

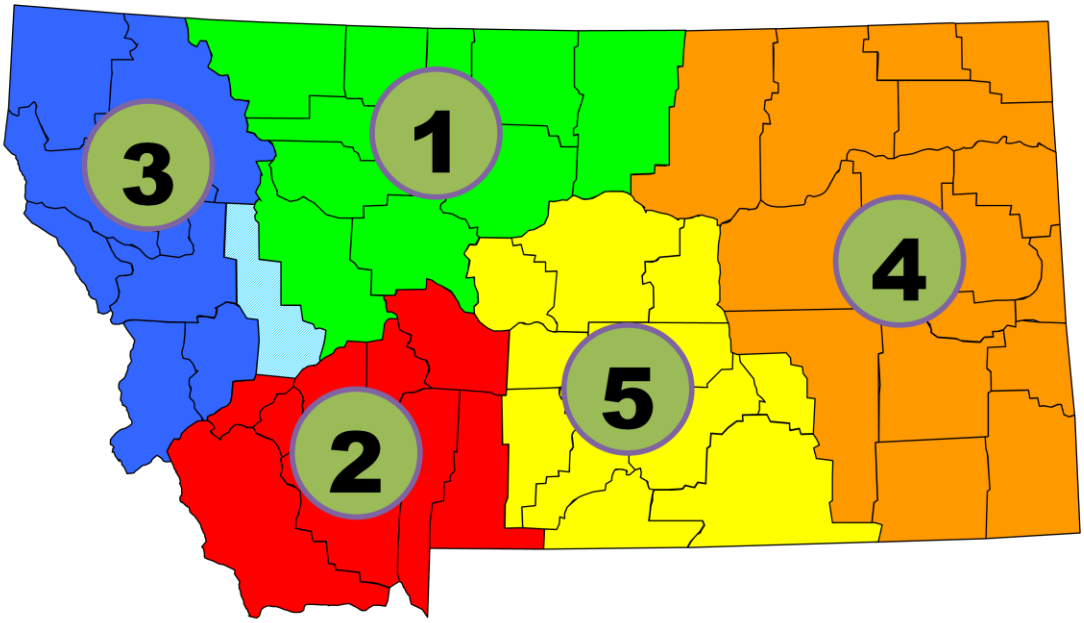


Respondents gave Overall Road Maintenance Ratings as follows:

- 12% Excellent
- 62% Good
- 23% Fair
- 2% Poor

Older residents, urban residents, and college graduates rated overall maintenance higher than their respective counterparts (younger, rural, not college educated).

Overall Maintenance Rating



There were also differences by administrative region. Ranking in order of overall rating is as follows:

1. Great Falls
2. Butte
3. Missoula
4. Glendive
5. Billings

Respondents rated the importance of overall road maintenance as follows:

- 65% Very Important
- 24% Important
- 10% Somewhat Important
- 1% Not Important

Rural residents place higher importance upon overall road maintenance than did urban residents.

For those interviewed who had driven in another state within the past 12 months, 27% rated MT's road maintenance as better than other states, 55% rated it as about the same, and 18% believed MT's road maintenance was worse than that found in other states. Those who have lived in MT for 20 or more years and those who have lived in MT their entire lives were more likely to report MT having better roads than comparison states.

Winter Maintenance

Questions

- How would you rate winter maintenance of interstates and state highways in Montana? By winter maintenance, I mean snow and ice control including plowing, sanding, de-icing, and preventing drifting.
- How important would you say interstate and state highway winter maintenance is to you?
- What resource priority should be placed on interstate and state highway winter maintenance in Montana?
- How would you compare winter maintenance of Montana's state maintained roadways with winter maintenance of state maintained highways in other states?

Overall Results

Winter Maintenance Rating		
Rating	**Frequency**	**Percent**
Poor	59	6%
Fair	209	21%
Good	567	57%
Excellent	155	16%

Frequency Missing = 49

Importance of Winter Maintenance		
Rating	**Frequency**	**Percent**
Not Important	14	1%
Somewhat Important	62	6%
Important	198	20%
Very Important	741	73%

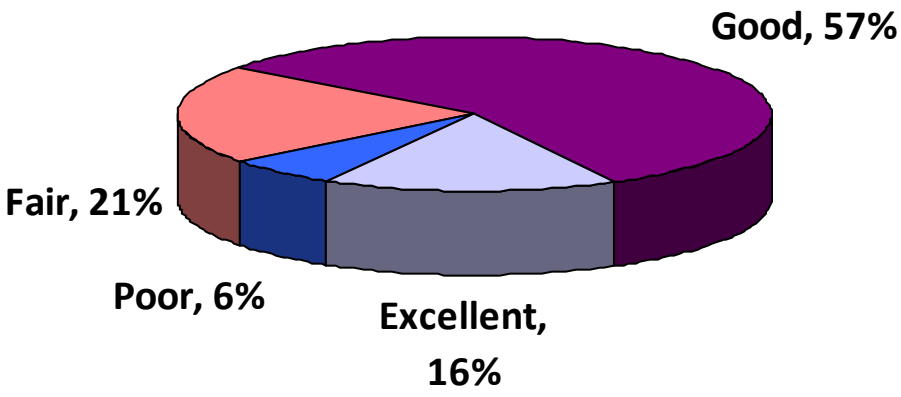
Frequency Missing = 24

Priority of Winter Maintenance		
Rating	**Frequency**	**Percent**
Low	5	Less than 1%
Medium	48	5%
Moderately High	276	27%
Very High	693	68%

Frequency Missing = 17

Winter Comparison of Roads		
	Frequency	**Percent**
MT Winter Maint Worse	82	14%
About the Same	302	52%
MT Winter Maint Better	195	34%

Discussion

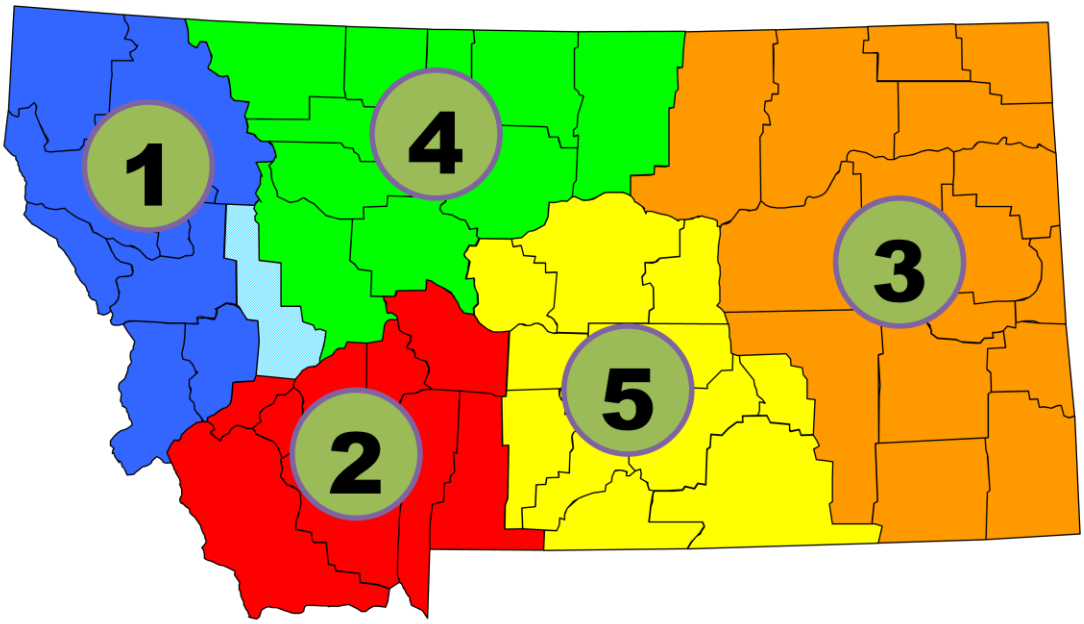


Respondents gave winter road maintenance ratings as follows:

- 16% Excellent
- 57% Good
- 21% Fair
- 6% Poor

Older residents and college graduates rated winter road maintenance higher than their respective counterparts (younger and not college educated).

Winter Maintenance Rating



There were also differences by administrative region. Ranking in order of winter rating is as follows:

1. Missoula
2. Butte
3. Glendive
4. Great Falls
5. Billings

Respondents rated the importance of winter road maintenance as follows:

- 73% Very Important
- 20% Important
- 6% Somewhat Important
- 1% Not Important

Residents under age 55 place higher importance upon winter road maintenance than did older residents.

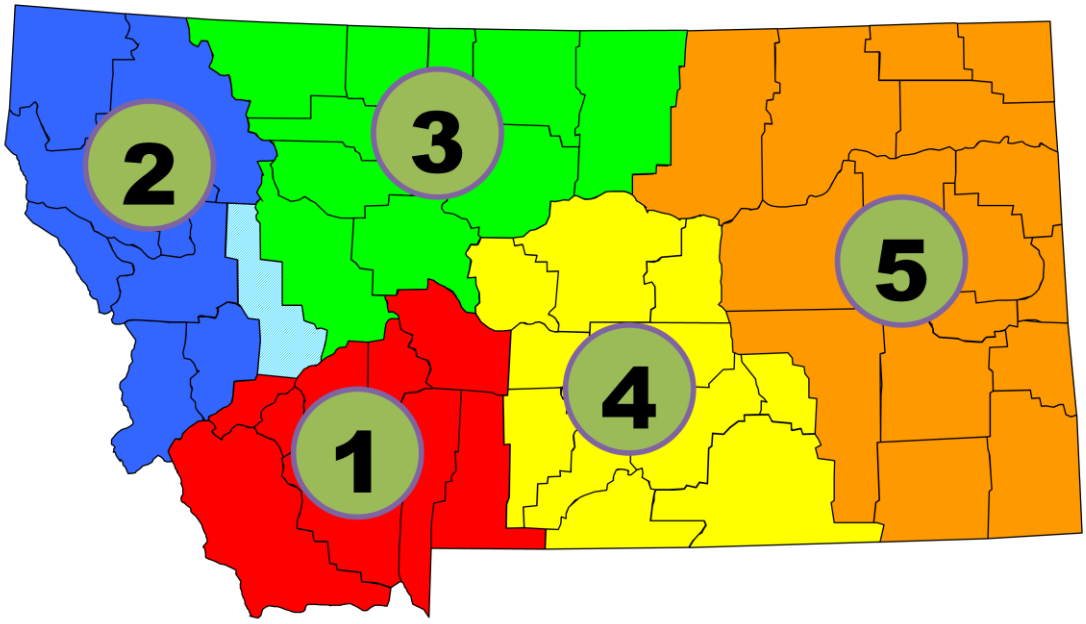
Respondents rated the priority of winter road maintenance as follows:

- 68% Very High
- 27% Moderately High

- 5% Medium
- Less than 1% Low

Women gave a higher priority to winter road maintenance than did men.

Winter Maintenance Priority



For those who had driven in other states within the previous 12 months, 34% found MT's winter road maintenance better that that of the other states they had visited; 34% said winter road maintenance was about the same as that found in other states, and 14% felt that MT's winter road maintenance was worse than that they had experienced in other states. Views of winter road differences also differed by administrative region. Ranking in order most agreement that MT winter maintenance was better than that found in other states is as follows:

1. Butte
2. Missoula
3. Great Falls
4. Billings
5. Glendive

Surface Maintenance

Questions

- How would you rate the surface of Montana's interstates and state highways? In making this rating, consider ride quality which is affected by potholes, ruts, bumps, cracks, etc.
- How important is the smoothness of Montana's interstates and state highways to you?
- What resource priority should be placed on smooth pavement on interstates and state highways in Montana?

Overall Results

Surface Rating		
Rating	**Frequency**	**Percent**
Poor	58	6%
Fair	295	29%
Good	583	57%
Excellent	94	9%

Frequency Missing = 9

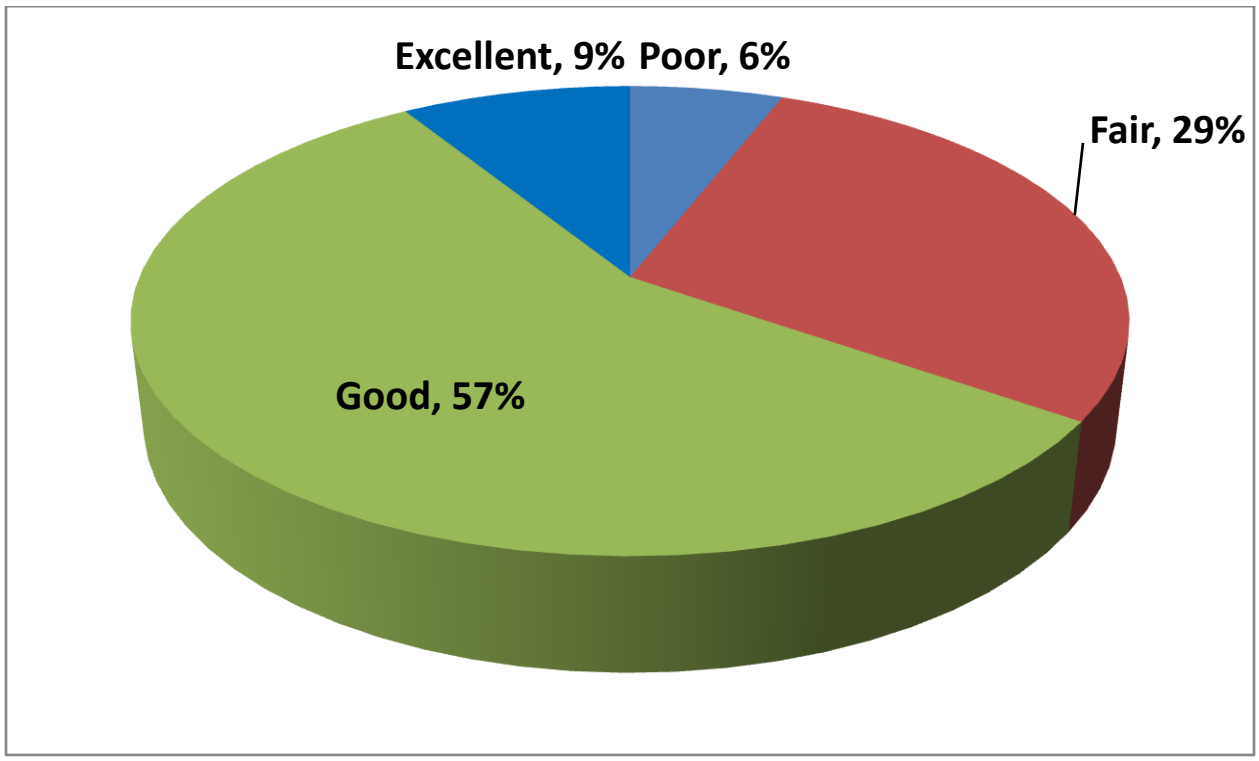
Importance of Road Surface		
Rating	**Frequency**	**Percent**
Not Important	10	1%
Somewhat Important	118	11%
Important	329	32%
Very Important	575	56%

Frequency Missing = 7

Priority of Road Surface		
Rating	Frequency	Percent
Low	14	1%
Medium	150	15%
Moderately High	505	49%
Very High	353	35%

Frequency Missing = 17

Discussion

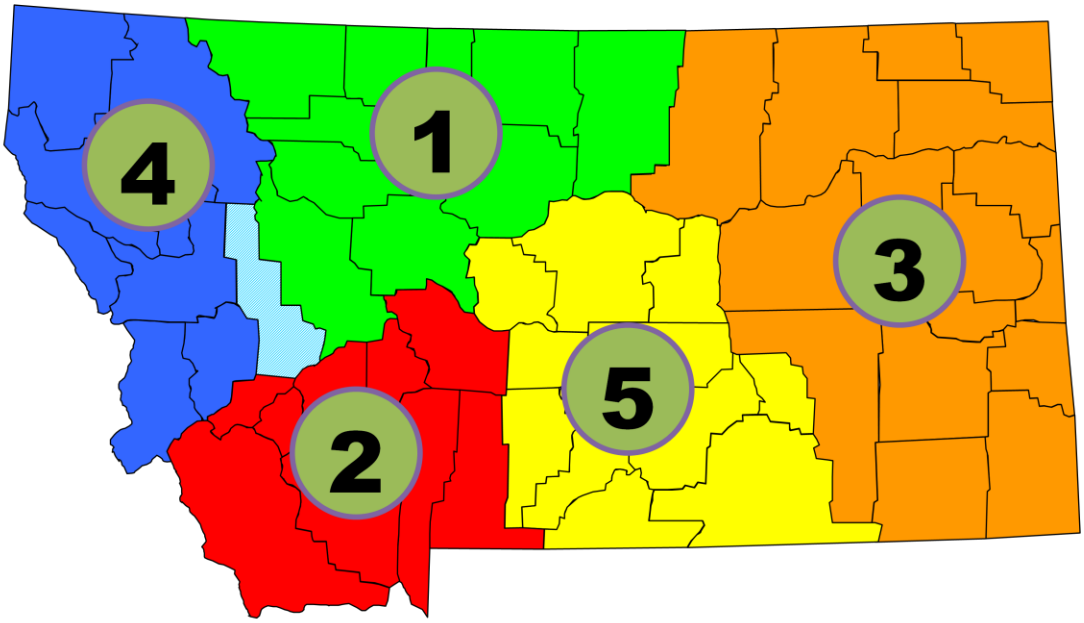


Respondents gave road surface maintenance ratings as follows:

- 9% Excellent
- 57% Good
- 29% Fair
- 6% Poor

Older residents and college graduates rated road surface maintenance higher than their respective counterparts (younger and not college educated).

Road Surface Maintenance Rating



There were also differences by administrative region. Ranking in order of average rating is as follows:

1. Great Falls
2. Butte
3. Glendive
4. Missoula
5. Billings

Respondents rated the importance of road surface maintenance as follows:

- 56% Very Important
- 32% Important
- 11% Somewhat Important
- 1% Not Important

Residents over age 55 place higher importance upon road surface maintenance than did older residents.

Respondents rated the priority of road surface maintenance as follows:

- 35% Very High
- 49% Moderately High
- 15% Medium
- 1% Low

Residents who were not born in MT, those without a college degree, and rural residents gave a higher priority to road surface maintenance than did their counterparts (lifetime residents, college graduates, and urban residents).

Roadside Maintenance

Questions

- How would you rate the management of interstate and state highway roadsides in Montana? Roadside management includes mowing shoulders and eliminating unwanted vegetation.
- How important is interstate and state highway roadside management in Montana to you?
- What resource priority should be placed on interstate and state highway roadside management in Montana?

Overall Results

Roadside Rating		
Rating	**Frequency**	**Percent**
Poor	74	7%
Fair	237	23%
Good	560	55%
Excellent	145	14%

Frequency Missing = 23

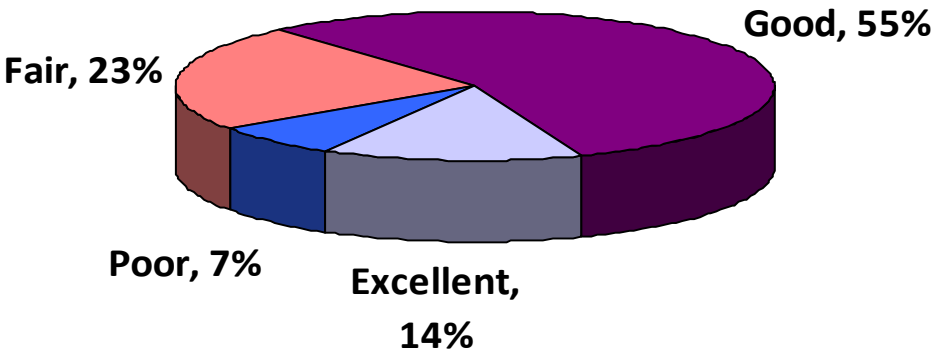
Importance of Roadside		
Rating	**Frequency**	**Percent**
Not Important	52	5%
Somewhat Important	237	23%
Important	354	34%
Very Important	385	37%

Frequency Missing = 11

Priority of Roadside		
Rating	Frequency	Percent
Low	93	9%
Medium	288	28%
Moderately High	429	42%
Very High	213	21%

Frequency Missing = 16

Discussion



Respondents gave road side maintenance ratings as follows:

- 14% Excellent
- 55% Good
- 23% Fair
- 14% Poor

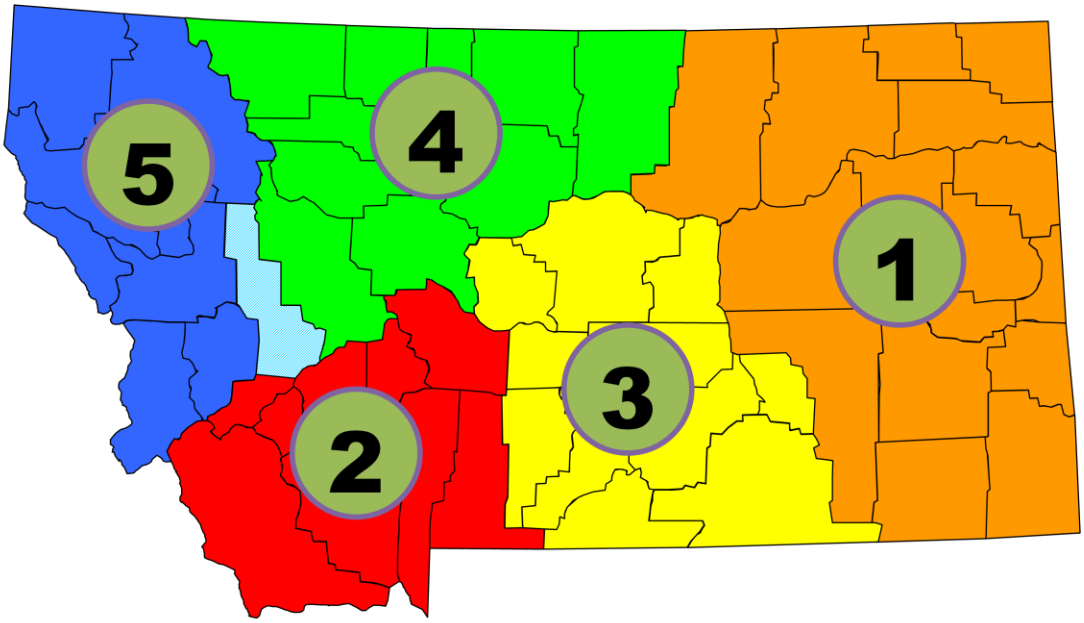
Urban residents and those not born in MT rated road side maintenance higher than their respective counterparts (rural and lifetime MT residents).

Respondents rated the importance of road side maintenance as follows:

- 37% Very Important
- 34% Important
- 23% Somewhat Important
- 5% Not Important

Several groups placed more importance upon road side maintenance that their counterparts. Females, older residents, and rural residents registered higher importance scores than did males, residents under age 55, and urban residents. Long-time and lifetime residents place more importance upon road side maintenance than did those who had lived in MT for fewer than 20 year or not their entire life respectively. Also, residents with less than a college degree give higher importance scores than did college graduates.

Road Side Maintenance Importance



Road side importance scores differed by administrative region. From highest to lowest importance the regions were as follows:

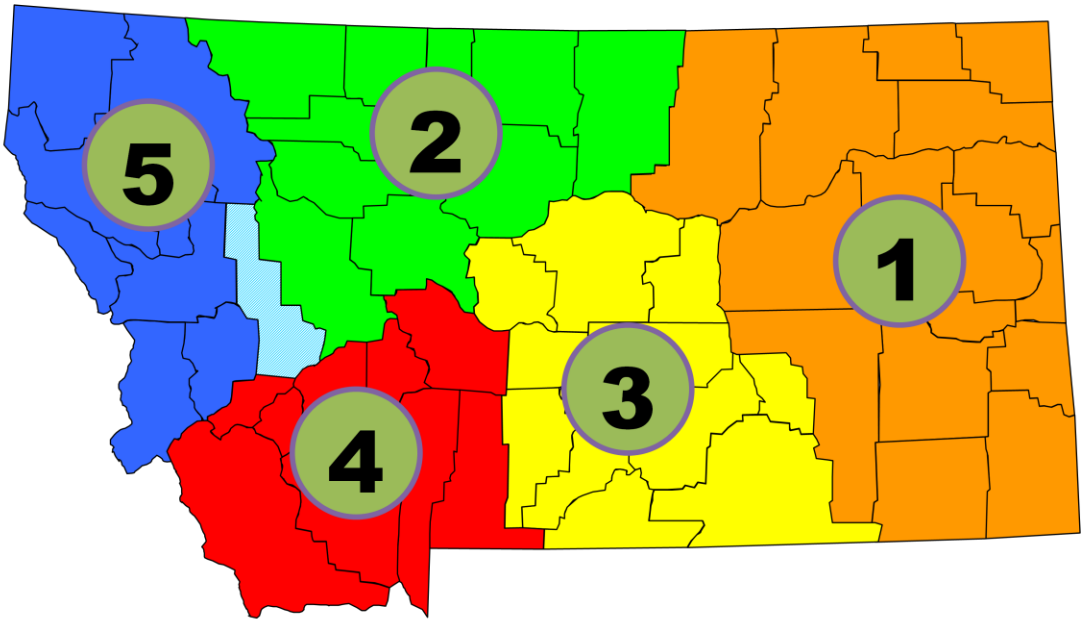
1. Glendive
2. Butte
3. Billings
4. Great Falls
5. Missoula.

Respondents rated the priority of road side maintenance as follows:

- 21% Very High
- 42% Moderately High
- 28% Medium
- 9% Low

Women, residents age 55 or older, rural residents, long-time residents, and residents who did not hold a college degree gave a higher priority to road side maintenance than did men, younger residents, urban resident, those living in MT for fewer than 20 years, and college graduates respectively.

Road Side Maintenance Priority



The priority of road side maintenance scored differed by administrative region. From highest to lowest priority the regions were as follows:

1. Glendive
2. Great Falls
3. Billings
4. Butte
5. Missoula

Road Signs Maintenance

Questions

- How would you rate the condition of interstate and state highway signs in Montana?
- How important is interstate and state highway roadsign management in Montana to you?
- What resource priority should be placed on repairing and replacing signs on interstates and state highways in Montana?

Overall Results

Signage Rating		
Rating	Frequency	Percent
Poor	12	1%
Fair	132	13%
Good	668	65%
Excellent	218	21%

Frequency Missing = 9

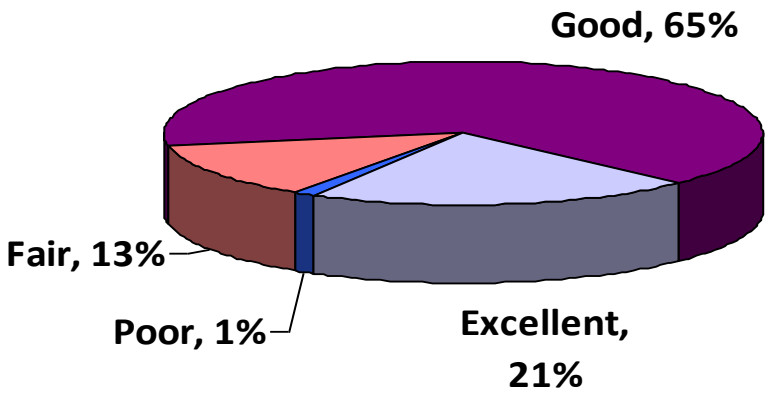
Importance of Signage		
Rating	Frequency	Percent
Not Important	14	1%
Somewhat Important	146	14%
Important	357	35%
Very Important	515	50%

Frequency Missing = 7

Priority of Signage		
Rating	Frequency	Percent
Low	33	3%
Medium	208	20%
Moderately High	413	41%
Very High	364	36%

Frequency Missing = 21

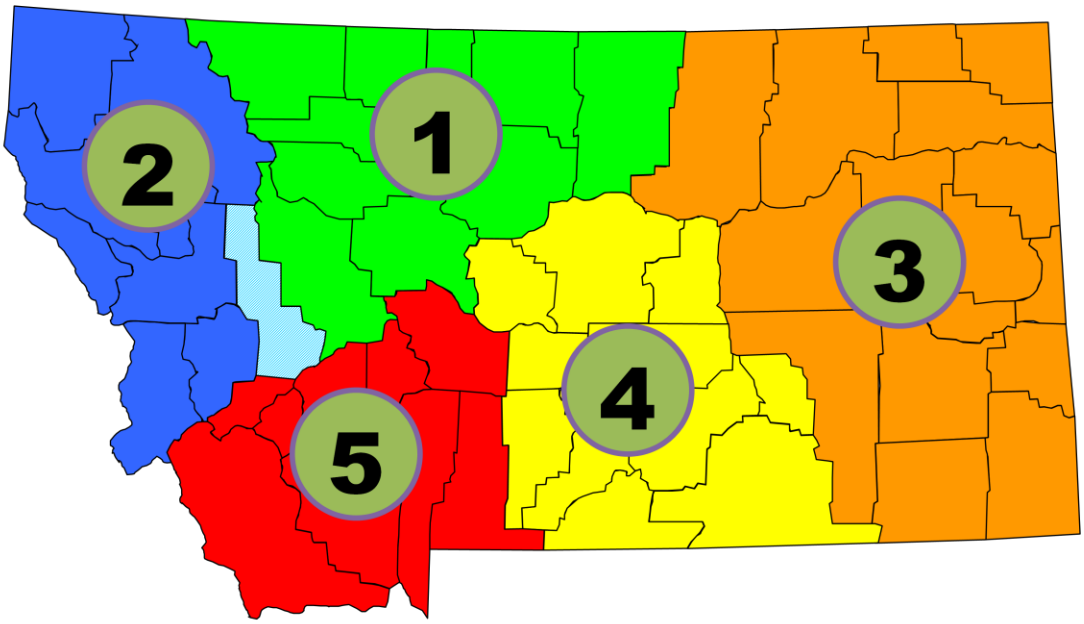
Discussion



Respondents gave road sign maintenance ratings as follows:

- 21% Excellent
- 65% Good
- 13% Fair
- 1% Poor

Road Sign Maintenance Rating



Males rated road sign maintenance higher than females. There were also differences by administrative region. Ranking in order of overall road sign rating is as follows:

1. Great Falls
2. Missoula
3. Glendive
4. Billings
5. Butte

Respondents rated the importance of road sign maintenance as follows:

- 50% Very Important
- 35% Important
- 14% Somewhat Important
- 1% Not Important

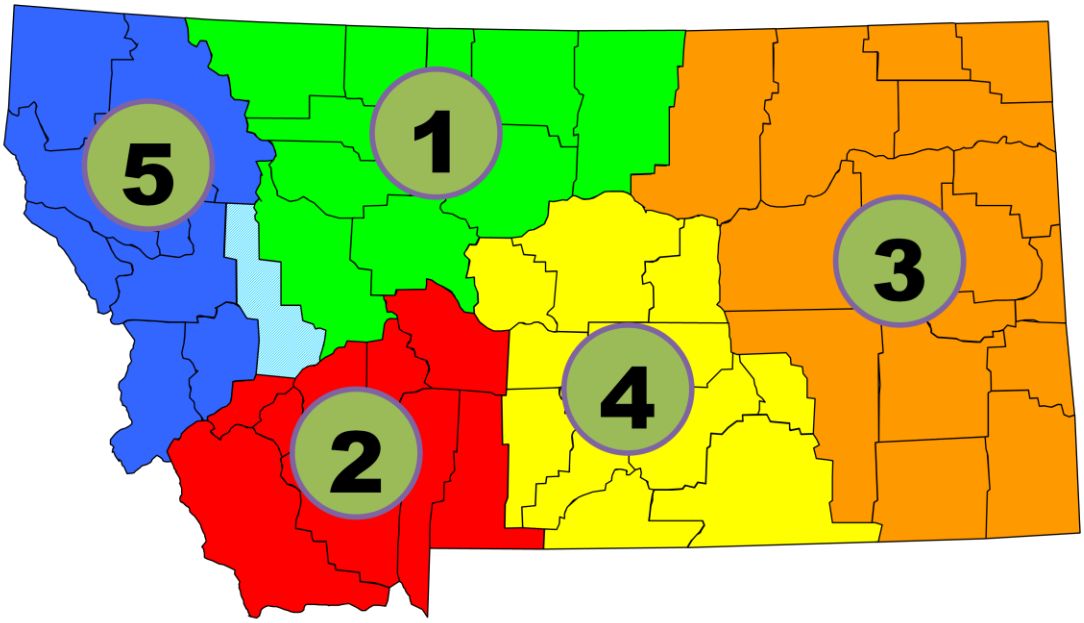
Females and residents age 55 and older placed higher importance upon signage maintenance than did males and younger residents. Also, residents with less than a college degree placed more importance upon sign maintenance than did college graduates.

Respondents rated the priority of road sign maintenance as follows:

- 36% Very High
- 41% Moderately High
- 20% Medium
- 3% Low

Older residents and those who did not hold a college degree gave higher priority to road sign maintenance than did residents under age 55 and college graduates respectively.

Road Sign Maintenance Priority



Signage importance also differed by region. The following ranks average importance ratings by administrative region, from highest to lowest:

1. Great Falls
2. Butte
3. Glendive
4. Billings
5. Missoula

Road Debris Maintenance

Questions

- How would you rate the removal of debris such as litter, road kill, and fallen rocks, on Montana's interstates and state highways?
- How important is the removal of debris on interstates and state highways in Montana to you?
- What resource priority should be placed on debris removal on interstates and state highways in Montana?

Overall Results

Debris Removal Rating		
Rating	Frequency	Percent
Poor	75	7%
Fair	215	21%
Good	582	57%
Excellent	158	15%

Frequency Missing = 9

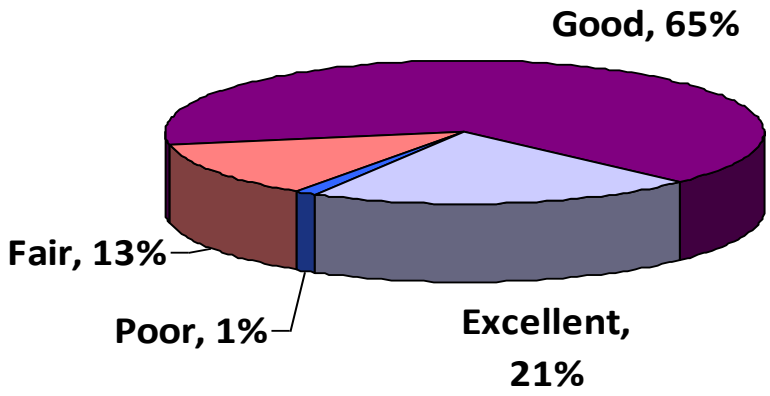
Importance of Debris Removal		
Rating	Frequency	Percent
Not Important	7	1%
Somewhat Important	120	12%
Important	287	28%
Very Important	617	60%

Frequency Missing = 8

Priority of Debris Removal		
Rating	Frequency	Percent
Low	18	2%
Medium	155	15%
Moderately High	374	37%
Very High	476	47%

Frequency Missing = 16

Discussion



Respondents rated the removal of road debris as follows:

- 15% Excellent
- 57% Good
- 21% Fair
- 7% Poor

Resident age 55 or older, college graduates, and those not born in MT rated road debris removal higher than younger, non-graduates, and lifetime MT residents respectively.

Respondents rated the importance of road debris removal as follows:

- 60% Very Important
- 28% Important
- 12% Somewhat Important
- 1% Not Important

Female place higher importance upon debris removal than did males.

Respondents rated the priority of road debris removal as follows:

- 47% Very High
- 37% Moderately High
- 15% Medium
- 2% Low

Females and those who did not hold a college degree gave higher priority to debris removal than did males and college graduates respectively.

Rest Area Maintenance

Questions

- How would you rate the maintenance of rest areas on Montana interstates and state highways. Rest area maintenance includes cleaning rest areas and keeping rest areas in working order.
- How important is interstate and state highway rest area maintenance to you?
- What resource priority should be placed on rest area cleanliness and maintenance on interstates and state highways in Montana?
- How would you compare rest area cleanliness and maintenance in Montana with rest area cleanliness and maintenance in other states?

Overall Results

Rest Area Rating		
Rating	**Frequency**	**Percent**
Poor	37	5%
Fair	158	20%
Good	452	57%
Excellent	153	19%

Frequency Missing = 239

Importance of Rest Area		
Rating	**Frequency**	**Percent**
Not Important	49	5%
Somewhat Important	152	17%
Important	317	35%
Very Important	389	43%

Frequency Missing = 132

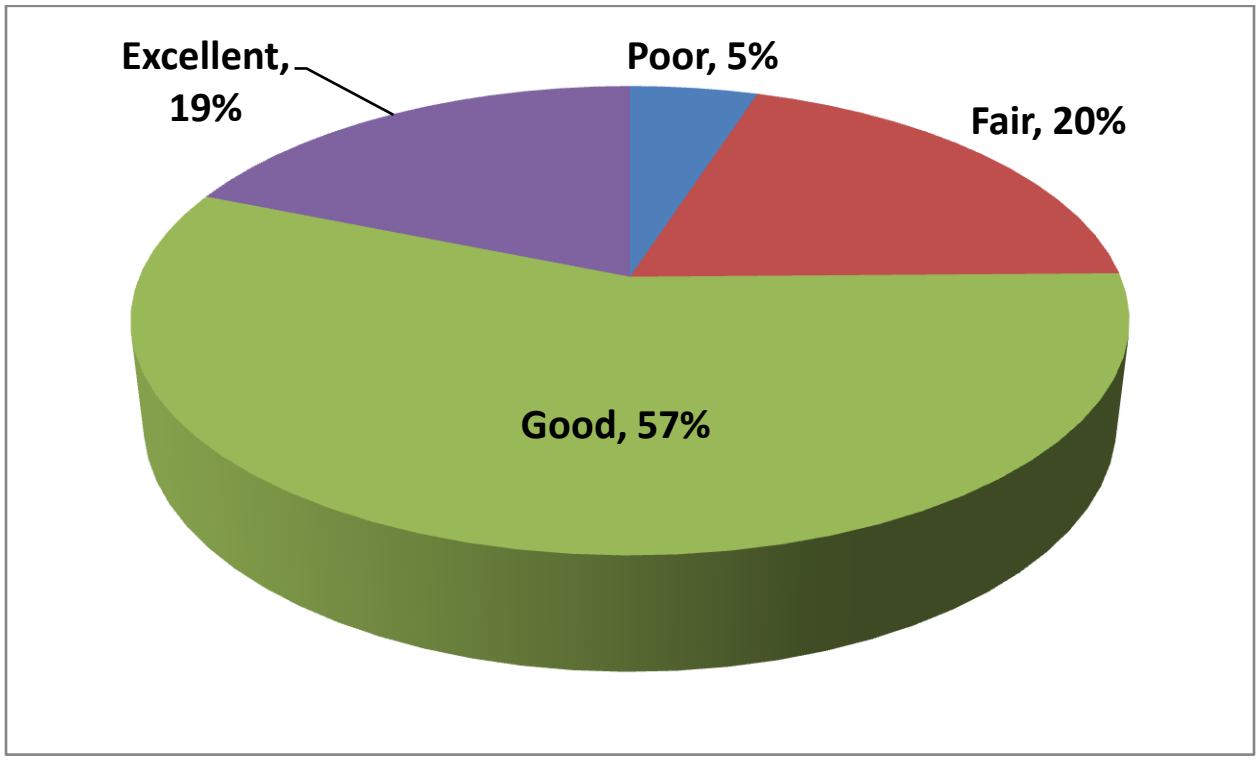
Priority of Rest Areas		
Rating	Frequency	Percent
Low	28	3%
Medium	190	20%
Moderately High	400	43%
Very High	315	34%

Frequency Missing = 106

Comparison of Rest Areas		
	Frequency	Percent
MT Rest Areas Worse	129	22%
About the Same	349	59%
MT Rest Areas Better	112	19%

Frequency Missing = 449

Discussion



Respondents gave rest area maintenance ratings as follows:

- 19% Excellent
- 57% Good
- 20% Fair
- 5% Poor

Respondents rated the importance of rest area maintenance as follows:

- 43% Very Important
- 35% Important
- 17% Somewhat Important
- 5% Not Important

Females place higher importance upon rest area maintenance than did males.

Respondents rated the priority of rest area maintenance as follows:

- 34% Very High
- 43% Moderately High
- 20% Medium
- 3% Low

Older residents and those who did not hold a college degree gave higher priority to rest area maintenance than did residents under age 55 and college graduates respectively.

For those interviewed who had driven in another state within the past 12 months, 19% rated MT's rest area maintenance as better than other states, 59% rated it as about the same, and 22% believed MT's rest area maintenance was worse than that found in other states. Residents under age 55 and those living in MT for fewer than 20 years were more likely than women to report MT having better rest area maintenance than comparison states.

Pavement Markers Maintenance

Questions

- How would you rate the condition of striping (lines) on Montana's interstates and state highways? Striping and lines include the middle lines, no-passing lines, left turn lanes, and shoulder lines.
- How important is interstate and state highway striping to you?
- What resource priority should be placed on roadway striping on interstates and state highways in Montana?

Overall Results

Pavement Markers Rating		
Rating	Frequency	Percent
Poor	43	4%
Fair	185	18%
Good	632	62%
Excellent	167	16%

Frequency Missing = 12

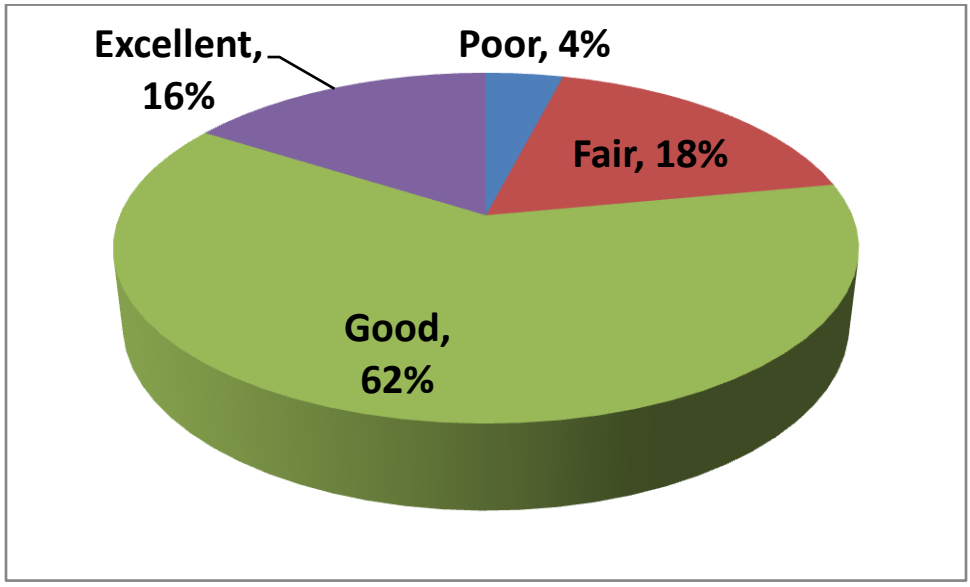
Importance of Pavement Markers		
Rating	Frequency	Percent
Not Important	9	1%
Somewhat Important	107	10%
Important	261	25%
Very Important	654	63%

Frequency Missing = 8

Priority of Pavement Markers		
Rating	Frequency	Percent
Low	19	2%
Medium	114	11%
Moderately High	361	35%
Very High	529	52%

Frequency Missing = 16

Discussion



Respondents gave pavement marker maintenance ratings as follows:

- 16% Excellent
- 62% Good
- 18% Fair
- 4% Poor

Residents age 55 or older gave higher pavement marker maintenance ratings than did those under 55.

Respondents rated the importance of pavement marker maintenance as follows:

- 63% Very Important
- 25% Important
- 10% Somewhat Important
- 1% Not Important

Females and residents age 55 or older placed higher importance upon pavement marker maintenance than did males or residents under age 55.

Respondents rated the priority of pavement marker maintenance as follows:

- 52% Very High
- 35% Moderately High
- 11% Medium
- 2% Low

Females, long-time residents and those who did not hold a college degree gave higher priority to pavement marker maintenance than did males, residents living in MT for fewer than 20 years, and college graduates respectively.

Highway Information

Questions

- How important is up to date winter interstate and state highway information to you?
- What resource priority should be placed providing accurate and up to date information about the current condition of state maintained highways in Montana?

Overall Results

Importance of Winter Info		
Rating	**Frequency**	**Percent**
Not Important	50	5%
Somewhat Important	124	13%
Important	220	22%
Very Important	598	60%

Frequency Missing = 47

Priority of Winter Information		
Rating	**Frequency**	**Percent**
Low	17	2%
Medium	103	10%
Moderately High	341	34%
Very High	551	55%

Frequency Missing = 27

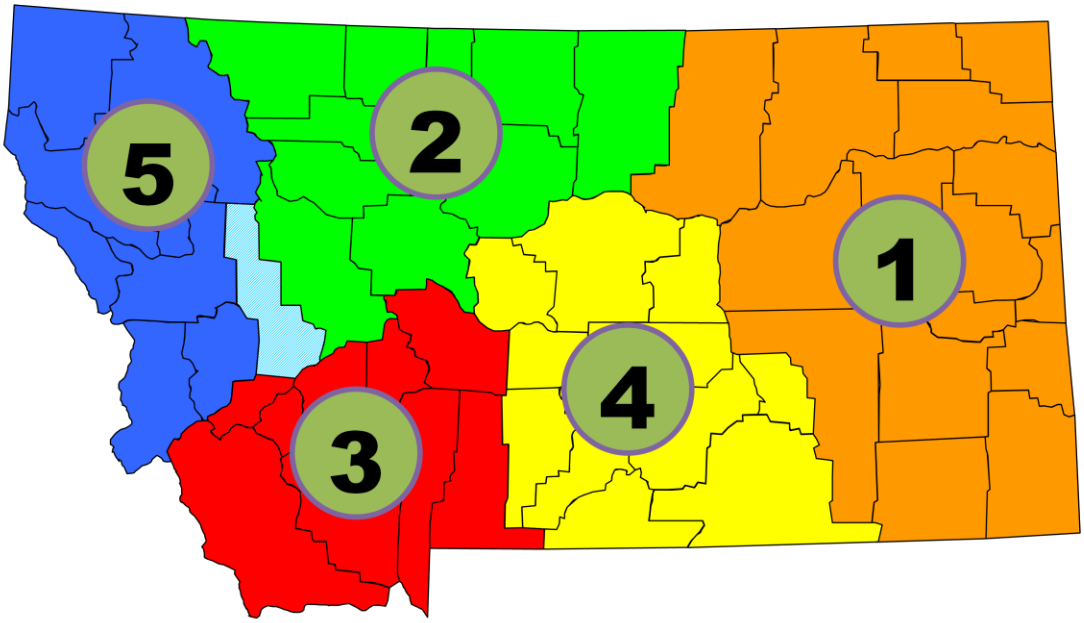
Discussion

Respondents rated the importance of roadway information as follows:

- 60% Very Important
- 22% Important
- 13% Somewhat Important
- 5% Not Important

Females and residents age 55 or older placed higher importance upon roadway information than did males or residents under age 55.

Roadway Information Importance



The importance of roadway information also differed by administrative region. Ranking in order of highest importance of roadway information is as follows:

1. Glendive
2. Great Falls
3. Butte
4. Billings
5. Missoula

Respondents rated the priority of roadway information as follows:

- 55% Very High
- 34% Moderately High
- 10% Medium
- 2% Low

Females gave higher priority to roadway information than did males.

Safety Rating

As a result of a request from the MDT, I created a composite indicator from the Pavement and Road Sign indicators. The results of these Safety-related indicators is as follows.

Overall Results

Safety Rating		
Rating	**Frequency**	**Percent**
Poor	4	2%
Fair	354	34%
Good	604	59%
Excellent	53	5%

Importance of Safety		
Rating	**Frequency**	**Percent**
Not Important	7	1%
Somewhat Important	118	11%
Important	529	52%
Very Important	373	36%

Priority of Safety		
Rating	Frequency	Percent
Low	16	2%
Medium	235	23%
Moderately High	579	57%
Very High	373	18%

Frequency Missing = 27

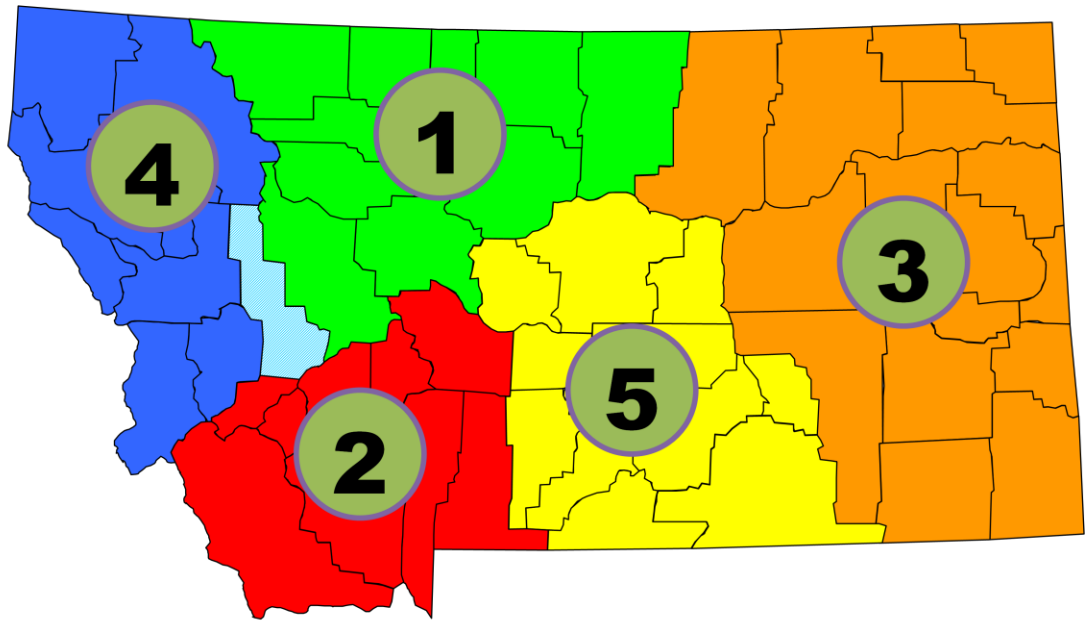
Discussion

The constructed composite safety rating could be interpreted as follows:

- 5% Excellent
- 59% Good
- 34% Fair
- 2% Poor

College graduates gave higher safety ratings than did those with less than a college degree.

Safety Rating



There were also differences by administrative region, ranked in the following order:

1. Great Falls
2. Butte
3. Glendive
4. Missoula
5. Billings

Respondents rated the importance of safety issues as follows:

- 36% Very Important
- 52% Important
- 11% Somewhat Important
- 1% Not Important

Females and residents age 55 or older placed higher importance upon safety than did males or residents under age 55, while college graduates placed a lower importance upon it.

Respondents rated the priority of safety measures as follows:

- 18% Very High
- 57% Moderately High
- 23% Medium
- 2% Low

Respondents age 55 or older and those with less than a college degree placed a higher priority upon safety measures than their respective counterparts..

Seat Belt Usage Attitudes

Question

- Would you support a Primary Seat Belt law for the state of Montana?
- Could you tell us why you are against a primary seat belt law? **(If they answered 'No' to the previous question)**
- Do you support a primary law for child restraint in motor vehicles?
- Which best describes your use of seat belts. You wear a seat belt…

Overall Results

Support Primary Seat Belt Law		
	Frequency	Percent
Yes	552	55%
No	455	45%

Frequency Missing = 32

Reasons against primary seat belt law?		
Reason	Frequency	Percent
Don't Believe in Seat Belts	12	3%
Individual Right	308	69%
Not Necessary in Rural Areas	11	2%
Other	114	26%

Frequency Missing = 594

Support for Child Restraint Law		
	Frequency	Percent
Yes	393	89%
No	51	11%

Frequency Missing = 595

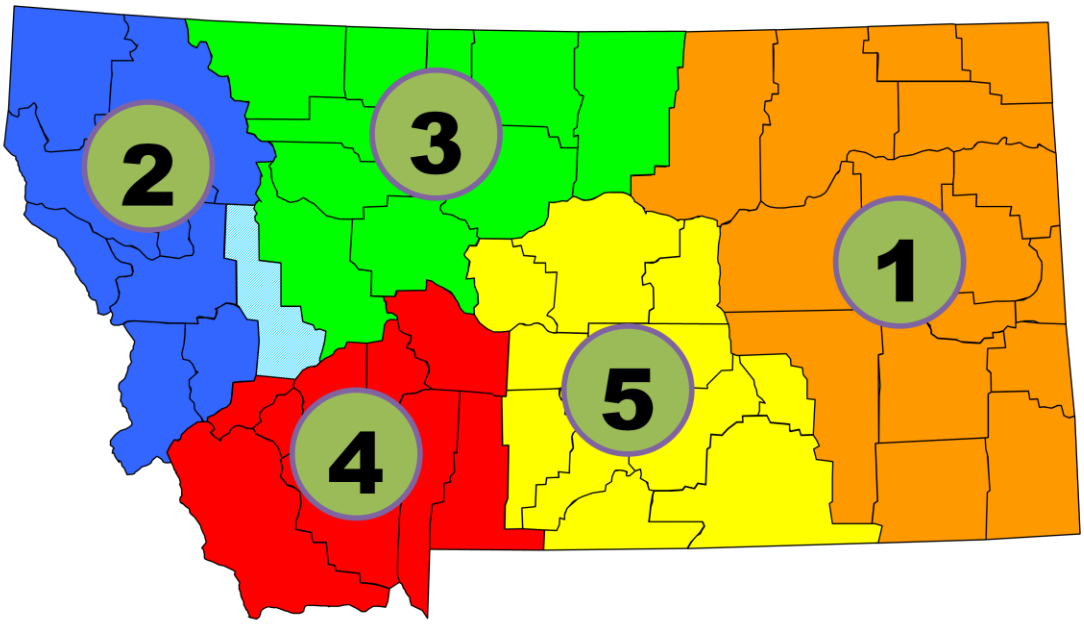
Seat Belt Use		
Use	Frequency	Percent
All of the time	698	68%
Most of the time	220	21%
Half of time	45	4%
Less than half the time	30	3%
Rarely or Never	36	4%

Frequency Missing = 10

Discussion

Fifty-five percent (55%) of respondents supported a primary seat belt law. Males and lifetime residents of MT showed more support than females and those not born in MT.

Support for Primary Seat Belt Law



Also, support differed by administrative region as follows (from highest to lowest support levels):

1. Glendive
2. Missoula
3. Great Falls
4. Butte
5. Billings.

The reasons given by those who did not support a primary seat belt law were as follows:

- 69% Individual Rights
- 26% Other
- 3% Don't Believe in Seat Belts
- 2% Not Necessary in Rural Areas

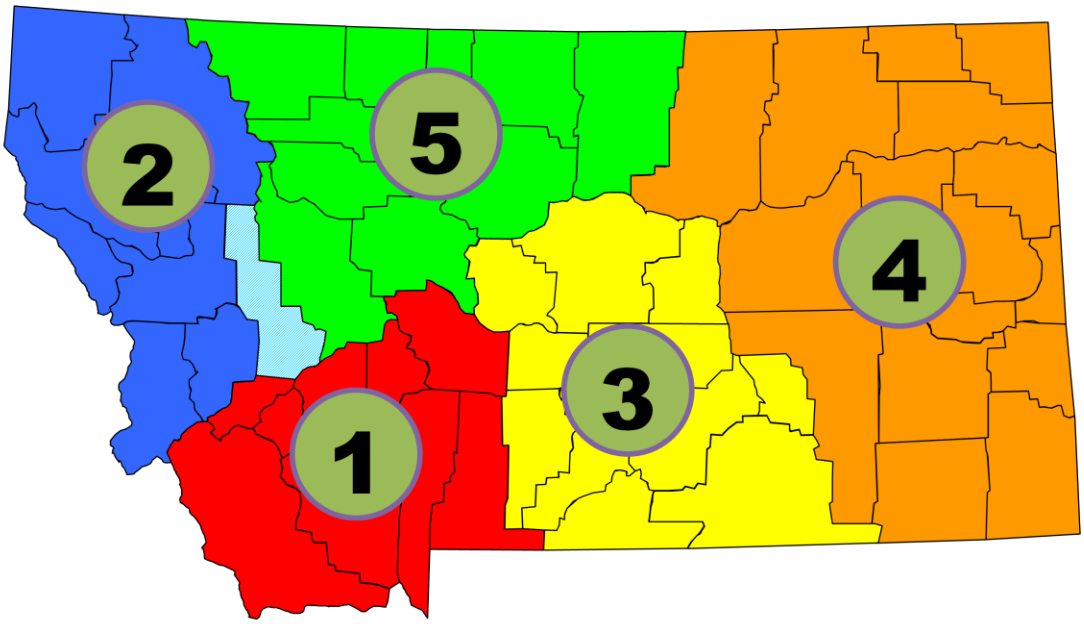
Respondents who did not hold a college degree cited 'Individual Rights' more frequently than college graduates.

Note that this was an open-ended question and that, based upon the respondent's answer, the interviewer would either choose one of the pre-programmed choices (if it fit with the respondent's answer) or transcribed the actual response. A summary of how frequently specific themes were discussed is as follows:

- It's an excuse for the police to pull people over (75)
- Seat belts are dangerous or cause death (5)
- Because there is no helmet law (5)
- There should not be any seat belt laws (2)
- Forgot or inconvenient (2)
- Police should enforce existing laws (2)
- Medical or comfort reasons (2)
- Yes for children, no for special needs kids (2)
- Vehicle doesn't have seat belts (1)
- Not until school buses have them (1)

The vast majority of respondents (89%) supported a child restraint law, with college graduates in more support than those without a college degree.

Support for Child Restraint Laws

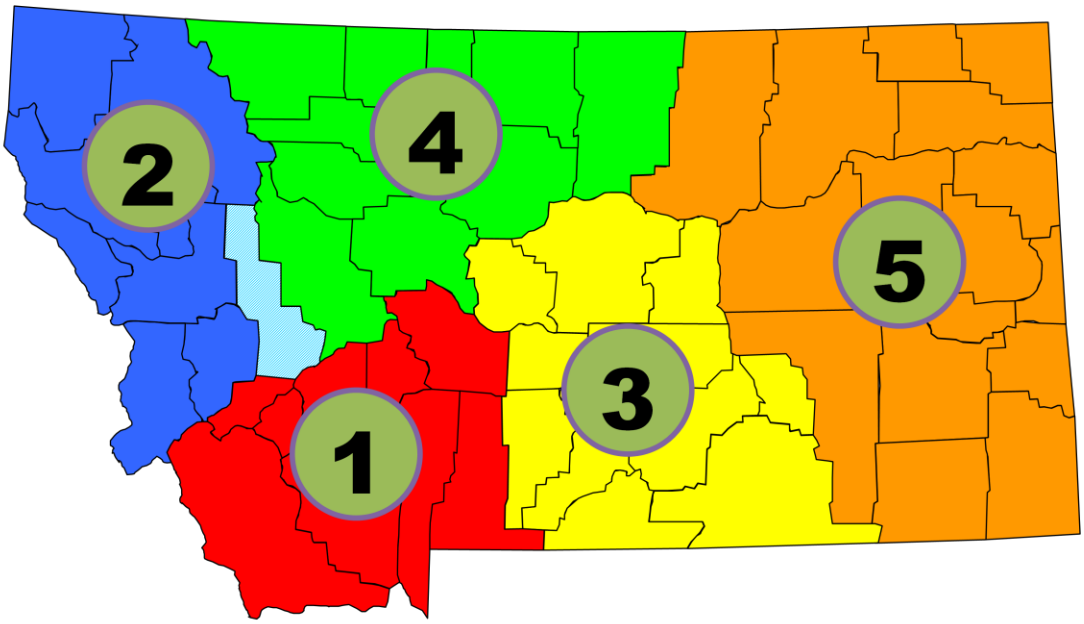


Support for child restraint laws varied by administrative region as follows (from highest to lowest levels of support):

1. Butte
2. Missoula
3. Billings
4. Glendive
5. Great Falls

Concerning the individual's seat belt use, over two-thirds (68%) reported using their seat belt 'All of the Time' and another 21% said they used it 'Most of the Time'. A total of 11% of respondents said they used their seat belts one half of the time or less. Groups with higher seat belt usage rates include females, college graduates, urban residents, and those living in MT fewer than 20 years.

Seat Belt Usage



Seat belt usage varied by administrative region as follows (from highest rates to lowest):

1. Butte
2. Missoula
3. Billings
4. Great Falls
5. Glendive

Automobile Accident Beliefs and Attitudes

Questions

- Which of the following do you believe is the most frequent type of fatal crash?
- I would like to know which you think is the most frequent cause, the second most frequent cause and the third most frequent cause.

Overall Results

Most Frequent Crash		
	Frequency	Percent
Two Vehicle	230	25%
One Vehicle w/ Fixed Object	88	10%
One Vehicle Roll-over	580	63%
Passenger Vehicle hits Pedestrian	22	2%

Frequency Missing = 119

Top Three Causes		
	Frequency	Percent
DUI	922	89%
Distracted/Inattentive	838	81%
Speeding	461	44%
Falling Asleep	378	37%
Passing	257	25%
Road Rage	118	11%
Other/Don't Know/ None of Above	40	6%

Discussion

Nearly two-thirds (63%) of respondents identified one-vehicle roll-overs as the most frequent type of automobile crash. Twenty-five percent (25%) chose two-vehicle accidents and ten percent (10%) picked one-vehicle accidents involving fixed objects. Only two percent of those surveyed picked accidents where a passenger vehicle struck a pedestrian.

The following group differences were found:

- Females cited single-vehicle roll-over more frequently.
- Males cited two-vehicle crashes more frequently.
- Residents under age 55 cited fewer two-vehicle crashes.
- Residents over age 55 cited more two-vehicle crashes.
- Residents of the Glendive administrative region cited more one-vehicle roll-over and fewer one vehicle fixed-object and two vehicle crashes.

- Residents of the Missoula administrative region cited fewer one-vehicle roll-over and more one vehicle fixed-object and two vehicle crashes.

When asked to pick the top three causes of automobile accidents, most individuals chose driving while intoxicated and inattentive or distracted driving (89% and 81% respectively). No other cause was chosen by one-half or more of those surveyed, although speeding (44%), falling asleep at the wheel (37%), and passing (25%) received many votes. Only 11% of those surveyed picked road rage and 6% chose other, don't know, or none of the above.

Other causes provided by respondents when asked this open-ended question include:

- Wildlife crossing (8)
- Not wearing seat belts (1)
- Wearing seat belt (1)
- Road conditions (1)
- Eating or reaching for things (1)
- Not familiar with road (1)
- Driver age (1)
- Inexperience (1)

Driving Habits

Questions

- Have you driven on roadways in states other than Montana in the last 12 months?
- Which of the following types of trips would you say is most typical of your driving?
- Would you say you drive more or less than 15,000 miles per year?
- Have your driving habits changed due to the higher cost of fuel? Would you say that you are…
- Are you doing any of the following to mitigate or offset the cost of fuel.
- How would you rate your success in reducing your fuel consumption?

Overall Results

Driven in Other States		
	Frequency	Percent
Yes	750	73%
No	275	27%

Frequency Missing = 14

Most Frequent Type of Trips		
Type of Trips	**Frequency**	**Percent**
Work Commute	217	21%
Work Related	137	13%
Personal/Family	588	57%
Ag-Related	41	4%
Prof. Driving	31	3%
Other	9	1%

Frequency Missing = 16

Drove More than 15,000 Miles		
	Frequency	**Percent**
Yes	417	41%
No	599	59%

Frequency Missing = 23

Changing Driving Habits?		
	Frequency	**Percent**
Driving More	11	1%
Driving Less	646	63%
No Change	372	36%

Frequency Missing = 10

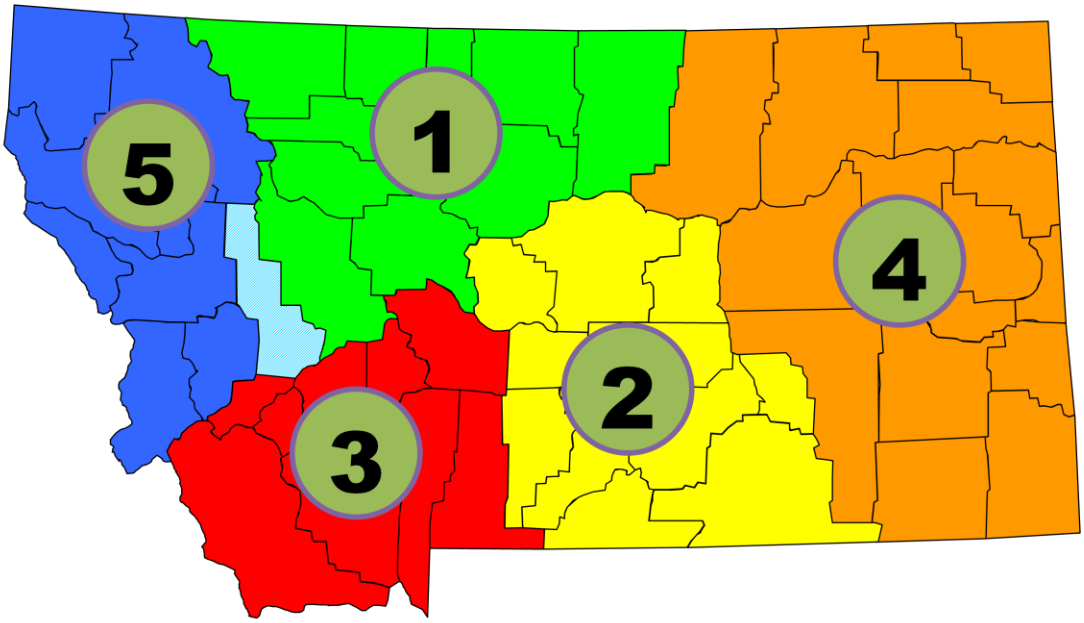
Are Fuel Conservation Changes Successful?		
Rating	Frequency	Percent
Very Successful	173	17%
Somewhat Successful	556	54%
No Change in Fuel Consumption	247	24%
Somewhat Unsuccessful	29	3%
Very Unsuccessful	23	2%

Frequency Missing = 11

Discussion

Nearly three-quarters (73%) of respondents reported driving on roads outside Montana within the previous 12 months. Short-term residents and college graduates were more likely to have driven in another state than were long-term residents and those without college degrees.

Recent Experience Driving in Other States



There were also differences based upon administrative region and these can be ranked as follows (from highest to lowest):

1. Great Falls
2. Billings
3. Butte
4. Glendive
5. Missoula

The most frequent types of driving trip were as follows:

- 57% Personal or Family
- 21% Work Commute
- 13% Work-Related
- 4% Ag-Related
- 3% Professional Driving
- 1% Other

Differences in primary trip type were as follows:

- Residents age 55+ reports one half the work commute trips of Under 55
- Residents age 55+ reports two-thirds more family-related trips compared to Under 55
- Rural residents report fewer work-related trips than Urban residents
- Rural residents report more agricultural-related trips

Less than one-half (41%) of respondents reported driving in excess of 15,000 miles in the previous year. Groups with greater tendencies to driving at least this distance include males, those under age 55, residents living in MT for fewer than 20 years, rural residents, and individuals without a college degree.

Nearly two-thirds (63%) of respondents reported driving less due to higher fuel prices, and 36% reported no change in the distance driven. When asked to rate the success of all fuel conservation actions, 17% reported these actions to be very successful and another 54% reported some success.

Open-Ended Questions

Questions

- The Department of Transportation is striving to improve maintenance operations. In your opinion what could the department do better?
- What is the department doing that meets or exceeds your expectations?

Results

The following general themes were found in answers to the question of performance areas meeting or exceeding expectations. As can be seen, those interviewed frequently mentioned a topic better suited in the 'what can we improve' question. Some of these answers may also provide a basis for new or revised questions on future MDT road maintenance surveys.

- Overall winter maintenance (169)
- Don't Know or No Response (156)
- No or Nothing (155)
- Overall maintenance (125)
- Overall maintenance excellent (109)
- Debris / Road kill removal (39)
- Smoothness (22)
- Road signs (22)
- Repave/Seal/Patch/Seal Seams (21)
- More personnel and equipment (21)
- More police / Control speeding and DUIs (21)
- Shoulder maintenance (18)
- Striping (18)
- Weather update cameras (14)
- Rest areas (14)
- Wider Roads (12)
- Public relations (12)
- Pass a law against cell phone use while driving (10)
- Rumble strips or bumps (8)
- More productivity – Work nights (8)
- Fewer personnel (7)
- Wildlife crossings under highways (6)
- Not enough federal funds (6)
- Inspection of roads (5)
- Automated signs/ Safety signals (4)
- Bridge work (3)

In answers to the question of areas for improvement, the following topics were mentioned:

- Winter maintenance (122)
- Patch cracks and road surfaces (82)
- Overall maintenance for a specific roadway (69)
- More open rest areas in the winter (57)
- Debris removal (55)
- Road markers (50)
- Highway signs (40)
- Less chip seal / Finer sand/No salt / Sodium Chloride/No chemicals / Less sand (28)
- Wider roads (25)
- Reduce construction times (24)
- Bridges and inspections (12)
- Weather-related road condition reports on TV and radio (7)
- Exit reflectors / Road marker reflectors and lights (4)
- More guard rails (3)
- Better public relations (3)
- Use asphalt/ Use concrete (2)
- Ramps too short (1)
- More cameras (1)
- Telephone number to report road problems (1)

Comparisons with 2006 Survey Results

A comparison of the average scores on the 2008 results with those from the 2006 MDT survey shows that, while some ratings did change, none of these differences were statistically significant. A table showing sample statistics is presented in Appendix A. As seen in that table, mean maintenance scores in 2008 are not significantly different from those found in the 2006 survey.

Comparison of Maintenance Conditions Ratings

	2006	2008
Winter	2.79	2.69
Striping	2.85	2.87
Debris Removal	2.76	2.77
Surfaces	2.61	2.67
Signage	3.07	3.03
Rest Area	2.90	2.23
Roadsides	2.80	2.70

Comparison of Maintenance Importance Scores

	2006	2008
Winter	3.70	3.56
Striping	3.58	3.49
Information	3.51	3.22
Debris Removal	3.47	3.44
Surfaces	3.35	3.40
Signage	3.28	3.31
Rest Area	3.19	2.75
Roadsides	2.99	3.01

Comparison of Maintenance Priority Scores

	2006	2008
Winter	3.66	3.56
Striping	3.42	3.32
Information	3.41	3.32
Debris Removal	3.28	3.23
Surfaces	3.08	3.12
Signage	3.09	3.03
Rest Area	3.06	2.77
Roadsides	2.81	2.70

As an alternative to mean-based comparisons, a composite score was created based upon adding the Rating, Importance, and Priority ranking scores in each maintenance category.

Comparison of 2006-2008 Scores Results

Composite Score	Winter Maint	Winter Maint	Surface Maint	Surface Maint	Roadside Maint	Roadside Maint	Road Sign Maint	Road Sign Maint
	2006	2008	2006	2008	2006	2008	2006	2008
2	0.1%	0.29	0.1%	0.10	0.1%	0.48	0.0%	0.10
3	0.7%	0.38	0.2%	0.29	0.6%	0.48	0.4%	0.10
4	1.4%	1.44	0.4%	0.19	2.3%	1.15	0.6%	0.58
5	0.6%	0.87	1.2%	0.96	5.0%	3.27	2.8%	0.87
6	1.1%	1.83	4.3%	3.85	9.6%	8.85	9.0%	2.41
7	3.2%	2.41	11.3%	7.89	21.3%	13.38	15.2%	7.41
8	13.2%	7.41	24.4%	14.24	23.8%	20.02	24.6%	15.21
9	27.0%	16.27	29.2%	25.22	19.1%	22.52	26.6%	22.23
10	33.9%	26.66	16.1%	27.53	11.6%	17.81	16.5%	24.35
11	13.2%	32.05	9.4%	15.59	4.7%	9.24	3.5%	19.54
12	5.6%	9.72	3.4%	3.85	1.8%	2.41	0.7%	6.93

Comparison of 2006-2008 Scores Results

Composite Score	Debris Maint	Debris Maint	Rest Area Maint	Rest Area Maint	Road Stripe Maint	Road Stripe Maint
	2006	2008	2006	2008	2006	2008
2	0.1%	0.10	1.9%	1.54		
3	0.1%	0.29	3.1%	4.81	0.1%	0.10
4	0.1%	1.25	2.4%	3.37	0.2%	0.10
5	0.8%	2.69	3.3%	2.79	1.1%	0.58
6	4.7%	7.70	9.3%	5.77	2.8%	2.41
7	11.2%	12.13	14.0%	7.51	7.7%	5.39
8	19.1%	21.94	23.7%	14.82	17.3%	9.91
9	26.4%	23.48	22.0%	15.78	29.4%	19.92
10	23.3%	22.91	13.3%	17.04	27.5%	26.18
11	10.9%	7.12	4.2%	13.28	9.4%	26.37
12	3.3%	0.10	1.9%	5.29	4.4%	8.37

Using the percentage of respondents with each composite score, it is possible to compare maintenance category results between 2006 and 2008. Comparing the percentage of respondents each year giving a composite score of 11 or 12 (the highest rating in at least two of the three categories), the data suggests that residents are placing a higher value upon six of the maintenance categories.

Note

I was unable to find the underlying data from the 2006 survey and thus am basing this comparison upon the published 2006 sample statistics. I therefore am less comfortable and confident in this conclusion than if I had the underlying data for both years, as should you.

Comparisons with 1998-2008 Ratings

The following table shows the percentage of Good or Excellent ratings given in each maintenance ratings category for the surveys conducted in 1998 through 2008. Several of the maintenance categories show improvements over time and in the following categories these improvements are statistically significant:

- Rest Area Maintenance
- Lane Marker Maintenance
- Winter Maintenance
- Debris Removal
- Pavement Maintenance

10-Year Comparison of Maintenance Conditions Ratings

Good or Excellent Rating	1998	2000	2002	2004	2006	2008
Signage	87%	88%	88%	88%	87%	86%
Information	74%	78%	82%	81%	77%	
Rest Area	72%	60%	70%	77%	77%	76%
Lane Markers	73%	68%	78%	77%	76%	78%
Roadside	66%	70%	72%	77%	72%	69%
Winter Maintenance	68%	69%	68%	70%	69%	73%
Debris Removal	67%	64%	68%	70%	69%	72%
Pavement	45%	50%	59%	61%	61%	66%

Ranking Maintenance Priorities

There are a number of different methods for using the survey results to rank the maintenance priorities for the Montana Department of Transportation, and this section describes two methods. The first uses variation of the composite score methodology that has been employed in previous MDT road maintenance survey projects. In this method, which I will call the Scoring Method, the Rating, Information, and Priority values for each maintenance category are summed, and then the categories are ranked based upon highest average sum.

A second methodology is then presented which uses regression analysis to determine how those surveyed decide upon the overall maintenance rating and importance rankings, with the goal of narrowing the priority list down to those aspects of road maintenance which appear to be most highly valued by the respondent in their decision on an overall maintenance rating.

Method 1: Composite Score

In order to use the maintenance survey data to rank maintenance priorities, one has to decide which variables to use. In the case of this survey, rankings based upon rating produces different results as does that based upon importance or priority.

Ranking by Evaluation Area (Best to Worst)

	Ranked on Rating	Ranked on Importance	Ranked on Priority
Winter Maintenance	4th	1st	1st
Roadside Maintenance	3rd	3rd	2nd
Road Information	n.a.	5th	3rd
Surface Maintenance	6th	2nd	4th
Pavement Marker Maintenance	7th	4th	2nd
Road Sign Maintenance	1st	6th	6th
Rest Area Maintenance	2nd	7th	7th
Debris Removal Maintenance	5th	8th	8th

As shown above, ranking using any one category will not match the ranking based upon the other two categories. So some way is needed to deal with these differences. One way is via scoring a composite variable.

This method is compatible with the methods used in previous survey analyses. In this approach, the Rating, Importance, and Priority scores for each respondent are added together to create a composite score. For example, an individual rating Winter Maintenance as good, its importance as very importance, and its priority as moderately high would have a composite score for Winter Maintenance of 3 + 4 + 3 = 10.

Composite Score Ranking

	Average Score	Rank
Winter Maintenance	10.12	1st
Pavement Marker Maintenance	9.78	2nd
Debris Removal Maintenance	9.55	3rd
Road Sign Maintenance	9.50	4th
Surface Maintenance	9.30	5th
Rest Area Maintenance	9.24	6th
Roadside Maintenance	8.56	7th
Road Information	6.80	N.A.

Based upon this composite score, ranking shows that winter maintenance has the highest relative importance and roadside maintenance the lowest. (Road Information is not ranked because we did not ask a Rating question for this topic and thus the highest value possible was 8 instead of 12.) Note that while this method shows a clear winner, the ranks of other categories such as debris removal and road sign maintenance were very close and may not be significantly different.

There are a few difficulties with this method, one being the similarity between answers for the importance of a maintenance area and its priority. In all cases, information and priority scores are correlated, with higher values for one being associated with higher values in the other. This would suggest that either the information or priority score could be dropped from the composite score and ranking based upon rating and either importance or priority.

Method 2: Priority Ranking

As an alternative to the composite score approach, I analyzed the results to see how well a respondent's overall maintenance importance score could be predicted based upon his or her answers to the other survey questions. The goal was to see how an individual evaluated the relative importance of the various maintenance categories.

The results of this approach were mixed. I was not able to definitively rank all eight maintenance categories because only four of the categories were found to be significant predictors of an individual's overall maintenance rating or the overall importance placed upon maintenance.

The model of overall maintenance rating was as follows[1]:

*Overall Rating = 0.65 + 0.24*Winter Rating + 0.3*Surface Rating + 0.07*Roadside Rating + 0.08*Pavement Marker Rating (R^2 = 0.36).*

These results suggest that a respondent's overall maintenance rating is based in part upon his opinion on the existing quality of road surface, winter, roadside, and pavement marker maintenance. Relatively speaking, an given level of improvement in an individual's road surface rating produces the largest amount of increase in his or her evaluation of overall road maintenance, and four times that of a similar amount of increase in his rating of road side maintenance (0.3 compared to 0.07).

These results also suggest that the other four categories do not play a significant role in his overall maintenance rating, and that perceptions of improvements in these maintenance categories will not drive higher overall maintenance scores.

The model for the overall importance of road maintenance is as follows:

*Overall Importance = 1.0 + 0.38*Winter Imp. + 0.17*Surface Imp. + 0.10*Roadside Imp. + 0.07*Road Info Imp (R^2=0.29).*

An individual's views on the overall importance of road maintenance are driven in part on her views on the importance of winter, surface, roadside, and road marker maintenance, and not on the other categories.

[1] This analysis was conducted using SAS Version 9.1, procedure CATMOD.

Using the results of these two models, it would appear that improvements in the following maintenance areas, in order of relative importance, would lead to the greatest increases in an individual's overall maintenance rating:

1. Winter Maintenance
2. Road Surface Maintenance
3. Road Side Maintenance
4. Road Information
5. Pavement Marker Maintenance

Maintenance Priority Rankings

	Ranked on Composite Score	Ranked on Drivers of Overall Rating and Importance
Winter Maintenance	1st	1st (and 3x as important)
Pavement Marker Maintenance	2nd	5th
Debris Removal Maintenance	3rd	
Road Sign Maintenance	4th	
Surface Maintenance	5th	2nd (and 2x as important)
Rest Area Maintenance	6th	
Roadside Maintenance	7th	3rd
Road Information		4th

Composite maintenance scores can be used to rank the relative importance of the eight maintenance categories, producing the results show below. However, if one wishes to rank priorities in the order of which maintenance areas are the most important to the individual as he or she is grading overall road maintenance, it may be preferable to focus more resources on those few categories which drive the overall scores.

Conclusion

Based upon a telephone survey of 1039 adult Montana residents, it appears that residents are in general reasonably satisfied with Montana Department of Transportation's road maintenance activities. In all categories at least two-thirds of respondents rate maintenance levels as Good or Excellent. There is some evidence that there has been statistically-significant improvement in most maintenance categories scores since 2006.

An analysis of the survey data shows that winter maintenance and road surface maintenance are the principal maintenance-related drivers of a resident's overall rating of MT road quality, and that maintenance activity should be prioritized as follows:

1. Winter Maintenance
2. Road Surface Maintenance
3. Road Side Maintenance
4. Road Information
5. Road Marker Maintenance

Appendix A: Summary Tables of Survey Results

Statistical Results of 2008 Survey

Variable	Mean	Std Dev	Lower-Bound	Upper-Bound
Overall Rating	2.83	0.68	1.50	4.16
Overall Importance	2.69	0.95	0.82	4.56
Travel to Other State	2.67	0.75	1.19	4.14
General Comparison	2.70	0.87	0.99	4.42
Winter Rating	3.03	0.68	1.70	4.36
Winter Importance	2.77	0.82	1.16	4.39
Winter Priority	2.23	1.39	-0.49	4.95
Winter Comparison	2.87	0.77	1.36	4.37
Surface Rating	3.51	0.75	2.04	4.99
Surface Importance	3.56	0.85	1.89	5.23
Surface Priority	3.40	0.78	1.87	4.93
Roadside Rating	3.01	0.95	1.16	4.86
Roadside Importance	3.31	0.81	1.72	4.90
Roadside Priority	3.44	0.78	1.91	4.97
Signage Rating	2.75	1.34	0.13	5.38
Signage Importance	3.49	0.78	1.97	5.01
Signage Priority	3.22	1.12	1.04	5.41
Debris Rating	3.56	0.75	2.09	5.03
Debris Importance	3.12	0.82	1.51	4.73
Debris Priority	2.70	0.94	0.85	4.55
Rest Area Rating	3.03	0.93	1.21	4.84
Rest Area Importance	3.23	0.87	1.52	4.94
Rest Area Priority	2.76	1.21	0.40	5.13
Rest Area Comparison	3.32	0.86	1.64	4.99
Pavement Marker Rating	3.32	0.91	1.54	5.10
Winter Score	9.81	1.85	6.19	13.43
Road Surface Score	9.19	1.61	6.03	12.35
Roadside Score	8.42	1.87	4.75	12.08
Road Sign Score	9.37	1.67	6.10	12.64
Debris Removal Score	9.44	1.70	6.11	12.78
Rest Area Score	7.75	3.24	1.39	14.10
Pavement Marker Score	9.67	1.68	6.37	12.97
Information Score	6.54	1.76	3.10	9.99

Table of Significant Differences

	Administrative Region (Highest-to-Lowest)				
	Missoula	**Butte**	**Great Falls**	**Glendive**	**Billings**
Overall Rating	3rd	2nd	1st	4th	5th
Overall Importance					
Travel to Other State	5th	3rd	1st	4th	2nd
General Comparison					
Winter Rating	1st	2nd	4th	3rd	5th
Winter Importance					
Winter Priority					
Winter Comparison	2nd	1st	3rd	5th	4th
Surface Rating	4th	2nd	1st	3rd	5th
Surface Importance					
Surface Priority					
Roadside Rating					
Roadside Importance	5th	2nd	4th	1st	3rd
Roadside Priority	5th	4th	2nd	1st	3rd
Signage Rating	2nd	5th	1st	3rd	4th
Signage Importance					
Signage Priority	5th	2nd	1st	3rd	4th
Debris Rating					
Debris Importance					
Debris Priority					
Rest Area Rating					
Rest Area Importance					
Rest Area Priority					
Rest Area Comparison					
Pavement Marker Rating					
Pavement Marker Importance					
Pavement Marker Priority					
Information Importance	5th	3rd	2nd	1st	4th
Information Priority					

Table of Significant Differences

	Sex M or F	Age 55 or Older	Long-time (LT) Residents	Life-time (LF) Residents
Overall Rating		55+ Higher		
Overall Importance				
Travel to Other State		55+ Higher	LT Higher	LF Higher
General Comparison			LT Lower	LF Lower
Winter Rating		55+ Higher		
Winter Importance		55+ Lower		
Winter Priority	Female Higher			
Winter Comparison	Male Higher		LT Lower	
Surface Rating		55+ Higher		
Surface Importance		55+ Higher		
Surface Priority				LF Lower
Roadside Rating			LT Lower	
Roadside Importance	Female Higher	55+ Higher	LT Higher	LF Higher
Roadside Priority	Female Higher	55+ Higher	LT Higher	
Signage Rating	Male Higher			
Signage Importance	Female Higher	55+ Higher		
Signage Priority		55+ Higher		
Debris Rating		55+ Higher		LF Lower
Debris Importance	Female Higher			
Debris Priority	Female Higher			
Rest Area Rating				
Rest Area Importance	Female Higher			
Rest Area Priority		55+ Higher		
Rest Area Comparison		55+ Lower	LT Lower	
Pavement Marker Rating		55+ Higher		
Pavement Marker Importance	Female Higher	55+ Higher		
Pavement Marker Priority	Female Higher		LT Higher	
Information Importance	Female Higher	55+ Higher		
Information Priority	Female Higher			

Table of Significant Differences

	College Grads (CG)	Live in Urban or Rural County
Overall Rating	CG Higher	Urban Higher
Overall Importance		Rural Higher
Travel to Other State	CG Lower	
General Comparison		
Winter Rating	CG Higher	
Winter Importance		
Winter Priority		
Winter Comparison		
Surface Rating	CG Higher	
Surface Importance		
Surface Priority	CG Lower	Rural Higher
Roadside Rating		Urban Higher
Roadside Importance	CG Lower	Rural Higher
Roadside Priority	CG Lower	Rural Higher
Signage Rating		
Signage Importance	CG Lower	
Signage Priority	CG Lower	
Debris Rating	CG Higher	
Debris Importance		
Debris Priority	CG Lower	
Rest Area Rating		
Rest Area Importance		
Rest Area Priority	CG Lower	
Rest Area Comparison		
Pavement Marker Rating		
Pavement Marker Importance		
Pavement Marker Priority	CG Lower	
Information Importance		
Information Priority		

Table of Significant Differences

	Administrative Region (Highest-to-Lowest)				
	Missoula	Butte	Great Falls	Glendive	Billings
Primary Seat Belt Law	2nd	4th	3rd	1st	5th
Why not using…					
Child Seat Belt Law	2nd	1st	5th	4th	3rd
Seat Belt Use	2nd	1st	4th	5th	3rd
Typical Crash	5th	3rd	2nd	1st	4th

Table of Significant Differences

	Sex M or F	Age 55 or Older	Long-time (LT) Residents	Life-time (LF) Residents
Primary Seat Belt Law	Male Higher			LF Higher
Why not using…				
Child Seat Belt Law				
Seat Belt Use	Male Less		LT Less	
Typical Crash	Male Higher	55+ Lower		
Travel to Other State				LF Less
Trips		55+ Higher		
Distance Driven	Female Higher	55+ Higher	LT Higher	
Changing Habits		55+ Higher		
Are Changes Working				

Table of Significant Differences

	College Grads (CG)	Live in Urban or Rural County
Primary Seat Belt Lay		
Why not using…	CG Higher	
Child Seat Belt Law	CG Higher	
Seat Belt Use	CG More	Rural Less
Typical Crash		
Travel to Other State		
Trips		Rural Higher
Distance Driven	CG Lower	Urban Higher
Changing Habits	CG Higher	

Appendix B : Summary Interview Script

```
CATI ON
RETURN PGDN

Q:  Hello
T:
Hello, my name is _____ and I am calling from Montana State
University, Billings.  We are conducting a survey on
attitudes and opinions of highway maintenance for the
Montana Department of Transportation.  The Department of
Transportation wants the opinions of citizens of Montana
about the condition of our roadways. Your participation in
this survey will assist the department in establishing
future priorities and enable the maintenance program to
better use available resources. In order to interview the
right person, I need to speak to the member of your
household who is at home, over 18, and has had the most
recent birthday.  Would that be you?  CTRl-END OR 3 DIGITS
I:
NUM 200 990 3 0 25 70

Q: Intruct
T:
Before I ask the first question, let me explain that this
survey deals only with maintenance of highways. Maintenance
includes such things as maintaining the established roadway
surface, snow and ice removal, removal of debris and litter,
maintaining roadsides, repairing signs, re-painting roadway
stripes and rest area maintenance.  This survey does not
deal with the construction of new highways nor construction
of new rest stops. This survey only deals with interstates
and state highways in Montana.  We are not asking you about
city streets or county roads, just interstates and state
highways. Also, we are only interested in opinions based on
your experiences with interstates and state highways in
Montana in the last two years. Finally, your household was
randomly selected by a computer and all your answers will
remain anonymous.

             PRESS ANY KEY TO CONTINUE
I:
KEY

Q: RateAll
T:
How would you rate overall interstate and state highway
maintenance in Montana?

  1. Poor

  2. Fair

  3. Good
```

```
  4. Excellent

  5. DK or NR
I:
LOC 4 5 2
NUM 1 5
QAL Bye


Q: ImpAll
T:
How important would you say interstate and state highway
maintenance in Montana is to you?

  1. Not Important

  2. Somewhat Important

  3. Important

  4. Very Important

  5. DK or NR
I:
LOC 4 5 2
NUM 1 5

Q: RateWint
T:
How would you rate winter maintenance of interstates and
state highways in Montana?  By winter maintenance, I mean
snow and ice control including plowing, sanding, de-icing,
and preventing drifting.
I:
GET RateAll 4 12 6
NUM 1 5

Q: ImpWint
T:
How important would you say interstate and state highway
winter maintenance is to you?
I:
GET ImpAll 4 12
NUM 1 5

Q: RateSurf
T:
How would you rate the surface of Montana's interstates and
state highways.  In making this rating, consider ride
quality which is affected by potholes, ruts, bumps, cracks,
etc.
I:
GET RateAll 4 12 6
NUM 1 5

Q: ImpSurf
T:
```

```
How important is the smoothness of Montana's interstates and
state highways to you?
I:
GET ImpAll 4 12
NUM 1 5

Q: RateSide
T:
How would you rate the management of interstate and state
highway roadsides in Montana?  Roadside management includes
mowing shoulders and eliminating unwanted vegetation.
I:
GET RateAll 4 12 5
NUM 1 5

Q: ImpSide
T:
How important is interstate and state highway roadside
management in Montana to you?
I:
GET ImpAll 4 12
NUM 1 5

Q: RateSign
T:
How would you rate the condition of interstate and state
highway signs in Montana?
I:
GET RateAll 4 12
NUM 1 5

Q: ImpSign
T:
How important is the condition of interstate and state
highway signs to you?
I:
GET ImpAll 4 12
NUM 1 5

Q: RateRemv
T:
How would you rate the removal of debris such as litter,
roadkill, and fallen rocks, on Montana's interstates and
state highways?
I:
GET RateAll 4 12 5
NUM 1 5

Q: ImpRemv
T:
How important is the removal of debris on interstates and
state highways in Montana to you?
I:
GET ImpALL 4 12
NUM 1 5

Q: RateRest
```

T:
How would you rate the maintenance of rest areas on Montana interstates and state highways. Rest area maintenance includes cleaning rest areas and keeping rest areas in working order.
I:
GET RateAll 4 12 6
NUM 1 5

Q: ImpRest
T:
How important is interstate and state highway rest area maintenance to you?
I:
GET ImpAll 4 12
NUM 1 5

Q: RateStrp
T:
How would you rate the condition of striping (lines) on Montana's interstates and state highways? Striping and lines include the middle lines, no-passing lines, left turn lanes, and shoulder lines.
I:
GET RateAll 4 12 6
NUM 1 5

Q: ImpStrp
T:
How important is interstate and state highway striping to you?
I:
GET ImpAll 4 12
NUM 1 5

Q: ImpInfo
T:
How important is up to date winter interstate and state highway information to you?
I:
GET ImpALL 4 12
NUM 1 5

Q: PriWint
T:
Now I am going to go back through the list of maintenance activities. This time, I want you to think about allocation of resources to each of the activities. For each activity, please tell me if you think it warrants a low, medium, moderately high, or very high resource priority when deciding how state highway maintenance resources should be utilized. Remember, we are only dealing with interstates and state maintained roadways.

What resource priority should be placed on interstate and state highway winter maintenance in Montana?

```
  1. Low

  2. Medium

  3. Moderately High

  4. Very High

  5. DK or NR
I:
NUM 1 5

Q: PriSurf
T:
What resource priority should be placed on smooth pavement
on interstates and state highways in Montana?
I:
GET PriWint 12 20 4
NUM 1 5

Q: PriSide
T:
What resource priority should be placed on interstate and
state highway roadside management in Montana?
I:
GET PriWint 12 20 4
NUM 1 5

Q: PriSign
T:
What resource priority should be placed on repairing and
replacing signs on interstates and state highways in Montana?
I:
GET PriWint 12 20 4
NUM 1 5

Q: PriRemv
T:
What resource priority should be placed on debris removal
on interstates and state highways in Montana?
I:
GET PriWint 12 20 4
NUM 1 5

Q: PriRest
T:
What resource priority should be placed on rest area
cleanliness and maintenance on interstates and state
highways in Montana?
I:
GET PriWint 12 20 5
NUM 1 5

Q: PriStrp
T:
What resource priority should be placed on roadway striping
on interstates and state highways in Montana?
```

I:
GET PriWint 12 20 4
NUM 1 5

Q: PriInfo
T:
What resource priority should be placed providing accurate
and up to date information about the current condition of
state maintained highways in Montana?
I:
GET PriWint 12 20 5
NUM 1 5

Q: Primary
T:
A primary seat belt law allows a law enforcement officer to
stop you and give you a ticket if you are not wearing your seat
belt. A secondary seat belt law allows a law enforcement officer
to give you a ticket for non-seat belt use only if he has a
already stopped you for some other offense, such as expired
license tags. Currently Montana has a secondary seat belt law.

Would you support a Primary Seat Belt law for the state of Montana?

1. Yes

2. No

3. DK-NR
I:
LOC 10 3 2
NUM 1 3
SKP RespUse 1
SKP RespUse 3
SKP RespUse 4

Q: Whynot
T:
Could you tell us why you are against a primary seat belt law?
DO NOT READ ANSWERS

1. Don’t believe in seat belts

2. Individual rights/freedom - It’s my choice

3. Racial profiling

4. Not necessary in a rural area

5. Other

6. DK-NR
I:
LOC 4 6 2
NUM 1 6
OTH 5

Q: Child
T:
Do you support a primary law for child restraint in motor vehicles?

  1. Yes

  2. No

  3. DK-NR
I:
LOC 3 3 2
NUM 1 3

Q: RespUse
T:
Which best describes your use of seat belts. You wear a seat belt

  1. All of the time

  2. Most of the time

  3. Half the time

  4. Less than half the time

  5. Rarely or never

  6. DK-NR
I:
LOC 3 6 2
NUM 1 6

Q: Crash
T:
What do you think is the most frequent type of fatal crash?

  1. Two vehicle crash including passenger car with a semi

  2. One vehicle fixed object crash

  3. One vehicle roll-over crash

  4. Passenger vehicle/pedestrian crash

  5. DK-NR
I:
LOC 3 5 2
NUM 1 5

Q: Cause
T:
I am going to mention some possible causes of fatal crashes.
I would like to know which you think is the most frequent cause,
the second most frequent cause and the third most frequent cause.
MAKE SURE YOU PLACE THE CHECK MARKS IN THE SAME ORDER THEY ANSWER

  1. Distracted or inattentive driving

```
  2. Driving under the influence

  3. Falling asleep

  4. Speeding

  5. Road rage

  6. Passing

  7. Other

  8. DK or no more of the above
I:
LOC 6 8 2
OTH 7
SEL 8 0 3 1


Q: OthState
T:
Just a couple of more questions about interstate and state
highway maintenance.

Have you driven on roadways in states other than Montana in
the last 12 months?

  1. Yes

  2. No

  3. DK or NR
I:
NUM 1 3
SKP Better 2
SKP Better 3

Q: GenComp
T:
How would you compare general roadway conditions of
Montana's state maintained roadways with the general roadway
conditions of state maintained roadways in other states?  IF
THEY SAY THEY HAVE BEEN IN MORE THAN ONE STATE, ASK FOR A
GENERAL COMPARISON.  IF THEY CANNOT DO THAT, HAVE THEM
COMPARE WITH THE STATE THEY DROVE IN MOST RECENTLY.

  1. Montana roadways worse

  2. About the same

  3. Montana better

  4. DK or NR
I:
NUM 1 4
```

```
Q:WintComp
T:
How would you compare winter maintenance of Montana's state
maintained roadways with winter maintenance of state
maintained highways in other states?

  1. Montana winter maintenance worse

  2. About the same

  3. Montana better

  4. DK or NR
I:
NUM 1 4

Q: RestComp
T:
How would you compare rest area cleanliness and maintenance
in Montana with rest area cleanliness and maintenance in
other states?

  1. Montana rest areas worse

  2. About the same

  3. Montana better

  4. DK or NR
I:
NUM 1 4

Q: Better
T:
The Department of Transportation is striving to improve
maintenance operations.  In your opinion what could the
department do better?

TYPE IN ANSWER AND THEN CLICK THE NEXT BUTTON.  YOU HAVE
3 LINES.
I:
OPN 8 5 10 75 U N

Q: GoodNow
T:
What is the department doing that meets or exceeds your
expectations?

TYPE IN RESPONSE AND THEN CLICK THE NEXT BUTTON.  YOU HAVE
3 LINES.
I:
OPN 7 5 9 75 U N
CPL
DISPOS = 20

Q: Trips
```

T:
As you probably know different types of people have different types of opinions. The following questions are for statistical purposes only.

Which of the following types of trips would you say is most typical of your driving?

1. Commuting to and from work

2. Work related trips, that is trips that are made as a part of work activities.

3. Personal and family errands or trips

4. Agriculture related trips

5. Professional driving

6. Other

7. DK or NR

I:
NUM 1 7
OTH 6 22 5 23 75

Q: HowFar
T:
Would you say you drive more or less than 15,000 miles per year?

1. More

2. Less

3. DK or NR

I:
NUM 1 3

Q: Habits
T:
Have your driving habits changed due to the higher cost of fuel? Would you say that you are…

1. Driving More

2. Driving Less

3. No Change

I:
LOC 4 3 2
NUM 1 3

Q: Mitigate
T:
Are you doing any of the following to mitigate or offset the cost of fuel.

1. Driving Less

2. Driving a fuel efficient vehicle

3. Carpooling

4. Using alternative fuel

5. Bicycle or walking

6. Using other means of Transportation (e.g. bus, dial-a-ride)

7. No change

I:
LOC 3 7 2SEL 7 1 6

Q: Working
T:
How would you rate your success in reducing your fuel consumption?

1. Very Successful

2. Somewhat Successful

3. No Change in my fuel consumption

4. Somewhat Unsuccessful

5. Very Unsuccessful

I:
LOC 3 5 2
NUM 1 5

Q: Age
T:
How old are you?

TYPE IN THEIR AGE AND PRESS ENTER USE 100 FOR 100 OR OLDER
AND 101 FOR DK OR NR.
I:
NUM 18 101 3 0 1 30

Q: Educ
T:
What is the highest level of education you have completed?

TYPE IN ANSWER AND PRESS ENTER. 12 IS HIGH SCHOOL GRADUATE,
16 IS COLLEGE GRADUATE, 18 IS MASTERS DEGREE AND 20 IS
DOCTORATE. USE 21 FOR DK OR NR
I:
NUM 0 21 2 0 3 40

Q: InMT

```
T:
How long have you lived in Montana?

TYPE IN THEIR ANSWER AND PRESS ENTER.  USE 100 FOR 100 OR MORE
AND 101 FOR DK OR NR.
I:
NUM 1 101 3 0 1 45

Q: Sex
T:
RESPONDENTS SEX (DO NOT ASK)

  1. MALE

  2. FEMALE
I:
LOC 3 2 2
NUM 1 2

Q: Followup
T:
The Montana Department of Transportation may make changes in the
way it allocates resources based on the results of this study.
Would you be willing to participate in a follow up study so
that we can see if your opinions of highway maintenance change
in the next two years?

  1. Yes

  2. No

  3. DK or NR
I:
NUM 1 3
SKP Bye 2
SKP Bye 3

Q: Address
T:
In order to include you in the follow up study, I will need your
name, address and telephone number.

ENTER NAME ON ONE LINE; STREET ADDRESS ON THE NEXT LINE; CITY,
STATE, AND ZIP CODE ON THE THIRD LINE; AND TELEPHONE NUMBER ON THE
FOURTH LINE.  PLEASE USE APPROPRIATE CAPITALIZATION AND SPELLING.
YOU HAVE AN EXTRA LINE FOR ANY STRANGE THINGS IN THE ADDRESS.
I:
OPN 9 5 13 70 M

Q: Bye
T:
That was the last question.  Thank you very much for taking
the time to answer these questions.  Good bye and have a
nice day (or evening).
I:
PAUSE 5
```