

# PERCEPTIONS OF HIGHWAY MAINTENANCE IN MONTANA IN 2010: THE RESULTS OF A TELEPHONE SURVEY

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## Executive Summary

The 2010 Montana Department of Transportation Road Maintenance telephone survey of over 1,000 Montanans was conducted in Aug-Oct, 2010 by the MSU-Billings Center for Applied Economic Research. The results of this survey show that in each case the majority of residents rate existing road conditions and maintenance as Good or Excellent, but differences exist in some subgroups within the state. Composite scores suggest Montanans increasingly value rest area maintenance and debris removal, but model-based approaches of how respondents think of MDT overall road maintenance suggests that actions which improve winter maintenance and road surface maintenance will have the largest impact upon their overall perception of Montana roads. In terms of household driving behavior, in 2010 it appears that most households are consciously making the decision to drive fewer miles, and succeeding.

A side analysis conducted after the initial presentation of the results found evidence that respondents underestimate the importance of speeding as a cause of fatal vehicle accidents in Montana.

## Introduction

In the summer of 2010, 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, and Research Associate Jonna Jones, who worked with the MDT to develop the survey. The interviews were conducted August – October, 2010, by the professional telephone interviewers who work for the CAER. Dr. Rickard and Miss Jones analyzed the results and are 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](http://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 two lists 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 random samples of ‘land line’ and wireless telephone exchanges (respectively) in Montana, with filtering to remove non-residential listings. This represented the first time that the MDT survey was conducted using cell phone numbers in an attempt to reach those households that did not have a land-line telephone.

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	481	48%
Female	518	52%

CATI Lab interviewers produced a total of 1022 usable telephone interviews, with 183 of these from cell phone numbers. 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	231	24%
45-64	480	50%
65+	254	26%

The average age of a respondent was 56, with 80% of those answering between 32 and 75 years old.

### High School Graduates

Education	Frequency	Percent
Less than High-School Degree	47	5%
High-School Graduate	869	95%

### College Graduates

Education	Frequency	Percent
Less than College Degree	590	62%
College Graduate	366	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 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.

In terms of location, the distribution of those interviewed tended to be more rural than what the census estimates of population would suggest. While 54% of the observations came from residents of one of Montana’s seven largest counties, external population statistics would suggest that this value should be somewhat higher. This offers the possibility that the survey results presented here to some degree under-represent the opinions of urban residents.

**Administrative Regions of Respondents**

<b>Region</b>	<b>Name</b>	<b>Frequency</b>	<b>Percent</b>
<b>1</b>	Missoula	140	20%
<b>2</b>	Butte	130	19%
<b>3</b>	Great Falls	215	31%
<b>4</b>	Glendive	77	11%
<b>5</b>	Billings	128	19%

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**

<b>Length of Residence (Years)</b>	<b>Frequency</b>	<b>Percent</b>
<b>0-9</b>	118	12%
<b>10-19</b>	152	18%
<b>20-29</b>	120	16%
<b>30+</b>	570	60%

The average respondent has lived in Montana for 38 years, with only 12% of those surveyed living in the state for 9 years or less. Thirty Eight (38%) percent of respondents reported living in MT for their entire lives.

## 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 2010 telephone survey
3. A discussion of the results, including statistically-significant difference for surveyed sub-groups

Following this, I compare the 2010 results to those from the 2006 and 2008 Transportation surveys. The end of this section presents suggested rankings of maintenance priorities using the 2010 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	36	4%
Fair	232	23%
Good	608	60%
Excellent	132	13%

*Frequency Missing = 14*

Overall Importance		
Rating	Frequency	Percent
Not Important	10	1%
Somewhat Important	83	8%
Important	340	34%
Very Important	577	57%

*Frequency Missing = 12*

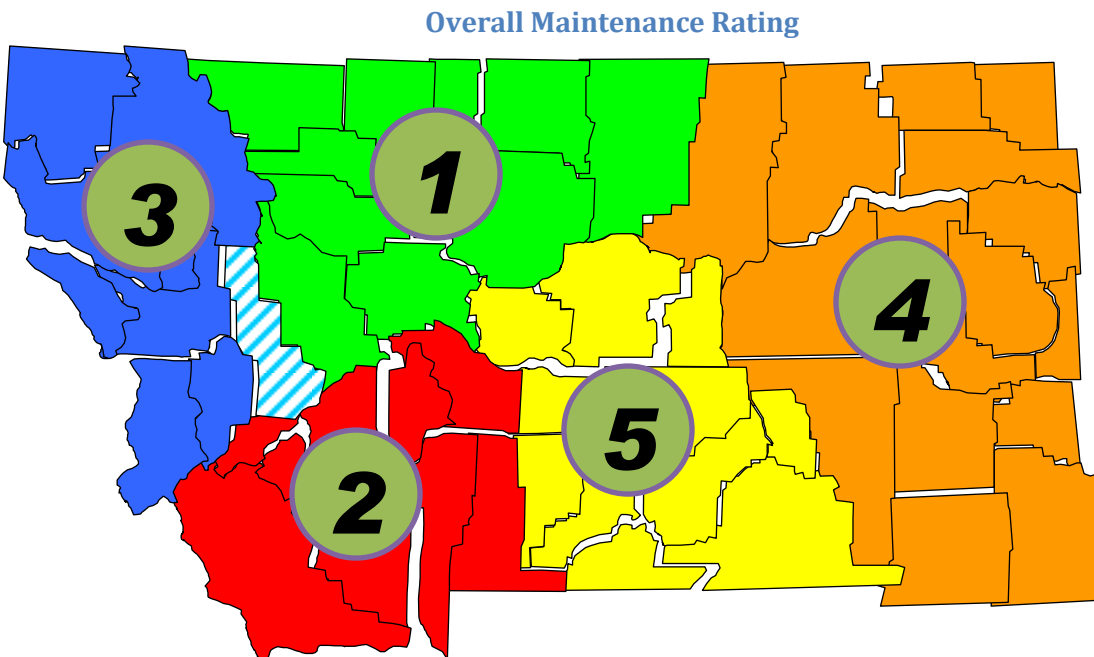
General Comparison of Roads		
	Frequency	Percent
MT Roads Worse	150	20%
About the Same	364	55%
MT Roads Better	231	31%

## Discussion

Respondents gave Overall Road Maintenance Ratings as follows:

- 13% Excellent
- 60% Good
- 23% Fair
- 4% Poor

Residents who have lived in MT for 10 years or more rate overall road maintenance lower than did residents who lived in MT for less than 10 years.



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

(Note: the blue and white striped area is Powell County and it is unclear which maintenance district it belongs in)

Respondents rated the importance of overall road maintenance as follows:



- 57% Very Important
- 34% Important
- 8% 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, 31% rated MT’s road maintenance as better than other states, 49% rated it as about the same, and 20% believed MT’s road maintenance was worse than that found in other 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	66	7%
Fair	194	20%
Good	537	55%
Excellent	188	19%

*Frequency Missing = 39*

Importance of Winter Maintenance		
Rating	Frequency	Percent
Not Important	8	Less than 1%
Somewhat Important	49	5%
Important	174	18%
Very Important	763	77%

**Frequency Missing = 28**

Priority of Winter Maintenance		
Rating	Frequency	Percent
Low	1	Less than 1%
Medium	38	4%
Moderately High	240	24%
Very High	707	72%

**Frequency Missing = 36**

Winter Comparison of Roads		
Rating	Frequency	Percent
MT Winter Maint Worse	88	10%
About the Same	285	49%
MT Winter Maint Better	239	41%

**Frequency Missing = 168**

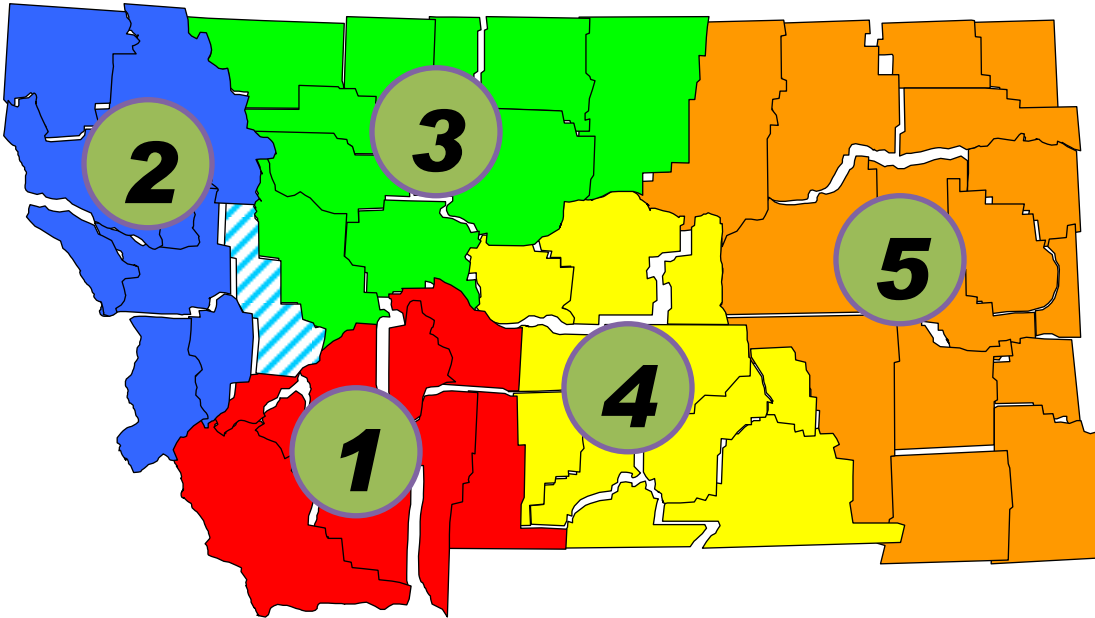
## Discussion

Respondents gave winter road maintenance ratings as follows:

- 19% Excellent
- 55% Good
- 20% Fair
- 7% Poor

Older residents and males rated winter road maintenance higher than their respective counterparts (younger and females).

### Winter Maintenance Rating



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

1. Butte
2. Missoula
3. Great Falls
4. Billings
5. Glendive
6. (Note: the blue and white striped area is Powell County and it is unclear which maintenance district it belongs in)

Respondents rated the importance of winter road maintenance as follows:

- 77% Very Important
- 18% Important
- 5% Somewhat Important
- 1% Not Important

Residents over age 50 place higher importance upon winter road maintenance than did younger residents.

Respondents rated the priority of winter road maintenance as follows:

- 72% Very High
- 24% Moderately High
- 4% Medium

- Less than 1% Low

For those who had driven in other states within the previous 12 months, 31% found MT’s winter road maintenance better than that of the other states they had visited; 37% said winter road maintenance was about the same as that found in other states, and 11% felt that MT’s winter road maintenance was worse than that they had experienced in other states.

## 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	72	7%
Fair	269	27%
Good	559	55%
Excellent	110	11%

**Frequency Missing = 12**

Importance of Road Surface		
Rating	Frequency	Percent
Not Important	12	1%
Somewhat Important	110	11%
Important	411	41%
Very Important	475	47%

**Frequency Missing = 14**

Priority of Road Surface		
Rating	Frequency	Percent
Low	21	2%
Medium	189	19%
Moderately High	533	54%
Very High	241	25%

*Frequency Missing = 39*

## Discussion

Respondents gave road surface maintenance ratings as follows:

- 11% Excellent
- 55% Good
- 27% Fair
- 7% Poor

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

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

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

Respondents rated the importance of road surface maintenance as follows:

- 47% Very Important
- 41% Important
- 11% Somewhat Important
- 1% Not Important

Residents over age 50 place higher importance upon road surface maintenance than did younger residents.

Respondents rated the priority of road surface maintenance as follows:

- 25% Very High
- 54% Moderately High
- 19% Medium
- 2% Low

Residents over age 50 placed a higher priority on road surface maintenance than did younger respondents.

## 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?
- How would you rate the traffic control while maintenance crews are working on interstates and state highways?

### Overall Results

Roadside Rating		
Rating	Frequency	Percent
Poor	50	5%
Fair	205	21%
Good	571	57%
Excellent	173	17%

**Frequency Missing = 24**

Importance of Roadside		
Rating	Frequency	Percent
Not Important	43	4%
Somewhat Important	231	23%
Important	392	39%
Very Important	331	33%

*Frequency Missing = 25*

Priority of Roadside		
Rating	Frequency	Percent
Low	82	8%
Medium	295	30%
Moderately High	420	43%
Very High	188	19%

*Frequency Missing = 37*

Traffic Control Rating		
Rating	Frequency	Percent
Poor	49	5%
Average	203	21%
Good	406	41%
Very Good	330	33%

## Discussion

Respondents gave road side maintenance ratings as follows:

- 17% Excellent
- 57% Good
- 21% Fair
- 5% Poor

Urban residents and college graduates rated road side maintenance higher than their respective counterparts. Those who had lived in MT for 10 or more years rated it lower than those who had lived in the state for more than 10 years.

Respondents rated the importance of road side maintenance as follows:

- 33% Very Important
- 39% Important
- 23% Somewhat Important
- 4% Not Important

College graduates and urban residents placed less importance on road side maintenance than did those with less than a 4-year degree and those who lived in rural counties.

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

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

Respondents rated the priority of road side maintenance as follows:

- 19% Very High
- 43% Moderately High
- 28% Medium
- 8% Low

Respondents over age 50, college graduates, and urban residents gave lower priorities to road side maintenance than did their alternatives.

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

1. Glendive & Great Falls (tie)
2. Butte
3. Billings
4. 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 road sign 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	11	1%
Fair	100	10%
Good	661	66%
Excellent	233	23%

*Frequency Missing = 18*

Importance of Signage		
Rating	Frequency	Percent
Not Important	28	3%
Somewhat Important	127	13%
Important	402	40%
Very Important	449	45%

*Frequency Missing = 16*

Priority of Signage		
Rating	Frequency	Percent
Low	59	6%
Medium	202	21%
Moderately High	402	41%
Very High	319	32%

*Frequency Missing = 40*

## Discussion

Respondents gave road sign maintenance ratings as follows:

- 23% Excellent
- 66% Good
- 10% Fair
- 1% Poor

Respondents rated the importance of road sign maintenance as follows:

- 45% Very Important
- 40% Important
- 13% Somewhat Important
- 1% Not Important

Females and residents age 50 and older placed higher importance upon signage maintenance than did males and younger residents

Respondents rated the priority of road sign maintenance as follows:

- 32% Very High
- 41% Moderately High
- 21% Medium
- 6% Low

Females gave higher priority to road sign maintenance than did males.

## 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	65	6%
Fair	207	21%
Good	534	53%
Excellent	198	20%

*Frequency Missing = 18*

Importance of Debris Removal		
Rating	Frequency	Percent
Not Important	14	1%
Somewhat Important	79	8%
Important	383	32%
Very Important	530	53%

*Frequency Missing = 16*

Priority of Debris Removal		
Rating	Frequency	Percent
Low	39	4%
Medium	137	14%
Moderately High	403	41%
Very High	406	41%

*Frequency Missing = 396*

## Discussion

Respondents rated the removal of road debris as follows:

- 20% Excellent
- 53% Good
- 21% Fair
- 6% Poor

Resident of MT for less than 10 years rated road debris removal lower than those who had lived in the state for 10 or more years.

Respondents rated the importance of road debris removal as follows:

- 53% Very Important
- 32% Important
- 8% Somewhat Important
- 1% Not Important

Respondents age 50+ placed higher importance upon debris removal than did those age 18-49.

Respondents rated the priority of road debris removal as follows:

- 41% Very High
- 41% Moderately High
- 14% Medium
- 1% Low

There were significant priority differences by administrative unit. Listed in order of highest ranking follows:

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

## 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?
- How often did you use the rest areas in Montana in the last 12 months?

### Overall Results

Rest Area Rating		
Rating	Frequency	Percent
Poor	39	5%
Fair	146	17%
Good	492	57%
Excellent	180	21%

**Frequency Missing = 165**

Importance of Rest Area		
Rating	Frequency	Percent
Not Important	33	4%
Somewhat Important	143	16%
Important	351	38%
Very Important	394	43%

**Frequency Missing = 101**

Priority of Rest Areas		
Rating	Frequency	Percent
Low	22	2%
Medium	229	24%
Moderately High	425	44%
Very High	287	30%

*Frequency Missing = 59*

Comparison of Rest Areas		
	Frequency	Percent
MT Rest Areas Worse	133	21%
About the Same	346	56%
MT Rest Areas Better	144	23%

*Frequency Missing = 400*

Rest Area Usage		
Rating	Frequency	Percent
One to two	268	34%
Three to four	202	26%
Five to 10	204	26%
10 or more	116	14%

## Discussion

Respondents gave rest area maintenance ratings as follows:

- 21% Excellent
- 57% Good
- 17% Fair
- 5% Poor

College graduates rated rest area maintenance lower than did those with less than a 4-year degree.

Respondents rated the importance of rest area maintenance as follows:

- 43% Very Important
- 35% Important
- 16% Somewhat Important
- 4% Not Important

Females place higher importance upon rest area maintenance than did males, while college graduates and urban residents placed less importance than females and those with less than a 4-year degree respectively.

Respondents rated the priority of rest area maintenance as follows:

- 30% Very High
- 44% Moderately High
- 24% Medium
- 2% Low

Older residents and females gave higher priority to rest area maintenance than did residents under age 50 and males respectively.

For those interviewed who had driven in another state within the past 12 months, 23% rated MT's rest area maintenance as better than other states, 56% rated it as about the same, and 21% believed MT's rest area maintenance was worse than that found in other 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	41	4%
Fair	166	17%
Good	621	62%
Excellent	177	18%

*Frequency Missing = 17*

Importance of Pavement Markers		
Rating	Frequency	Percent
Not Important	16	2%
Somewhat Important	707	7%
Important	293	29%
Very Important	629	62%

*Frequency Missing = 17*

Priority of Pavement Markers		
Rating	Frequency	Percent
Low	20	2%
Medium	127	13%
Moderately High	369	38%
Very High	468	48%

*Frequency Missing = 38*



## Discussion

Respondents gave pavement marker maintenance ratings as follows:

- 18% Excellent
- 62% Good
- 17% Fair
- 4% Poor

There were differences by administrative unit. In order of highest rankings first, the ranking is as follows:

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

Respondents rated the importance of pavement marker maintenance as follows:

- 62% Very Important
- 38% Important
- 13% Somewhat Important
- 2% Not Important

Females placed higher importance upon pavement marker maintenance than did males.

Respondents rated the priority of pavement marker maintenance as follows:

- 48% Very High
- 38% Moderately High
- 13% Medium
- 2% Low

Those respondents age 50+ and college graduates gave lower priorities to pavement markers than did those age 18-49 and those with less than a 4-year degree 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	44	5%
Somewhat Important	125	13%
Important	371	38%
Very Important	435	45%

*Frequency Missing = 47*

Priority of Winter Information		
Rating	Frequency	Percent
Low	44	5%
Medium	125	13%
Moderately High	371	38%
Very High	435	45%

*Frequency Missing = 47*

### Discussion

Respondents rated the importance of roadway information as follows:

- 45% Very Important

- 38% Important
- 13% Somewhat Important
- 5% Not Important

Females placed higher importance upon roadway information than did males, while college graduates and urban residents placed less importance than did those with less than a 4-year degree and rural residents respectively.

Respondents rated the priority of roadway information as follows:

- 45% Very High
- 13% Moderately High
- 38% Medium
- 2% Low

College graduates and urban residents gave higher lower to roadway information than did those with less than a 4-year degree and rural residents respectively.

## 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	26	2%
Fair	119	12%
Good	407	40%
Excellent	462	46%

Importance of Safety		
Rating	Frequency	Percent
Not Important	42	4%
Somewhat Important	185	18%
Important	610	61%
Very Important	171	17%

Priority of Safety		
Rating	Frequency	Percent
Low	40	4%
Medium	196	20%
Moderately High	468	48%
Very High	280	28%

## Discussion

The constructed composite safety rating could be interpreted as follows:

- 46% Excellent
- 40% Good
- 12% Fair
- 2% Poor

Respondents rated the importance of safety issues as follows:

- 17% Very Important
- 61% Important
- 18% Somewhat Important
- 4% Not Important

Respondents rated the priority of safety measures as follows:

- 28% Very High
- 48% Moderately High

- 20% Medium
- 2% Low

## 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	537	55%
No	435	45%

*Frequency Missing = 50*

Reasons against primary seat belt law?		
Reason	Frequency	Percent
Don't Believe in Seat Belts	16	4%
Individual Right	212	49%
Not Necessary in Rural Areas	17	4%
Other	187	43%

*Frequency Missing = 590*

Support for Child Restraint Law		
	Frequency	Percent
Yes	882	90%
No	93	10%

**Frequency Missing = 47**

Seat Belt Use		
Use	Frequency	Percent
All of the time	659	67%
Most of the time	194	20%
Half of time	79	8%
Less than half the time	18	2%
Rarely or Never	35	4%

**Frequency Missing = 37**

## Discussion

Fifty-five percent (55%) of respondents supported a primary seat belt law.

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

- 49% Individual Rights
- 43% Other
- 4% Don't Believe in Seat Belts
- 2% Not Necessary in Rural Areas

Respondents who selected other had the option to list why they do not support a primary seat belt law.

The other reasons were as follows:

- More important reasons to pull people over (30)
- Just gives cops an excuse to pull people over (19)
- The law is fine now (17)
- Takes law enforcement away from people who are really in need (14)

- Too much government/No more laws (11)
- Inconvenient (7)
- Medical/Comfort (6)
- Personal responsibility (5)
- Waste of funds (2)
- Little or no consequence (2)
- Not until school buses have them (2)
- Don't think law will pass (2)
- Enforce existing law (2)
- Dangerous/Cause death (2)
- Just how I feel (2)
- Vehicle doesn't have them (1)
- No helmet law (1)
- Irrelevant to public safety (1)

The vast majority of respondents (90%) supported a child restraint law.

Concerning the individual's seat belt use, two-thirds (67%) reported using their seat belt 'All of the Time' and another 20% said they used it 'Most of the Time'. A total of 10% of respondents said they used their seat belts one half of the time or less.

## 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	287	32%
One Vehicle w/ Fixed Object	195	22%
One Vehicle Roll-over	413	46%
Passenger Vehicle hits Pedestrian	112	1%

*Frequency Missing = 116*

Top Three Causes	
	Frequency
DUI	484
Distracted/Inattentive	223
Speeding	54
Falling Asleep	33
Passing	99
Cell Phone Usage	152

## Discussion

Nearly one-half (46%) of respondents identified one-vehicle roll-overs as the most frequent type of automobile crash. Thirty-two percent (32%) chose two-vehicle accidents and twenty-two percent (22%) picked one-vehicle accidents involving fixed objects. Only one percent of those surveyed picked accidents where a passenger vehicle struck a pedestrian.

When asked to pick the top three causes of automobile accidents, most individuals chose driving while intoxicated, inattentive or distracted driving, and using a cell phone (89%, 81%, and 81% respectively). No other cause was chosen by one-half or more of those surveyed, although speeding (31%), falling asleep at the wheel (28%), and passing (10%) received many votes.

## 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	728	74%
No	256	26%

**Frequency Missing = 38**

Most Frequent Type of Trips		
Type of Trips	Frequency	Percent
Work Commute	172	18%
Work Related	133	14%
Personal/Family	545	57%
Ag-Related	42	4%
Prof. Driving	39	4%
Other	30	3%

**Frequency Missing = 61**

Drove More than 15,000 Miles		
	Frequency	Percent
Yes	463	49%
No	484	51%

**Frequency Missing = 75**

Changing Driving Habits?		
	Frequency	Percent
Driving More	157	31%
Driving Less	354	69%

**Frequency Missing = 511**

How Have You Tried to Save Fuel	
Method	Frequency
Driving Style	373
Carpool	124
Alt Fuel	26
Walk	103
Other	102
No Change	284

Are Fuel Conservation Changes Successful?			
	Rating	Frequency	Percent
	Very Successful	142	15%
	Somewhat Successful	381	41%
	No Change in Fuel Consumption	396	42%
	Somewhat Unsuccessful	14	1%
	Very Unsuccessful	5	1%

*Frequency Missing = 84*

## Discussion

Nearly three-quarters (74%) of respondents reported driving on roads outside Montana within the previous 12 months. College graduates were more likely to have driven in another state than were those without college degrees.

The most frequent types of driving trip were as follows:

- 57% Personal or Family
- 18% Work Commute
- 14% Work-Related
- 4% Ag-Related
- 4% Professional Driving
- 3% Other

Nearly one-half (49%) 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 and individuals with a college degree.

Over two-thirds (69%) of respondents reported driving less due to higher fuel prices. When asked to rate the success of all fuel conservation actions, 15% reported these actions to be very successful and another 41% reported some success. Males reported more success at fuel conservation than did females.

## 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

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

- Don't Know or No Response (128)
- Overall winter maintenance (105)
- No or Nothing (103)
- Overall maintenance excellent (70)
- Smoothness/Potholes (60)
- Overall maintenance (58)
- Construction/Start earlier/Remove signs when not working (46)
- Rest area maintenance (42)
- Striping (37)
- Debris / Road kill removal (30)
- Road signs (26)
- More productivity – Work nights (18)
- Shoulder maintenance (16)
- Wider Roads (16)
- More police / Control speeding and DUIs (13)
- More personnel and equipment (12)
- Repave/Seal/Patch/Seal Seams (8)
- Wildlife crossings under highways (7)

- Bridge work (7)
- Automated signs/ Safety signals (6)
- Lower speed limit (5)
- Public relations (4)
- Not enough federal funds (3)
- Disallow large oil equipment to travel on roads (3)
- Contract with companies that stay within budget and time line (3)
- Rumble strips or bumps (2)
- Inspection of roads (2)
- Better management of Highway Patrol (2)
- More bike and walking paths (2)
- Fewer personnel (1)
- Turn some roadways over to other distinctions (1)
- Pass a law against cell phone use while driving (1)
- Gasoline rationing/limit drivers licensing (1)
- Extend concrete barriers in mountain passes (1)

The following general themes were found in answers to the question of performance areas meeting or exceeding expectations.

- No comment/Nothing (260)
- Doing a good job/Satisfied (156)
- General Road Maintenance (132)
- Winter maintenance (104)
- Overall Maintenance (69)
- Debris removal/Roadway Cleanliness (28)
- Don't know/No response (18)
- Bridge/Overpass Repairs (15)
- Road Signs (15)
- Traveler/Roadside Information (13)
- Fixing/Rebuilding Highways (11)
- Construction Time/Signs (10)
- Striping (9)
- Rest Area Maintenance (8)
- Efficient use of funds (8)
- Roadside Safety (6)
- Law Enforcement (5)
- Widening of specific highways (3)
- New Road Design/Roundabouts (2)

- Better than surrounding states (2)
- Keeping large truck tires off highways (1)
- Replacing damaged rails/posts (1)
- Consistent with checking weight limits on large trucks (1)
- Rumble Strips (1)
- Restricting cell phone use (1)

## Comparisons of 2010 with 2006 and 2008 Survey Results

A comparison of the average scores on the 2010 results with those from the 2006 and 2008 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.

### Comparison of Maintenance Conditions Ratings

	2006	2008	2010
Winter	2.79	2.69	2.86
Striping	2.85	2.87	2.93
Debris Removal	2.76	2.77	2.86
Surfaces	2.61	2.67	2.70
Signage	3.07	3.03	3.11
Rest Area	2.90	2.23	2.95
Roadsides	2.80	2.70	3.11

### Comparison of Maintenance Importance Scores

	2006	2008	2010
Winter	3.70	3.56	3.71
Striping	3.58	3.49	3.52
Information	3.51	3.22	3.21
Debris Removal	3.47	3.44	3.42
Surfaces	3.35	3.40	3.34
Signage	3.28	3.31	3.26
Rest Area	3.19	2.75	3.20
Roadsides	2.99	3.01	3.01

### Comparison of Maintenance Priority Scores

	2006	2008	2010
Winter	3.66	3.56	3.68
Striping	3.42	3.32	3.31
Information	3.41	3.32	3.23
Debris Removal	3.28	3.23	3.19
Surfaces	3.08	3.12	3.01
Signage	3.09	3.03	3.00
Rest Area	3.06	2.77	3.01
Roadsides	2.81	2.70	2.72

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 2006-2010 Scores Results

Composite Score	Winter Maint	Winter Maint	Winter Maint	Surface Maint	Surface Maint	Surface Maint
	2006	2008	2010	2006	2008	2010
2	0.1%	0.29		0.1%	0.10	
3	0.7%	0.38		0.2%	0.29	
4	1.4%	1.44		0.4%	0.19	0.10
5	0.6%	0.87	.011	1.2%	0.96	0.61
6	1.1%	1.83	1.05	4.3%	3.85	2.96
7	3.2%	2.41	1.26	11.3%	7.89	10.83
8	13.2%	7.41	6.62	24.4%	14.24	18.90
9	27.0%	16.27	16.07	29.2%	25.22	27.68
10	33.9%	26.66	25.84	16.1%	27.53	23.60
11	13.2%	32.05	35.82	9.4%	15.59	12.16
12	5.6%	9.72	13.24	3.4%	3.85	3.17

### Comparison of 2006-2010 Scores Results

Composite Score	Roadside Maint	Roadside Maint	Roadside Maint	Road Sign Maint	Road Sign Maint	Road Sign Maint
	2006	2008	2010	2006	2008	2010
2	0.1%	0.48		0.0%	0.10	
3	0.6%	0.48	0.1	0.4%	0.10	
4	2.3%	1.15	0.72	0.6%	0.58	0.10
5	5.0%	3.27	2.38	2.8%	0.87	0.72
6	9.6%	8.85	7.33	9.0%	2.41	2.47
7	21.3%	13.38	13.74	15.2%	7.41	8.22
8	23.8%	20.02	22.00	24.6%	15.21	15.93
9	19.1%	22.52	23.35	26.6%	22.23	23.74
10	11.6%	17.81	17.67	16.5%	24.35	23.33
11	4.7%	9.24	9.09	3.5%	19.54	18.29
12	1.8%	2.41	3.62	0.7%	6.93	7.19

### Comparison of 2006-2010 Scores Results

Composite Score	Debris Maint			Rest Area Maint		
	2006	2008	2010	2006	2008	2010
2	0.1%	0.10		1.9%	1.54	
3	0.1%	0.29		3.1%	4.81	
4	0.1%	1.25	0.51	2.4%	3.37	0.24
5	0.8%	2.69	0.92	3.3%	2.79	0.96
6	4.7%	7.70	2.87	9.3%	5.77	3.59
7	11.2%	12.13	6.66	14.0%	7.51	10.29
8	19.1%	21.94	12.60	23.7%	14.82	16.15
9	26.4%	23.48	25.20	22.0%	15.78	24.76
10	23.3%	22.91	22.44	13.3%	17.04	22.25
11	10.9%	7.12	19.88	4.2%	13.28	14.71
12	3.3%	0.10	8.91	1.9%	5.29	7.06

### Comparison of 2006-2010 Scores Results

Composite Score	Road Stripe Maint		
	2006	2008	2010
2			
3	0.1%	0.10	
4	0.2%	0.10	0.20
5	1.1%	0.58	0.61
6	2.8%	2.41	1.43
7	7.7%	5.39	4.50
8	17.3%	9.91	10.43
9	29.4%	19.92	21.68
10	27.5%	26.18	27.40
11	9.4%	26.37	26.18
12	4.4%	8.37	7.57

Using the percentage of respondents with each composite score, it is possible to compare maintenance category results between 2006, 2008, and 2010. The composite scores for rest areas and debris removal grew significantly, as to a lesser extent did winter maintenance and roadside maintenance. The scores for the remaining categories stayed very close to their 2008 levels and thus holding on to their improvements over the values estimated in the 2006 survey.

## Comparisons with 1998-2010 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 2010. In 2010 Roadside ratings saw the biggest increase while rest area ratings declined the be the largest amount. The other ratings remained close to their 2008 values

### 10-Year Comparison of Maintenance Conditions Ratings

Good or Excellent Rating	1998	2000	2002	2004	2006	2008	2010
<b>Signage</b>	87%	88%	88%	88%	87%	86%	87%
<b>Information</b>	74%	78%	82%	81%	77%		
<b>Rest Area</b>	72%	60%	70%	77%	77%	76%	66%
<b>Lane Markers</b>	73%	68%	78%	77%	76%	78%	78%
<b>Roadside</b>	66%	70%	72%	77%	72%	69%	73%
<b>Winter Maintenance</b>	68%	69%	68%	70%	69%	73%	71%
<b>Debris Removal</b>	67%	64%	68%	70%	69%	72%	72%
<b>Pavement</b>	45%	50%	59%	61%	61%	66%	65%

## 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	4 tie	1	1
Roadside Maintenance	3	8	7
Road Information	Na	6	3
Surface Maintenance	5	4	5 tie
Pavement Marker Maintenance	1 tie	2	2
Road Sign Maintenance	1 tie	5	6
Rest Area Maintenance	2	7	5 tie
Debris Removal Maintenance	4 tie	3	4

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	10.24	1 <sup>st</sup>
Pavement Marker Maintenance	9.75	2 <sup>nd</sup>
Road Information	9.70	3 <sup>rd</sup>
Debris Removal Maintenance	9.48	4 <sup>th</sup>
Road Sign Maintenance	9.38	5 <sup>th</sup>
Rest Area Maintenance	9.20	6 <sup>th</sup>
Surface Maintenance	9.05	7 <sup>th</sup>
Roadside Maintenance	8.61	8 <sup>th</sup>

Based upon this composite score, ranking shows that winter maintenance has the highest relative importance and roadside maintenance the lowest.

## 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<sup>1</sup>:

*Overall Rating = 0.54 + 0.21\*Winter Rating + 0.33\*Surface Rating + 0.13\*Roadside Rating + 0.138\*Road Sign Rating (R<sup>2</sup> = 0.38).*

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 road sign 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 almost three times that of a similar amount of increase in his rating of road side maintenance (0.33 compared to 0.13).

These results also suggest that the other 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 = 0.49 + 0.43\*Winter Imp. + 0.19\*Surface Imp. + 0.07\*Roadside Imp. + 0.06\*Road Debris Imp + 0.09\*Road Stripe Imp (R<sup>2</sup>=0.34).*

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, road debris, and road marker maintenance, and not on the other categories. However, the importance of winter maintenance has twice the impact upon overall importance than does the importance of pavement maintenance, and four-time the impact of the other explanatory variables in the model.

Using the results of these two models, it would appear that improvements in winter and surface maintenance would lead to the greatest increases in an individual's overall maintenance rating (just as it did in the 2008 survey), with additional benefit from improvements in pavement marking, signage, and debris removal.

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<sup>1</sup> This analysis was conducted using SAS Version 9.1, procedure CATMOD.

## Maintenance Priority Rankings

	Ranked on Composite Score	Ranked on Drivers of Overall Rating and Importance
Winter Maintenance	1 <sup>st</sup>	1 <sup>st</sup> (by factor of 2x or more)
Pavement Marker Maintenance	2 <sup>nd</sup>	4 <sup>th</sup>
Road Information	3 <sup>rd</sup>	
Debris Removal Maintenance	4 <sup>th</sup>	4 <sup>th</sup>
Road Sign Maintenance	5 <sup>th</sup>	4 <sup>th</sup>
Rest Area Maintenance	6 <sup>th</sup>	
Surface Maintenance	7 <sup>th</sup>	2 <sup>nd</sup> (by factor of 1.5x -2x)
Roadside Maintenance	8 <sup>th</sup>	3 <sup>rd</sup>

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 1020 adult Montana residents, it appears that residents are in general reasonably satisfied with Montana Department of Transportation's road maintenance activities. In all categories two-thirds or more 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 2008.

In 2010 most the average scores in most categories remained fairly close to their 2008 estimates. Winter, rest area, and road side maintenance exhibited the largest rating increases. The importance of rest area maintenance showed the most improvement in the Importance scores, while in the priority scoring rest areas showed an increase while information and road surfaces showed the (relatively) largest declines.

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 to a lesser degree pavement markers, signage, and debris removal also driving the overall rating of MT residents.

In terms of how Montanans drive, in 2010 over two-thirds of respondents reported driving less in the past 12 months, and the percentage of those reporting driving more than 15,000 miles per year fell to below 50%.

## Appendix A: Summary Tables of Survey Results

### Statistical Results of 2010 Survey

Variable	Mean	Std Dev
Overall Rating	2.83	0.68
Overall Importance	3.47	0.95
Winter Rating	2.86	0.80
Winter Importance	3.70	0.60
Winter Priority	3.68	0.55
Surface Rating	2.70	0.76
Surface Importance	3.34	0.72
Surface Priority	3.01	0.72
Roadside Rating	2.87	0.75
Roadside Importance	3.01	0.86
Roadside Priority	2.72	0.86
Signage Rating	3.11	0.60
Signage Importance	3.26	0.78
Signage Priority	3.00	0.88
Debris Rating	2.86	0.80
Debris Importance	3.42	0.70
Debris Priority	3.19	0.82
Rest Area Rating	2.95	0.75
Rest Area Importance	3.20	0.83
Rest Area Priority	3.01	0.79
Pavement Marker Rating	2.93	0.71
Pavement Marking Priority	3.31	0.77
Pavement Marking Import.	3.52	0.70
Information Importance	3.21	0.94
Information Priority	3.23	0.83
Rate Crew	3.03	0.86

## Table of Significant Differences

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

## Table of Significant Differences

	Sex M or F	Age 18-49	10 Year + Residents
<b>Overall Rating</b>			Lower
<b>Overall Importance</b>			
<b>Travel to Other State</b>			
<b>General Comparison</b>			
<b>Winter Rating</b>	Male Higher	50+ Higher	
<b>Winter Importance</b>		50+ Lower	
<b>Winter Priority</b>			
<b>Winter Comparison</b>			
<b>Surface Rating</b>			
<b>Surface Importance</b>		50+ Higher	
<b>Surface Priority</b>		50+ Higher	
<b>Roadside Rating</b>			Lower
<b>Roadside Importance</b>			
<b>Roadside Priority</b>		50+ Higher	
<b>Signage Rating</b>			
<b>Signage Importance</b>	Female Higher	50+ Higher	
<b>Signage Priority</b>	Female Higher		
<b>Debris Rating</b>			Lower
<b>Debris Importance</b>		50+ Higher	
<b>Debris Priority</b>			
<b>Rest Area Rating</b>			
<b>Rest Area Importance</b>	Female Higher		
<b>Rest Area Priority</b>	Female High	50+ Higher	
<b>Rest Area Comparison</b>			
<b>Pavement Marker Rating</b>			
<b>Pavement Marker Importance</b>			
<b>Pavement Marker Priority</b>		50+ Higher	
<b>Information Importance</b>	Female Higher		
<b>Information Priority</b>			
<b>Rate_Crews</b>		50+ Higher	

## Table of Significant Differences

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



## Appendix B : Summary Interview Script

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 the age of 18, and has had the most recent birthday. Would that be you? If no, repeat above when new person answers phone.

Before I ask the first questions, 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.

How would you rate overall interstate and state highway maintenance in Montana?

- Poor
- Fair
- Good
- Excellent
- Don't know/No response

How important would you say interstate and state highway maintenance in Montana is to you?

- Not important
- Somewhat important
- Important
- Very important
- Don't know/No response

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.

- Poor
- Fair
- Good
- Excellent
- Don't know/No response

How important would you say interstate and state highway winter maintenance is to you?

- Not important
- Somewhat important
- Important
- Very important
- Don't know/No response

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.

- Poor
- Fair
- Good
- Excellent
- Don't know/No response

How important is the smoothness of Montana's interstates and state highways to you?

- Not important
- Somewhat important
- Important
- Very important
- Don't know/No response

How would you rate the management of interstate and state highway roadsides in Montana? Roadside management includes mowing shoulders and eliminating unwanted vegetation.

- Poor
- Fair
- Good
- Excellent
- Don't know/No response

How important is interstate and state highway roadside management in Montana to you?

- Not important
- Somewhat important
- Important
- Very important
- Don't know/No response

How would you rate the condition of interstate and state highway signs in Montana?

- Poor
- Fair
- Good
- Excellent
- Don't know/No response

How important is the condition of interstate and state highway signs to you?

- Not important
- Somewhat important
- Important
- Very important
- Don't know/No response

How would you rate the removal of debris such as litter, road kill, and fallen rocks on Montana's interstates and state highways?

- Poor
- Fair
- Good
- Excellent
- Don't know/No response

How important is the removal of debris on interstates and state highways in Montana to you?

- Not important
- Somewhat important
- Important
- Very important
- Don't know/No response

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.

- Poor
- Fair
- Good
- Excellent
- Don't know/No response

How important is interstate and state highway rest area maintenance to you?

- Not important
- Somewhat important
- Important
- Very important
- Don't know/No response

How would you rate the condition of striping or pavement markings on Montana's interstates and state highways? Striping and lines include the middle lines (solid and skip), no-passing lines (solid), left turn lane lines, and shoulder lines.

- Poor
- Fair
- Good
- Excellent
- Don't know/No response

How important is interstate and state highway striping to you?

- Not important
- Somewhat important
- Important
- Very important
- Don't know/No response

How important is traveler information - road and weather condition and construction information to you?

- Not important
- Somewhat important
- Important
- Very important
- Don't know/No response

Now I am going to go back through the list of maintenance activities. This time, I want you to think about allocation of resources (labor, equipment, and materials) 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?

- Low
- Medium
- Moderately high
- Very high
- Don't know/No response

What resource priority should be placed on smooth pavement on interstates and state highways in Montana?

- Low
- Medium
- Moderately high
- Very high
- Don't know/No response

What resource priority should be placed on interstate and state highway roadside management in Montana?

- Low
- Medium
- Moderately high
- Very high
- Don't know/No response

What resource priority should be placed on repairing and replacing signs on interstates and state highways in Montana?

- Low
- Medium
- Moderately high
- Very high
- Don't know/No response

What resource priority should be placed on debris removal on interstates and state highways in Montana?

- Low
- Medium
- Moderately high
- Very high
- Don't know/No response

What resource priority should be placed on rest area cleanliness and maintenance on interstates and state highways in Montana?

- Low
- Medium
- Moderately high
- Very high
- Don't know/No response

What resource priority should be placed on roadway striping on interstates and state highways in Montana?

- Low
- Medium
- Moderately high
- Very high
- Don't know/No response

What resource priority should be placed providing accurate and up to date information about the current condition of state maintained highways in Montana?

- Low
- Medium
- Moderately high
- Very high
- Don't know/No response

How would you rate the traffic control while maintenance crews are working on interstates and state highways?

- Poor
- Average
- Good
- Very good
- Don't know/No response

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 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 laws for the state of Montana?

- Yes
- No
- Don't know/No response

Could you tell us why you are against a primary seat belt law?

- Don't believe in seat belts
- Individual rights/freedom - It's my choice
- Racial profiling
- Not necessary in a rural area
- Other
- Don't know/No response

Would you support a primary seat belt law for child restraint in motor vehicles?

- Yes
- No
- Don't know/No response

Which best describes your use of seat belts? You wear a seat belt.....

- All of the time
- Most of the time
- Half the time
- Less than half the time
- Rarely or never
- Don't know/No response

In Montana, which type of vehicle collisions do you think occur most frequently?

- Collision between two vehicles (including passenger car with a semi)
- One vehicle fixed object crash
- One vehicle roll-over crash
- Vehicle/pedestrian crash
- Don't know/No response

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 MARK THE OPTIONS IN THE SAME ORDER THEY ANSWER

- Distracted or inattentive driving
- Driving under the influence
- Distracted by cell phone use (talking or texting)
- Falling asleep
- Speeding
- Road rage
- Passing
- Other
- Don't know/None of the above

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?

- Yes
- No
- Don't know/No response

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.

- Montana roadways are worse
- About the same
- Montana roadways are better
- Don't know/No response



How would you compare winter maintenance of Montana's state maintained roadways with winter maintenance of state maintained highways in other states?

- Montana winter maintenance is worse
- About the same
- Montana is better
- Don't know/No response

How would you compare rest area cleanliness and maintenance in Montana with rest area cleanliness and maintenance in other states?

- Montana rest areas are worse
- About the same
- Montana is better
- Don't know/No response

How often did you use the rest areas in Montana in the last 12 months?

- One to two
- Three to four
- Five to 10
- 10 or more
- Don't know/No response

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?

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?

- Commuting to and from work
- Work related trips, that is trips that are made as a part of work activities
- Personal and family errands or trips
- Agriculture related trips
- Professional driving
- Other
- Don't know/No response

Would you say you drive more or less than 15,000 miles per year?

- More
- Less
- Don't know/No response

Compared to previous years, in the past 12 months, would you say that you are.....

- Driving more
- Driving less
- No change

Are you doing any of the following to mitigate or offset the cost of fuel?

- Driving less
- Driving a fuel efficient vehicle
- Carpooling
- Using alternative fuel
- Bicycling
- Walking
- Using other means of transportation (e.g. bus, dial-a-ride)
- Other
- No change
- Don't know/No response

How would you rate your success in reducing your fuel consumption?

- Very successful
- Somewhat successful
- No change in my fuel consumption
- Somewhat unsuccessful
- Very unsuccessful
- Don't know/No response

How old are you?

What is the highest level of education you have completed?

How long have you lived in Montana?

Respondents sex (DON'T READ)

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/ I would like to reassure you that all information will be kept confidential and will not be released for any other purpose.

- Yes
- No

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

That was the last question. Thank you very much for taking the time to answer these questions. Good bye and have a nice evening.

## Appendix C. Side Analysis

At the February, 2011 presentation of this analysis to MDT personnel, two areas of side analysis were suggested to answer questions raised in this presentation. The first pertained to the relationship between Importance, Rating, and Priority scores, more specifically whether individuals tended to give a road characteristic a higher rating, for example, if this individual had given this characteristic a higher priority. To address this question, correlations were run measuring the degree of association between the importance, rating, and priority scores given for each road characteristic by each person interviewed.

Table C-1 Significant Correlations

	Importance and Priority	Importance and Rating
Winter	0.32	
Striping	0.44	
Debris Removal	0.40	0.15
Surfaces	0.35	
Signage	0.35	
Rest Area Information	0.43	0.10
Roadsides	0.50	
	0.46	

The results of this analysis are presented in Table C-1, which shows those associations which were found to be statistically significant at a 95% confidence level. In all road characteristics, if an individual gave a higher importance he or she also tended to choose a higher maintenance priority, but the magnitude of this association (ranging from 0.32 to 0.50) suggests that these two measurements were not seen as synonymous by those individuals interviewed. Importance and Rating were found to be correlated in the cases of Debris Removal and Rest Areas, but the size of these correlations (0.10 and 0.15) were small.

A second area of inquiry opened up during the MDT presentation was how perceptions compared to reality in the cases of leading causes of motor vehicle accidents. This survey captured the perceptions of relative importance, and the MDT possessed statistics on actual causes, and the author agreed to compare the two. The results of this analysis are presented in Table C-2.

Table C-2 Perception vs. Reality for Fatal Accidents

Top Three Causes of Fatal Accidents		
	(Relative Rank of Risk) Number of Individuals Choosing This Answer	(Relative Rank of Risk) <u>Actual</u> % Fatalities 2005-2010
DUI	(1st) 484	(3rd) 14%
Distracted/Inattentive	(2nd) 223	(1st) 24%
Cell Phone Usage	(3rd) 152	(6th) less than 1%
Passing	(4th) 99	(5th) 1%
Speeding	(5th) 54	(2nd) 15%
Falling Asleep	(6th) 33	(4th) 3%

As shown in this table, in comparison to actual motor vehicle fatality statistics, those surveyed were able to identify DUI and Distracted/Inattentive driving as among the leading causes, but were far less likely to name speeding as a leading cause, with roughly 5% of respondents naming in their top three causes while 15% of the fatal accident statistics listed this as the contributing circumstances involving the driver. In comparison, individuals answering this question overestimated the impact of cell phone usage and passing as fatal accident causes relative to their prevalence in the MDT accident statistics. (Note that, according to this database, No Circumstances, Alcohol, and Inattentive Driving were the top three causes, representing one-half of all listed causes.)