

PERCEPTIONS OF MONTANA HIGHWAY MAINTENANCE IN 2014: THE RESULTS OF TWO TELEPHONE SURVEYS

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Introduction

In 2013 the Montana Department of Transportation (MDT) contracted with the Center for Applied Economic Research (CAER) at Montana State University Billings to conduct a pair of 2014 telephone surveys 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 Jessica Perius, who worked with MDT to develop the survey. The interviews were conducted March-April and August – October, 2014, by the professional telephone interviewers who work for the CAER. Dr. Rickard and Mrs. Perius analyzed the results and are the authors of this report.

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 third 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.

When a telephone call was answered, the interviewer immediately identified herself or himself and his or 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 possibly an additional screening question (such as the person with the most recent birthday or a male resident). 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.

Survey Timing and Productivity

The Winter survey occurred just a few weeks after large snowfalls in most of the state and snow removal was an issue in several cities. The timing of the Summer survey corresponded with the US national elections, and in Montana the aggressive direct telephone outreach by candidates, parties, and special interest groups made it increasingly difficult to reach potential survey participants and convince them that we were not interested in influencing their vote. Also complicating the process was our goal of reaching approximately 40% of our respondents using cell phone numbers.

Overall, our interviewers' success rate, measured in the number of completed surveys per hour of calling, averaged 1.3 completion per interviewer-hour.

Presentation of Survey Results

In order to make this report as readable as possible, we have placed the information on the results of statistical tests in the appendices. In this report the words 'significant', 'significance' or 'significantly' refer to a statistical significance of at least 95%, 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.

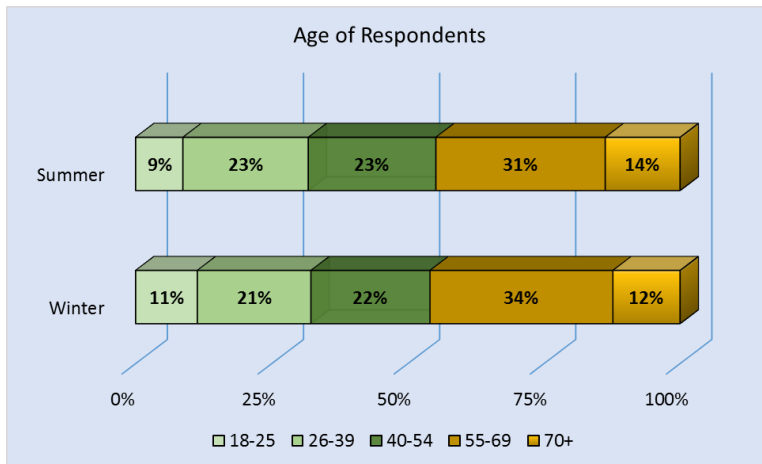
When we are comparing the characteristics of those surveyed with the overall population, the comparison is the US Census results reported for Montana. Census figures come from American Factfinder at www.factfinder.census.gov.

Not all individuals chose to answer every question. If the respondent answered the most important question, this survey was included in the totals. Some individuals would answer some questions but not others. These refusals are the reason that there are different answer totals for some questions.

Demographics of Respondents

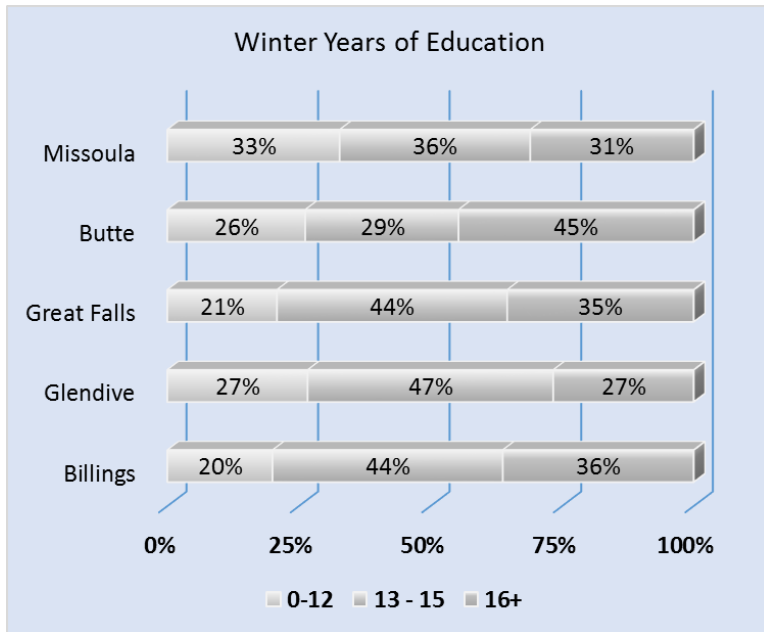
In order to evaluate how well the survey was capturing the views of a representative sample of MT's population a number of demographic questions were asked and these results compared to other data sources.

At least 500 observations were collected in the Winter and again in the Summer surveys. Respondents did not always answer every question, and the total responses to a given question varied. For example, 503 individuals surveys in the Winter provided their age, while the number answering the same question in the Summer survey was 495. Exact numbers were used to calculate the statistics presented in this report.

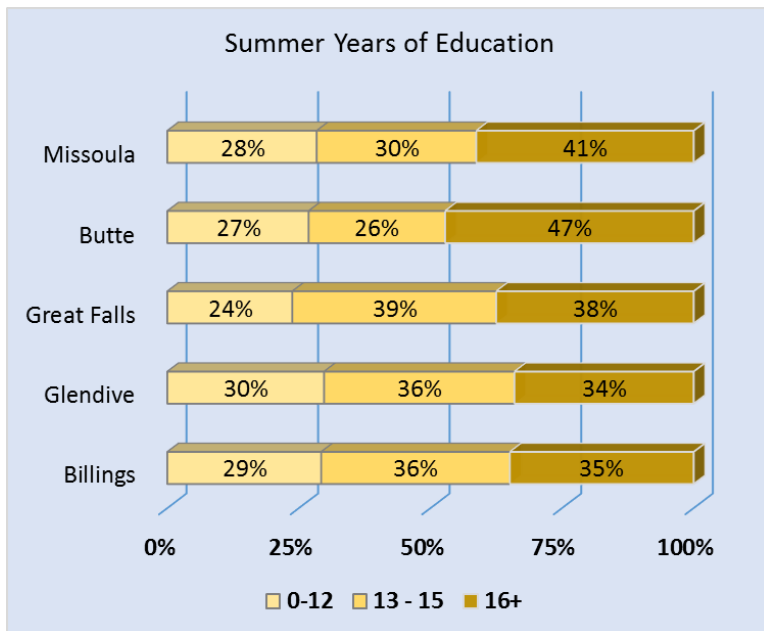


In both the Winter and Summer surveys, one-half (50%) of respondents were Male and one-half Female.

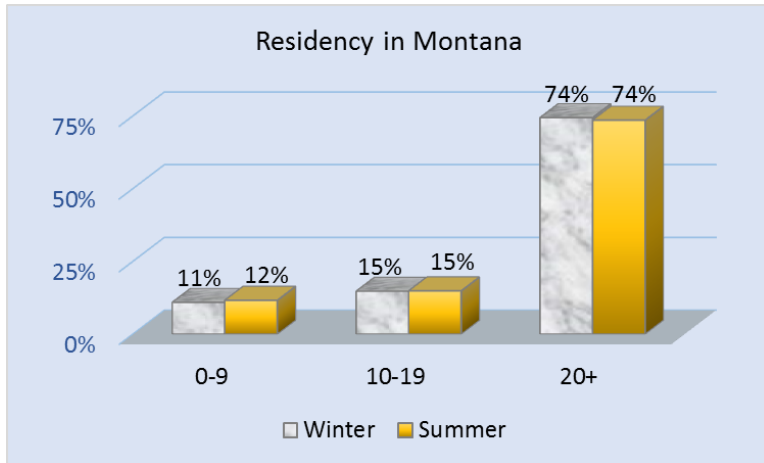
The median age of a respondent was 50 in the Winter survey and 52 in the Summer survey. Thirty-two percent (32%) of those answering each survey were under age 40.



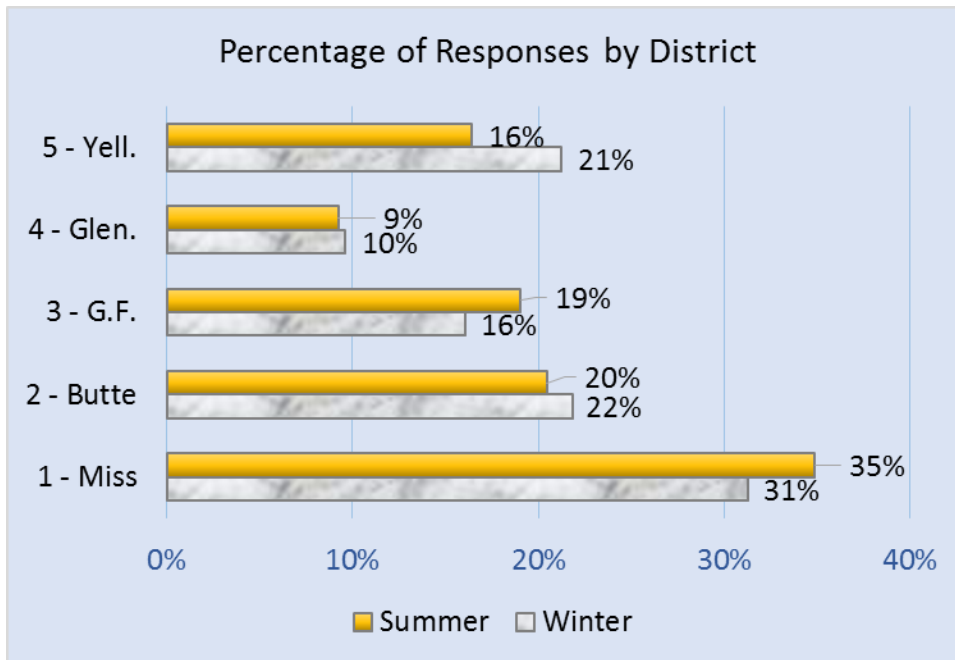
Overall, 27% of Winter respondents reported education up to high school graduation (12 years of education), 38% some post-high-school education (13-15 years), and 35% report completing 16 or more years of education. Nearly one-half (45%) of Butte District respondents reported at least 16 years, nearly twice the percentage of Glendive District respondents.



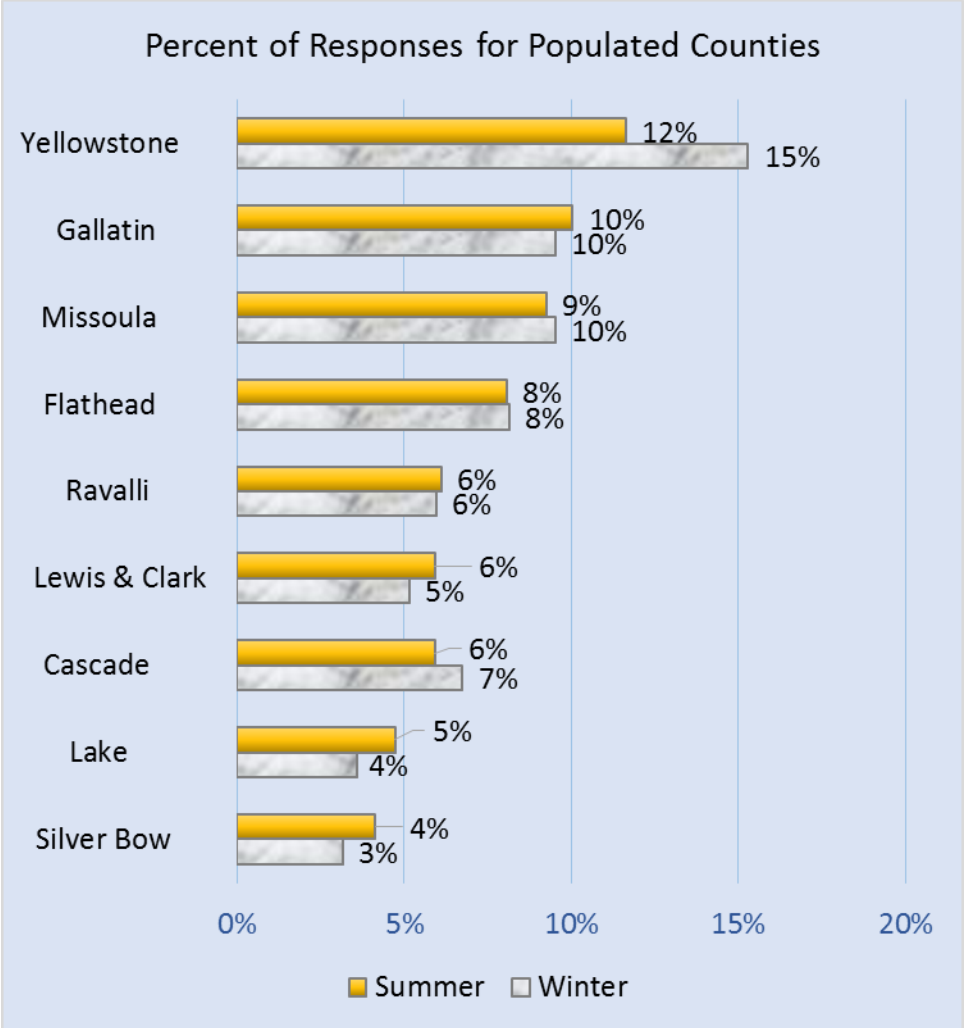
In the Summer survey the average respondent reported significantly-higher average years of education than in the Winter survey. Twenty-eight percent (28) of respondents reported up to 12 years of education; 32% reported 13-15 years of education, and 40% reported 16 or more years of education. By district, there was no significant difference between Summer and Winter educational levels.



Nearly three-quarters (74%) of both Winter and Summer respondents resided in Montana for twenty or more years.



The distribution of overall responses by maintenance district were statistically different between the Winter and Summer surveys. This was largely due to Billings District, representing 21% of the Winter survey and 16% of the Summer survey, a statistically-significant difference. More broadly, eastern Montana (The Glendive and Billings Districts) represented 31% of responses in the Winter survey and 25% in the Summer survey.



For the most-populated counties, the response rates across the two survey periods were reasonably close. (This is important because in past surveys residents in urban counties sometimes had significantly-different maintenance perceptions compared to their rural county counterparts.) Nine counties represented 66% of all usable Winter responses and 67% of all usable Summer responses. The distribution of responses within these counties were not significantly different between the two surveys. Based upon adult populations, Yellowstone County is somewhat underrepresented in the Summer survey (15% actual compared to 12% of the sample) but this difference is not significant.

Overall, each survey captured responses from 49 of the 56 Montana counties and between the two surveys at least one resident of each Montana county was interviewed.

Survey Scales Used in This Analysis

This section presents the results of the Winter and Summer road maintenance surveys. The Summer survey questions largely follow those asked in 2012 (and before). The Winter survey was shorter and contained an expanded set of Winter Road Maintenance questions.

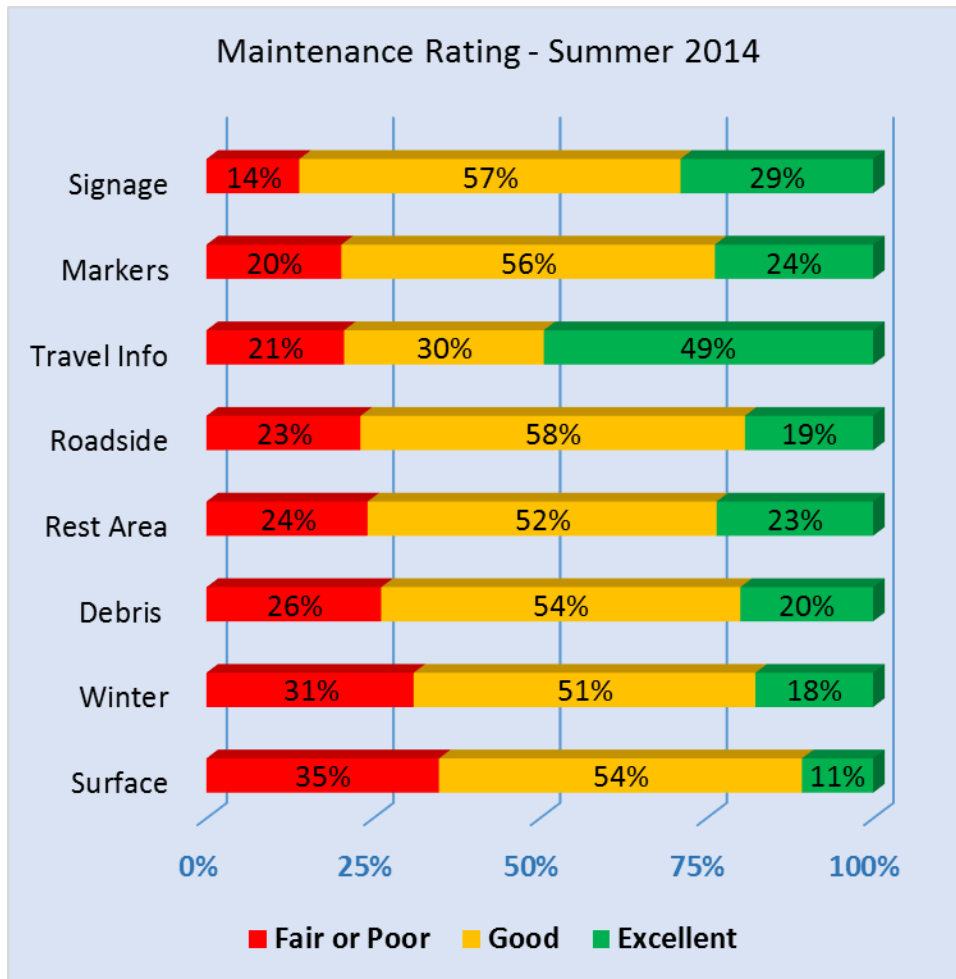
Survey respondents were asked to evaluate road maintenance areas using the following scales (from best to worst):

Maintenance Rating	Maintenance Importance	Maintenance Priority
<ul style="list-style-type: none">• Excellent	<ul style="list-style-type: none">• Very Important	<ul style="list-style-type: none">• Very High
<ul style="list-style-type: none">• Good	<ul style="list-style-type: none">• Moderately Important	<ul style="list-style-type: none">• Moderately High
<ul style="list-style-type: none">• Fair	<ul style="list-style-type: none">• Somewhat Important	<ul style="list-style-type: none">• Medium
<ul style="list-style-type: none">• Poor	<ul style="list-style-type: none">• Not Important	<ul style="list-style-type: none">• Low

In general, the number and proportion of responses in the lowest two categories (e.g. Fair and Poor for a Maintenance Rating) was so small that, when evaluating differences across the maintenance regions, some standard statistical tests were unreliable. For this reason the bottom two categories were combined for analysis and reporting purposes. Also, in discussing how districts compared on a given ranking, the comparison is sometimes the percentage of responses in the top two categories combined (e.g. Excellent and Good), since this combination may be seen as a reasonable approximation of general satisfaction with this area of road maintenance services.

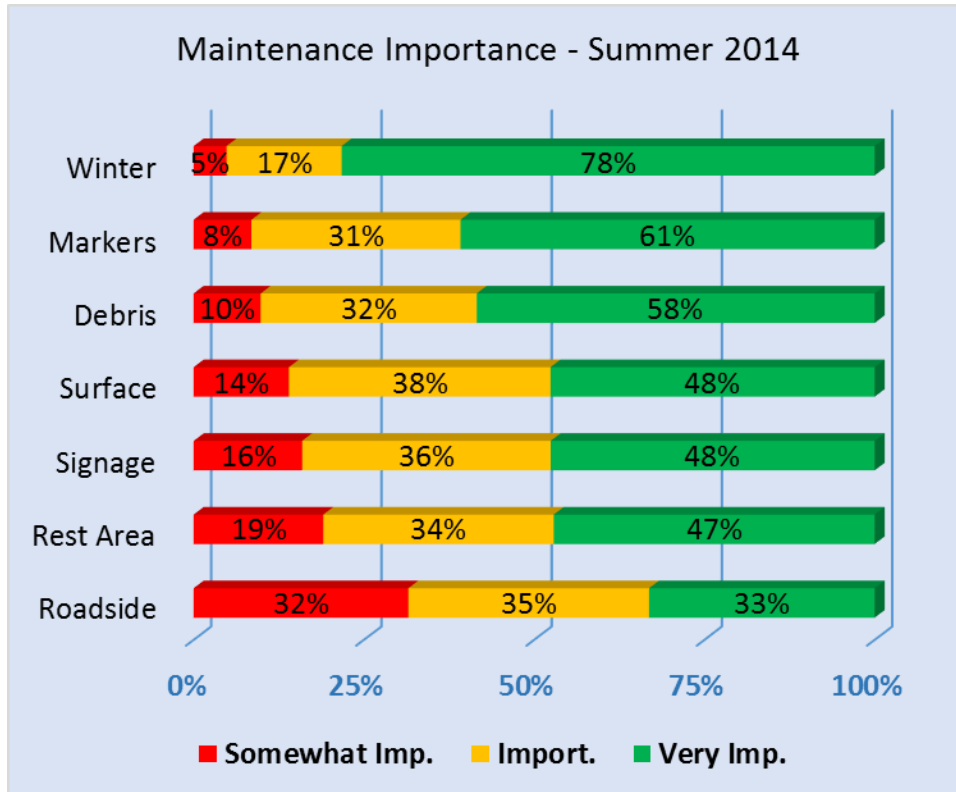
Maintenance Rating Summary

This section summarizes the results of the Summer 2014 Road Maintenance Survey.



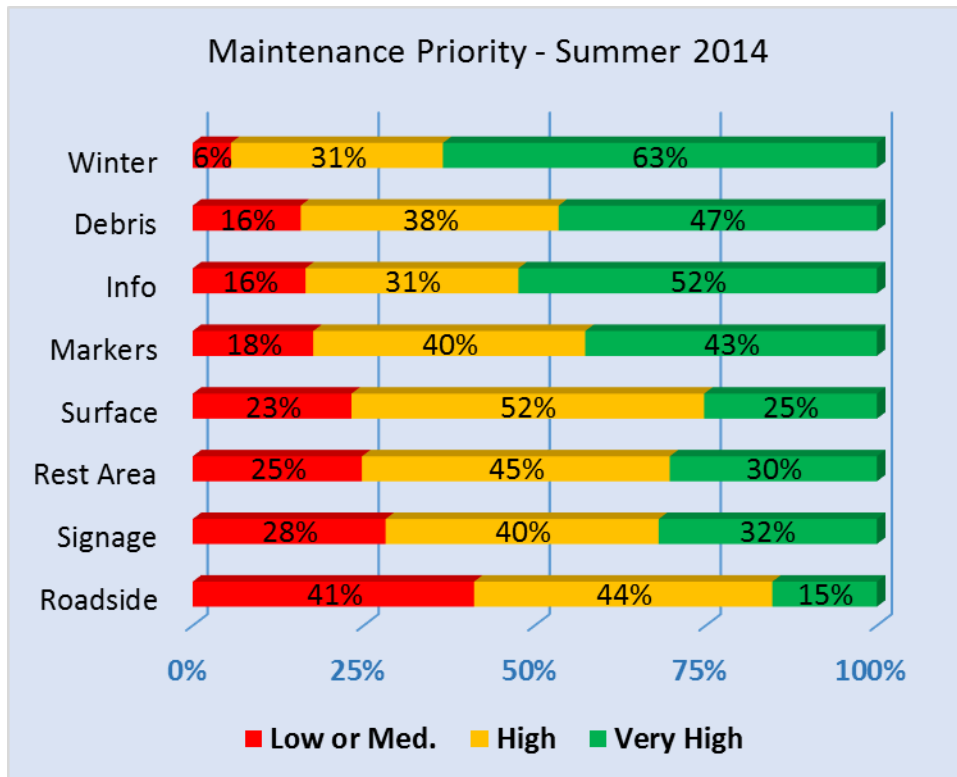
In the Summer 2014 survey the percentage of respondents rating an area of road maintenance as Good or Excellent ranged from 64% for Road Surface Maintenance to 86% for Road Signage Maintenance. Travel Information received the highest percentage of Excellent ratings (49%) while Road Surface received the lowest (11%)

Maintenance Importance Summary



In the areas of Maintenance Importance, the Summer 2014 survey responses gave highest importance to Winter Road Maintenance, with over three-quarters (78%) rating it Very Important. Road Markers and Road Debris Maintenance were Very Important to six-in-ten respondents (61% and 58% respectively), while just under one-half of those surveyed scored Surface, Signage, and Rest Area Maintenance as Very Important.

Maintenance Priority Summary



In general, Maintenance Priorities follow the same relative patterns of Maintenance Importance, but with a downward shift from the highest category (From Very Important to Moderately High). Winter Maintenance received the higher priority ratings with 63% Very High Priority, followed by Debris Maintenance, Travel Info, and Pavement Marker Maintenance at more than eight-in-ten respondents giving these areas a Very or Moderately High Priority. Roadside Maintenance was given the lowest priority, with only 15% rating it Very High Priority and 41% rating it Low or Medium Priority.

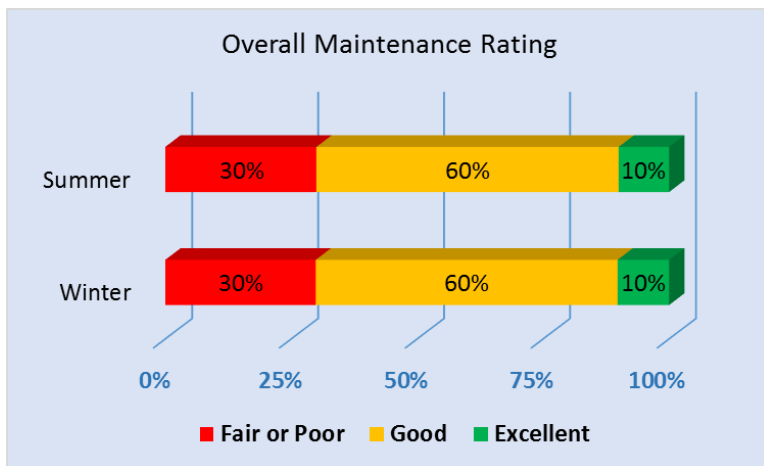
2014 Summer Maintenance Ranking of Average Scores

	SCORE			RANK		
	Rating	Import	Priority	Rating	Import	Priority
Winter	2.78	3.73	3.57	7 th	1 st (highest)	1 st
Striping	2.99	3.51	3.22	3 rd	2 nd	4 th
Debris	2.87	3.47	3.29	6 th	3 rd	3 rd
Surface	2.71	3.33	3	8 th	4 th	5 th
info	3.22	3.22	3.32	1 st	7 th	2 nd
Signage	3.13	3.27	2.97	2 nd	5 th	6 th
Rest Area	2.94	3.24	2.84	4 th	6 th	7 th
Road Side	2.93	2.95	2.64	5 th	8 th (lowest)	8 th

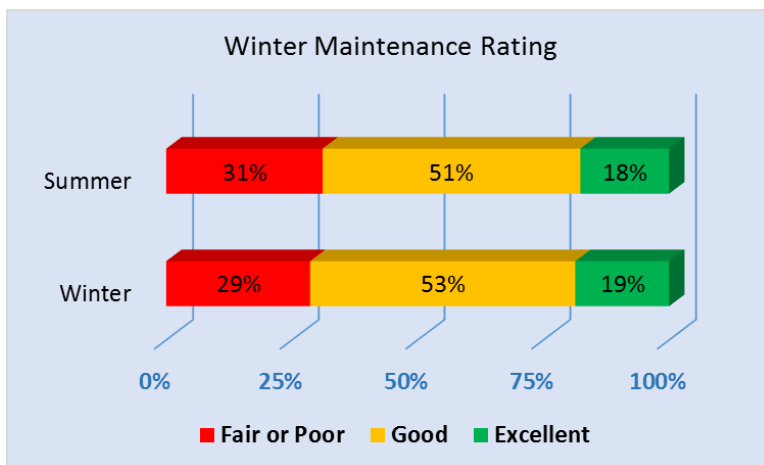
A rough ranking of actual performance compared to desired performance was created using a scale of 1 through 4 for the lowest through highest Rating, Importance, and Priority scores and averaging the results of each core maintenance category. In general, the maintenance areas with the lowest Ratings had higher Importance and Priority ranks.

Winter and Summer Maintenance Comparisons

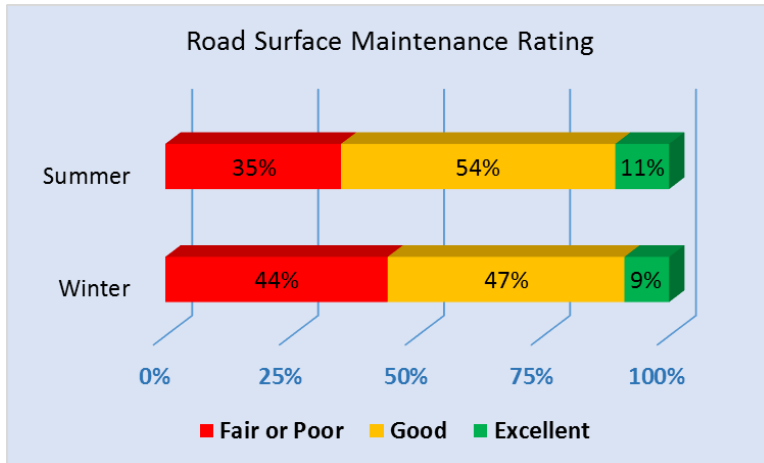
Both Winter and Summer surveys collected over 500 responses from a random sample of MT households with known MT telephone exchanges. The Winter survey asked a somewhat different set of questions than did the Summer survey. The following comparisons are for the questions asked both Winter and Summer.



The distribution of Overall Maintenance Ratings were very similar. Statewide, 70% of Summer or Winter respondents rated Overall Road Maintenance as Excellent or Good.



In the question on Winter Maintenance Rating, the results were also consistent, with 69% and 72% rating Winter Maintenance as Excellent or Good and three-in-ten rating it Fair or Poor.



Road Surface Maintenance received higher Maintenance Ratings in Summer (65% Excellent or Good) compared to Winter (56%).



One-half of respondents to either survey (49% in the Summer and 51% in the Winter) rated Travel Information as Excellent, while the percentage rating it Fair or Poor was 26% in the Winter survey and 21% in the Summer survey.

2014 Road Maintenance Survey Results

This section describes the specific results of the 2014 Winter and Summer Montana Road Maintenance Surveys. Results are grouped by Maintenance area, reporting the results for the Maintenance Rating, Maintenance Importance, and Maintenance Priority. For each Maintenance area, the follow is presented

- The survey questions
- Distribution of answers for each question by survey (Winter vs. Summer).
- A description of statistically-significant differences between the surveys and/or the districts.
- A description of statistically-significant differences involving demographic variables (e.g., education levels or gender).

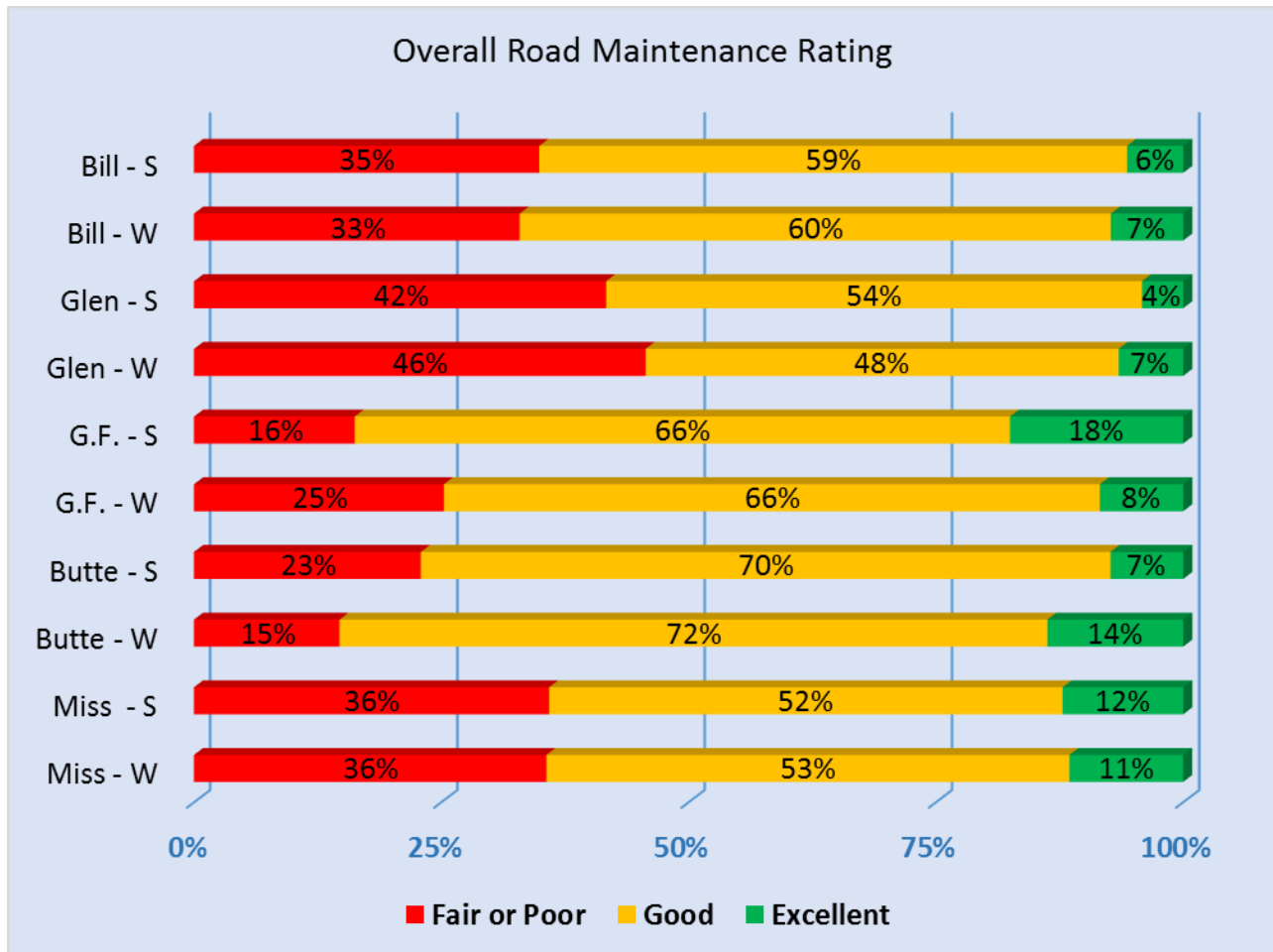
Note: Tables listing all significant differences and Survey scripts for both surveys are presented in the Appendix of this report.

Overall Road System Maintenance

Questions

- How would you rate overall interstate and state highway maintenance in Montana?
- How important would you say interstate and state highway maintenance in Montana is to you?
- 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 Road System Maintenance Rating



In general across the two surveys, Glendive District rated Overall Maintenance the lowest (with Excellent or Good Ratings of 54%-58%) while Butte and Great Falls Districts rated Overall Maintenance the highest (Excellent or Good Ratings of 75%-85%). The distribution of ratings for Billings and Missoula Districts was similar, but with Missoula District receiving around twice the percentage of Excellent Ratings as did Billings (11%-12% compared to 6%-7%).

Significant Differences

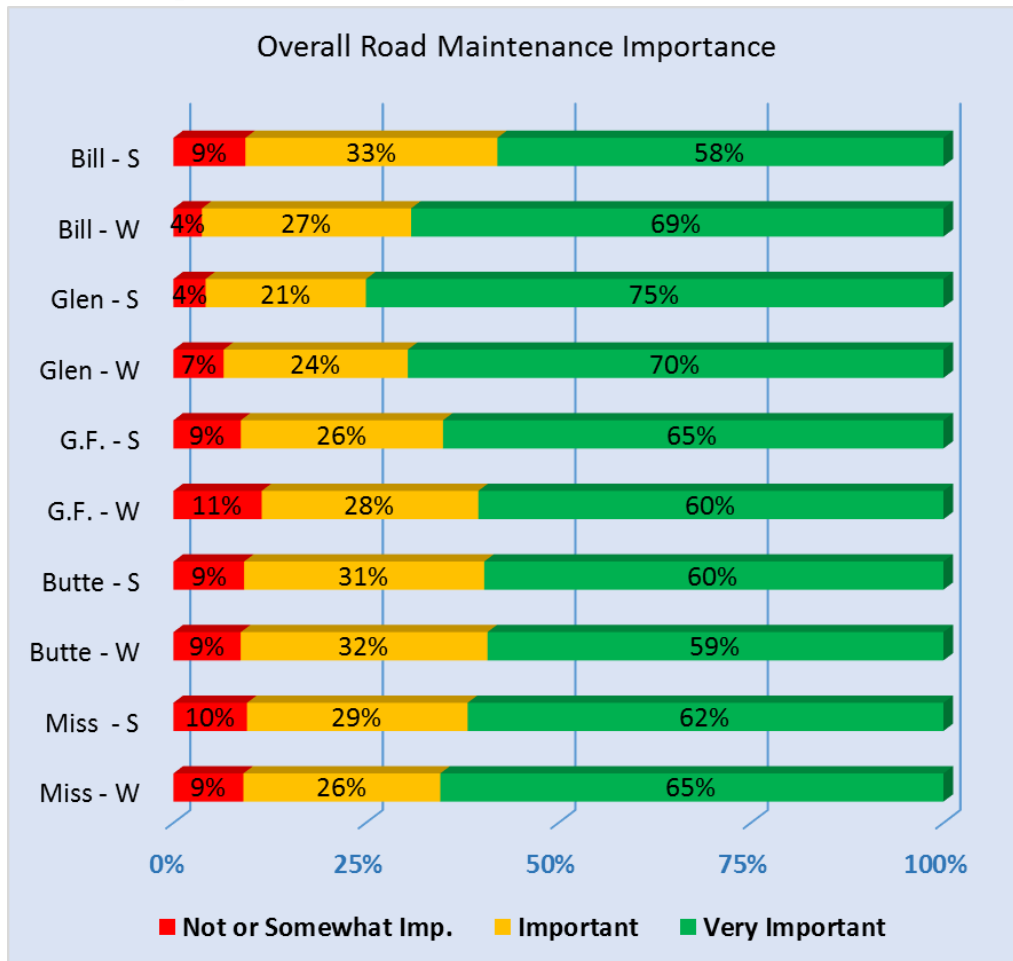
District	Summer Survey	Winter Survey
5. Billings		
4. Glendive		
3. Great Falls	District > Statewide	
2. Butte	District > Statewide	Summer > Winter
1. Missoula		

Ratings in Butte District were significantly higher than state averages in the Summer survey and Butte's Summer ratings were significantly higher than its Winter survey Overall Maintenance Ratings. Great Falls District Summer survey Overall Maintenance ratings were also higher than state averages.

Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban > Rural	Urban > Rural
Age 18-39 vs 40+	40+ > Under 40	
College vs. H.S. Ed	College > H.S.	College > H.S.
Male vs Female		

Urban residents (defined as households reporting to be in one of the seven most-populated counties in Montana) rates Overall Maintenance significantly higher than did Rural residents. In the Summer survey, respondents over age 40 gave significantly higher Overall Maintenance Ratings than did those age 18-39. In both surveys, the average ratings for those reporting having at least 16 years of education was higher than the ratings for respondents with less education.

Overall Importance of Road System Maintenance



There was broad agreement as to the Importance of Overall Road Maintenance. Across the surveys and districts at least 90% of respondents chose that Overall Road Maintenance was Very Important or Important. Glendive District gave the highest percentage of Very Important ratings (70% in Winter and 75% in Summer) while Butte District gave the lowest (59% and 60%).

Significant Differences

District	Summer Survey	Winter Survey
5. Billings		Winter > Summer
4. Glendive		
3. Great Falls		
2. Butte		
1. Missoula		

Billings District reported significantly higher Importance levels in the Winter survey compared to the Summer survey.

Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban < Rural	
Age 18-39 vs 40+	40+ > Under 40	
College vs. H.S. Ed	College > H.S.	
Male vs Female		

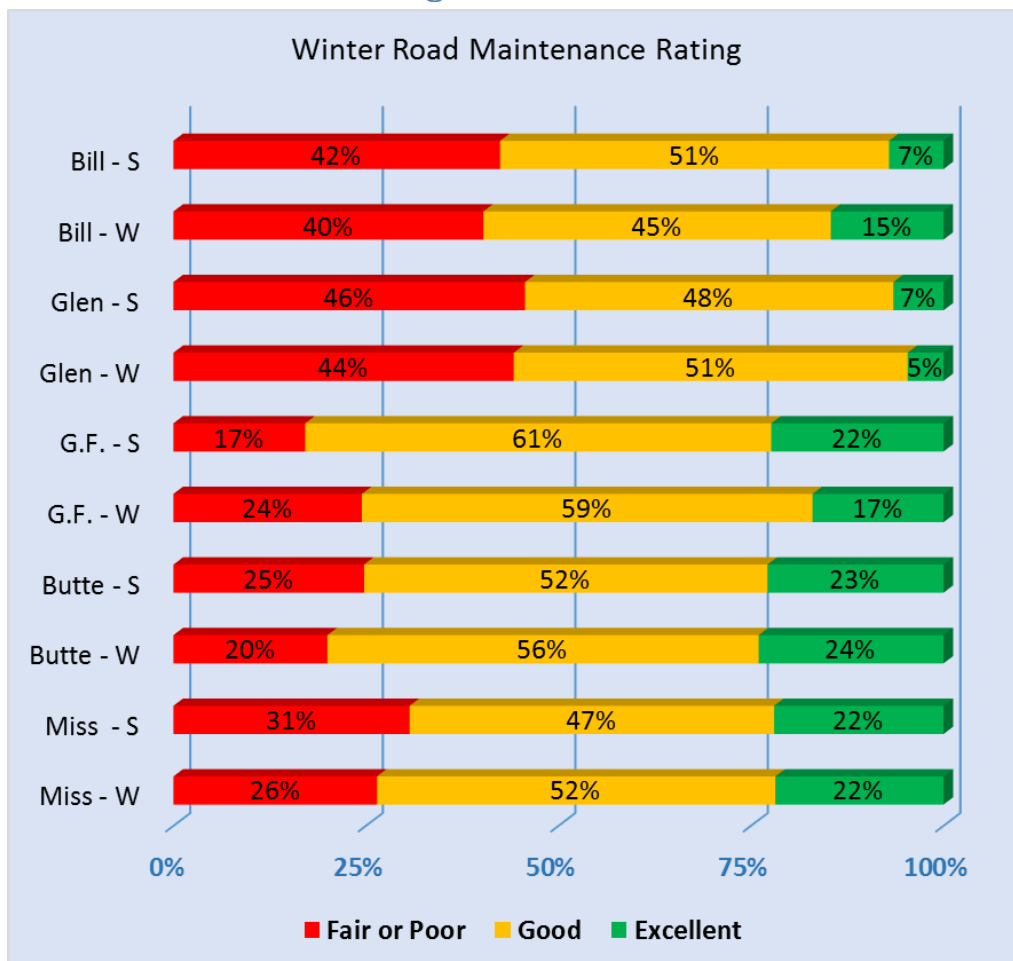
Rural residents, those over age 40, and those with 16 or more years of education placed higher importance than their respective urban, younger, and less-educated counterparts.

Winter Maintenance

Questions

- *Thinking about this last winter, 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?*
- *Thinking about this past winter, 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?*

Winter Maintenance Rating



By district there was no statistically-significant difference between a district’s Winter Road Maintenance Rating and the district’s Summer rating of Winter Road Maintenance. Combined ratings of Excellent or Good in the Winter survey ranged from 56% to 60% for Glendive/Billings to 73% to 80% for Great Falls and Butte Districts.

Significant Differences

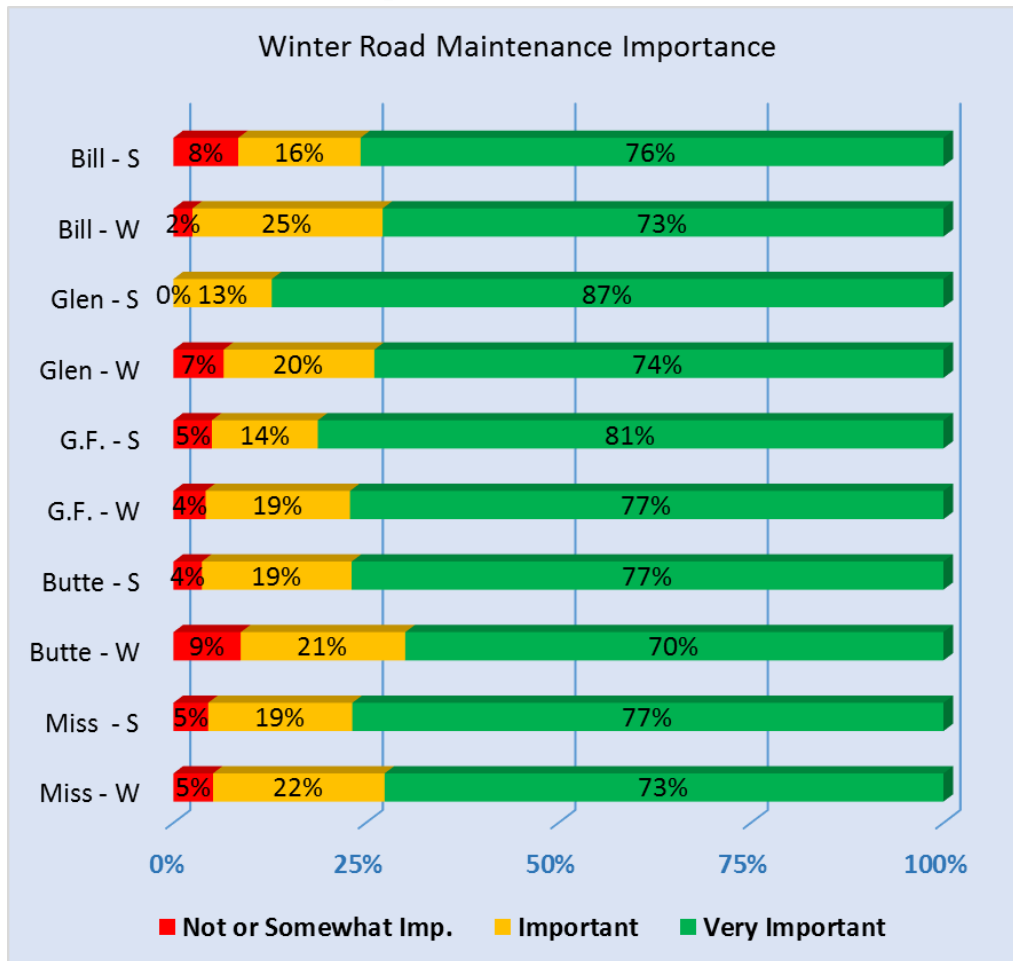
District	Summer Survey	Winter Survey
5. Billings		
4. Glendive	District < Statewide	
3. Great Falls	District > Statewide	
2. Butte		
1. Missoula		

By season, Glendive’s Summer rating was significantly lower than statewide averages and Great Falls District’s Summer rating was significantly higher than the statewide averages.

Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban > Rural	
Age 18-39 vs 40+		
College vs. H.S. Ed	College > H.S.	College > H.S.
Male vs Female	Male > Female	Male > Female

In the Summer survey, Urban residents rated Winter Maintenance higher than Rural counterparts. In both surveys, respondents with less than 16 years of education rated Winter Maintenance higher than those with 16 or more years, and men tended towards higher ratings than women.

Winter Maintenance Importance



Winter Road Maintenance was viewed as Very Important or Important by over 90% of respondents in each district in both the Winter and Summer surveys. Districts tended to rate Winter Maintenance as more important when asked in the Winter survey compared to their average responses in the Summer survey.

Significant Differences

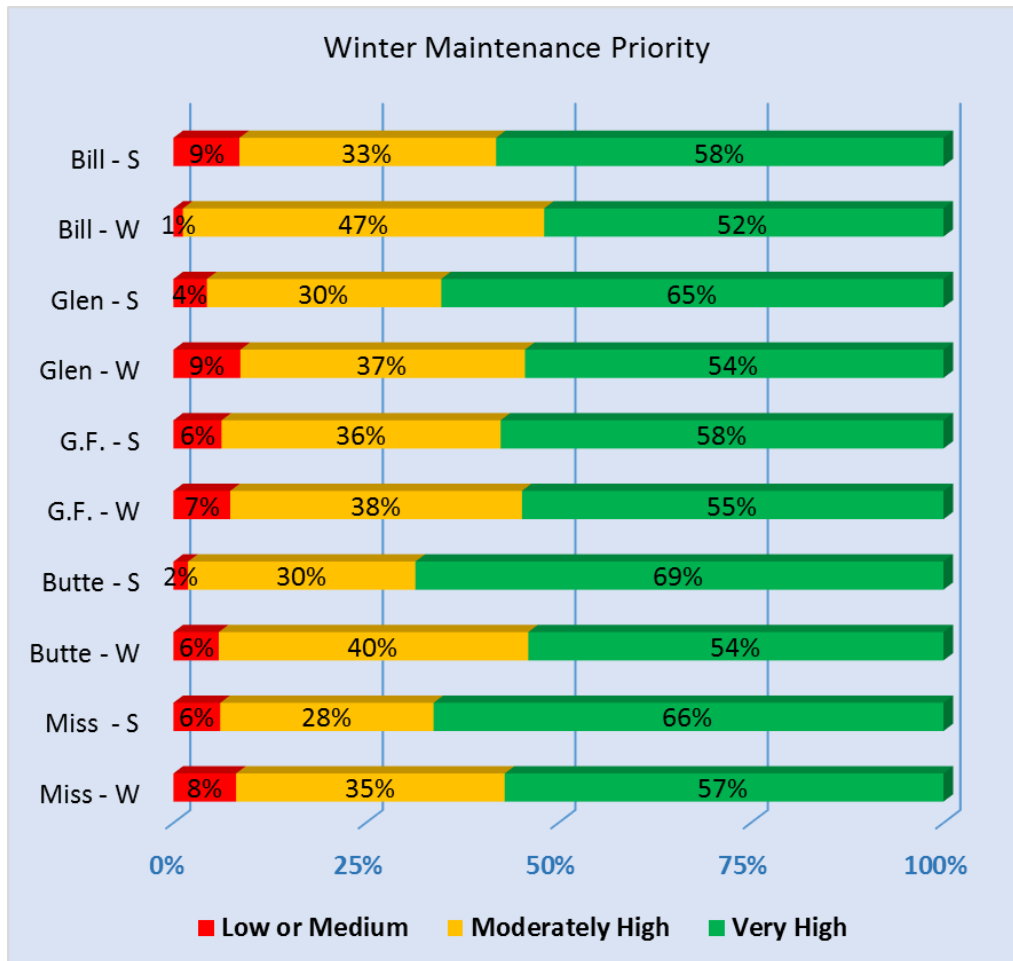
District	Summer Survey	Winter Survey
5. Billings	District < Statewide	District < Statewide Winter > Summer
4. Glendive	District < Statewide	
3. Great Falls	District > Statewide Summer > Winter	
2. Butte		
1. Missoula		
Statewide		Winter > Summer

In the Summer survey, 99% of Glendive District responses rated Winter Road Maintenance district as Very Important or Important. This was significantly higher than the averages for the rest of the state.

Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban > Rural	
Age 18-39 vs 40+		
College vs. H.S. Ed	College > H.S.	College > H.S.
Male vs Female	Male > Female	Male > Female

Demographic preferences concerning Winter Road Maintenance were similar to those for Winter Road Maintenance Ratings. In the Summer survey, Urban residents rated Winter Maintenance as more important than Rural counterparts. In both surveys, respondents with 16 or more years of education rated Winter Maintenance at higher importance levels than those with less education and men tended towards higher importance ratings than women.

Winter Maintenance Priority



At the state level, Winter Maintenance had higher Priority during the Summer survey than during the Winter survey. At the maintenance district level, in each district, during both surveys, over 90% of respondents gave Winter maintenance a Very High or Moderately High Priority

Significant Differences

District	Summer Survey	Winter Survey
5. Billings	Summer > Winter	
4. Glendive		
3. Great Falls		
2. Butte	Summer > Winter	
1. Missoula	Summer > Winter	
Statewide	Summer > Winter	

In Missoula, Butte, and Billings Districts, Summer priorities were significantly higher than each district's Winter averages.

Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban < Rural	
Age 18-39 vs 40+		
College vs. H.S. Ed	College > H.S.	College > H.S.
Male vs Female		Male < Female

In the Summer survey, Rural residents reported higher Winter Maintenance priorities than Urban residents. In the Winter survey, women gave higher Winter Maintenance priorities than men. In both surveys, College Educated residents expressed higher priorities for Winter Maintenance than did those with less education.

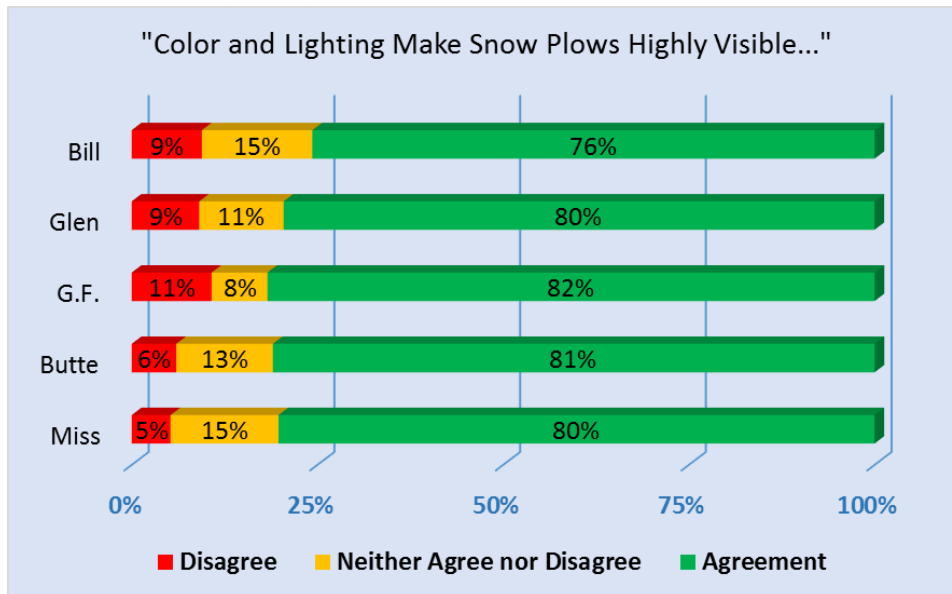
New Winter Road Maintenance Questions

The following questions were new to the 2014 Road Maintenance Survey. The questions on visibility of snow plows and frequency of changing travel plans due to winter road conditions were only asked on the Winter survey. The question on speed of snow removal was asked in both the Winter and Summer surveys.

Questions

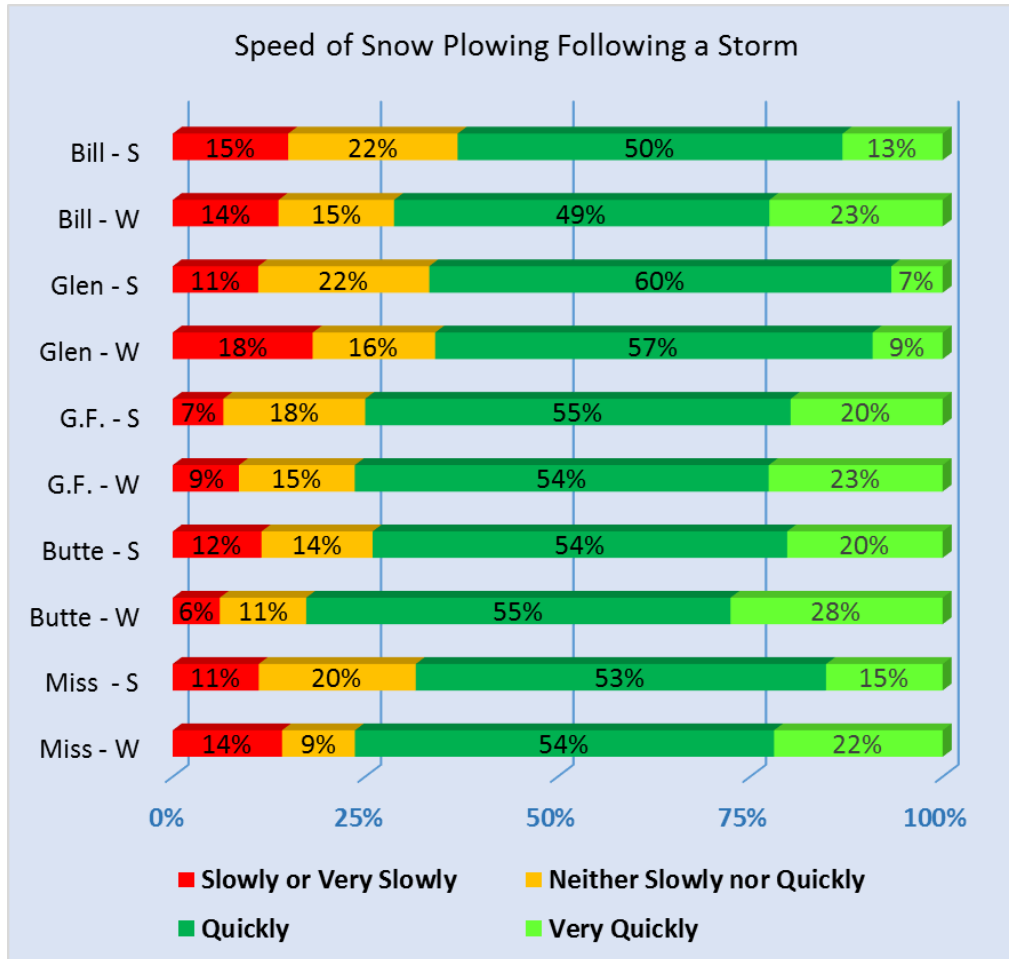
- *Thinking about snow removal this last winter, please indicate your level of agreement with the following statement. The color and the lighting of Montana State snow plows make them highly visible during winter snow removal operations.*
- *How quickly do you feel the roads important to your travel are maintained after a snow storm?*
- *How frequently did winter road conditions cause you to cancel your travel plans?*

Snow Plow Lighting and Visibility



Three-quarters or more of respondents agreed that the color and lighting of snow plows made them highly visible, and the percentage who either disagreed or neither agreed nor disagreed ranged from 19% to 24%.

Speed of Snow Removal



Across both Winter and Summer surveys the percentage of respondents saying their important roads were maintained Very Quickly following a snow storm ranged from 7% in Glendive (Summer survey) to 28% in Butte (Winter survey). Combining Very Quickly and Quickly, percentages ranged from 63% in Billings (Summer) to 83% in Butte (Winter).

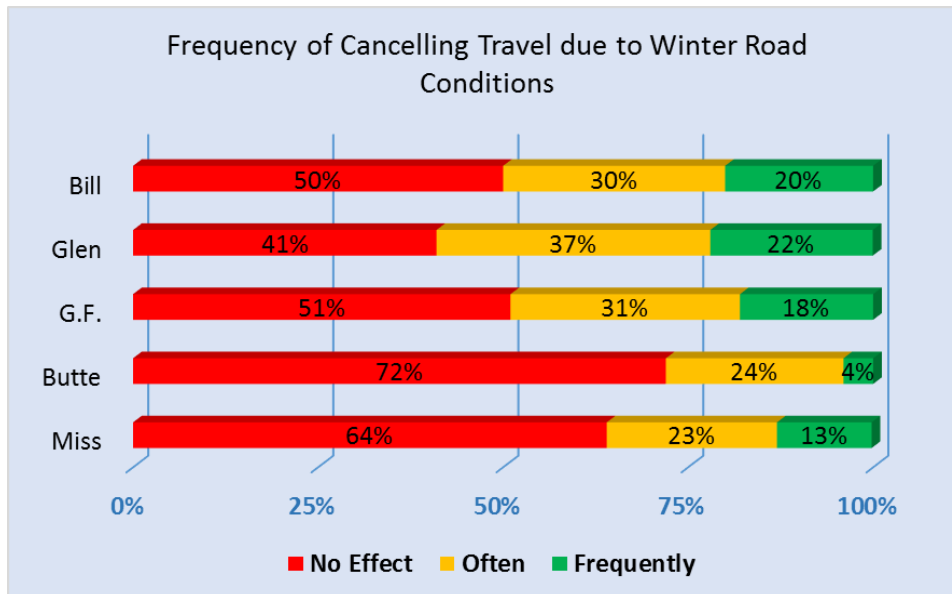
At the other end of the range, the largest percentages of Slowly or Very Slowly ratings came from Glendive (18% in the Winter survey), followed by Billings (15% in Summer and 14% in Winter) and Missoula (14% in the Winter survey).

Significant Differences

District	Summer Survey	Winter Survey
5. Billings		
4. Glendive		
3. Great Falls	District > Statewide	
2. Butte	Summer > Winter	
1. Missoula		
Statewide		

Respondents from Great Falls District reported significantly better ratings than the state as a whole, and Butte District residents surveyed in the Summer gave significantly better ratings than Butte District residents asked in the Winter survey.

Cancellation of Travel Plans



Nearly six-in-ten Glendive respondents (59%) reported Often or Frequently cancelling travel plans due to winter road conditions, and in Billings and Great Falls Districts one-half of respondents cited Often or Frequent cancellations (50% and 49% respectively). Cancellations were less of an issue in western Montana, with Butte District reporting Often or Frequent cancellations at a significantly lower rate than the Glendive District (28% compared to 59%)

Significant Differences

District	Summer Survey	Winter Survey
5. Billings		
4. Glendive		
3. Great Falls		
2. Butte		District < Statewide
1. Missoula		
Statewide		

Respondents from Butte District reported significantly fewer travel cancellations than did the overall state.

Demographic	Summer Survey	Winter Survey
Urban vs Rural		Urban < Rural
Age 18-39 vs 40+		
College vs. H.S. Ed		College < H.S.
Male vs Female		Male < Female

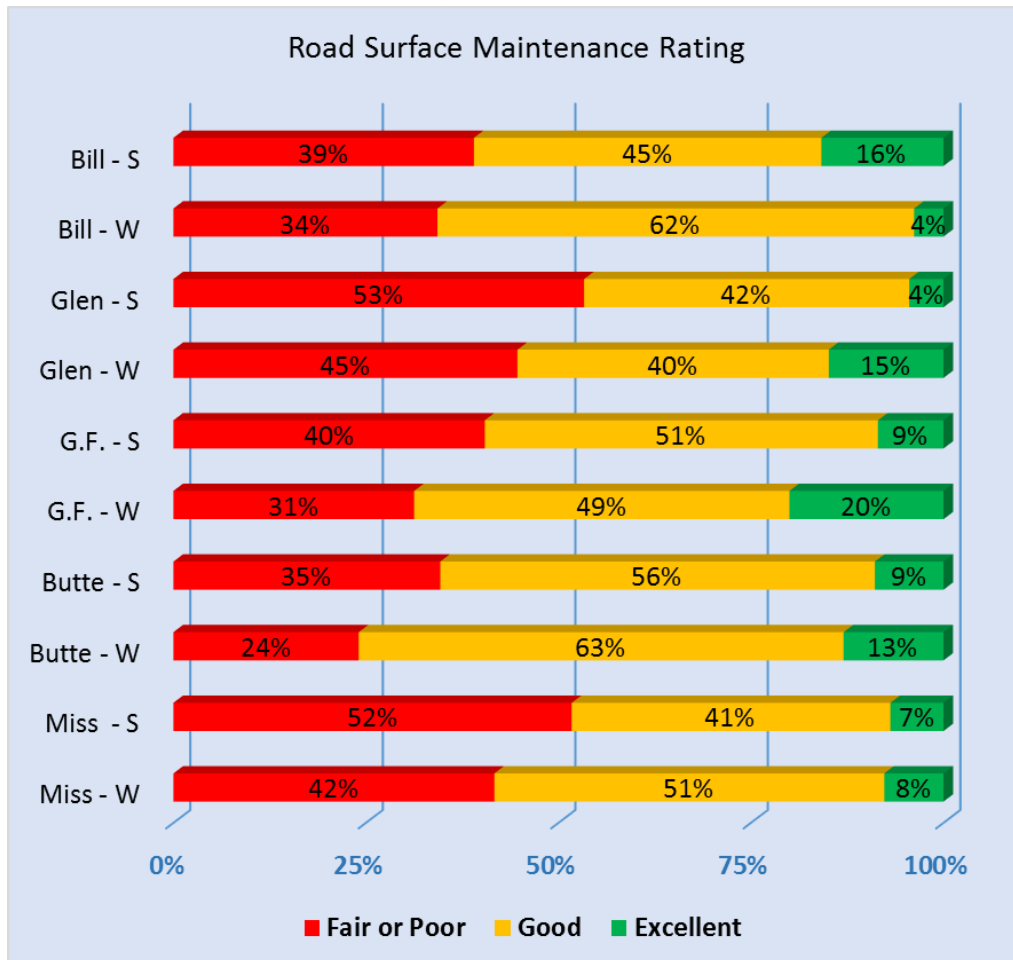
Higher rates of cancellations were reported by Rural residents, women, and those with less than 16 years of education than did their Urban, male, and those with 16 or more years of education counterparts.

Road Surface Maintenance

Questions

- Overall, 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 Road Surface Rating



In the Summer survey, districts gave Road Surface Maintenance a lower rating than in the Winter survey, with the percentage of Excellent or Good ratings declining by between five and 10 percentage points. This difference was statistically significant. Butte District reported the largest percentage of Excellent or Good ratings (76%) in the Winter survey while Glendive and Missoula Districts reported the lowest (46% and 48% respectively).

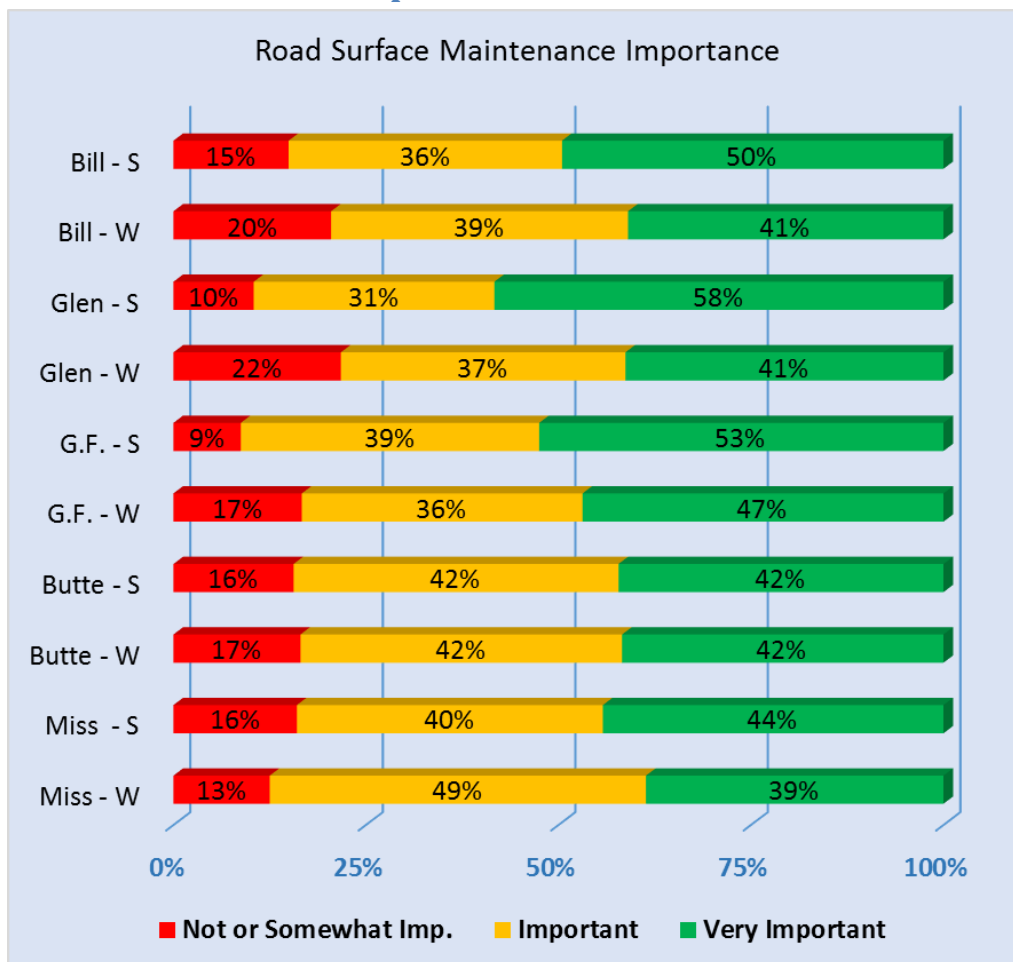
Significant Differences

District	Summer Survey	Winter Survey
5. Billings		
4. Glendive		
3. Great Falls		
2. Butte		
1. Missoula		
Statewide	Summer < Winter	

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+		40+ > Age 18-39
College vs. H.S. Ed	College > H.S.	College > H.S.
Male vs Female	Male > Female	Male > Female

In the Winter survey, those over 40 offered significantly higher Road Surface Maintenance ratings, while in both Winter and Summer surveys residents with 16+ years of education, and men, gave significantly higher ratings than did women and those reporting lower levels of education.

Overall Road Surface Importance



The percentage of respondents in each district saying Road Surface Maintenance was Very Important ranged from 39% in Missoula District (Winter survey) to 58% in the Summer survey of Glendive District residents. Over three-quarters of respondents in each district in both surveys said Road Surface Maintenance was either Important or Very Important.

Significant Differences

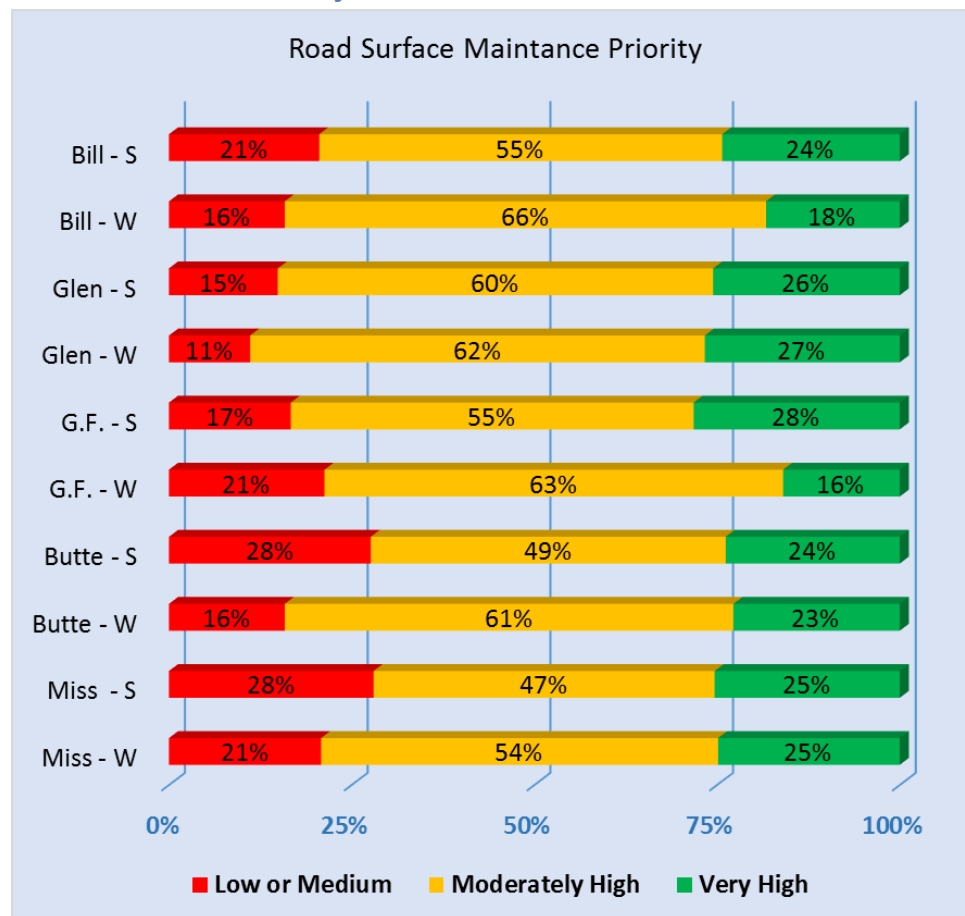
District	Summer Survey	Winter Survey
5. Billings		Winter < Summer
4. Glendive		Winter < Summer
3. Great Falls		Winter < Summer
2. Butte		
1. Missoula		Winter > Summer
Statewide		

Summer survey responses were significantly higher than their Winter survey counterparts in Billings, Glendive, and Great Falls Districts. Summer ratings of Road Surface Maintenance Importance were significantly lower than their Winter counterparts in Missoula District.

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed		College > H.S.
Male vs Female		

Looking at significant demographic differences, in the Summer survey those over age 40 gave higher importance ratings and in the Winter survey residents with 16+ years of education offered higher importance ratings than did those with lower levels of education.

Road Surface Priority



At the state level and in four of the five districts, the Winter survey produced significantly higher priority ratings for Road Surface Maintenance than did the same geographic areas in the Summer survey.

Glendive District reported the highest level or Very or Moderately High Priority (89%) while Butte and Missoula Districts reported the lowest (72% or each) in their Summer survey results.

Significant Differences

District	Summer Survey	Winter Survey
5. Billings		Winter > Summer
4. Glendive		
3. Great Falls		Winter > Summer
2. Butte		Winter > Summer
1. Missoula		Winter > Summer
Statewide		Winter > Summer

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ > Age 18-39	40+ > Age 18-39
College vs. H.S. Ed	College < H.S.	College < H.S.
Male vs Female		

In both Winter and Summer surveys, older resident (age 40+) and those with lower levels of education gave lower priorities for Winter Road Maintenance, and these differences were statistically-significant.

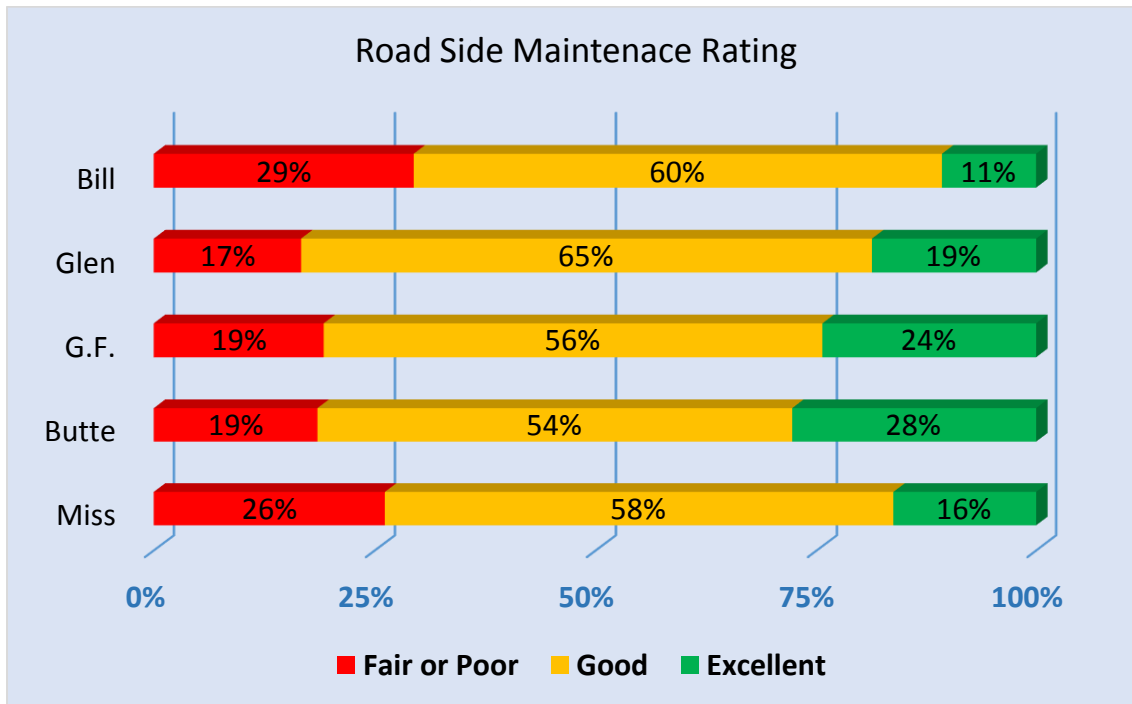
In 2014 a smaller percentage of respondents gave Road Surface Maintenance a Very High priority compared to 2012 (25% vs 28%) and a larger percentage responded that it had a Low or Medium priority (23% in 2014 compared to 18% in 2012). This difference was statistically significant.

Roadside Maintenance

Questions

- How would you rate the management of interstate and state highways 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?

Roadside Maintenance Rating



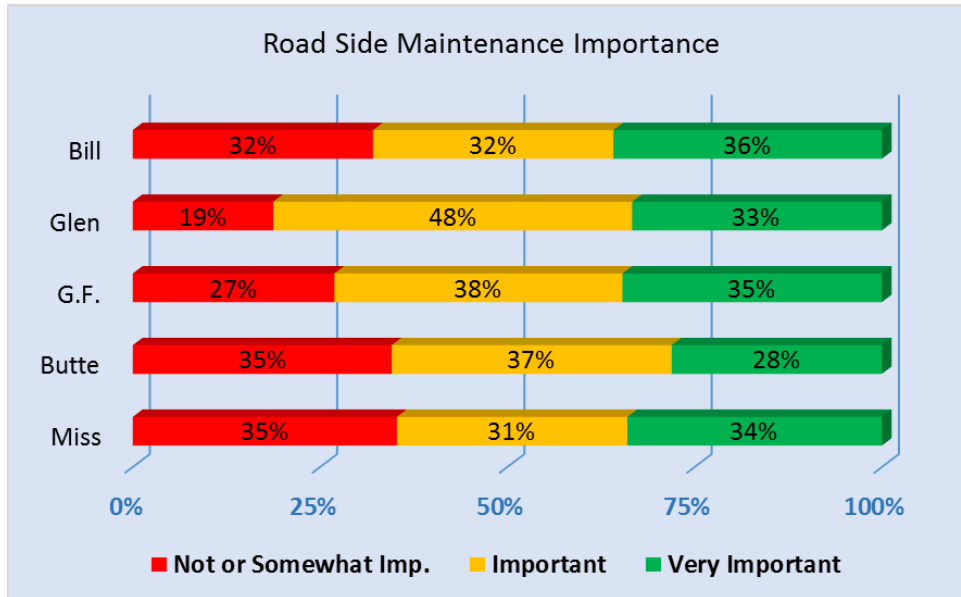
The percentage of respondents giving Road Side Maintenance an Excellent or Good rating ranged from 71% in Billings District to 83% in Glendive District. Billings District reported the highest percentage of Fair or Poor ratings (29%) followed by Missoula (26%).

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ < Age 18-39	
College vs. H.S. Ed	College < H.S.	
Male vs Female		

Younger residents and those with less than 16 years of education reported significantly higher Road Side Maintenance Ratings than did those over 40 and/or those with 16 or more years of education.

Roadside Maintenance Importance



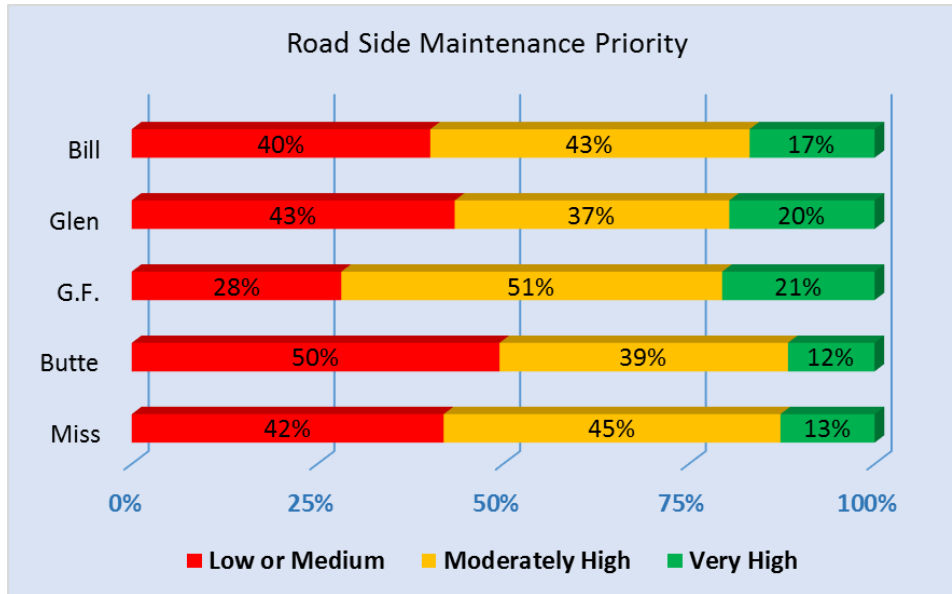
Sixty-five percent (65%) or more of respondents in each district said Road Side Maintenance was Important or Very Important, and in Glendive District this value is significantly higher (81%).

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban < Rural	
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed	College > H.S.	
Male vs Female		

Rural residents reported significantly higher Roadside Importance levels than did Urban residents as did older respondents compared to younger and college graduates compared to those with less-than a four-year college education.

Roadside Maintenance Priority



The percentage of respondents who gave Roadside Maintenance a Very High Priority ranged from 12-13% in Butte and Missoula Districts to 20-21% in Glendive and Great Falls Districts respectively. One-half of Butte District respondents have Roadside Maintenance a Low or Medium Priority, while for Billings, Glendive, and Missoula Districts this value was 40-42%. Great Falls District reported the lowest percentage of Low or Medium Priority at 28%.

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed	College < H.S.	
Male vs Female	Male < Female	

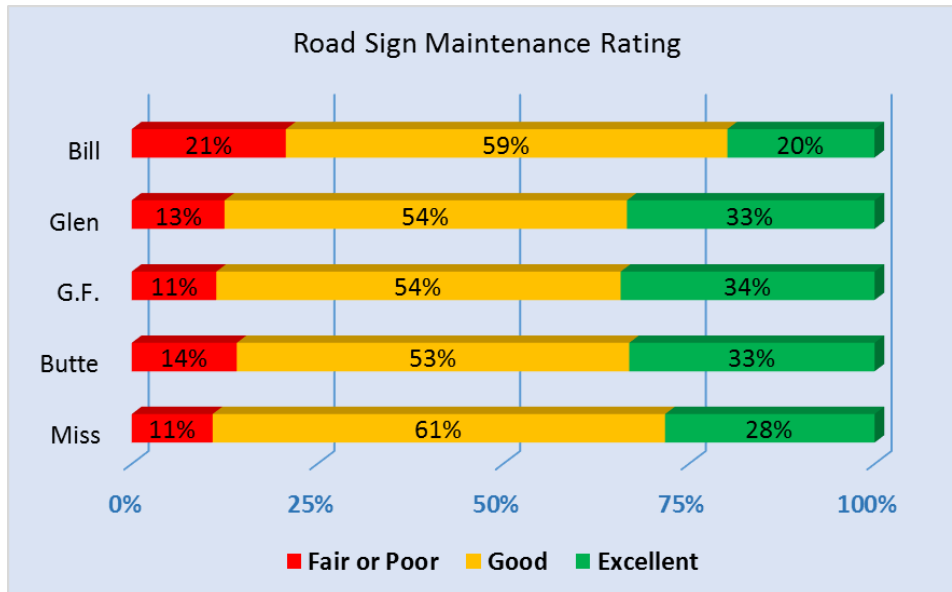
Respondents age 40 or older gave Road Side Maintenance significantly higher priorities than did those age 18-39. Those with less than 16 years of education reported higher priority levels than did those with 16+ years of education. Women reported significantly higher priority levels than did men.

Road Signage Maintenance

Questions

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

Road Signage Maintenance Rating



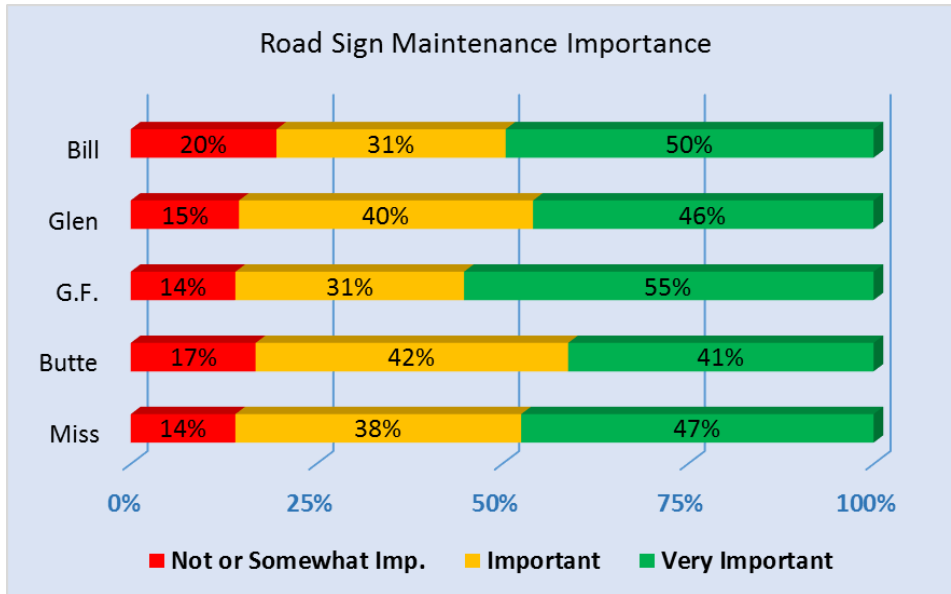
Billings District reported the lowest percentages of Excellent Road Sign Maintenance Ratings at 20% as well as combined Excellent or Good Ratings at 79%. This difference was significantly below the overall state averages for this rating. All of the other districts reported significantly higher percentages of Excellent Ratings (28-34%) and lower percentages of Fair or Poor Ratings (11-14%).

The 2014 distribution of ratings had significantly-larger percentages of Excellent (29% vs 27%) and Fair/Poor ratings (14% vs 11%) compared to 2012 statewide averages.

Significant Differences

District	Summer Survey	Winter Survey
5. Billings	District < Statewide	
4. Glendive		
3. Great Falls		
2. Butte		
1. Missoula		
Statewide		

Road Signage Maintenance Importance



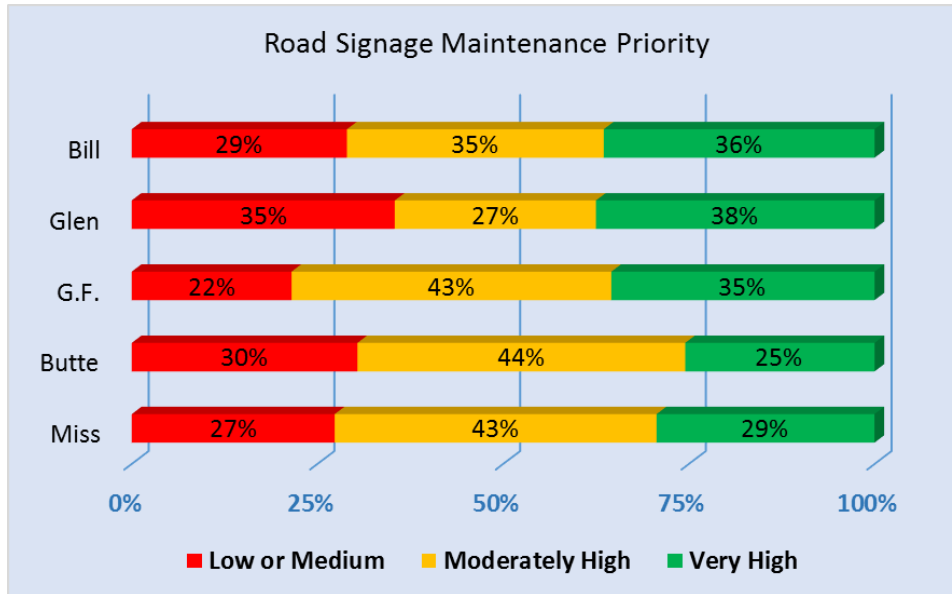
At least 80% of respondents in each district said Road Signage Maintenance was Important or Very Important.

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+		
College vs. H.S. Ed	College < H.S.	
Male vs Female		

Residents with less than 16 years of education reported significantly higher Importance for Road Signage Maintenance than did those with 16+ years.

Road Signage Maintenance Priority



The percentage of respondents giving Road Signage Maintenance Very High Priority showed a Western- vs. Eastern Montana split, with percentages of 25-29% for Butte and Missoula Districts to 35-38% for Great Falls, Billings, and Glendive Districts. In each district at least 65% rated Road Signage Maintenance a Moderately or Very High Priority, with Great Falls District at the top with 78%.

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban < Rural	
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed	College > H.S.	
Male vs Female	Male < Female	

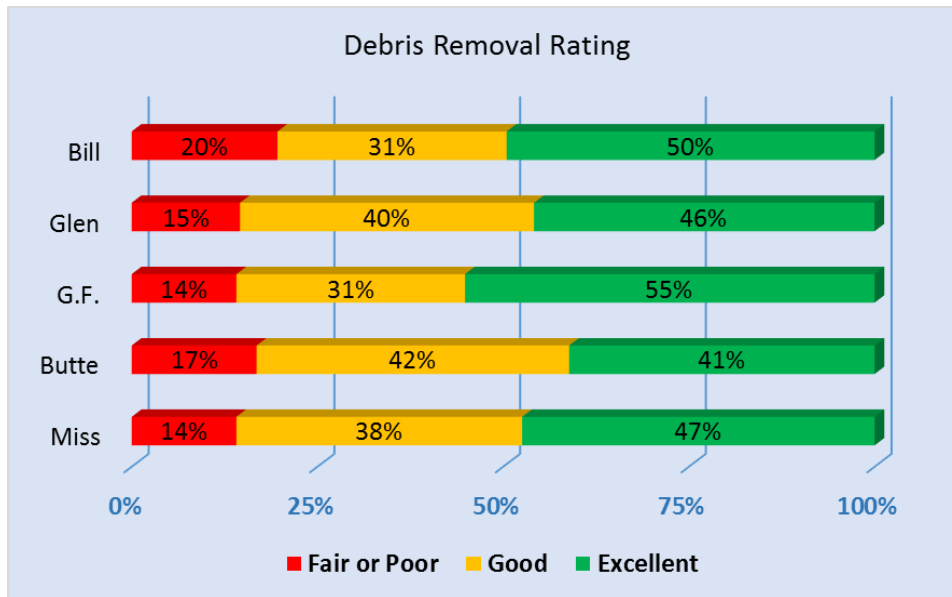
Rural residents, those age 40 or over, respondents with 16+ years of education, and women reported significantly higher priorities for Road Signage Maintenance than did their Urban, younger, less-educated and male counterparts.

Debris Removal Maintenance

Questions

- How would you rate the removal of debris such as litter, road kill, and fallen rocks on 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?

Debris Removal Maintenance Rating



District ratings of Debris Removal ranged from 41% Excellent in Butte District to 55% in Great Falls District. Combined Good or Excellent ratings were 80% or better in all districts.

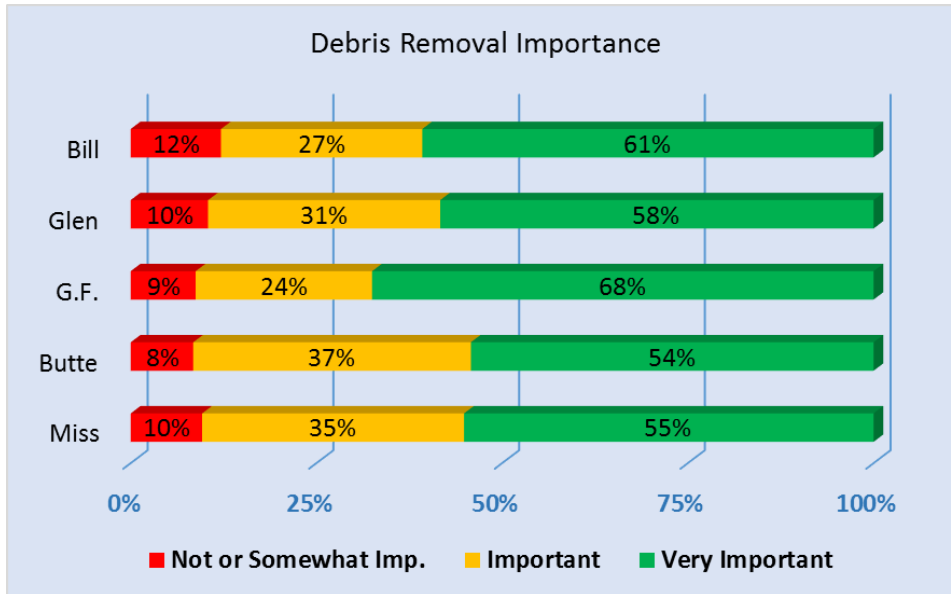
Compared to 2012, in 2014 a significantly smaller percentage of respondents rated Debris Removal Maintenance as Poor/Fair and Excellent and a larger percentage rated it as good.

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+		
College vs. H.S. Ed	College > H.S.	
Male vs Female	Male > Female	

Residents with 16+ years of education rated Debris Removal Maintenance significantly higher than did those with less than 16 years of education, as did men compared to women.

Debris Removal Maintenance Importance



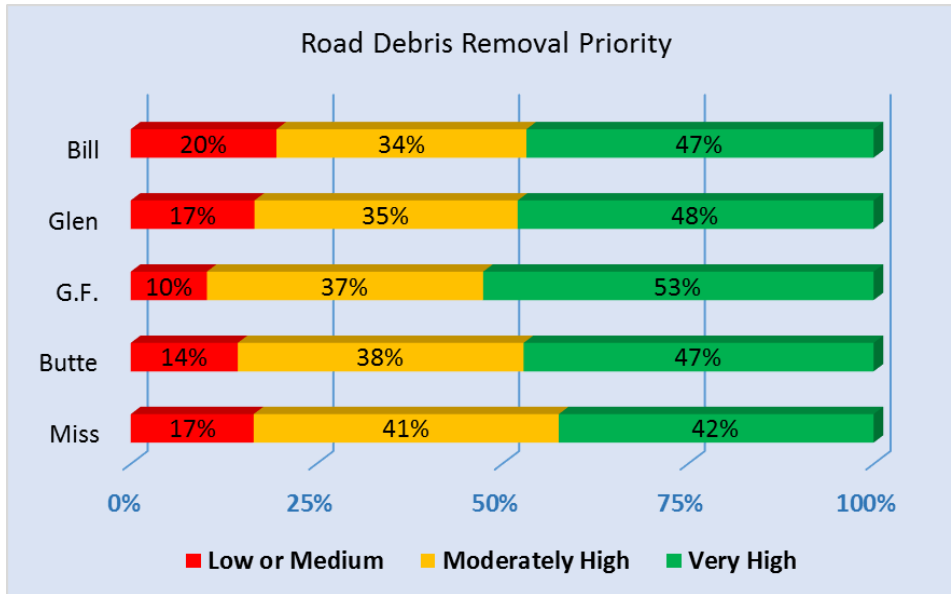
Debris Removal was viewed as Very Important in 54%-55% of Butte and Missoula District respondents and 68% of those living in the Great Falls District. More generally, when the categories of Important and Very Important are combined, agreement of Debris Removal Importance is close to nine-out-of-ten (88%-92%) in all districts.

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed		
Male vs Female		

Those age 40 and older offered significantly higher levels of importance to Debris Removal Maintenance compared to younger residents.

Debris Removal Maintenance Priority



Eighty to ninety percent (80%-90%) of respondents in each district gave Road Debris Removal a Moderately or Very High Priority.

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed	College < H.S.	
Male vs Female		

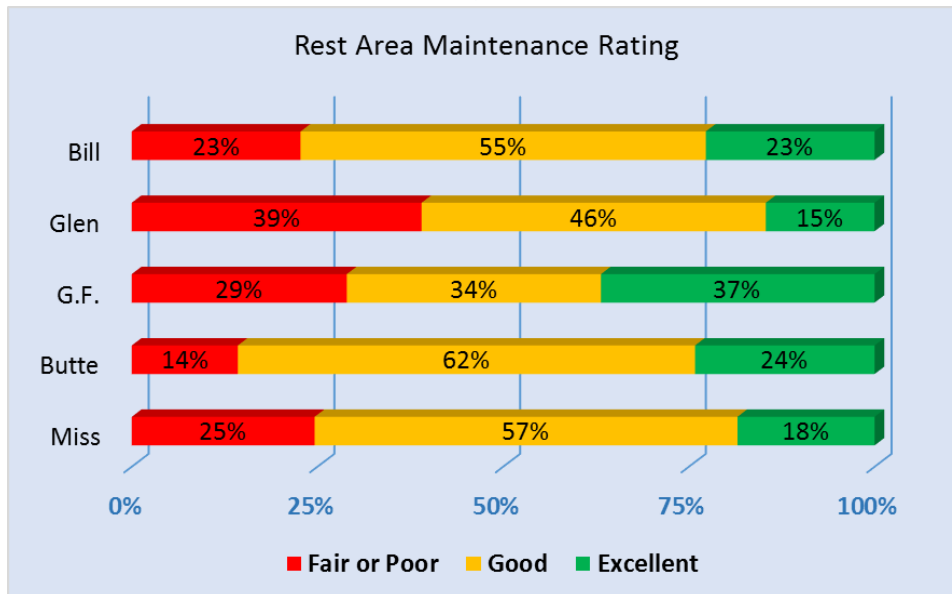
Older residents and those with less than 16 years of education offered significantly higher priority scores than did their younger and more-educated counterparts.

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?

Rest Area Maintenance Rating



There was significant variability in the district-level ratings for Rest Area Maintenance. Excellent Ratings represented 15% of Glendive District responses and 37% of Great Falls District. Nearly Four-in-ten (39%) Glendive District respondents rated Rest Area Maintenance as Fair or Poor, while for Butte District these low ratings were far less frequent (14%).

Significant Differences

District	Summer Survey	Winter Survey
5. Billings		
4. Glendive	District < Statewide	
3. Great Falls	District > Statewide	
2. Butte		
1. Missoula		
Statewide		

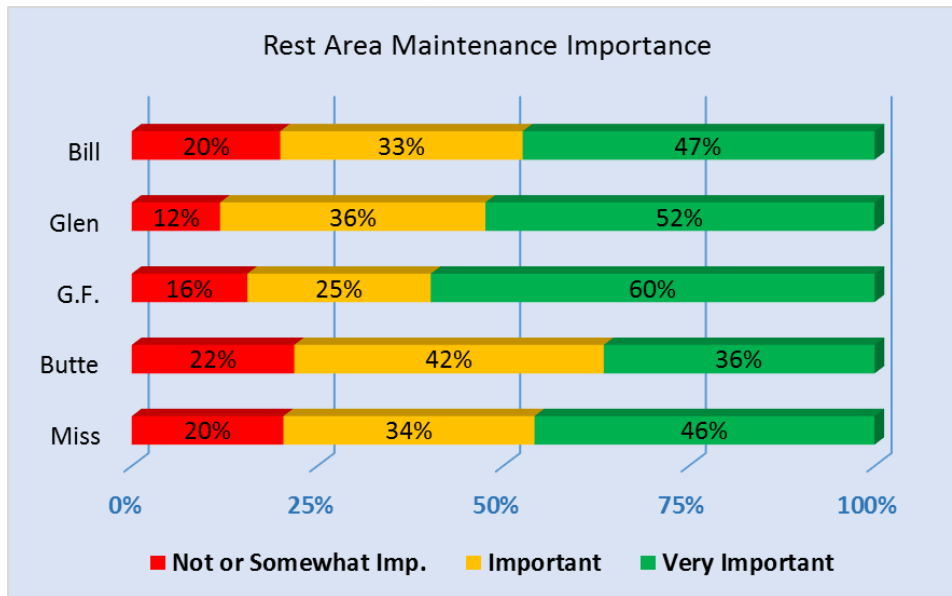
The Great Falls District maintenance ratings were significantly higher than the statewide averages, while the Glendive Districts ratings were significantly lower than statewide averages.

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed	College < H.S.	
Male vs Female		

Older residents (age 40+) reported significantly higher ratings than did younger residents, and those with less than 16 years of education rated Rest Area Maintenance higher than did those with higher levels of education.

Compared to 2012, a larger percentage of respondents rated rest area maintenance as Fair or Poor (19% in 2012 and 24% in 2014) and this difference was statistically significant.

Rest Area Maintenance Importance



The percentage of respondents saying Rest Area Maintenance was Very Important ranged from 36% in Butte District to 60% in Great Falls District. The percentage giving Rest Area Maintenance a Not Important or Somewhat Important rating was highest at 20%-22% for Missoula, Billings, and Butte Districts, while in Glendive District only 12% of responses gave it low importance.

Significant Differences

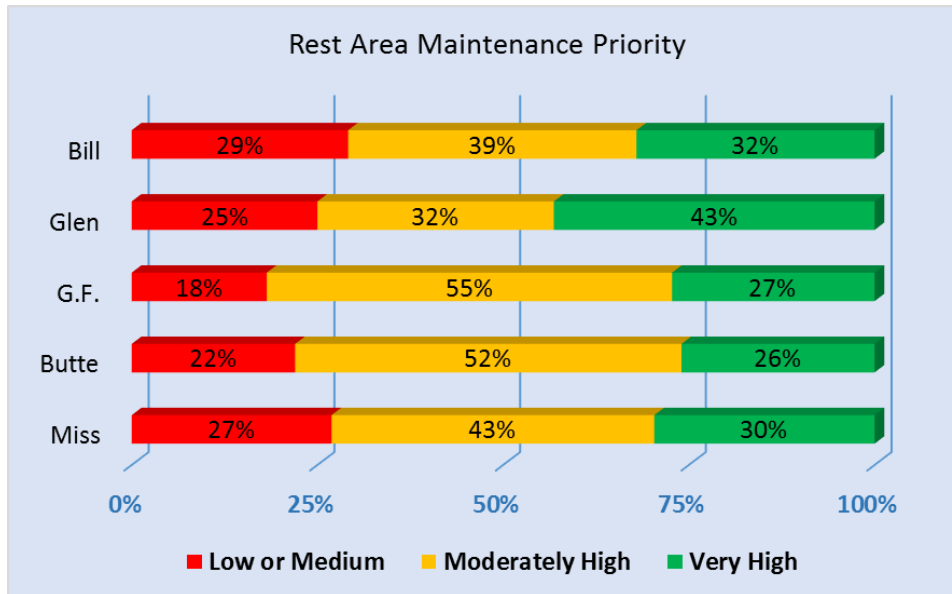
District	Summer Survey	Winter Survey
5. Billings		
4. Glendive		
3. Great Falls	District > Statewide	
2. Butte	District < Statewide	
1. Missoula		
Statewide		

The Great Falls District Rest Area Maintenance Importance scores were significantly higher than the statewide averages, while the Glendive District's Importance scores were significantly lower than statewide averages.

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed	College > H.S.	
Male vs Female	Male < Female	

Older respondents (age 40 or over), residents with at least 16 years of education, and women reported significantly higher Rest Area Maintenance Importance scores than did their counterparts (younger, lower-levels of education, and men, respectively).

Rest Area Maintenance Priority



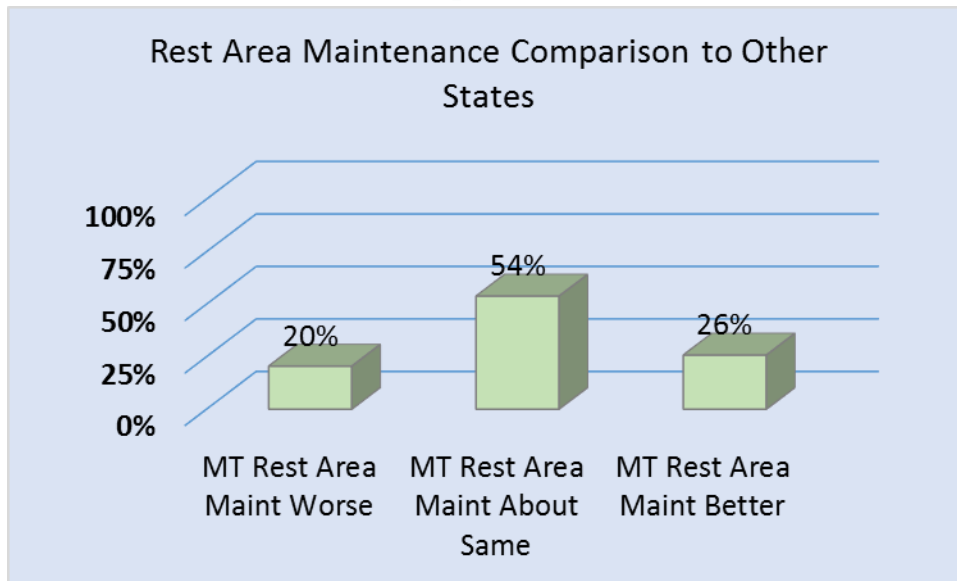
The percentage of respondents giving Rest Area Maintenance a Low or Medium Priority ranged from 18% in Great Falls to 29% in Billings District, while the percentage saying it has Very High Priority was between 26%-37% for Butte and Great Falls Districts to 43% for Glendive District.

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban < Rural	
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed	College < H.S.	
Male vs Female		

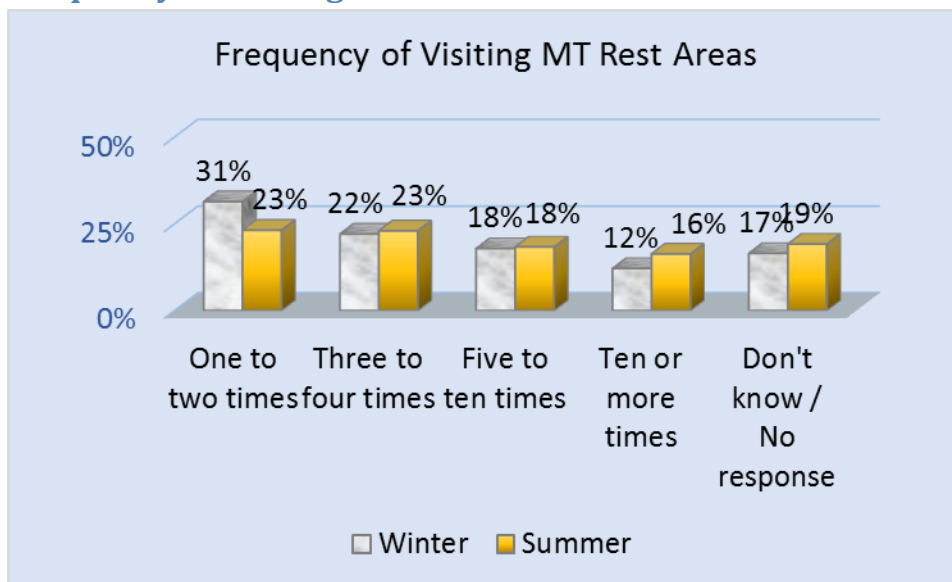
Priority scores for Rest Area Maintenance were significantly higher for Rural residents compared to Urban; Age 40+ compared to Age 18-39, and respondents with less than 16 years of education compared to those with 16+ years.

Rest Area Maintenance Comparison to Other States



Eighty percent (80%) of respondents reported that MT Rest Area Maintenance was ‘about the same’ or ‘better than’ Maintenance of rest areas in other states. Only 20% reported that MT Rest Area Maintenance was worse than that in other states.

Frequency of Visiting MT Rest Areas



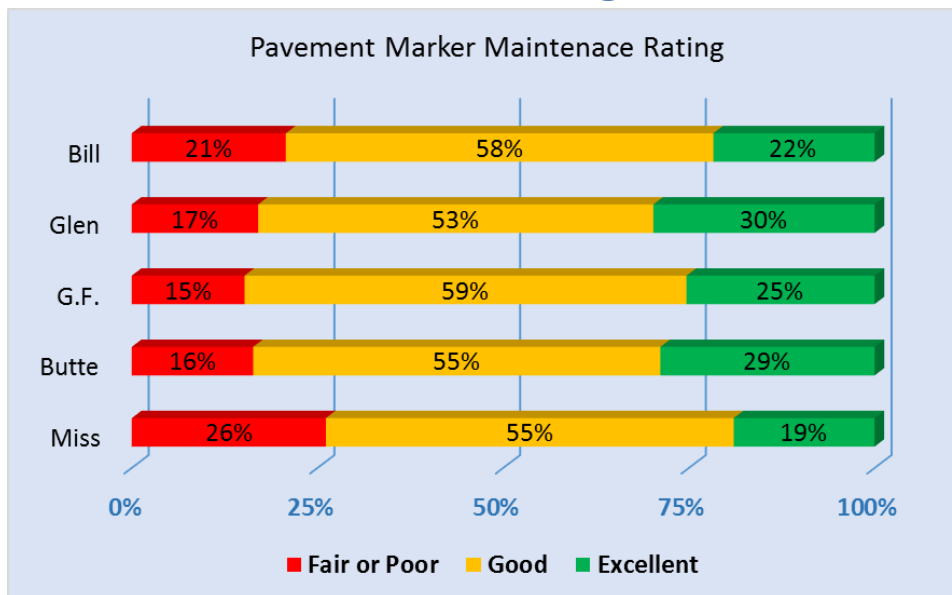
Over 80% of respondents in either Winter or Summer Survey reported visiting a MT Rest Area at least once in the previous year. Fifty-three percent (53%) of Winter survey respondents and 46% of Summer survey respondents reported four or fewer visits, while around one-third (30% Winter and 34% Summer) said they had made five or more visits.

Pavement Marker Maintenance

Questions

- 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.
- 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?

Pavement Marker Maintenance Rating



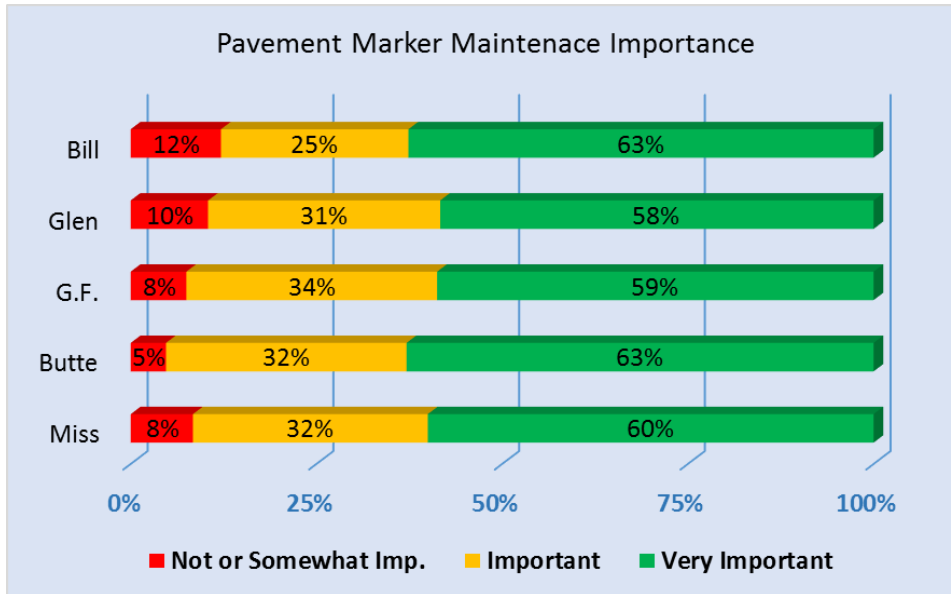
The percentage of respondents giving Pavement Marker Maintenance an Excellent Rating ranged from 15% in Missoula District to 29%-30% in Butte and Glendive Districts respectively. Missoula District reported the higher percentage of Fair or Poor Ratings (26%), while Great Falls, Butte, and Glendive Districts had significantly-lower percentages of low ratings (15%-17%).

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+		
College vs. H.S. Ed		
Male vs Female	Male > Female	

Men gave Pavement Marker Maintenance significantly higher ratings than did women.

Pavement Marker Maintenance Importance



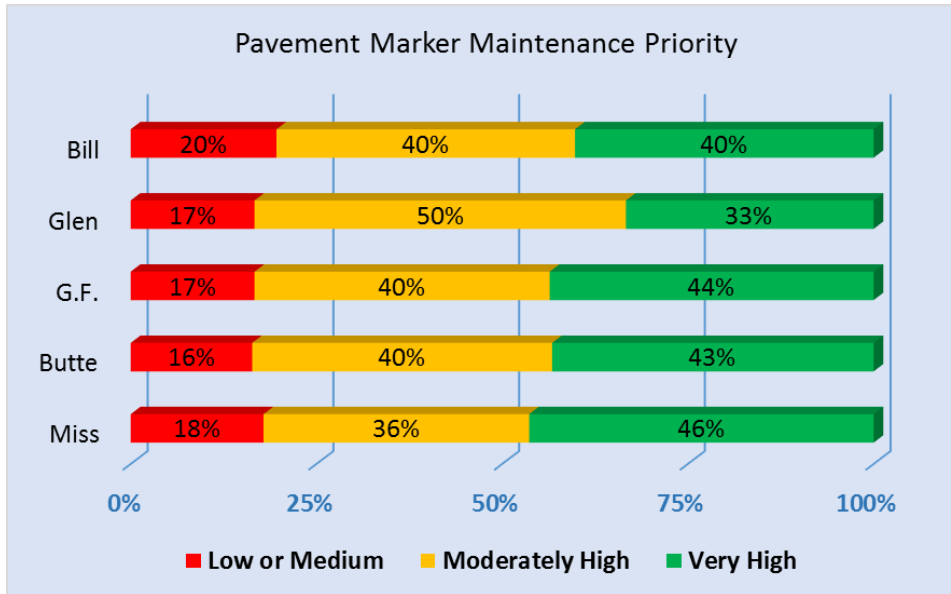
Eighty-eight percent (88%) or more of those responding from each maintenance district said Pavement Marker Maintenance was Important or Very Important, and the percentage giving it a Not or Somewhat Important was never more than 12%.

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed		
Male vs Female		

Respondents Age 40 or over gave Pavement Marker Maintenance significantly higher importance scores compared to those Age 18-39.

Pavement Marker Maintenance Priority



The percentage of respondents giving Pavement Marker Maintenance a Very High Priority ranged from 33% in Glendive District to 46% in Missoula District. More generally, at least 80% of each district's respondents said Pavement Marker Maintenance had a Moderately or Very High Priority.

Significant Differences

Demographic	Summer Survey	Winter Survey
Urban vs Rural		
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed	College < H.S.	
Male vs Female	Male < Female	

Being older (over age 39); having less than 16 years of education, or female was associated with significantly higher Pavement Marker Maintenance Priority scoring.

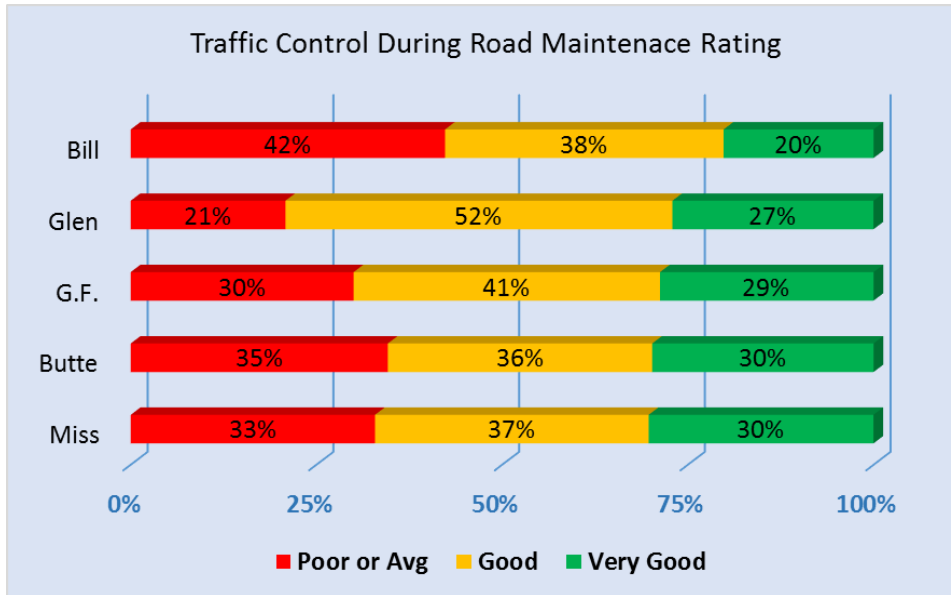
In 2014 pavement marking priority shifted lower compared to 2012. Ratings of Very High Priority declined from 43% to 40% while ratings of Low or Medium increased by 3% of responses. This shift was statistically-significant.

Traffic Control Rating

Question

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

Traffic Control Rating



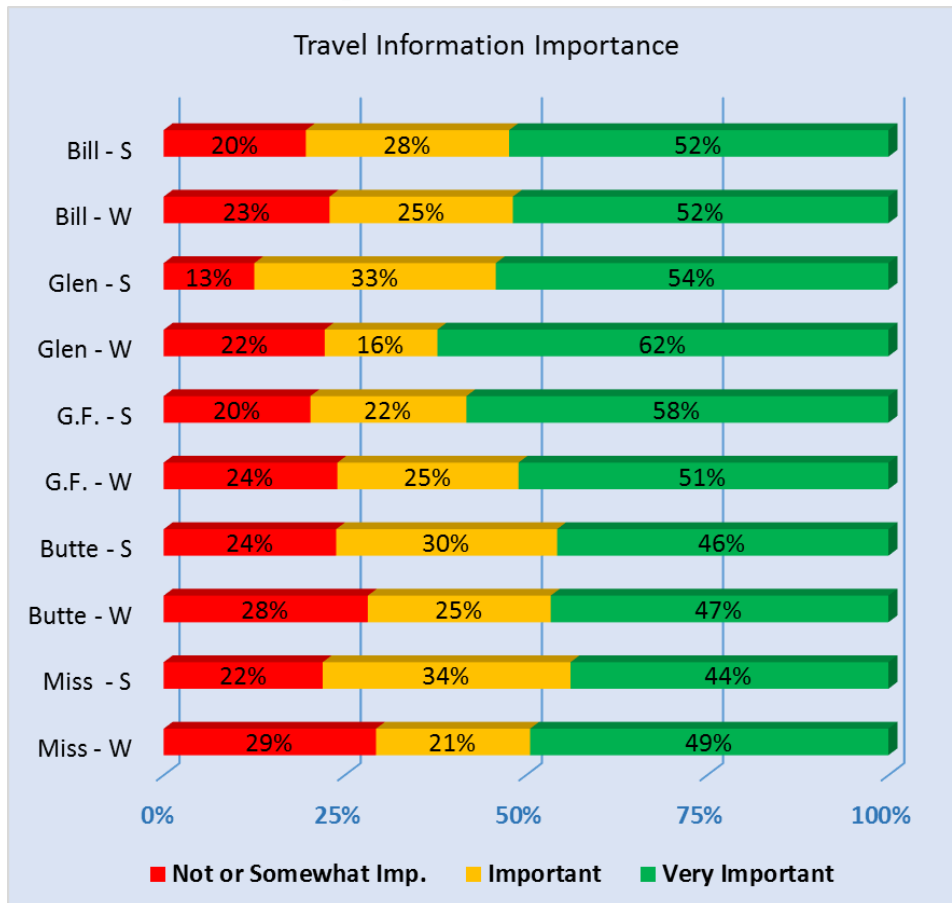
Traffic Control during road maintenance was viewed as Very Good by 20% of Billings District respondents while significantly higher (27%-30%) in the other districts. Ratings of Poor or Average ranged from a low of 21% in Glendive District to twice that size (42%) in Billings District.

Road Information

Questions

- How important is traveler information-road and weather condition and construction information to you?
- How often have you used MDT's traveler information website?
- Have you used the Montana Department of Transportation traveler information mobile phone app? → How often have you used the mobile phone app?
- What resource priority should be placed on providing accurate and up to date information about the current condition of state maintained highways in Montana?

Road Information Importance



Travel Information was viewed as Important or Very Important by 70% or more of the respondents in each district over both Winter and Summer surveys

Significant Differences

District	Summer Survey	Winter Survey
5. Billings		
4. Glendive	Summer > Winter	
3. Great Falls	Summer > Winter	
2. Butte		
1. Missoula	Summer > Winter	
Statewide	Summer > Winter	

Summer survey scoring of Travel Information Importance was significantly higher than average scores given in the Winter survey. Glendive District gave the highest percentage of Very Important ratings in the Winter survey 62% while Great Falls District reported the higher percentage of Very Important ratings in the Summer survey 58%. Butte and Missoula Districts averaged the highest percentages of Not or Somewhat Important (28% and 29%).

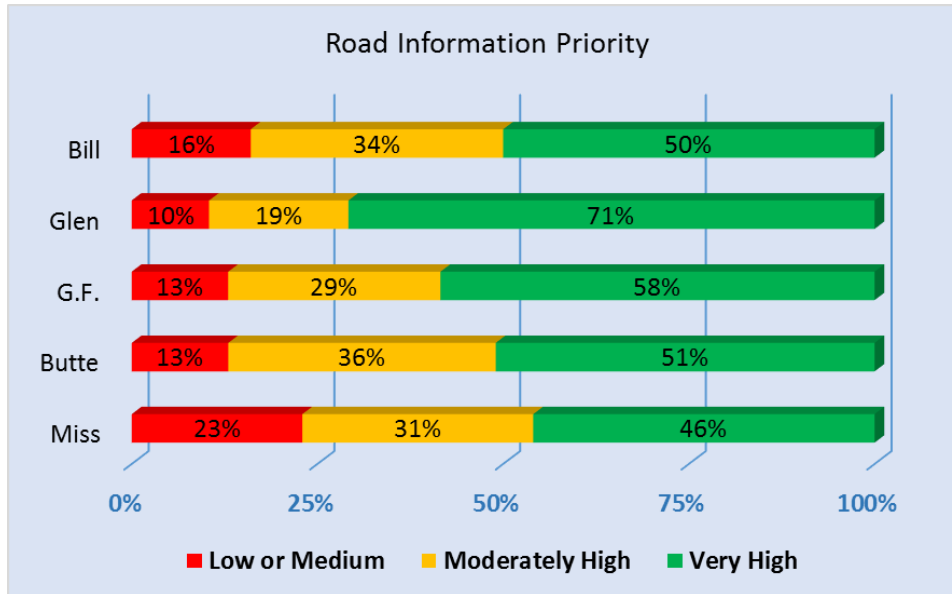
Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban < Rural	
Age 18-39 vs 40+	40+ > Age 18-39	40+ > Age 18-39
College vs. H.S. Ed	College < H.S.	
Male vs Female	Male < Female	Male < Female

In the Summer survey, Rural residents scored Travel Information at significantly higher levels of Importance than did Urban residents, as did those with less than 16 years of education (compared to their counterparts with 16+ years). In both the Winter and Summer surveys, residents over age 40 and women offered significantly higher importance for Travel Information than did younger respondents or men.

MDT Mobile Phone App and Frequency of Use

Only 11% of the Summer survey respondents reported using the MDT Mobile Phone App.

Travel Information Priority



There was significant differences in the percentage of respondents viewing Travel information Priority as Very High, ranging from 46% for Missoula District to 71% in Glendive District. When the categories of Moderately High and Very High were combined, it was seen as having a high priority by over three-quarters of those responding in each district. Across districts, Missoula District tended towards lower Priority ratings and Glendive District tended toward higher Priority levels for Travel Information.

Significant Differences

District	Summer Survey	Winter Survey
5. Billings		
4. Glendive	District > Statewide	
3. Great Falls		
2. Butte		
1. Missoula		
Statewide		

The average Road Information Priority score for Glendive District residents was significantly higher than state-wide averages.

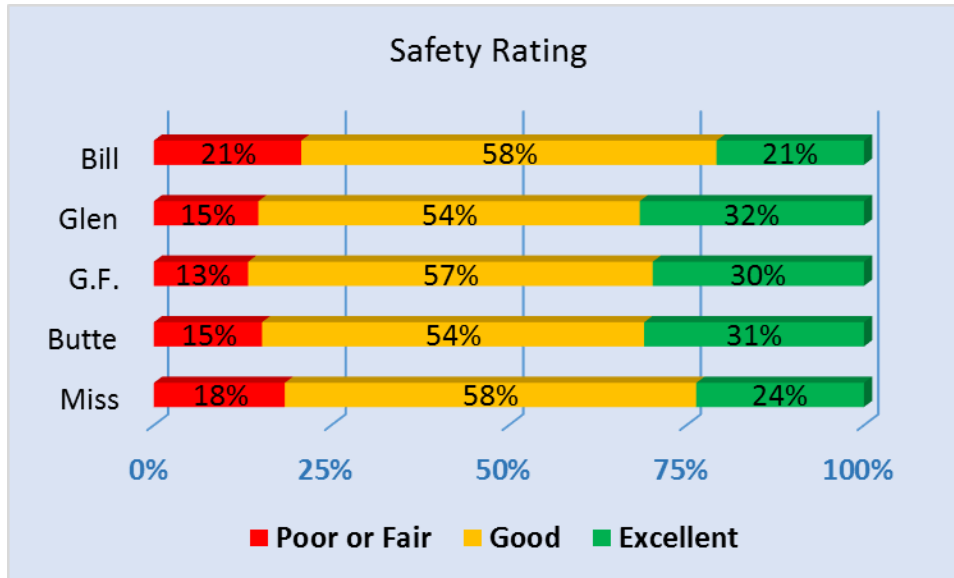
Demographic	Summer Survey	Winter Survey
Urban vs Rural	Urban < Rural	
Age 18-39 vs 40+	40+ > Age 18-39	
College vs. H.S. Ed		
Male vs Female	Male < Female	

Rural, older (40+), and female respondents gave Road Information significantly higher priorities than their Urban, younger, and male counterparts.

Safety Rating

The Safety category is a combination of Pavement Markings Maintenance and Road Sign Maintenance. This composite indicator was developed at the suggestion of MDT.

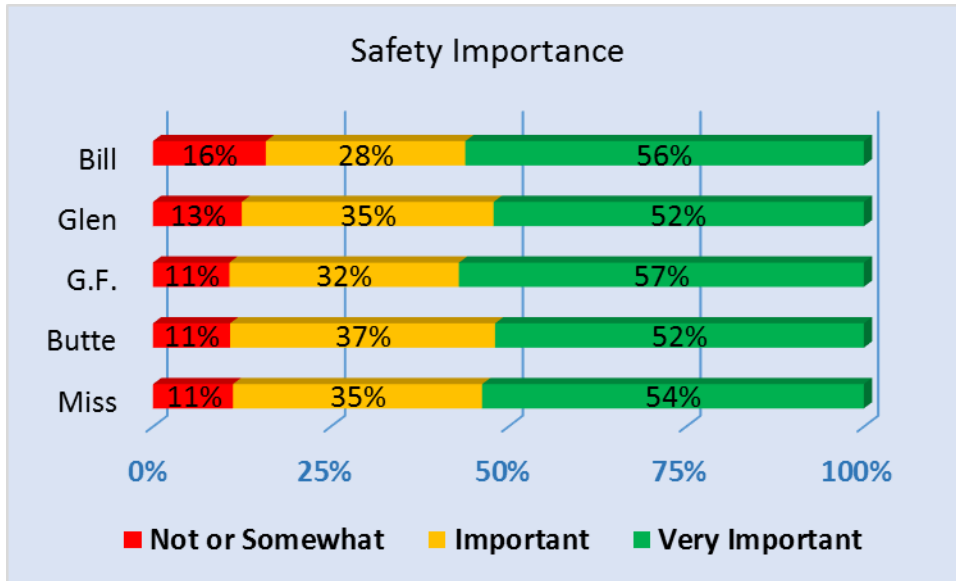
Safety Rating



Between 79% and 87% of respondents in each district gave Pavement Marker Maintenance and Road Signage Maintenance ratings such that the composite Safety Rating was Good or Excellent. Billings District received the lowest percentage of Excellent Ratings (21%) while Great Falls, Butte, and Glendive Districts had the highest, with 30%-32% Excellent Safety Ratings.

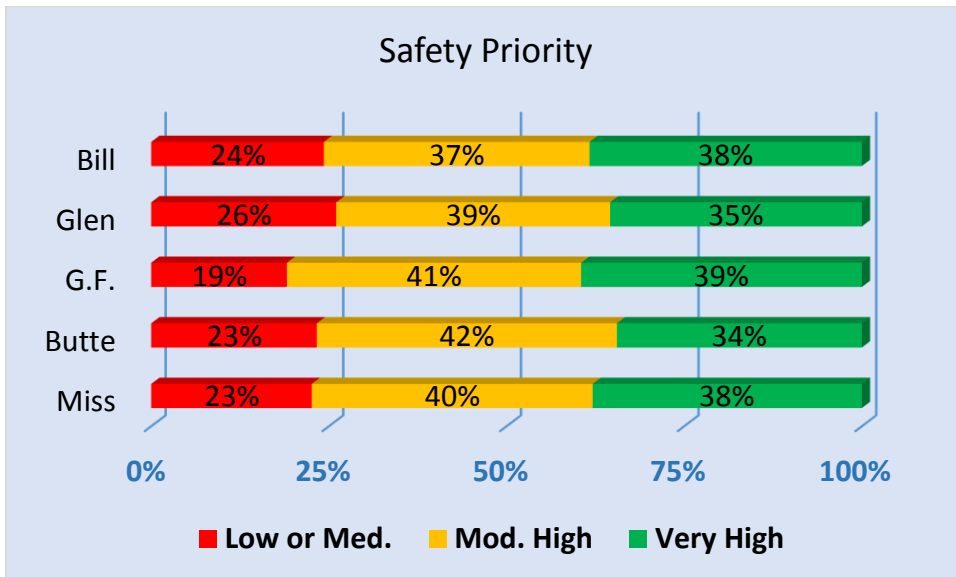
Overall 2014 Safety ratings were somewhat lower in 2014 than comparable values in 2012. This was largely due to a 2% or 3% increase in the percentage of Poor or Fair ratings in the 2012 Road Maintenance Survey.

Safety Importance



Over one-half of the respondents in each district gave importance ratings consistent with Very Important and 84% or more provided answers consistent with rating safety as at-least Important.

Safety Priority



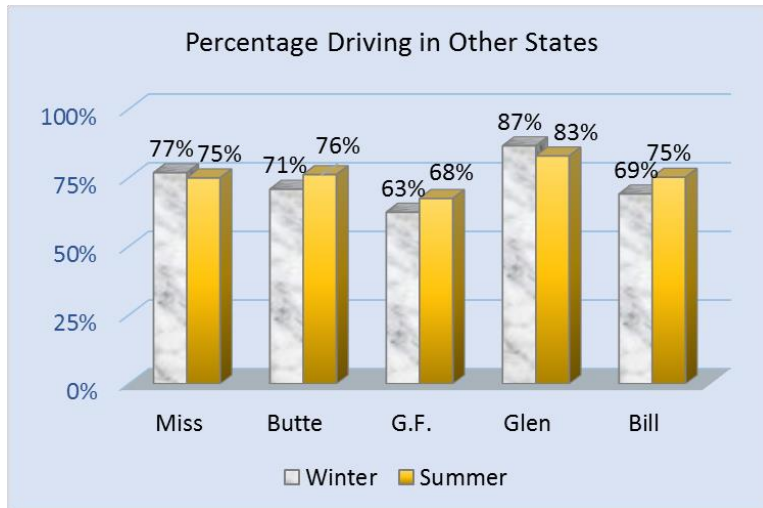
Overall, the Priority of Safety tended to be lower than its Importance, with Very High Priority representing 34%-39% of responses in each district and Low or Medium representing 19% to 26%.

Driving Behavior Questions

Questions

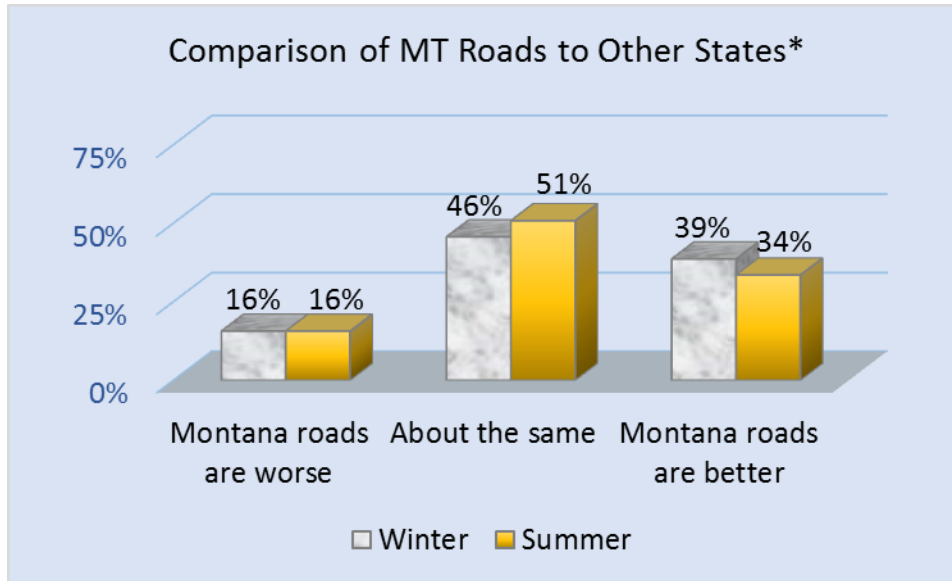
- *Have you driven on roadways in states other than Montana in the last 12 months?*
- *Which of the following types of trips would you say is most typical of your driving?*
- *Would you say you drive more or less than 15,000 miles per year?*
- *Compared to previous years, in the past 12 months, would you say that you are...*
- *Are you doing any of the following to mitigate or offset the cost of fuel?*
- *In Montana, which type of vehicle collisions do you think occur most frequently?*
- *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.*

Driven on Other Roadways



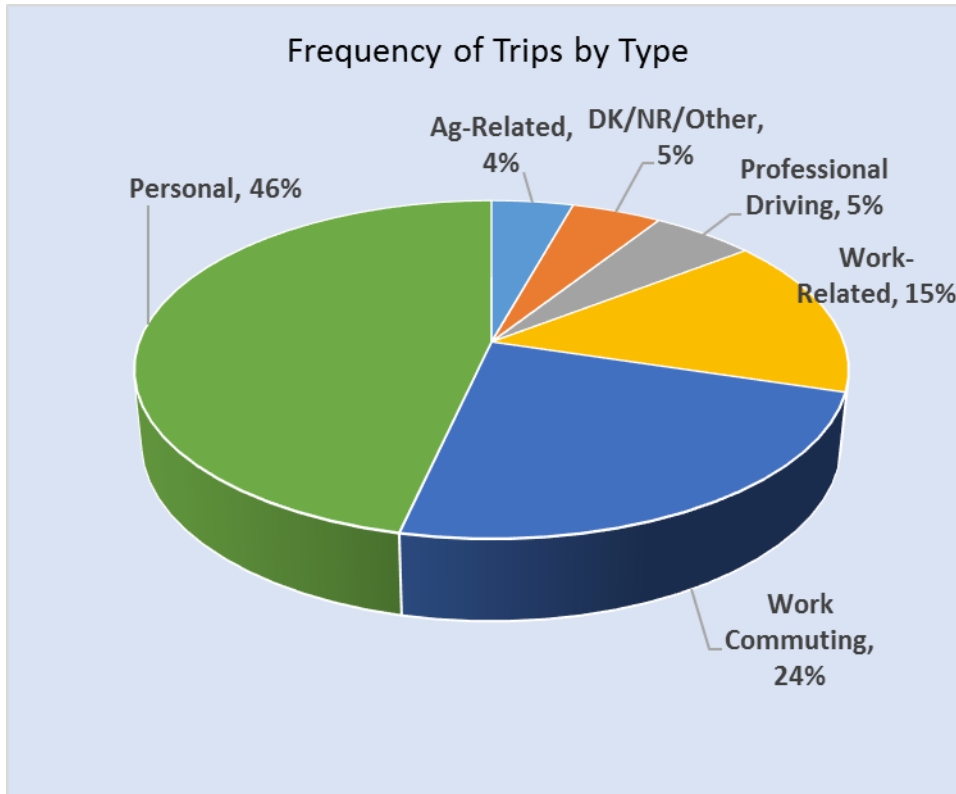
Statewide, around three-quarters of those surveyed had driven in another state in the previous twelve months. Glendive District respondents had the highest percentages while Great Falls District reported the lowest percentages.

Other Roadway General Comparison



Forty-six percent (46%) of Winter and 51% of Summer respondents who reported driving in other states in the past year rated Montana roads 'about the same' as those of other states, while the percentage rated MT roads as better than other states' was over twice as large as the percentage saying MT roads are worse (34%-39% compared to 16%-16%).

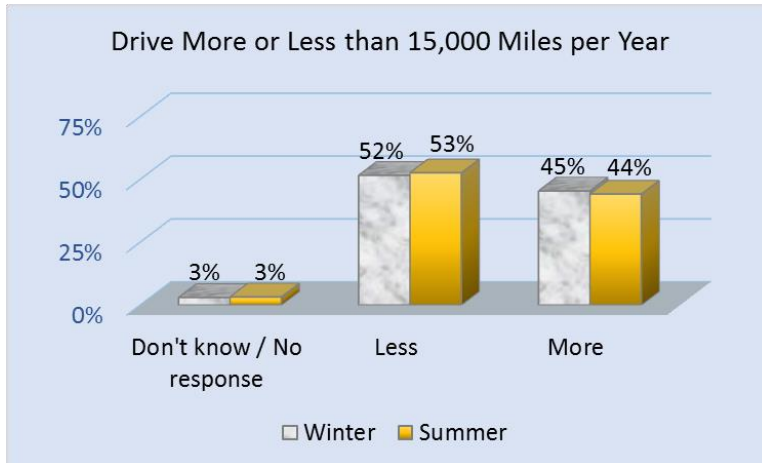
Types of Trips



By frequency, Personal trips were reported most often (48% in the Winter survey and 45% in the Summer survey), followed by Work Commuting (24%/23%) and Work-Related (15%/15%).

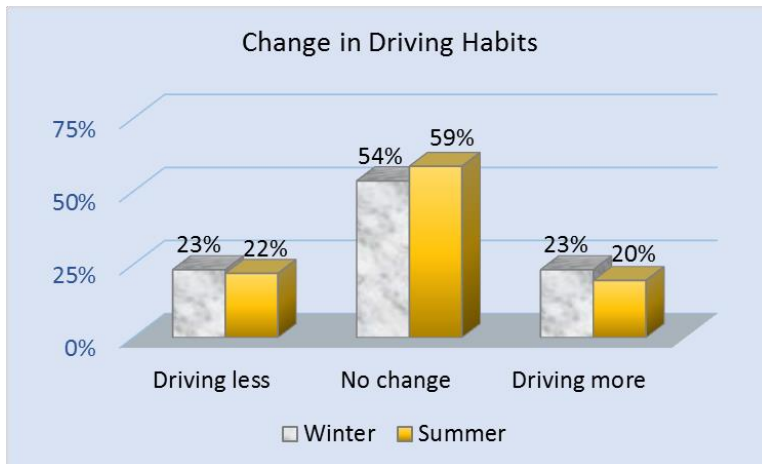
Trip Type	Summer	Winter
Personal	45%	48%
Work Commuting	24%	23%
Work-Related	15%	15%
DK/NR/Other	4%	4%
Prof. Driving	7%	4%
Ag-Related	4%	5%

Miles Driven



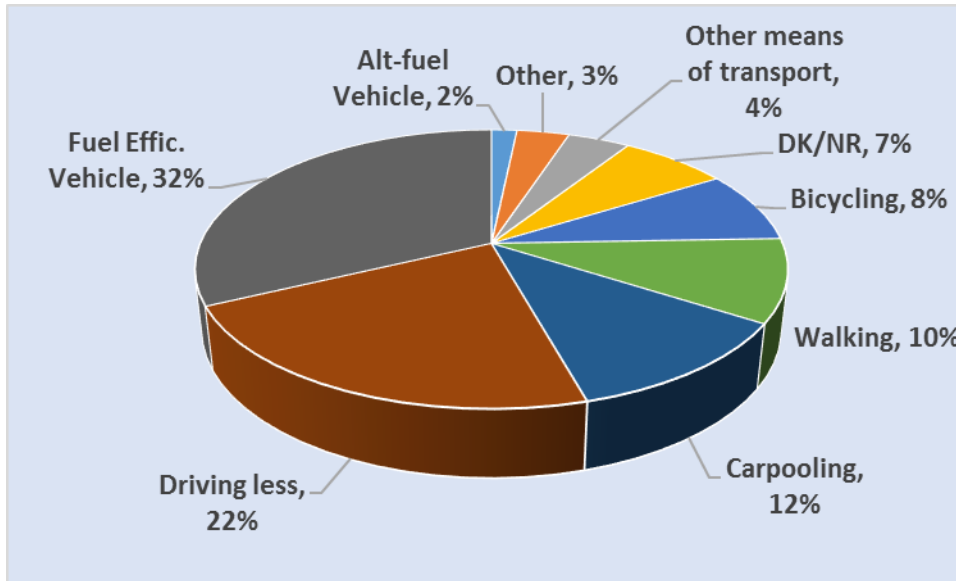
Just over one-half of those surveyed in either Winter or Summer survey reported driving less than 15,000 miles in the previous year, while 44%-45% reported driving more.

Change in Driving Habits



Over one-half of respondents reported no change in the driving habits, while the percentage reporting driving less and driving more were basically equal at around 22%.

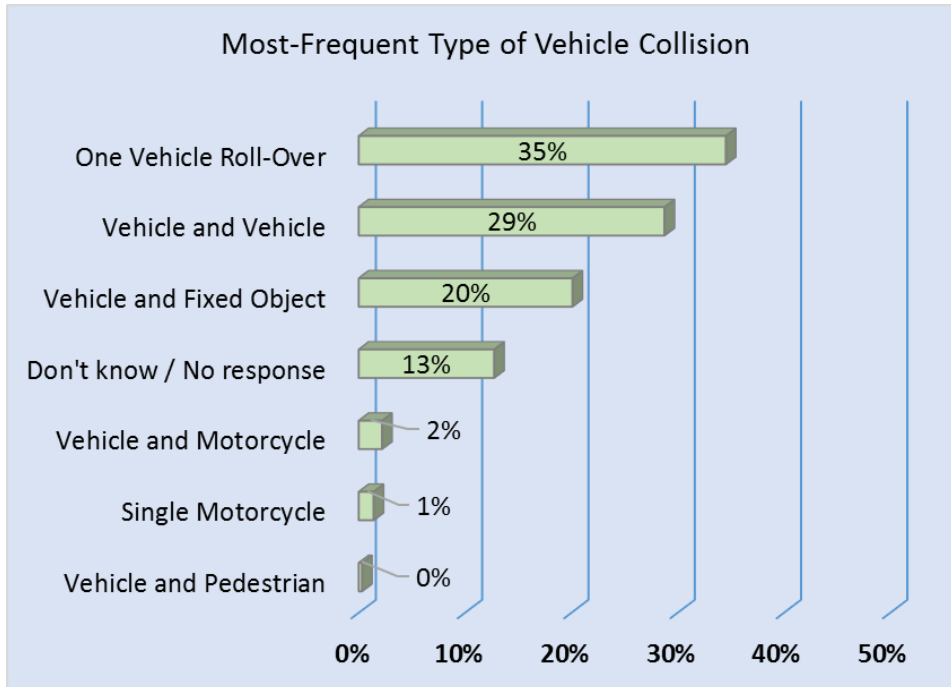
Changing Driving Behavior Due to Fuel Costs



One-third (33% in the Summer survey and 31% in the Winter survey) of respondents reported purchase of a fuel-efficient vehicle to mitigate fuel prices. Just over one-in-five (22%) reported driving less and 12% reported carpooling. Increased walking, bicycling, and other means of transported summed to 22% of responses.

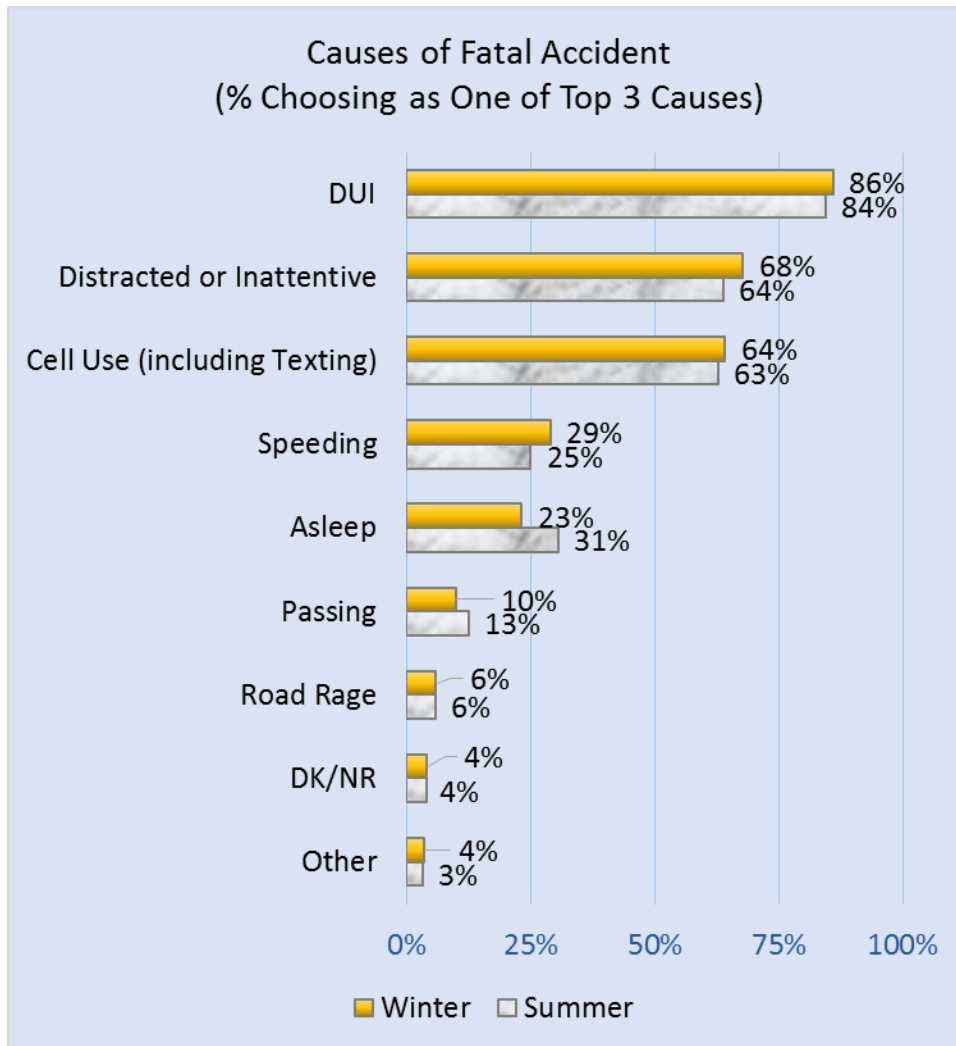
Action	Summer	Winter
Fuel Effic. Vehicle	33%	31%
Driving less	21%	24%
Carpooling	11%	12%
Walking	8%	11%
Bicycling	7%	10%
DK/NR	9%	5%
Other means of transport	4%	4%
Other	4%	3%
Alt-fuel Vehicle	3%	0%

Vehicle collisions



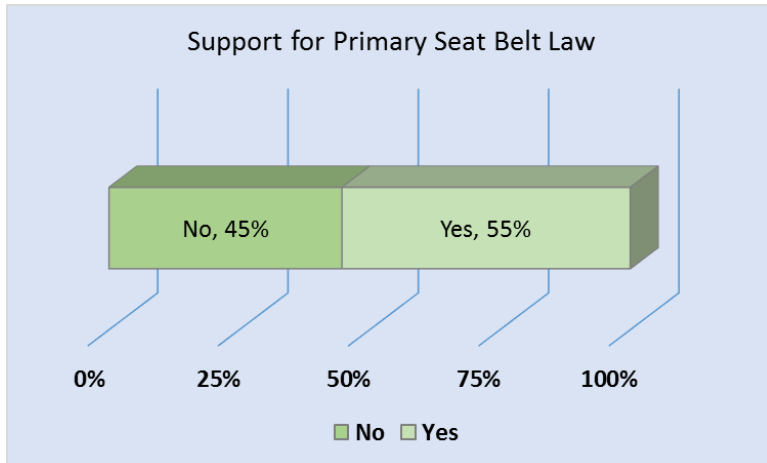
When asked which type of vehicle collision is most-frequent, just over one-third (35%) chose a single-vehicle roll-over and 29% chose a two-vehicle collision. A single vehicle striking a fixed object was picked by 20% of respondents.

Fatal crash ranking



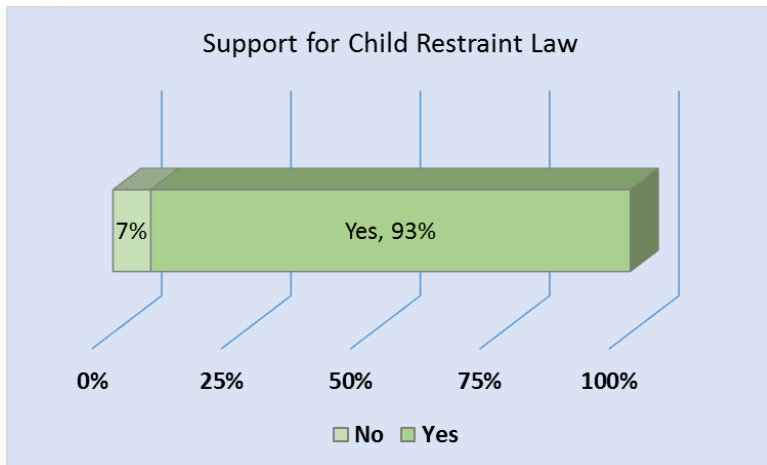
When asked to choose the top three causes of fatal vehicle accidents, the large majority of respondents (86% in the Summer survey and 84% in the Winter survey) included DUI, followed by Distracted or Inattentive driving (68%/64%) and Cell-Phone Use – Including Texting (64% / 63%). Around one-quarter of those surveyed included Speeding (29%/25%) or Asleep at the Wheel (23% Summer survey and 31% Winter survey).

Support for Primary Seat Belt Law



Significantly more respondents reported supporting a Primary Seat Belt Law (55%) than opposed it (45%).

Support for Child Restraint Seat Belt Law



Nearly everyone (93%) supported a Child Restraint Seatbelt Law.

Comparisons to Past Maintenance Surveys

When comparing the results of the 2014 Road Maintenance Survey to the results of prior surveys, it is important to remember that the set of questions asked to 1,000 residents in previous surveys was only asked to 500 residents in the Summer 2014 survey. This difference in sample sizes means that the statistics calculated using the 2014 data are somewhat less certain (with higher standard errors) than in, for example, the 2012 survey.

For this reason, we would expect that fewer 2014 statistics would achieve statistical significance compared to 2012 averages.

Average Maintenance Ratings

	2006	2008	2010	2012	2014*
Winter	2.79	2.69	2.7	2.89	2.78
Striping	2.85	2.87	2.93	2.99	2.99
Debris Removal	2.76	2.77	2.86	2.87	2.87
Surface	2.61	2.67	2.7	2.67	2.71
Signage	3.07	3.03	3.11	3.15	3.13
Rest Area	2.9	2.23	2.95	3.05	2.94-
Roadsides	2.8	2.7	2.87	2.83	2.93+
Road Crew			3.03	2.94	2.86
Information					3.22

In the 2014 Summer survey, average Rest Area Maintenance Rating was 2.94, significantly lower than the average in 2012. The average Roadside Maintenance Rating in 2014 was 2.93, which is significantly higher than its 2012 average.

Average Maintenance Importance

	2006	2008	2010	2012	2014*
Winter	3.7	3.56	3.71	3.69	3.73
Striping	3.58	3.49	3.52	3.52	3.51
Information	3.51	3.22	3.21	3.23	
Debris Removal	3.47	3.44	3.42	3.49	3.47
Surface	3.35	3.4	3.34	3.34	3.33
Signage	3.28	3.31	3.26	3.32	3.27
Rest Area	3.19	2.75	3.2	3.25	3.24
Roadsides	2.99	3.01	3.01	3.02	2.95

In 2014 none of the average Maintenance Importance scores were significantly different from their 2012 averages.

Average Maintenance Priority

	2006	2008	2010	2012	2014*
Winter	3.66	3.56	3.68	3.72	3.57-
Striping	3.42	3.32	3.31	3.31	3.22
Information	3.41	3.32	3.23	3.30	3.32
Debris Removal	3.28	3.23	3.19	3.29	3.29
Surface	3.08	3.12	3.01	3.11	3.00-
Signage	3.09	3.03	3	3.03	2.97
Rest Area	3.06	2.77	3.01	3.12	3.02-
Roadsides	2.81	2.7	2.72	2.75	2.64-

In four of the eight Maintenance Priority categories (Winter, Road Surface, Rest Area, and Roadside Maintenance) the average 2014 score was significantly lower than their 2012 counterparts.

Analyzing the Relationships between Maintenance Rating, Importance, and Priority

As in previous MDT Road Maintenance Surveys, an individual's Overall Maintenance Ratings tends to be systematically related to his or her ratings for the specific maintenance categories. For example, Overall Maintenance Ratings are positively correlated with Winter Maintenance Ratings (0.46) and Surface Maintenance Ratings (0.47). However these sub-categories may themselves be related. For example, Winter Maintenance Ratings and Surface Maintenance Ratings are somewhat correlated (0.32).

Models of Overall Maintenance Rating and Importance

Model 2: Ordered Logit, using observations 1-508 (n = 465)				
Missing or incomplete observations dropped: 43				
Dependent variable: OvRate				
Standard errors based on Hessian				
	Coefficient	Std. Error	z	p-value
WinRate	0.814348	0.13664	5.9598	<0.00001 ***
SurRate	1.27088	0.162783	7.8072	<0.00001 ***
SigRate	0.435199	0.16919	2.5722	0.01010 **
DebRate	0.447878	0.137823	3.2497	0.00116 ***
cut1	3.94746	0.631429	6.2516	<0.00001 ***
cut2	7.19423	0.672386	10.6995	<0.00001 ***
cut3	11.3371	0.814119	13.9256	<0.00001 ***
Mean dependent var	2.754839		S.D. dependent var	0.679204
Log-likelihood	-369.3117		Akaike criterion	752.6234
Schwarz criterion	781.6177		Hannan-Quinn	764.0356
Number of cases 'correctly predicted' = 321 (69.0%)				
Likelihood ratio test: Chi-square(4) = 335.431 [0.0000]				

Ordered Logistic regression was used to evaluate the Summer survey data. Initially all of the Maintenance Rating categories was used, but only a subset of them were found to be significant drivers of Overall Maintenance Rating. The best-fitting model (shown above) correctly predicted just under 70% of the Overall Rating scores using each respondent's rating of Winter Maintenance, Road Surface Maintenance, Roadsign Maintenance, and Debris Removal Maintenance.

Model of Overall Road Maintenance Rating

Sub-Rating	Coefficient	Size of Impact (Marg. Impact on Odds Ratio)	Relative Size of Impact
Road Surface Maintenance	1.27	3.56	2.3x
Winter Maintenance	0.81	2.26	1.4x
Debris Removal	0.45	1.57	1x
Roadsign Maintenance	0.44	1.55	1x

Interpreting the results, a one-unit higher rating (such as from a Good to an Excellent) in either Debris Removal Maintenance Rating or Roadsign Maintenance Rating increased the odds (by 1.57 or 1.55 respectively) that the average survey respondent would give a one-unit higher Overall Road Maintenance Rating Road Surface Maintenance Rating. A one-unit improvement in Winter Road Maintenance Rating increased Overall Maintenance Rating odds by 2.26 times. And the biggest predictor of a higher Overall Road Maintenance Rating was an individual's Road Surface Maintenance Rating (odds ratio = 3.56).

In relative terms, while all four categories were significant in predicting Overall Road Maintenance Ratings, Winter Road Maintenance Ratings was somewhat more important than Debris Removal or Roadsign Maintenance, while Road Surface Maintenance Ratings had 2.3 times the predictive power of Debris Removal and Roadsign Maintenance.

Model of Overall Road Maintenance Importance

Sub-Rating	Coefficient	Size of Impact (Marg. Impact on Odds Ratio)	Relative Size of Impact
Road Surface Maintenance	0.75	2.11	1.5x
Roadside Maintenance	0.55	1.73	1.25x
Debris Removal	0.34	1.40	1x
Urban Resident	-0.47	0.63	

The same modeling approach was used to evaluate how well the Importance scoring of individual maintenance categories predicted an individual's Overall Road Maintenance Importance score. This model also tested if there were geographic or demographic differences which systematically affected Overall Importance.

In the best-fitting model, a one-unit higher Importance score for Debris Removal increased the odds that an individual would give Overall Maintenance Importance a one-unit higher score by 1.4 times. For Roadside Maintenance Importance this improvement was 1.7 times, and a unit improvement in Road Surface Maintenance Importance more than doubled the odds that the respondent would give a higher Overall Importance score.

In addition, it was found that, independent of their other Maintenance Importance scores, residents of urban counties were significantly more likely to giving lower Overall Importance score. This size of this effect was not large, only about one-half the magnitude of the influence of Debris Removal Importance, but it further describes general maintenance preferences between city and rural residents.

While the previous two models were based-upon Summer survey results, other models were developed using the Winter survey.

Sub-Rating	Coefficient	Size of Impact (Marg. Impact on Odds Ratio)	Relative Size of Impact
Plowing Speed	1.49	4.44	2.5x
Surface Maintenance	0.55	1.73	1x
Yellowstone County	-0.08	0.93	
Glendive District	-1.04	0.35	

One set of results worth noting concerns models of Winter Road Maintenance Rating. As seen in the Summer survey results, a higher Road Surface Maintenance Ratings were a predictor of a higher Winter Maintenance Ratings. And as in the previous model, geography was important, with residents of Glendive District giving systematically lower Winter Road Maintenance Ratings and, to a lesser extent, slightly lower ratings from Yellowstone County residents.

New to the 2014 MDT Road Maintenance Survey are the findings of how important the perceptions of the speed of winter snow removal upon an individual's Overall Winter Maintenance Rating. A one-unit improvement in the speed of snow removal more than doubled the odds that this respondent would give a higher rating to Overall Winter Maintenance.