

Greater Yellowstone Regional Traveler Weather Information System

Pre-511 Evaluation Summary

Version 1.0

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EXECUTIVE SUMMARY

The Greater Yellowstone Regional Traveler and Weather Information System (GYRTWIS) has two main parts, to expand the pavement temperature thermal model designed in the SAFE PASSAGE project and to integrate and expand the #SAFE system designed by Meridian at the University of North Dakota. Currently the Montana Department of Transportation (MDT) has 14 travel information phone numbers for gaining road and weather conditions. When the #SAFE system/511 is implemented in Montana during the winter of 2002, MDT will have to decide what to do with their 14 legacy systems. The outcome of this evaluation will provide guidance to MDT about motorists' perceptions of the 14 numbers to help lead their decision about the future of these numbers, along with serving as a baseline study that will be used to compare with users' perceptions of the new 511 travel information number.

1500 surveys were distributed to Montanans with 125 surveys distributed to each of the maintenance districts containing one of the 12 local numbers. The return rate for surveys was 23% with the response rates for MDT maintenance districts ranging from 5.8% in Missoula to 18.3% in Butte. The response rate accounts for 0.05% of Montana's population.

The survey demographics indicate that certain groups of respondents were over-represented, including those in rural areas, males, those over age 45, those whose primary driving purpose is going to work, Cellular One and Verizon wireless cell phone owners, wealthier Montanans, and automobile drivers. The traveler characteristics of the respondents indicate that the majority of them travel on Montana highways less than once a day and use radio, television, and observations of current conditions to obtain information on road conditions and weather forecasts.

The functional measures section of the survey indicates that between 20-30% of respondents were unaware of the 14 phone numbers, when gaining traveler information the majority of respondents call prior to traveling and that the respondents use and prefer the statewide numbers to the local numbers. Of the local numbers, Great Falls, Glendive, Billings, and Miles City were used the most frequently by respondents and the Missoula, Billings and Great Falls numbers were used by respondents that live outside, as well as within, those local areas, and Missoula, Bozeman, Kalispell, Miles City, and Billings have the largest average monthly call volumes.

Several key conclusions can be drawn from the results of this survey:

- The majority of respondents used and preferred the statewide number. Some preferred the local numbers because the information provided is more specific. The new 511 service will allow them to access the same localized information currently available via the local phone numbers.
- Not all those surveyed were aware of the phone numbers. Awareness can be increased through marketing such as that planned for the new 511 service. As the majority of respondents tend to use the phone services before they leave for a trip, the majority of the marketing should reach people then.
- Respondents aware of the current services indicated that they are useful, people depend on them, and they are likely to have an affect on peoples' travel plans.

- Several areas for improvement in the current service. The messages are too fast paced, making them difficult to understand. The accuracy of the messages is also a concern, as they are delayed and not as accurate in the latter part of the day and on the weekends. The new service will address these issues, as messages will be read more slowly and updates to the information will be provided every half-hour or as major changes occur.
- Web volumes for #SAFE users indicated that one factor for Nebraska's high volume may be due to having a direct link on their traveler information web page for Meridian's safetravelusa.com website which provides travelers with the same information as 511.

In addition, the following considerations are indicated for future research:

- For better survey understandability and future analysis, two questions need to be altered, two questions eliminated, and two questions added.
- Better call volume comparisons for #SAFE users will be available during the next survey.

1 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Greater Yellowstone Regional Traveler and Weather Information System (GYRTWIS) project is the third phase of the Greater Yellowstone Rural Intelligent Transportation Systems (GYRITS) project that began in 1995. The GYRTWIS project has two main parts, to expand the pavement temperature thermal model and to integrate and expand the #SAFE system.

The Western Transportation Institute/Montana State University – Bozeman (WTI/MSU) has been developing and researching a pavement temperature thermal model since 1996 as part of the SAFE PASSAGE project. This model uses forecasted wind, air temperatures, humidity, radiation, and topography of the landscape to predict pavement temperatures. The greatest use for this model will be for regions with complex topographies such as those consisting of mountain passes and coulees. The pavement temperature thermal model was deployed at Bozeman Pass in Bozeman, Montana as part of the SAFE PASSAGE project. The GYRTWIS project will allow researchers at WTI/MSU to expand the pavement temperature thermal model and to deploy it in two additional locations, at Lookout Pass in Missoula, Montana and at the 19th street bridge in Bozeman, Montana.

The #SAFE system is the traveler information portion of the Advanced Traveler and Weather Information System (ATWIS) developed by Meridian Environmental Technologies of Grand Forks, North Dakota. This system provides travelers with road conditions, weather forecasts, road construction information, pass closure information, and oversize vehicle restrictions. The #SAFE system has been deployed in North Dakota and South Dakota with access to mobile phone users via the #SAFE (#7233) number. Since the system inception, 511, the national traveler information number, has become available. Therefore the #SAFE system has been deployed in Nebraska, but with 511 as the number to call. The same will be done with Montana.

1.2 WTI'S ROLE

WTI was instrumental in securing the funding for the GYRTWIS project and will be taking the lead on the majority of the project's six tasks. These tasks include:

- Project management – WTI (lead) and MDT
- Develop project architecture – WTI (lead), Meridian, and MDT
- Implement #SAFE – Meridian (lead) and MDT
- Pavement thermal model – WTI (lead), Meridian, MDT, Thermoanalytics
- Integration issues – WTI (lead), Meridian, and MDT
- Evaluation – WTI (lead) and MDT.

1.3 EVALUATION TASK

The purpose of this task is to determine the #SAFE/511 system's feasibility and effectiveness. The evaluation will be used to:

- Determine if the system should be continued in Montana.
- Identify additional travel information needs for MDT.
- Assist other agencies in deciding to fund similar projects.

One of the subtasks of the evaluation is a traveler survey to determine:

- Awareness of existing road and weather traveler information system.
- Perceived usefulness existing road and weather information.
- Perceived user satisfaction with existing telephone service.
- Number of system users.

1.4 PURPOSE OF SURVEY AND ASSESSMENT

The Montana Department of Transportation (MDT) currently has 14 travel information phone numbers for gaining road and weather conditions. These numbers include a statewide 800 number (800-226-ROAD), a cell phone number (*ROAD), and 12 local travel information numbers.

MDT is planning to implement 511, the nationwide travel information number, in winter 2002 using the #SAFE system. As the implementation of 511 approaches, MDT is faced with the decision of what to do with the legacy systems previously mentioned. MDT has already decided that the 800 number will still be in use, but will connect callers with the 511 system information, making the 800 number and 511 synonymous. The 800 number will allow motorists in other states to access the Montana 511 information toll free. It has also been decided that *ROAD will no longer exist as a number to gain travel information. The decision still facing MDT is what to do with the 12 local travel information numbers.

The objective of this survey and assessment is to determine user's perceptions of MDT's legacy road and weather information numbers. The outcome of the survey and assessment will serve two purposes. First, it will provide guidance to MDT about motorists' perceptions of these phone numbers and will help lead to their decision about the future of the local numbers. Secondly, it will serve as the "before" study or baseline study used to compare users' perceptions of the new 511 travel information number. This document reports the results of the "before" traveler information study.

2 SURVEY DESIGN AND DISTRIBUTION

2.1 SURVEY DESIGN

The Montana traveler information survey was based on preceding surveys administered by WTI for the #SAFE systems in North and South Dakota (1). It was designed to assess users' impressions of the availability, accuracy, and effectiveness of the service. The survey solicited the following types of information:

- Traveler characteristics (Questions 1 through 3);
- Functional measures i.e. frequency of service use, accuracy of system, availability of system, etc (Questions 4 through 11); and
- Demographic information (Questions 12 through 19).

Throughout the survey, three types of responses were used: multiple-choice, open-ended questions, and ordinal ratings. Multiple-choice questions contained between 3 and 14 response categories. For rated responses, survey participants were supposed to select one of five values depending on the question. A "don't recall" option was also given for this type of question.

2.2 SURVEY DISTRIBUTION

This survey, shown in Appendix A, was mailed in May 2002 to a sample of 1500 Montana residents. As one of the purposes of the survey was to provide MDT with motorists' perceptions of the 12 local travel information phone numbers, the 1500 surveys were distributed evenly based on the location of the 12 local numbers. One local number is located within each of the 11 MDT maintenance districts and the twelfth local phone number is located in Helena at the MDT headquarters. Therefore it was decided that 125 of the 1500 surveys should be randomly distributed within the MDT maintenance division boundaries with exception of the division that houses both its local number and the Helena local number. This division, Butte division, had 250 surveys randomly distributed within it.

The Western Transportation Institute (WTI) hired the Geographic Information and Analysis Center (GIAC) at Montana State University-Bozeman to determine which Montana zip codes fit within the 11 MDT districts, as the district borders do not mimic county borders. Any zip codes split between two districts were assumed to be within the district that held the majority of the zip code geographically. After the zip codes had been distributed per MDT district, WTI sent this information to Qwest and requested a list of names and phone numbers. Qwest sent WTI a list of randomly selected addresses based on these zip codes. The survey distribution map can be seen in FIGURE 1.

WTI then mailed surveys to the people on the list that Qwest provided. Montana residents receiving the survey were allowed four weeks to respond and were offered the chance to be included in a drawing for five \$50 prizes. The only requirements for inclusion in the drawing were to return a completed survey and to fill out the enclosed yellow drawing entry card.

Of the 1500 surveys distributed, 348 surveys were completed and returned with valid responses. This gave us a return rate of 23%. Six other surveys were returned and not used. Three surveys were returned incomplete with notice from relatives that the recipients had passed away. The other three surveys had been filled out incorrectly to the point that none of the answers were valid; mostly this was due to two people filling out the same survey form.

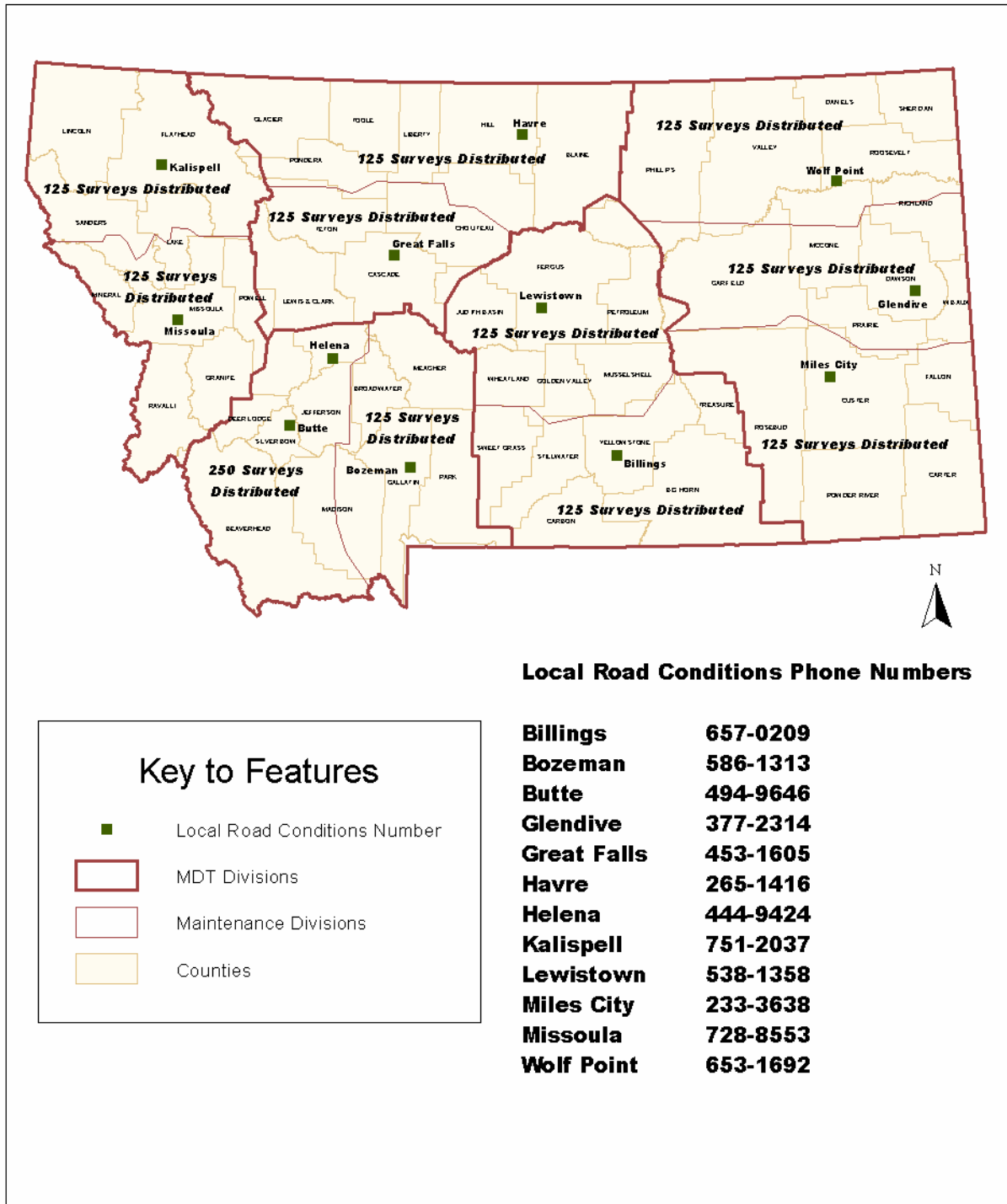


FIGURE 1 Survey distribution map.

The percentage of survey respondents per MDT maintenance district/local phone number compared to the population in that area can be seen in FIGURE 2. The response rate for MDT districts ranged between 5.8% from Missoula to 17.5% in Butte while the population distribution ranges between 2.5% in Lewistown to 18.3% in Missoula. The figure shows that the rural areas of the state (Glendive, Havre, Lewistown, Miles City, and Wolf Point) had higher response rates than their population distribution. For example 10.3% of survey respondents were from Miles City, but only 3% of the state population is from Miles City. This leads us to believe that the rural areas of the state are over represented in these findings. Another finding in the data is that Butte had the highest percentage of respondents (17.5%), this is not surprising as twice as many surveys were sent to this area due to two local phone numbers, Butte and Helena, residing there. The analysis for these zip codes can be found in Appendix B. It should be noted that the zip codes could not be tied to responses due to the survey design.

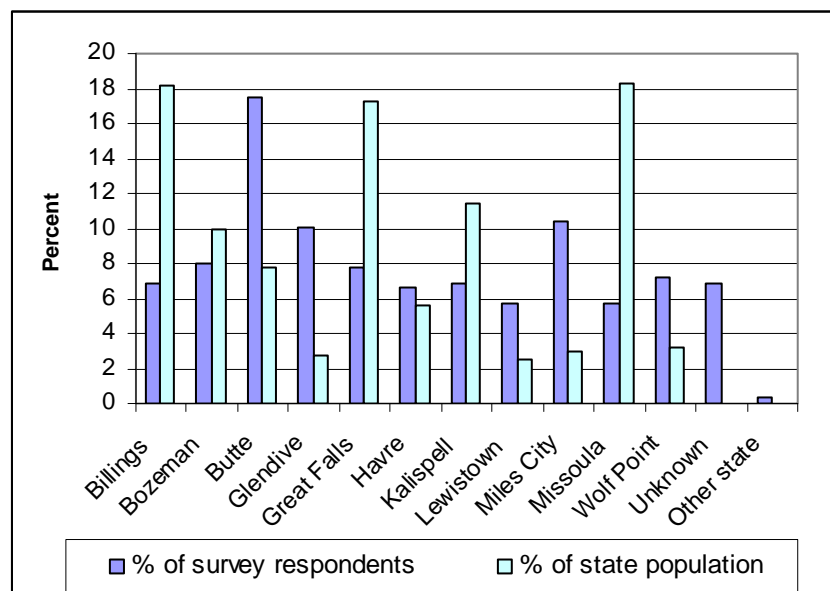


FIGURE 2 Distribution of survey respondents compared to distribution of state population.

2.3 STATISTICS

After tabulating the survey results, shown in Appendix C along with question means and standard deviations, the survey responses were analyzed using percentages, frequencies, and chi-squared values. Percentages and frequencies were used to determine motorist use and perception of the travel information numbers. Percentages were based on the total responses for each question and not on the survey total. This was done since respondents were only asked to fill out the questions (4-11) regarding their opinions and use of existing traveler weather information systems, if they had used one of these services, as indicated by their answer to Question 3. Only 51% of survey respondents answered Questions 4 through 11.

Differences between demographic characteristics and survey question answers are important to note trends in the data. This information can be used to better improve services and the marketing of those services. For example, if it could be determined that the travel information numbers are used more by people in a certain age category or gender, in this case it would be beneficial to know this information and plan a marketing campaign that targets the other ages

and gender to better inform them of the service. This information could also be useful if it were determined that older people tend to find the service harder to understand. In this case, we could infer that the recordings may need to be louder, clearer, and slower to improve this service for older people. The best way to get this information is to look at trends in a data set for the state population to determine if any association existed between the answers to survey questions and demographic characteristics. Because it is not possible to get data for an entire population, the next best way is to use a method that will infer these associations. The chi-square independence test is most commonly used for this purpose.

The chi-square independence test used to determine if two sets of data are statistically independent (non-associated). In this case, the categories of one of the characteristics are identical to the distribution of the other characteristic. If the distributions are not identical, the two characteristics are statistically dependent or associated (2). For this analysis, Minitab was used to analyze the chi-square relationships. Appendix D shows the outcomes of the chi-square independence test, the relationships that were valid both independently (analysis passed, no differences found) and dependently (analysis passed, differences found) as well as questions where the Chi Square analysis was invalid due to lack of data. The differences that were found are described in more detail in the sections relating to those respective survey questions.

Rated response questions (e.g. Questions 3, 6, 7, 8, 9) were analyzed by assigning a numerical value to each option with five representing the most positive answer and one representing the most negative answer. The “don’t recall” option was not given a numerical value. Therefore while this option was accounted for in the questions percentages, it was not accounted for in the means, standard deviations, and chi-square analysis.

Some questions had invalid answers that were omitted and included in the “no answer” count. This occurred if more than one option was selected for a question requiring only one answer. In this case, all of the answers for that individual in that particular question were omitted. This was done to avoid biasing results by randomly choosing one of the answers to be included. Failure to comply with written instructions for a question also resulted in the response for that question being omitted. If answers to one of the questions in a two-part question had to be omitted, this individual’s answers to both questions were omitted (i.e. if answers to Question 10 were omitted, then Question 11 answers were omitted as well).

3 DEMOGRAPHICS

The demographic questions in this survey were asked to compare the survey respondents to the demographics of the state. The data used for demographic comparisons included residence, gender, and age of survey participants, trip purpose, trip length, cellular phone information, average annual household income, and vehicle type.

3.1 RESIDENCE

Since one of the objectives of this evaluation was to research the use of travel information phone numbers in Montana, it was imperative to reach Montana residents that travel regularly on highways in Montana. Although all 1500 surveys were sent to Montana residences, 1% of the 348 respondents claimed to not be Montana residents. These respondents were from California, North Dakota, and Nevada.

According to the 2000 census, the total population of Montana was 902,195 with the population of people ages 15-65+ (population targeted by this survey) being 716,065 (3). This shows that surveys were received from 0.05% of Montana's population.

3.2 GENDER

Since the survey was using a random sample design it was assumed that the gender relation would be representative of the gender relation in Montana, given that all recipients were as likely to respond. According to the 2000 census, of Montana residents ages 15-65+, 49% were male and 51% were female, making the population split in this age category almost equal (3). Of the survey respondents, 60% were male and 40% were female. Although these numbers lead us to believe that males were more likely to answer the survey than females, further research into survey distribution shows that of the residents surveys were distributed to, 70% were male, 28% were female, and 1.9% were unknown (i.e. there was no Mr, Miss, Ms, Mrs to identify gender). Therefore, although more males responded to the survey, more surveys were sent to males. FIGURE 3 displays the gender comparison of the Montana population, the survey respondents, and survey distribution.

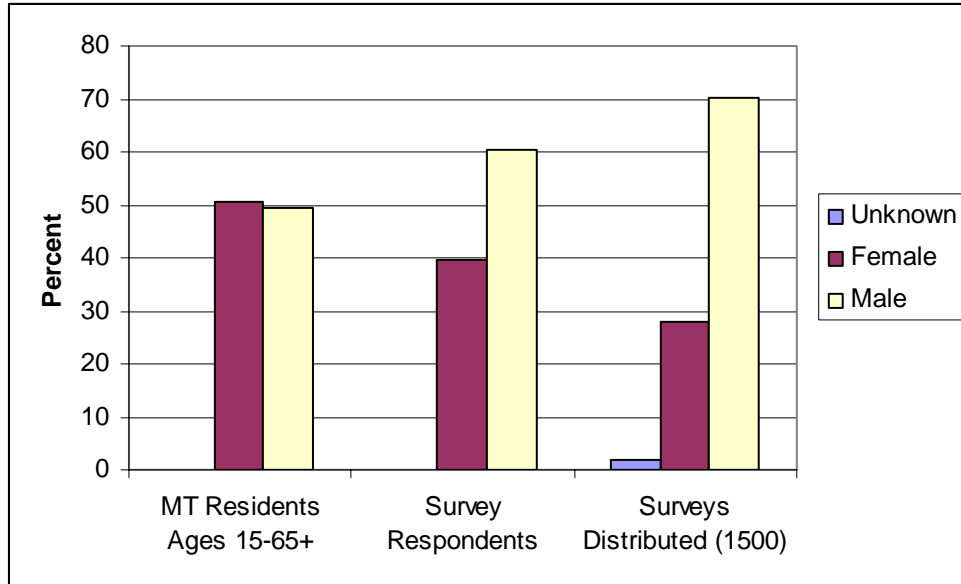


FIGURE 3 Gender comparison.

3.3 AGE

Of the 348 individuals who completed the survey, 1.4% were in the age category 15 to 24 years, 22% were in the age category 25 to 44 years, 51% were in the age category 45 to 64 years, and 26% were in the age category 65 years and older. FIGURE 4 shows the age comparison of survey respondents to the population of Montana and the U.S. population from the 2000 census (3). The figure illustrates that the majority of survey respondents were in the age category of 45-64 years. The figure also illustrates that the percentage of survey respondents ages 45-64 and 65+ was greater than the percentage of MT and U.S. residents in these age groups. This suggests that the survey respondents over represented people ages 45 years and above and under represent people ages 15-44.

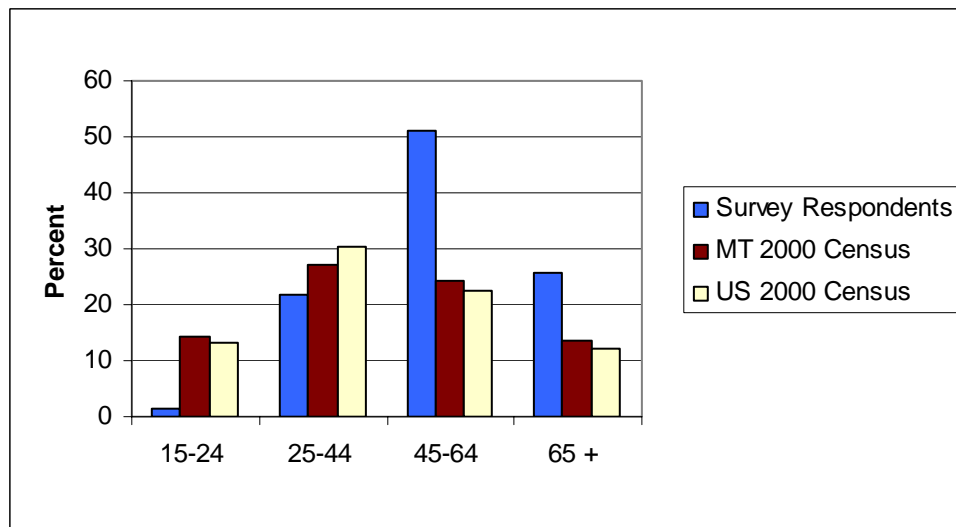


FIGURE 4 Age comparison.

3.4 TRIP PURPOSE

Survey participants were asked about the purpose of the majority of their vehicle trips on highways in Montana. They could choose between eight categories: work, school, shopping, medical, recreation, visit family and friends, vacation, and other. The results, shown in FIGURE 5, show that the majority of survey respondents travel with the purpose of going to work. Other trip purposes chosen frequently included shopping, recreation, and visiting family and friends. The results of this question are similar to the results of a survey conducted by WTI on the #SAFE traveler information system in North and South Dakota (1). For the #SAFE the primary purpose was also going to work (41% the respondents). The trip purposes written into the Montana survey's "other" option included: University of Montana football, fishing, airport, church travel, travel to winter home, meetings, hauling livestock, hauling children to universities and sports, weddings and funerals, child custody visits, and errands.

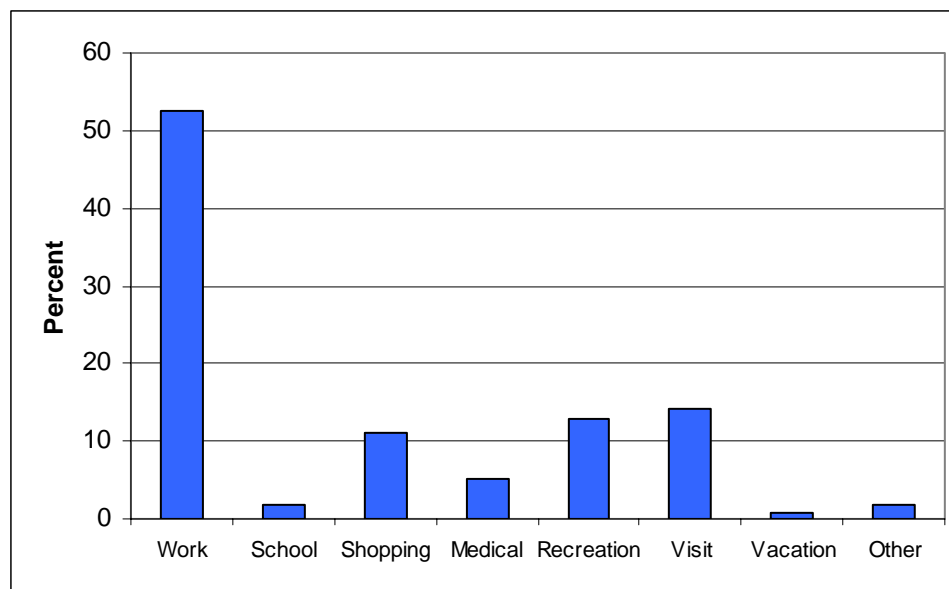


FIGURE 5 Comparison of trip purpose.

3.5 TRIP LENGTH

Survey participants were also asked to estimate the average length of their highway travel in Montana corresponding to the trip purpose in the previous question. Because of the rural characteristics of Montana it was expected that the average trip length would be in the higher ranges. FIGURE 6 shows that the average number of miles traveled for the trip purpose in Question 15 was 0-24 miles for 21% of respondents, 25-49 miles for 16%, 50-99 miles for 14%, 100-300 miles for 37%, and 300 or more miles for 12%. The average trip length was between 50-99 miles. The greatest percentage of respondents traveled 100-300 miles per trip on average. Again this is similar to the #SAFE survey results (1).

FIGURE 7 shows the average trip length for each trip purpose. Driving to school had the shortest average trip length and visiting family or friends had the longest average trip length.

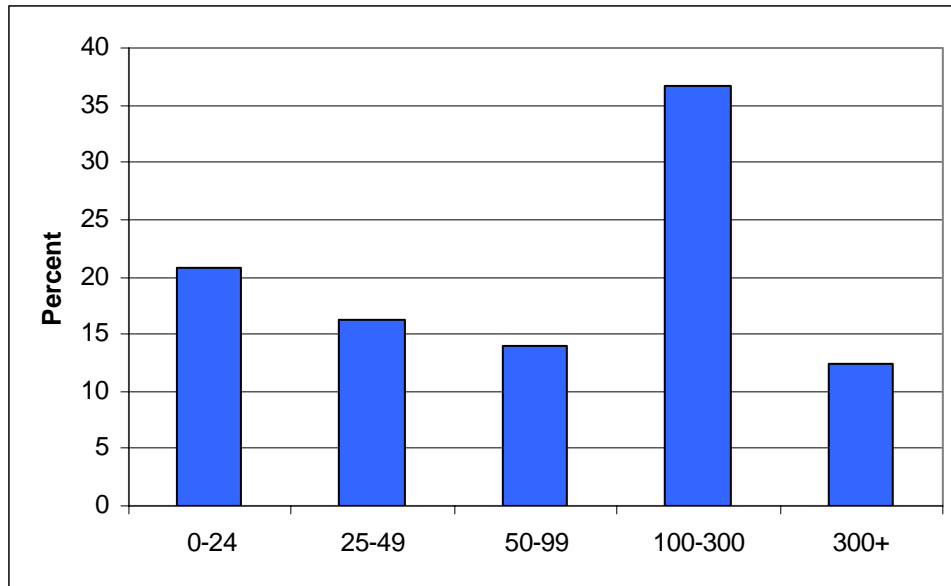


FIGURE 6 Average trip length.

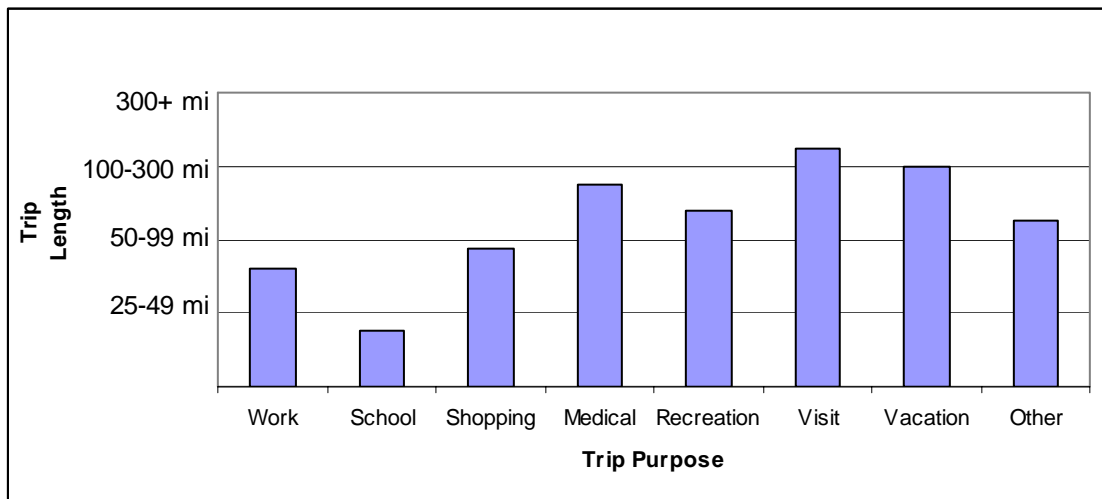


FIGURE 7 Average trip lengths for each trip purpose.

3.6 CELLULAR TELEPHONE INFORMATION

One of the objectives of this survey was to find out if the use of travel information numbers is related to ownership and use of a cell phone; this relationship is discussed in section 4.2. Fifty eight percent of those completing the survey said that they own a cell phone. The distribution of cell phone service providers for those owning cell phones is shown in FIGURE 8. As can be seen in this figure, Cellular One was the primary service provider followed closely by Verizon.

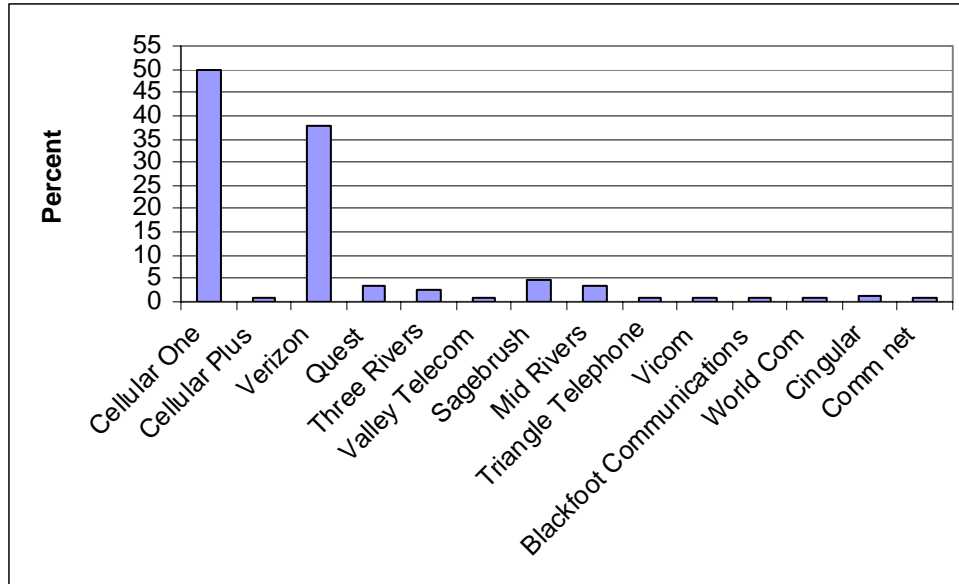


FIGURE 8 Cell phone service providers used by survey participants.

3.7 INCOME

Survey participants were asked to select from four categories the one that best described their average annual household income. The results are shown in FIGURE 9. As shown in this figure, 18% had an average annual household income of less than \$20,000, 31% had an income of \$20,000 to \$39,000, 38% had an income of \$40,000 to \$79,000 and 12% had an income of over \$80,000. It can also be seen that approximately half of the survey respondents make less than \$40,000 and half make more than \$40,000. The median household income for survey respondents was between \$40,000 to \$79,000. This indicates that the survey respondents were slightly wealthier than the average Montana residents, as the median household income for Montana reported in the 2000 census (3) was \$32,045.

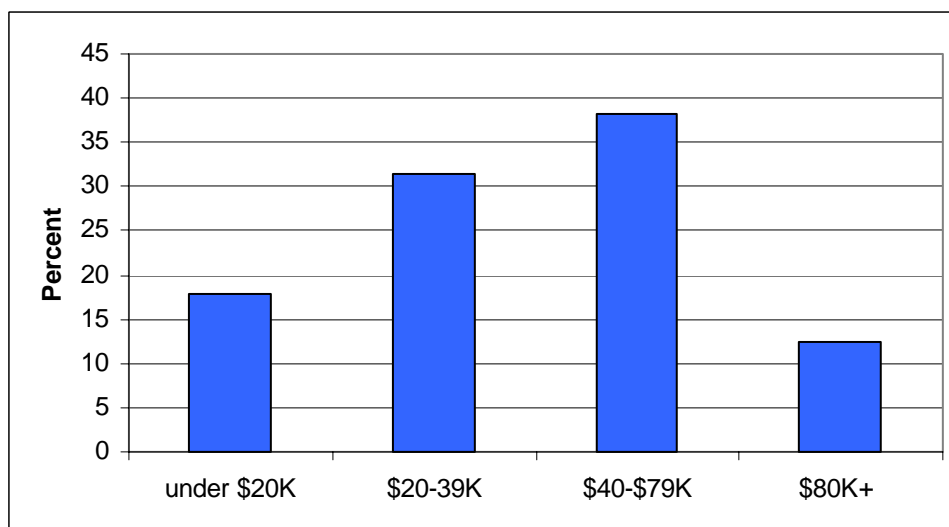


FIGURE 9 Average annual household incomes of survey participants.

3.8 VEHICLE TYPE

Survey participants were also asked what type of vehicle they primarily drive on the highways in Montana. The categories given were: automobile, commercial (truck, bus), and other. The analysis showed that this question did not supply choices that met with survey participants' expectations. Many participants checked the other category and wrote in pickup, SUV, and van, as they did not consider them to be automobiles. In this case, to use the collected data some data alterations were made. WTI tallied the answers where participants had chosen other, yet written in van, pickup, or sport utility vehicle (SUV) as an automobile as the survey design had intended. The results are shown in FIGURE 10. It can be seen that the majority of respondents drive automobiles. This was expected as surveys were only distributed to households and none were sent specifically to commercial vehicle operators.

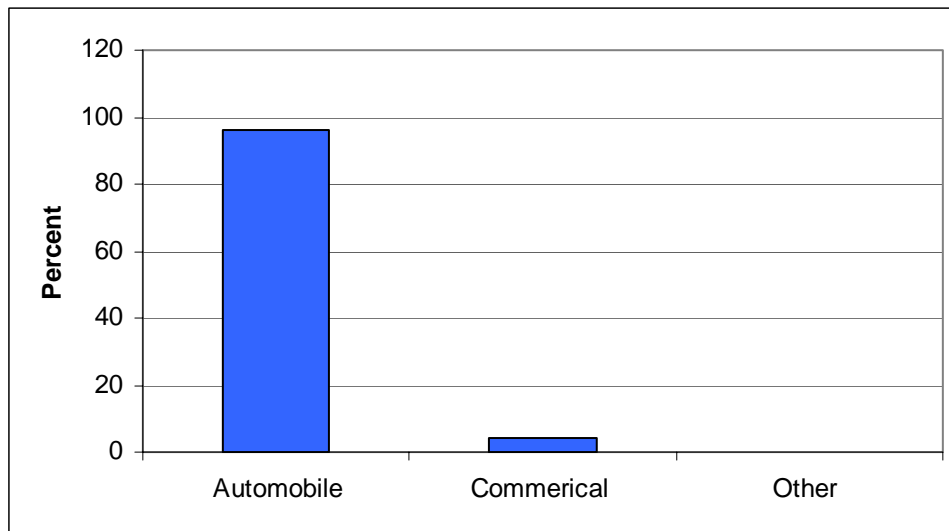


FIGURE 10 Types of vehicles.

4 TRAVELER CHARACTERISTICS

To better understand traveler characteristics, the first two questions of the survey investigated how often drivers used Montana highways and how they obtained travel information.

4.1 FREQUENCY OF TRAVEL

Drivers surveyed were asked, in question 1, to estimate how often they travel on highways in Montana by filling in one of the following blanks: times per day, times per week, times per month, and times per year. For the analysis, all responses were converted to the number of times traveled per day. FIGURE 11 displays the time ranges with the associated percentages. From the figure it can be seen that 62% of respondents indicated they travel on Montana highways less than once a day while 4% travel once a day, 4% travel between once and twice a day, 20% travel twice a day, 1% travel three times a day, and 5% travel four times per day. A small number (4%) travel more than five times per day. This shows that the majority of respondents indicated they travel on Montana highways less than once a day.

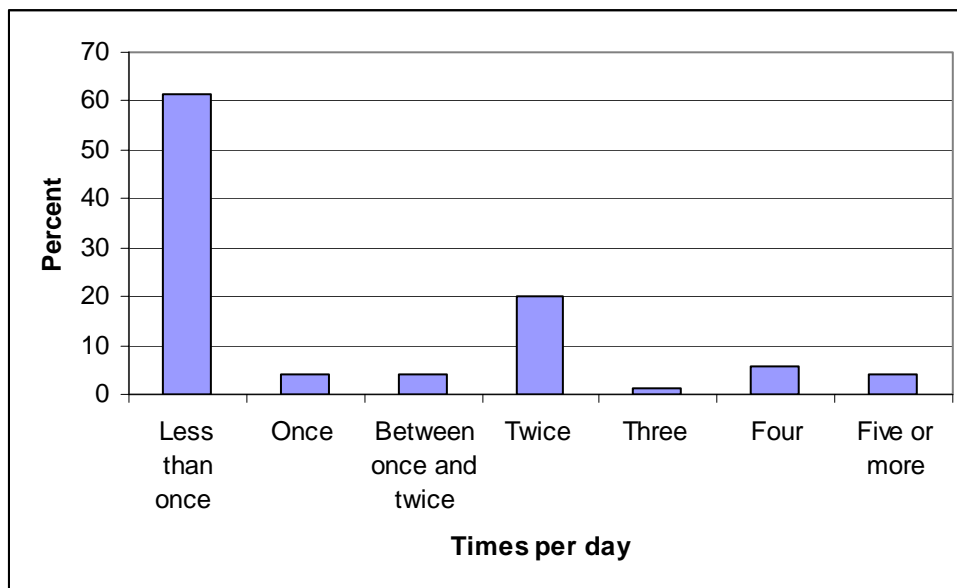


FIGURE 11 Times traveled per day as indicated in survey.

The mean number of times traveled on Montana highways per year was 448.3 or just over once per day and the median was 312 or just under once per day. The chi-squared analysis found no differences in the responses to this question with regard to the various demographic questions.

4.2 ROAD AND WEATHER RESOURCES USED

Montana drivers were also asked to indicate where they most frequently obtained road conditions and weather forecast information. A list of fourteen choices were provided that included:

- Television
- Radio (FM/AM)
- Telephone
- Cell phone
- *ROAD (*7623)
- (800) 226-ROAD (7623)
- Local Montana Department of Transportation phone numbers
- www.mdt.state.mt.us/travinfo
- Internet
- Highway advisory radio
- Observations of existing conditions
- Notices at truck stops
- Convenience stores
- Rest areas
- Communication with other drivers
- Other.

Participants were asked to choose all resources that apply. The resources used most often by Montana travelers, as shown in FIGURE 12, were radio (68%) and television (66%), followed by observations of existing conditions (45%). This is not surprising as television and radio have become conventional ways of getting travel information and many people are comfortable with them. The results show that of the MDT travel information resources, only 5.5% of respondents used *ROAD, 29% used (800) 226-ROAD, 13% used MDT local phone numbers, and 17% used the MDT website as a normal resources to determine road conditions or to hear a weather forecast report. Although 58% of respondents own cell phone, less than 10% normally use their cell phone to get travel information. Other resources that were named included:

- Aviation radio
- Newspaper
- Check vehicles for snow
- Weather band radio
- Road condition signs
- Check weather outside
- Two way radio weather CB
- Scanner
- Highway patrol.

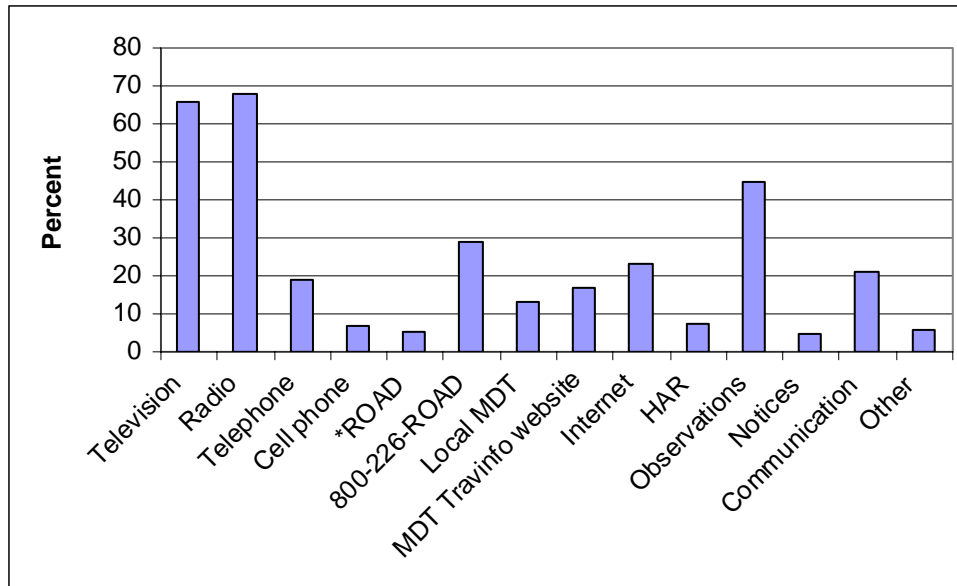


FIGURE 12 Comparison of information resources.

The chi-squared analysis found differences in the cell phone, MDT traveler information website, Internet, and observations of existing conditions with respect to ownership of cell phones and income. Respondents who owned a cell phone were more likely to use the Internet, MDT's Travinfo website, and cell phones as a source to determine road conditions or to hear a weather forecast report. Also respondents whose average annual household income was \$20,000-39,9999 were more likely as compared to the average respondent to use observations of existing conditions as a source to determine road conditions or to hear a weather forecast report.

General comments from survey participants indicated that one person believed Montana needs a better weather alert system such as NOAA and that a radar warning system on construction/accident areas is also needed. Another person said that they could only get two North Dakota television stations and no Montana television stations as they live on a border town, and therefore they are left to figure out the situation on their own.

5 FUNCTIONAL MEASURES

The travel information phone numbers were evaluated with regard to frequency of use and qualitative assessment of the service such as quality and user friendliness. Question 3 was designed to be a more specific and detailed question based on three of the choices listed in Question 2. This question was asked to determine how often the motorists use the 14 numbers listed, if the participant had used one of these services in the last twelve months then they were asked to fill out Questions 4 through 11, otherwise they were asked to skip to Question 12. Questions 4 through 11 were specifically designed to gain information on how easily available, understandable, accurate, and useful the services are perceived by the participants as well how likely the services were to affect their travel plans and when they typically access the service.

5.1 FREQUENCY OF MDT PHONE NUMBER USE

Question 3 was used to determine the usage of the different MDT road and weather travel information numbers. Participants were asked to rate their level of usage for each of the 14 numbers by selecting always, almost always, sometime, almost never, never, or didn't know about it. The 14 numbers included:

- *ROAD (*7623)
- 899-226-ROAD (7623)
- 657-0209 – Billings
- 586-1313 – Bozeman
- 494-9646 – Butte
- 377-2314 – Glendive
- 453-1605 – Great Falls
- 265-1416 – Havre
- 444-9424 – Helena
- 751-2037 – Kalispell
- 538-1358 – Lewistown
- 233-3638 – Miles City
- 728-8553 – Missoula
- 653-1692 – Wolf Point.

A mean was calculated for each of the travel information numbers to determine how often survey participants on average used these numbers. As shown in FIGURE 13, the mean usage for *ROAD was 1.89, the mean usage of 800-226-ROAD was 2.53, and the mean usages for each of the local MDT numbers ranged from 1.23 and 1.51. Of the local numbers the respondents used the Miles City and Glendive numbers the most often closely followed by the Great Falls and Billings numbers. From this graph it can be seen that, on average, the 800 number is used more frequently than *ROAD or any of the local numbers.

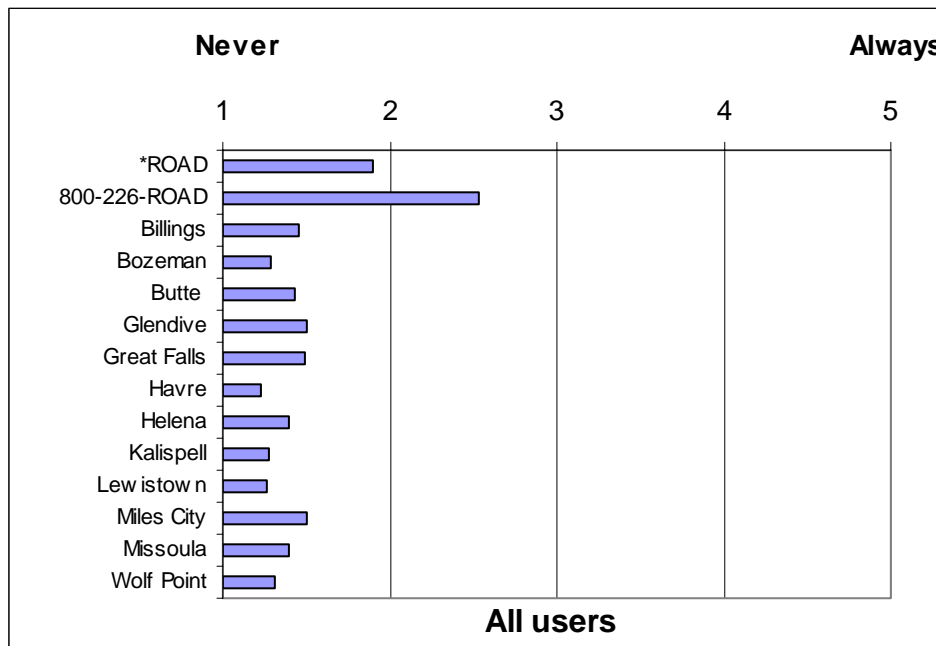


FIGURE 13 Mean usage for each travel information number.

Because the mean usage for each of the local numbers ranged from 1.23 to 1.51, the data was then analyzed to determine the mean usage of the local numbers collectively. The data was filtered to determine for each survey participant, what was the highest usage they had chosen for any of the given 12 local numbers. The survey participants' answer for the usage of the collective local number then became the highest usage they had given for any of the 12 local numbers. The graph depicting this usage is shown in FIGURE 14. The mean usage of the collective local numbers is 1.86. This shows that although on average the 800 number is used the most frequently, when the local numbers were considered as one collective number, their frequency closely rivaled that of *ROAD.

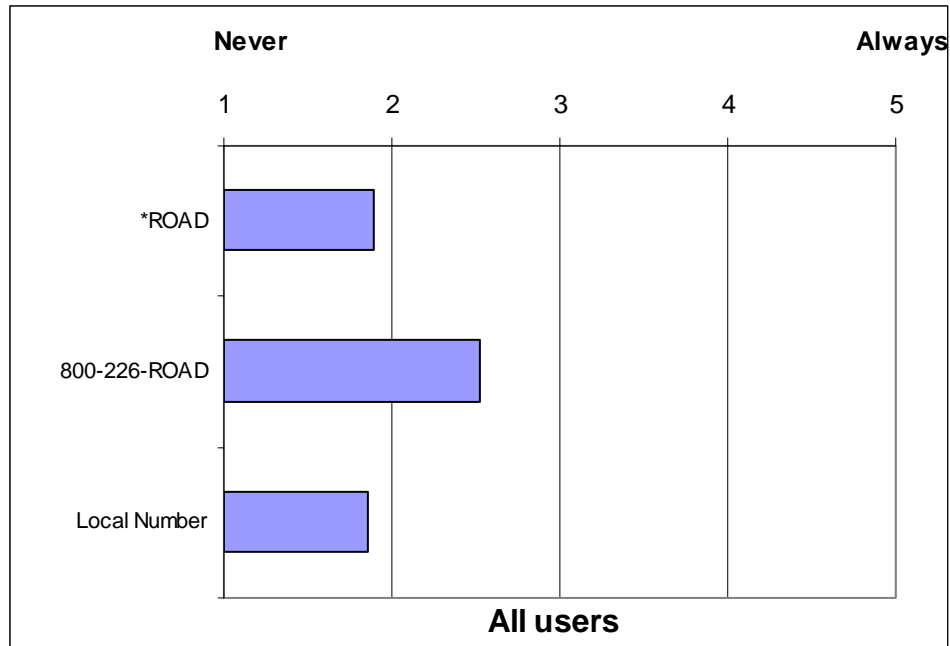


FIGURE 14 Mean usage of the three travel information numbers.

Besides indicating how often survey participants used these 14 travel information phone numbers, further investigation into the survey data also shows the number of users, non-users, and people that did not know about the individual numbers. The 348 survey participants were asked to answer this question (how often do you use the following services to determine road and/or weather conditions?) for each of the fourteen phone numbers. If each of the participants had answered all 14 parts of this question, there would have been a total of 4872 answers. Of the possible answers, 40% were not answered, 23% were in the category 'didn't know about it', 29% were in the category 'never' use number, and 8.8% were in one of the categories 'always, almost always, sometimes, and almost never' indicating that participants have used one or more number.

The data was examined to identify how many respondents used each of the phone numbers and how many respondents were not aware of these numbers. The analysis for the individual local numbers is shown in FIGURE 15. From this graph, it can be seen that between 40 and 44% of the respondents did not answer this question. Between 21 and 22% of the respondents did not know about the phone numbers and of those that knew about them, between 3 and 8% actually used the phone numbers. Leaving between 28 and 30% of the respondents to never use these numbers although they were aware of them. This leads us to believe that an increase in marketing, or improving knowledge of the numbers, may have an impact on the number of users.

To fairly compare the use of *ROAD, the 800 number, and the local numbers, the data was collected similar to that for FIGURE 14. Although the respondents were allowed to say they had used more than one local number, the local number they used the most was used, making the possible number of collective local number users the same as the number of survey responders. This makes the data for the three traveler information numbers comparable. This distribution is shown in FIGURE 16. It is indicated in this figure that, although each of the local numbers separately has a small percentage of users, there are collectively more local number users (37.1%) than for either *ROAD (16.4%) or the 800 number (36.8%). The amount of survey

respondents who know about the numbers, but never use them is 21.6% for *ROAD, 16.1% for the 800 number, and 23.9% for the local number. The amount of respondents who were not aware of the numbers was the greatest for *ROAD (31%), followed by the local number (21.3%), and lastly the 800 number (20.7%).

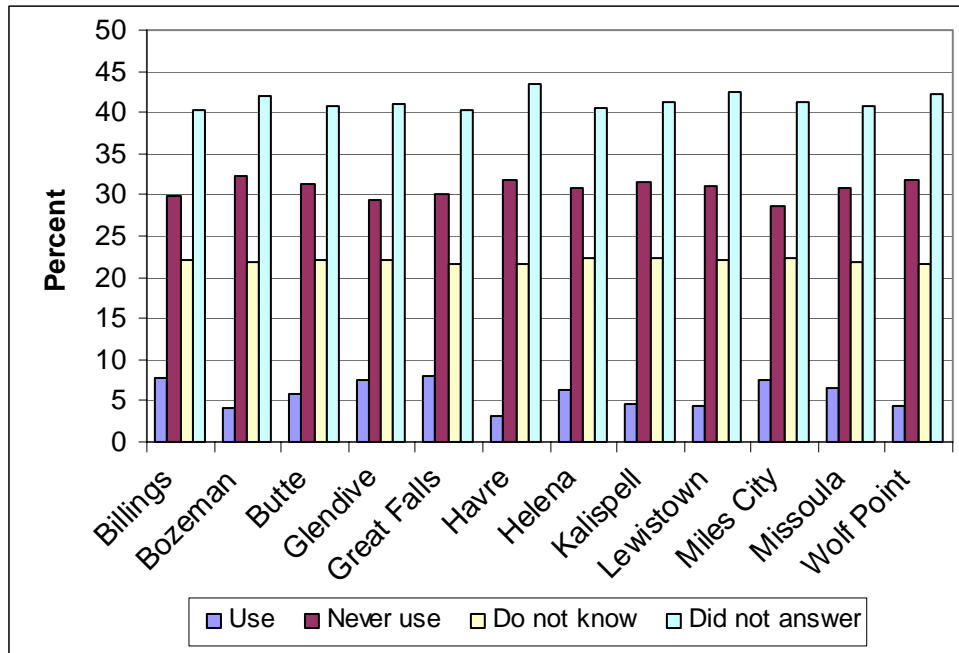


FIGURE 15 Comparisons of local MDT numbers.

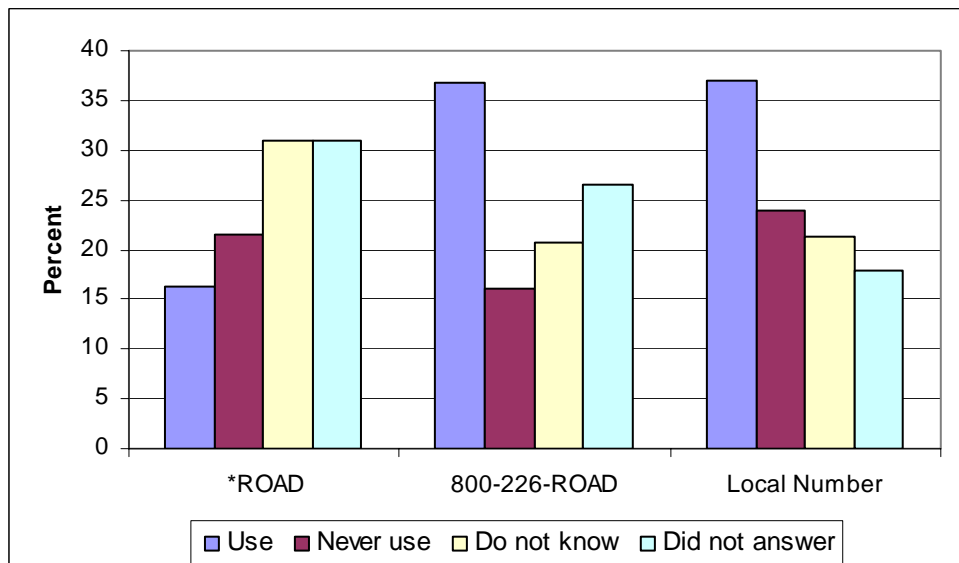


FIGURE 16 Comparison of users vs. non-users.

The fact that the survey shows the local number users rivaling the 800 number users resulted in an investigation into the actual call volumes for these numbers. Average call volumes per month (November 2001 through March 2002) are shown for the 800 number and the collective local numbers (*ROAD numbers are not available). This distribution can be seen in FIGURE 17.

This figure shows that the number of calls per month of the 800 number far exceeded the number of calls per month on the collective local numbers by two to three times with exception of November 2001. This indicates that although survey responses show that the number of local number users was close to the number of 800 number users, the fact that the mean frequency for 800 number uses was a more reliable statistic. It also shows that although respondents have tried the local numbers, they are more likely to use the 800 number again.

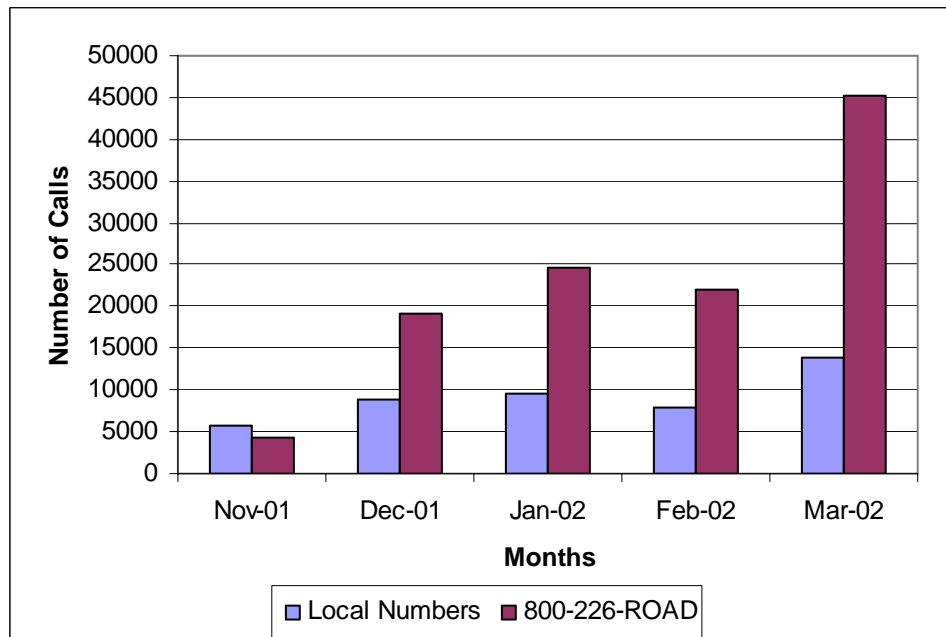


FIGURE 17 Monthly call volumes for Montana phone numbers.

To more accurately compare the usage of the phone numbers (800, local, and *ROAD), the usage for each number was normalized based on how many survey respondents lived in that area/district. This chart is shown in FIGURE 18. Although the researchers could not link the zip codes with the actual surveys, this was done to see if any trends would show up. If the number of users for the service divided by the number of responders from that district equaled one, then either every survey respondent from that district had used the phone number, or responders from outside the districts had tried it. In the cases where the ratio was greater than one, Billings, Great Falls, and Missoula, this shows researchers that responders, other than those from the district are using those local phone numbers. This shows that people who do not live in those areas, but travel to them use the local numbers as well. This makes sense as the three local numbers with the highest ratio are in Montana's urban areas.

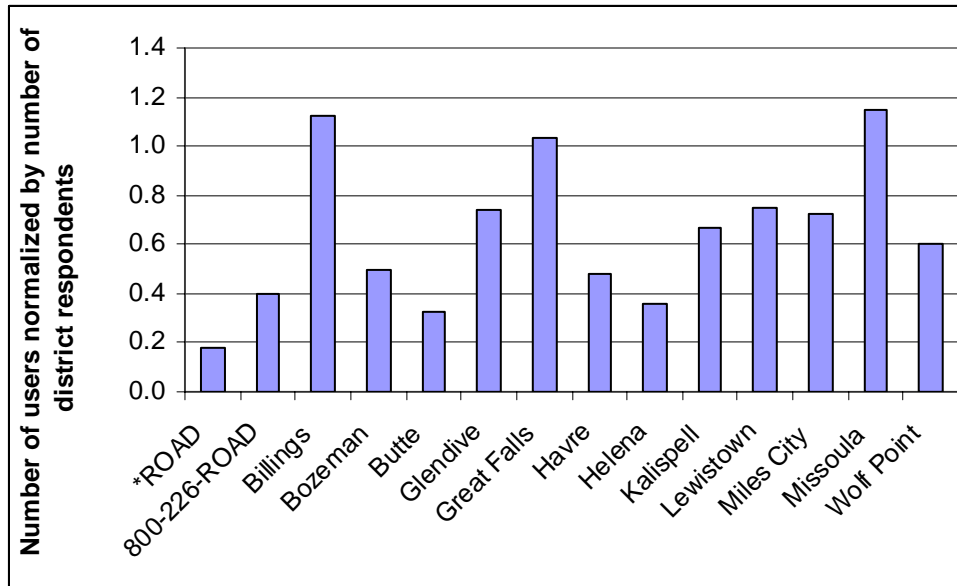


FIGURE 18 Number of users normalized by number of district respondents.

By looking at the average call volumes (November 2001 to March 2002) for the Montana phone numbers (*ROAD and Great Falls numbers were not available), shown in FIGURE 19, researchers would expect the call volumes for the three urban areas from above to have higher average monthly call volumes than the other local numbers. It is shown that this was true for Missoula, but not for Billings leaving the researchers to believe that the survey respondents were not representative of the entire state. As previously shown in FIGURE 2, the rural eastern districts were better represented in the survey responses than in the general population. If these regions use the Great Falls or Billings number, this would explain the difference. The local numbers with the highest average monthly call volumes include Bozeman, Kalispell, and Missoula.

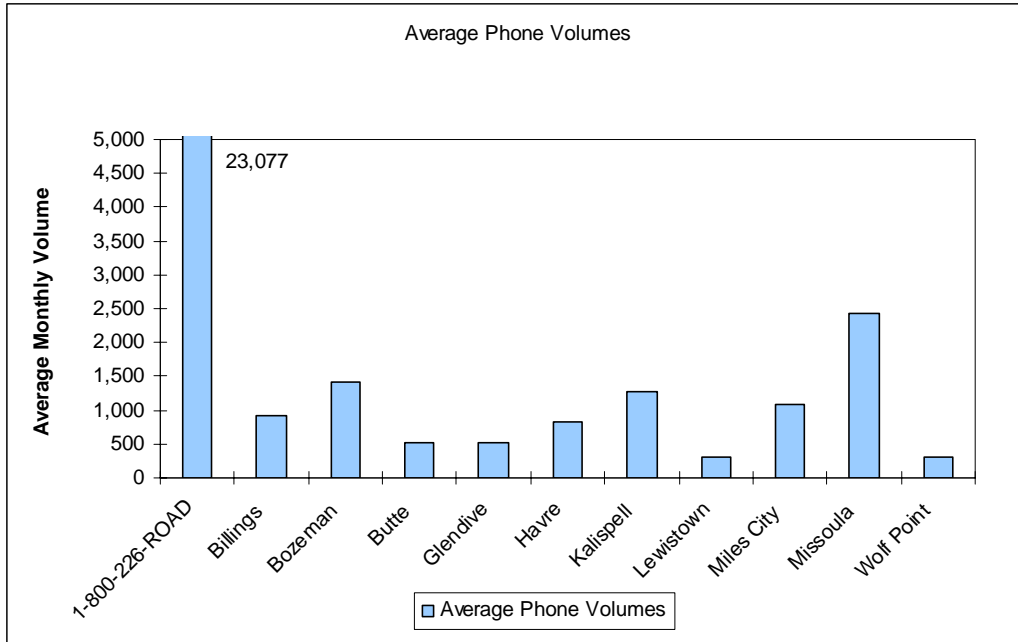


FIGURE 19 Average monthly volumes for Montana phone numbers.

FIGURE 20 is more indicative of the local number usage. This figure indicates the average monthly call volume divided by the population in that area. This figure shows which phone number is being used the most regardless of the population in that area. It is shown that the most popular number is Miles City followed by the 800 number with Bozeman, Glendive, and Havre being used slightly more than the rest of the numbers.

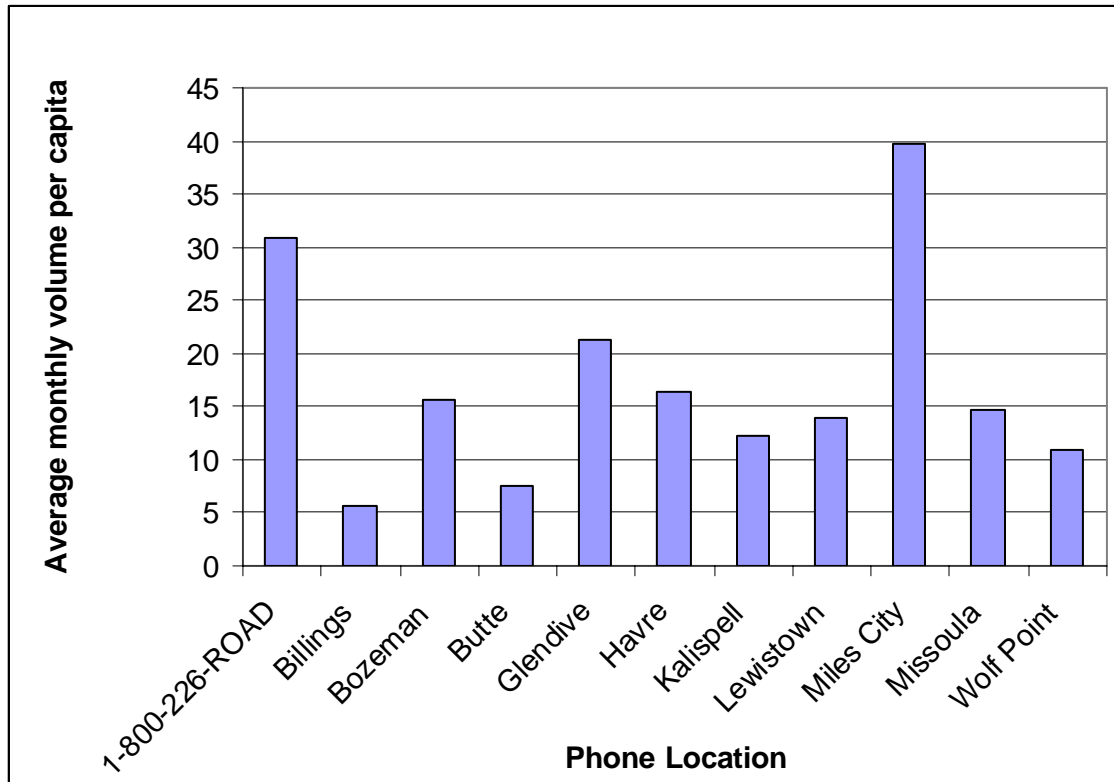


FIGURE 20 Average monthly volume per capita.

The chi-squared analysis revealed differences in response were based on age and income. Respondents who indicated knowing about the Wolf Point local number were more frequently in the 15-24 age group. Also, respondents who indicated knowing about the Bozeman local number were more frequently in the \$40,000-79,999 income bracket.

The general comments for the survey indicated that some people do not use these services because: they seldom drive due to age, use the radio and weather channel because reports on website are not always correct, and they do not have a reason to use the service. The comments also indicate that the people who did not know about the service wish they had known about it before and are glad that they know about it now. One person indicated that, "...I will use it from now on. Travel on MT roads can be hazardous when you don't know what you are heading into and may be unprepared – especially 2 lane highways, such as from Three Forks to Helena." Some of the participants also mentioned that they want the public to hear about the numbers in a "more public manner," and would like to see the numbers in a "more easy to find location" after having to search the phone book for them.

5.2 USE OF NUMBER BEFORE OR DURING A TRIP

The purpose of Question 4 was to find out whether service number users typically used the service before they leave or during a trip. The data in FIGURE 21 shows that the majority of service users (71%) accessed the service before a trip. About 29% of users used the service both before and during a trip. Only 1.1% accessed the service while traveling. The chi-squared analysis found no differences in the responses to this question with respect to the various demographic questions.

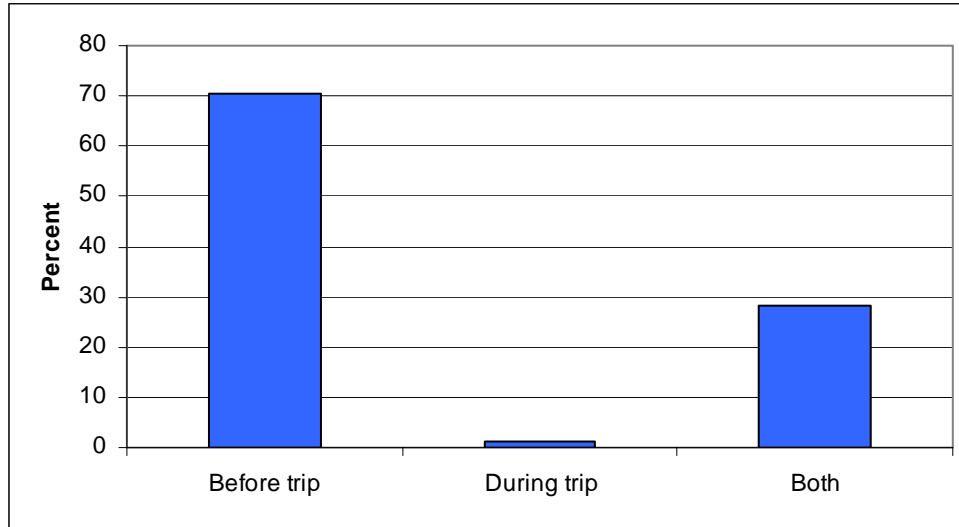


FIGURE 21 Use of service before or during a trip.

5.3 AVAILABILITY OF NUMBER

Question 5 was designed to collect data regarding the availability of the service. The future use of a service is often tied to its availability. If users experience difficulties accessing the service due to high call volume or too few phone lines they might not try to use it again. Survey participants had the option to rate the availability or answer the question with don't recall.

FIGURE 22 shows the respective ratings for the availability of service. The majority of respondents felt that availability was somewhat available (33%), very available (29%), or neutral (24%). A small number of participants (5.0%) could not recall. The overall mean for this question was 3.84 (out of 5.0), which corresponds with an average rating between neutral (3.0) and somewhat available (4.0). The chi-squared analysis found no differences in the responses to this question with respect to the various demographic questions.

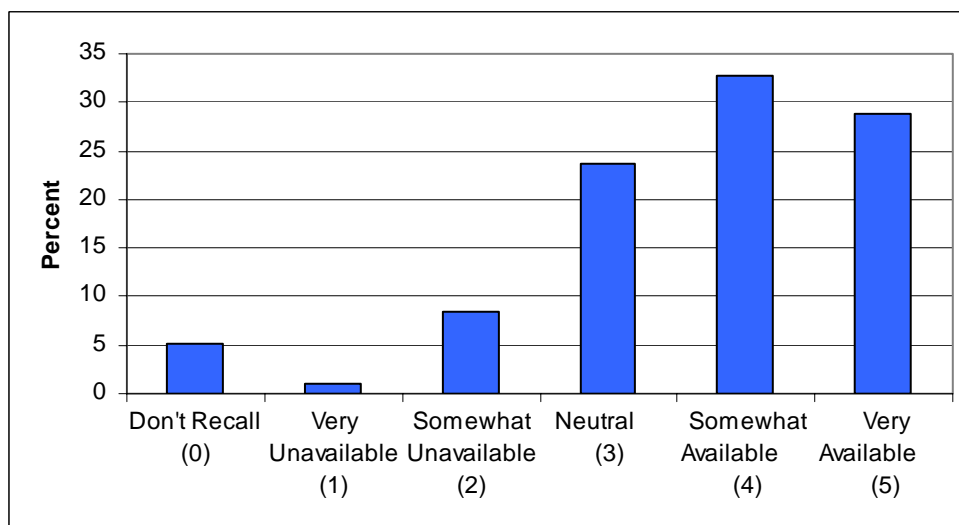


FIGURE 22 Availability of service.

5.4 UNDERSTANDABILITY OF NUMBER

Question 6 was asked to assess the users' impression of the understandability of the road reports and weather forecast. Understandability is critical because messages may contain information that could change travel plans. This is also important because if users do not understand the system or message the first time they use it, they may not be willing to try again. As shown in FIGURE 23, the majority of users found the information delivered through the service easy to understand. The service was rated very easy to understand by 44% of survey participants, while 29% found it somewhat easy. A neutral rating was given by 17% of survey participants and only 1.7% of participants did not recall. The mean response for this question was 4.09, which corresponds to an average rating of somewhat easy (4.0).

The chi-squared analysis found no differences in the responses to this question with respect to the various demographic questions. The general comments regarding the understandability of the services state that the biggest problem is the fast pace with which reports are being read. One survey participant has a "hard time keeping up" due to hearing problems and another participant wants someone hired that "can read slowly and articulate."

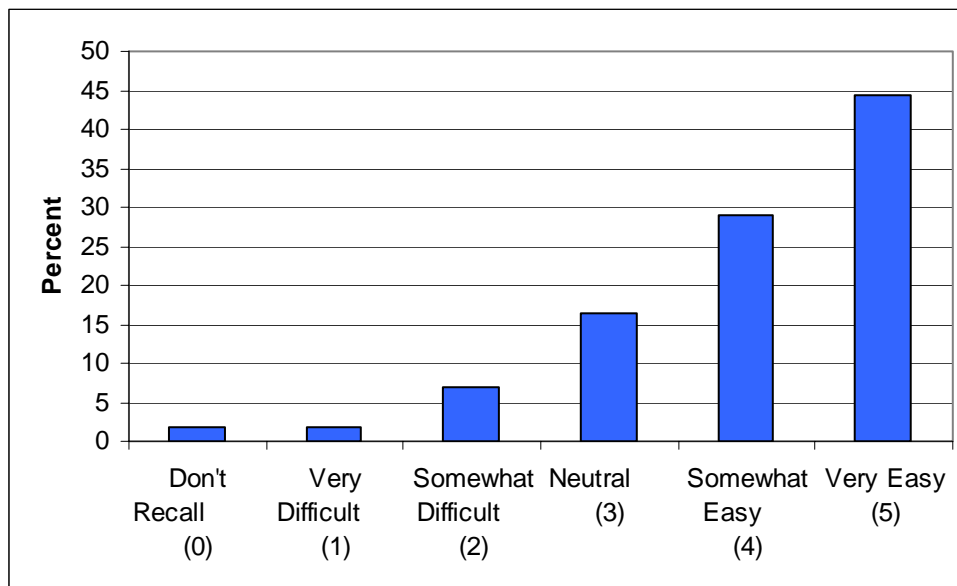


FIGURE 23 Understandability of service.

5.5 ACCURACY OF NUMBER

Question 7 was asked to determine the users' impression of the accuracy of the service numbers. Just like understandability, accuracy is one of the key features that will influence motorists' continued use of the service. Incorrect data might deter users from using the service again. The results from this question cannot be linked to actual accuracy of the data because they only take into account users' impressions of accuracy.

Overall the findings, shown in FIGURE 24, were mostly positive. The service was rated very accurate by 17% of survey participants while 47% thought the information was somewhat accurate and 25% were neutral. A small fraction (3.5%) did not recall how accurate the service was. The mean rating for service accuracy was 3.75, which corresponds to an average rating

between neutral (3.0) and somewhat accurate (4.0). The chi-squared analysis found no differences in the responses to this question with respect to the various demographic questions.

The general comments regarding the accuracy of the service numbers stated that some of the survey participants found the reports to not be accurate. The participants felt that the weekend updates “need improvement,” the road reports are “fairly accurate in the morning, after that they get very lax,” the “conditions aren’t as bad as the road reports say,” the road reports are “not always current in the day,” the road reports are “often delayed and not very accurate,” and the roads in southeastern Montana are “hard to get reports on.”

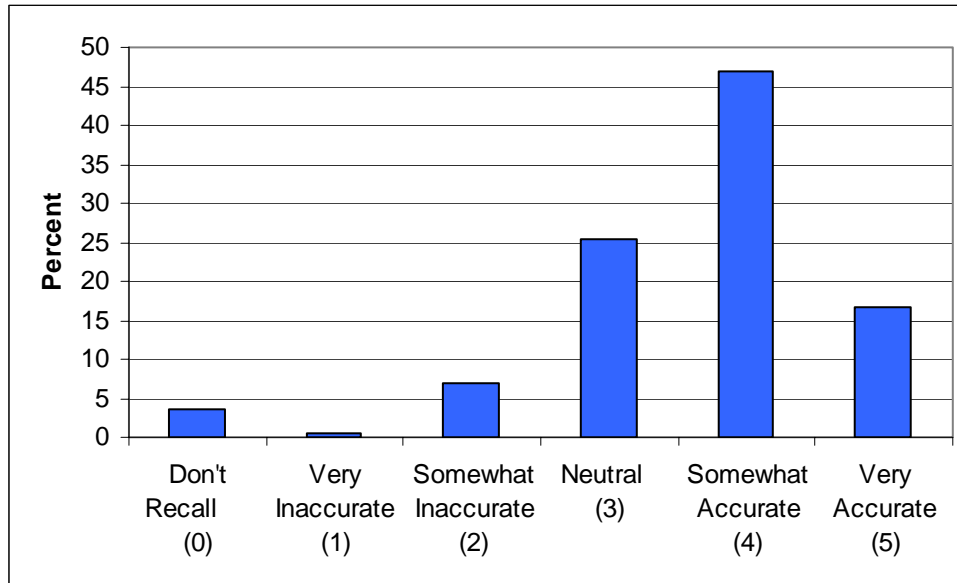


FIGURE 24 Accuracy of service.

5.6 LIKELIHOOD TO AFFECT TRAVEL PLANS

Question 8 was used to determine how likely the service’s road condition reports and weather forecasts are to affect users’ travel plans. This question, although still a rank question, did not offer a don’t recall response.

Ratings for this question, displayed in FIGURE 25, show that for the majority of respondents the road and weather travel information numbers will have an impact on their travel plans. The service was rated very likely to affect travel plans by 47% of survey respondents while 31% considered the report somewhat likely to affect their travel plans and 17% of were neutral. The mean response for this question was 4.2, which corresponds to an average rating between somewhat likely (4.0) and very likely (5.0). The chi-squared analysis found no differences in the responses to this question with respect to the various demographic questions.

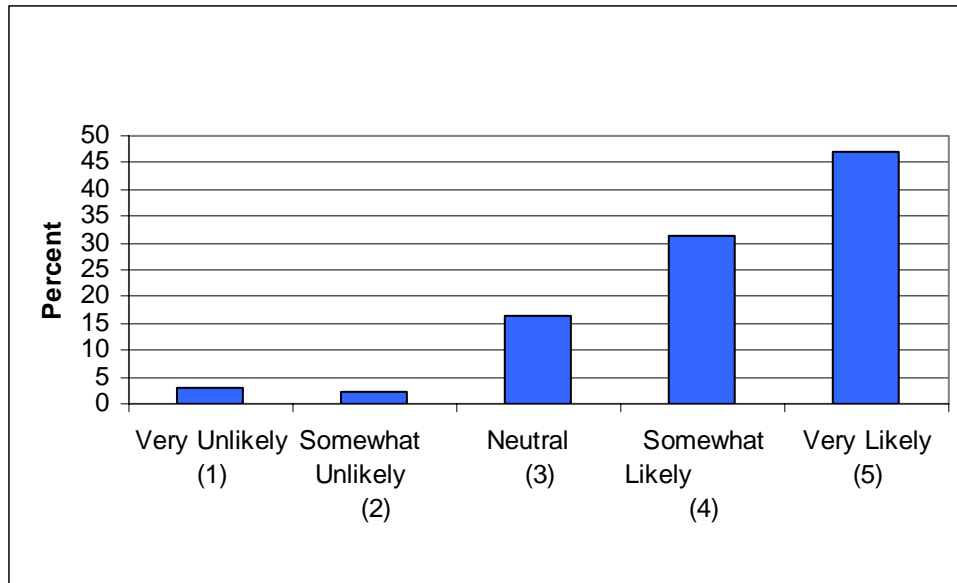


FIGURE 25 Likelihood of service to affect travel plans.

5.7 OVERALL USEFULNESS OF NUMBER

Question 9 was asked to gain an understanding of the overall usefulness of the service according to users' impressions. This data cannot be used to predict the use of service numbers since the question solely provides an estimate of users' assessments of usefulness. A don't recall response was not offered for this question.

As can be seen in FIGURE 26, a great majority of survey participants considers the service useful. The service was rated as very useful by 46% of survey participants while 42% thought it's somewhat useful and 9.9% were neutral. The mean response for this question was 4.30, which corresponds to an average rating between somewhat useful (4.0) and very useful (5.0). The chi-squared analysis found no differences in the responses to this question with respect to the various demographic questions.

The general comments regarding usefulness show that some people felt the travel information numbers were useful, while others thought they were a waste of money. The following comments are the opinion of specific survey respondents (one of 171) and can be considered outlier comments. For example, some survey participants said they "really count on updated road reports before starting on trips," the "info was valuable to direct travelers around fires last summer," "knowledge is power," and "work for an ambulance service, we travel in all conditions and regularly call 800-226-ROAD." Other survey participants however felt that the "road system is a waste of money," they did not know how it benefited colleges in Montana and they "would like money better spent on education," and "many checkpoints with information are needed at places besides convenience stores and rest stops [therefore] more rest areas or just more reader boards [are needed]."

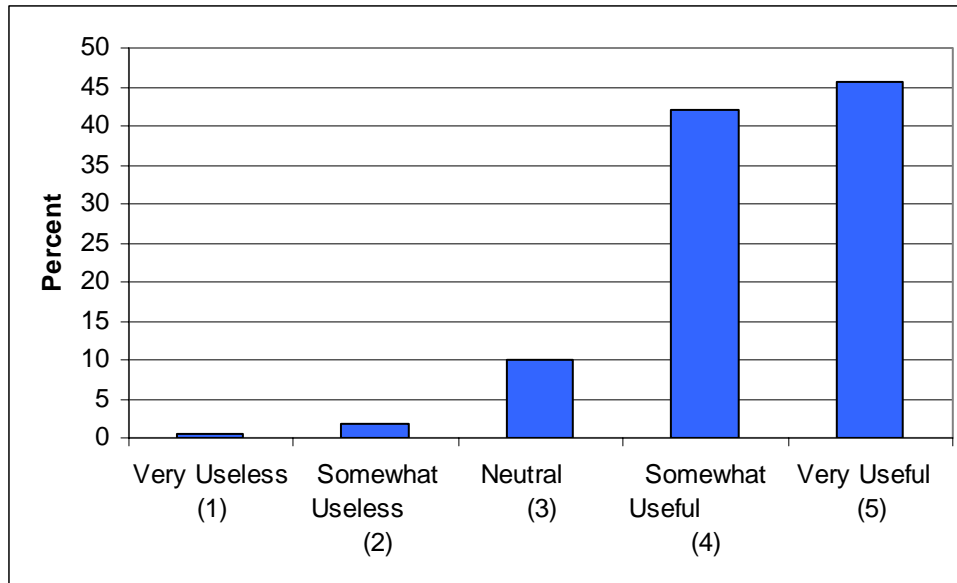


FIGURE 26 Usefulness of service.

5.8 PREFERENCE OF STATE VS LOCAL NUMBER

Question 10 was asked in regard to user preference. Users could choose between statewide numbers (800-226-ROAD, *ROAD) and the local MDT numbers listed in Question 3.

Participants' preferences are shown in FIGURE 27. The majority of service users preferred the statewide numbers (69%) while only 31% preferred the local MDT numbers. The chi-squared analysis revealed differences in preference with respect to use and knowledge of local MDT numbers, use of the telephone as a source to obtain road conditions and weather forecasts, and reasons for travel information preference. Respondents indicated that they preferred the statewide numbers more often upon using the statewide phone number as a source to obtain road conditions and weather forecasts, not using the telephone or local MDT numbers as a source to obtain road conditions and weather forecasts, not knowing about the Great Falls, Kalispell, Lewistown, and Missoula local numbers, and having a travel information number preference based on the number containing statewide information. Respondents indicated preferring the local numbers upon preferring a travel information number for its more localized information.

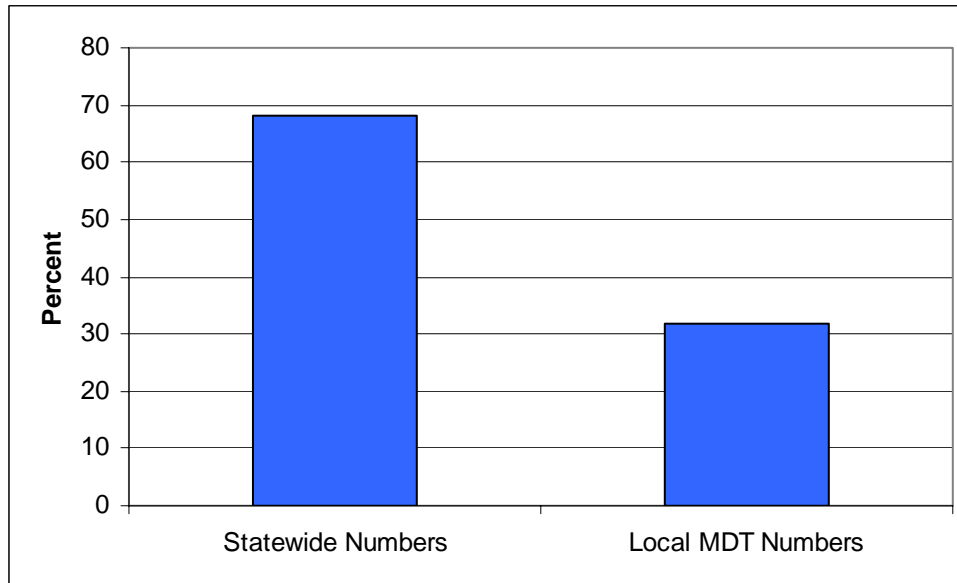


FIGURE 27 Number preference.

5.9 REASONS FOR PREFERENCE OF STATE VS LOCAL NUMBER

Question 11 was used as a follow-up to question to find out why motorists prefer the answer they chose in Question 10. The seven preference options provided included: contains statewide information, contains more localized information, shorter message, more accurate information, easier to use, know the phone number, and other.

FIGURE 28 displays the reasons for user preference. The majority of respondents that preferred the statewide numbers (i.e. 800-226-ROAD or *ROAD) tend to do so because the numbers contain statewide information (46%), they know the phone number (23%), and the numbers are easier to use (13%). The other reasons that respondents filled in include: three responses for “Toll free,” two responses for “The only one I’m aware of,” two responses for “Did not know about others,” and one response for “I travel through entire state so don’t want to remember multiple numbers.”

The majority of respondents that preferred the local numbers tend to do so because the numbers contain more localized information (48%). The other reasons that respondents filled in included: “Didn’t know about the statewide,” “Didn’t know about a-b [*ROAD and 800-226-ROAD],” and “These are the ones I could find in the phone book-hard to find.” The chi-squared analysis found no differences in the responses to this question with respect to the various demographic questions.

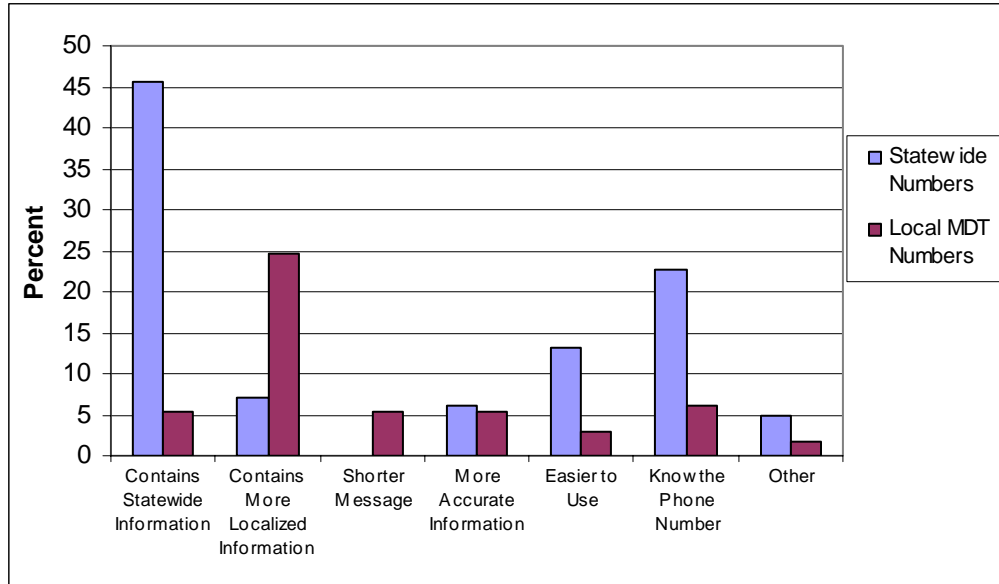


FIGURE 28 Number preference and reason.

6 FUTURE SURVEY DESIGN RECOMMENDATIONS

The Montana Traveler Information survey was the first survey to be distributed related to GYRTWIS and a new 511 system. The survey design therefore was based on preceding #SAFE surveys from North and South Dakota. After analyzing the data, responses indicated that some changes need to be made to the general survey design. The following recommendations are made in consideration of the follow up survey to be distributed after 511 implementation. Each question that posed a problem is described individually and a recommendation for improvement is given.

6.1 QUESTION 1

HOW OFTEN do you travel on U.S. or Interstate highways in Montana?

(Fill in only one blank)

- _____ times per day
- _____ times per week
- _____ times per month
- _____ times per year

The design of Question 1 seemed to invite survey participants to fill out more than one field. The instruction to fill in only one blank was frequently disregarded. As a result survey participants filled out two or more fields. In many cases the responses did not add up (i.e. the times per day were not converted to the correct number of times per week, month, and year). Because of this unreliable data a high number of responses had to be omitted from the analysis.

For future surveys the question design needs to be changed. Instead of listing four possible responses there will only be one field, times per year, to be filled in by survey participants. The new question will say:

Fill in the number of times in the last 12 months that you have traveled on highways in Montana.

_____ times per year

The new design eliminates bias and reduces the amount of analysis to be done on this question (e.g. all answers were converted to times per year so they could be compared) because the actual data is already in a times per year form.

6.2 QUESTION 15

What is the PRIMARY PURPOSE for the majority of your vehicle travel on highways in Montana?

- Work
- School
- Shopping
- Medical
- Recreation
- Visit family or friends
- Vacation
- Other_____.

Question 15 was designed to let survey participants choose from a list of trip purposes that reflects their primary purpose for the majority of vehicle travels. Although the wording of the question asked for the primary purpose, many survey participants checked more than one answer. Another factor that may have contributed to multiple responses was that no instructions stating (*Check only one*) were included with this question.

Changing the wording of the question might be a possible solution. The wording needs to clearly state that only one purpose is to be chosen. However, even with a change of wording and the instructions to fill in only one blank, experience shows that survey participants still fill out more than one blank.

For this survey round, there were not enough responses for the chi-squared analysis on this question to be valid. Due to the fact that the same number of surveys will be sent out next time and to the same 1500 people as this survey round, we can expect that the chi-square analysis will have no relevance in this question for the next round of surveys as well and therefore it would be best to eliminate this question.

6.3 QUESTION 16

What is the AVERAGE number of miles traveled for the trip purpose in Question 15?

- 0 – 24
- 25-49
- 50 – 99
- 100 – 300
- 300+

Question 16 was a follow-up to Question 15. Therefore, many survey participants who incorrectly answered Question 15 also gave incorrect responses for Question 16. Survey participants that chose more than one purpose for Question 15 consequently had to choose multiple mile averages corresponding to their responses. If at least one of the two questions was answered incorrectly, then that individual's answers to both questions had to be omitted.

Again, the responses for Question 16 show that the wording of the question is not clearly understandable. Although the chi-squared analysis for this question had sufficient data to be valid, there were no differences found, leading us to believe that this question could also be eliminated from future survey designs. Although distances traveled are important, by changing the wording and subsequently the responses for Question 1, this information will still be collected.

6.4 QUESTION 19

What TYPE of vehicle do you PRIMARILY drive on highways in Montana?

- Automobile
- Commercial (Truck, bus)
- Other _____

Question 19 showed similar problems with the wording “primarily.” Survey participants checked multiple responses naming each vehicle they owned. Moreover, the definition of automobile and truck was not clear and left wide open for interpretations. Some survey

participants checked the category “Automobile” and the category “Other” naming their pickup truck under “Other.” Some survey participants just checked “Other” and wrote in pickup truck, van, and SUV although they should be considered as automobiles. Overall, participants were confused with the question layout.

As a result, the categories for Question 19 need to be changed and defined clearly. Other surveys that WTI has administered have shown that the following categories are better understood:

- Motorcycle
- Passenger Car
- Pickup truck
- Sport Utility Vehicle (SUV) / Minivan
- Recreational Vehicle (RV or camper)
- Commercial (i.e. semi truck)
- Bus (i.e. public transit or coach bus)
- I normally ride as a passenger

Therefore it is recommended that for future surveys, the question should read:

What TYPE of vehicle do you PRIMARILY drive on highways in Montana?

(Check only one)

- Motorcycle
- Passenger Car
- Pickup truck
- Sport Utility Vehicle (SUV) / Minivan
- Recreational Vehicle (RV or camper)
- Commercial (i.e. semi truck)
- Bus (i.e. public transit or coach bus)
- I normally ride as a passenger

6.5 ZIP CODES

Another change needed in future surveys is the inclusion of a question about survey respondents’ zip codes. This information would have allowed researchers to link all of the survey answers with the local phone numbers to see if survey participants who do not live in the area use a local number or to identify if there were differences in preference between statewide and local number based on area of Montana.

6.6 INSTRUCTIONS

Lastly, the instructions after question 3 stated:

If you have *NOT* used the services described in Question 3 in the past 12 months, please skip to *Question 12* on the back.

OTHERWISE

Answer Questions 4-11 based on the service most frequently used, as indicated in Question 3.

Attempts to link answers to Questions 4 through 11 with the “most frequently used service, as indicated in Question three,” failed due to the fact that many survey participants had multiple numbers ranked identically causing more than one service to be “the service most frequently

used.” Correlations between Question three and 4 through 11 could not be made due to this. Therefore it is recommended that in further surveys, the question directly below these directions should be:

For which road and/or weather condition service are you answering questions 5 through 12?

(Check only one)

- | | |
|---|--|
| <input type="checkbox"/> *ROAD (*7623) | <input type="checkbox"/> 265-1416 – Havre |
| <input type="checkbox"/> 800-226-ROAD (7623) | <input type="checkbox"/> 444-9424 – Helena |
| <input type="checkbox"/> 657-0209 - Billings | <input type="checkbox"/> 751-2037 – Kalispell |
| <input type="checkbox"/> 586-1313 - Bozeman | <input type="checkbox"/> 538-1358 – Lewistown |
| <input type="checkbox"/> 494-9646 - Butte | <input type="checkbox"/> 233-3638 – Miles City |
| <input type="checkbox"/> 377-2314 – Glendive | <input type="checkbox"/> 728-8553 – Missoula |
| <input type="checkbox"/> 453-1605 – Great Falls | <input type="checkbox"/> 653-1692 – Wolf Point |

7 SYSTEM USAGE STATISTICS

To give Montana Department of Transportation a better example of call volumes for the #SAFE system, WTI has compiled call volumes for November 2001 through March 2002 for North Dakota (ND), South Dakota (SD), Nebraska (NE), and Montana (MT). These call volumes were provided to WTI by the #SAFE vendor, Meridian Environmental Technologies. Currently ND and SD are using both the #SAFE system and phone number. Nebraska is using the #SAFE system, but using the 511 phone number. Currently Montana is still using an 800 number and has not yet switched to the #SAFE system.

Populations for these states estimated for 2001 (4) are shown in TABLE 1.

TABLE 1 POPULATION BY STATE

	Population
North Dakota	634,448
South Dakota	756,600
Nebraska	1,713,235
Montana	904,433
Minnesota	4,972,294

FIGURE 29 shows the call volumes by state for November 2001 through March 2002. It can clearly be seen that NE has a larger number of calls on the 511 than Montana does on the 800 number. One of the possible reasons for this is that Nebraska has a larger population than Montana. One possible reason for low call volumes in North and South Dakota is that the #SAFE service they are using is only for wireless calls. The data was then analyzed so the call volumes could be compared evenly regardless of state populations. This can be seen in FIGURE 30. This figure indicates that while Nebraska had the highest call volumes in November, February, and March, Montana had higher call volumes in December and January.

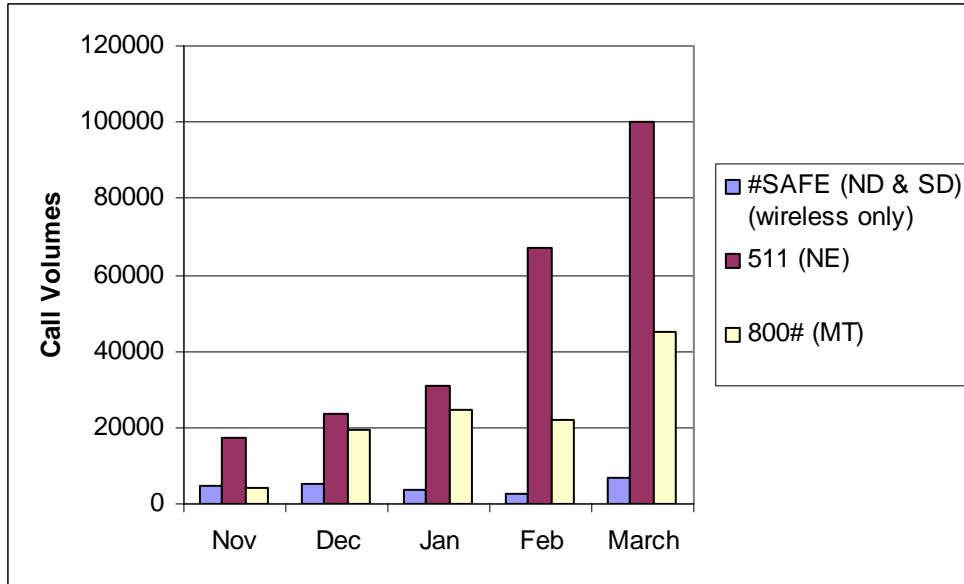


FIGURE 29 Comparison of state call volumes.

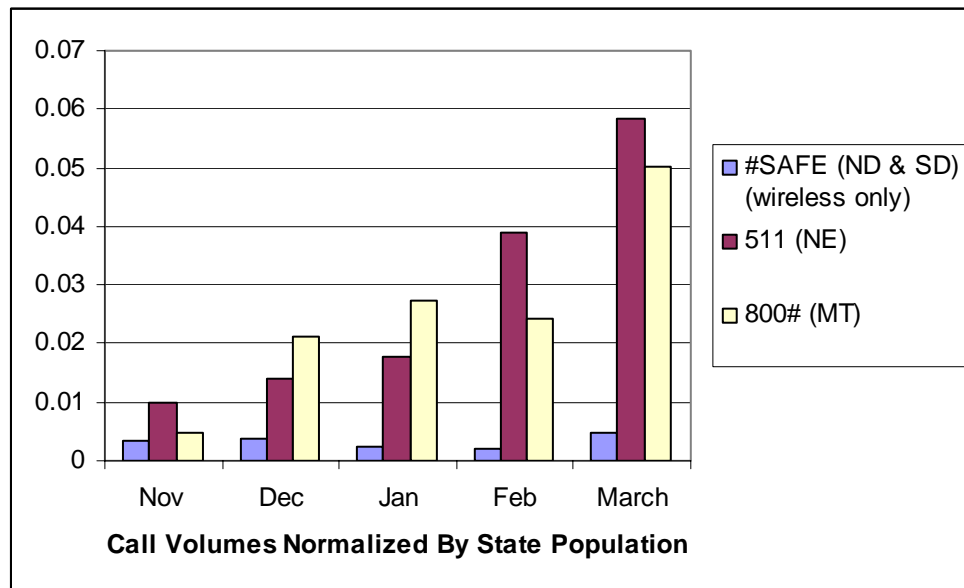


FIGURE 30 Comparison of state call volumes normalized by state population.

FIGURE 31 shows the comparison of web hits (number of times people got information from the site) on the safetravelusa.com website per state from November 2001 through March 2002. Although Montana’s information is not shown here, Minnesota’s is shown. Again it is shown that Nebraska has the greatest amount of web hits. The fact that Nebraska is the only state of the four that has a direct link from their website to the safetravelusa.com website is a factor in why this state has more web hits than the other three states. Another factor affecting web usage may be state population; therefore the data was analyzed to show web hit comparisons regardless of state population. This can be seen in FIGURE 32. Normalizing the web hits still shows that Nebraska has the most use of their website, but it also shows that of the other three states, South Dakota’s website is the most used.

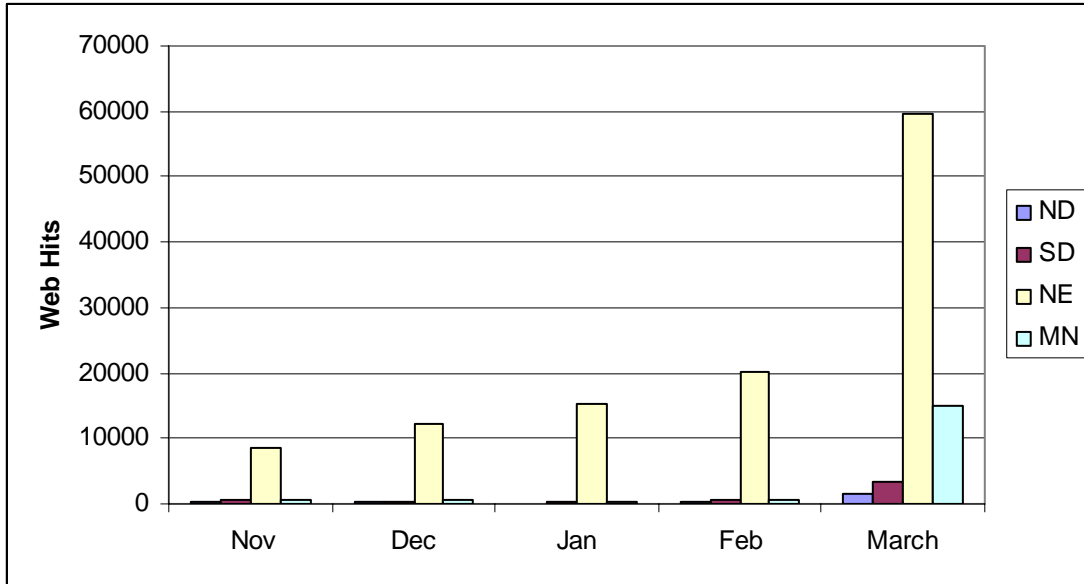


FIGURE 31 Web hits by state.

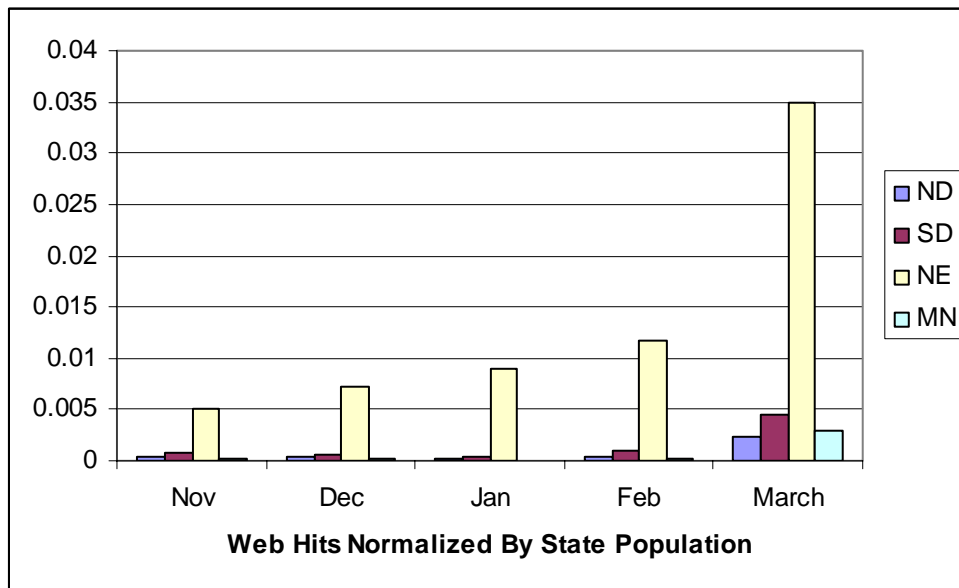


FIGURE 32 Web hits normalized by state population.

8 SUMMARY

1500 surveys were distributed to Montanans with 125 surveys distributed to each of the maintenance districts containing one of the 12 local numbers. The return rate for surveys was 23% accounting for 0.05% of Montana's population.

The demographics indicate that survey respondents were over representative of:

- Rural areas
- Males
- Ages 45+
- People with the primary driving purpose of going to work
- Cellular One and Verizon Wireless cell phone owners
- Wealthier Montanans
- Automobile drivers.

The traveler characteristics of the respondents indicate that:

- The majority of them travel on Montana highways less than once per day (62%).
- They use radio (68%), television (66%), and observations of existing conditions (45%) to frequently obtain road conditions and weather forecasts.

The functional measures section of the survey indicates that:

- While 37.9% of respondents are aware of *ROAD, 52.9% are aware of the 800 number, and 35-58% are aware of the local numbers, 31% are unaware of *ROAD, 20.7% are unaware of the 800 number, and 21-23% are unaware of the local numbers with the rest of the respondents not answering the question (therefore these people also may be unaware of the services). General comments included wanting people to hear about the numbers in a "more public manner" and that they would like to see the numbers in a "more easy to find location" after having to search the phone book for them.
- Respondents normally use the 800 number more than *ROAD or the local numbers to get road conditions and weather forecasts.
- Respondents use the 800 number more frequently than *ROAD or the local numbers.
- The greatest number of respondents use both the 800 number and local numbers over *ROAD.
- The respondents prefer the statewide number to the local numbers.
- Of the local numbers:
 - Great Falls, Glendive, Billings, and Miles City are used the most frequently by respondents and have the highest number of responding users.
 - Missoula, Billings, and Great Falls phone numbers are also used by respondents who live outside of those local areas.

- Missoula, Bozeman, Kalispell, Miles City and Billings have the largest average monthly call volumes.
- Miles City, Glendive, Havre, Bozeman, and Missoula have the largest average call volumes per capita.
- The majority of respondents access the service number before a trip.
- The mean availability of the phone numbers is between neutral and somewhat available.
- The mean understandability of the number is somewhat easy although the general comments stated that the biggest problem is the fast pace with which the messages are read.
- Respondents felt that the mean accuracy of the number is between neutral and somewhat accurate. The general comments suggested that the reports are fairly accurate in the morning, but are delayed and not accurate later in the day and on the weekends.
- Respondents felt that the mean for the phone reports to affect their travel plans was between somewhat likely and very likely.
- Respondents felt that the mean overall usefulness of the numbers was between useful and very useful. General comments suggested that some people felt the service was very useful, “really count on updated road reports before starting on trips” and “work for an ambulance service, we travel in all conditions and regularly call 800-226-ROAD,” while others felt the service was a waste of money and should go towards education.
- The statewide number (69%) was preferred to the local numbers (31%).
- Respondents preferred the statewide number because it contained statewide information, they knew the phone number, and the numbers are easier to use. General comments suggested other reasons include the fact that it is toll free, that they did not know the local numbers, and that they travel the entire state and don’t want to remember multiple numbers.
- Respondents that prefer the local numbers do so because they contain more localized information. General comments indicate that respondents also did not know about the statewide numbers and that the local numbers were the ones listed in the phone book.

The results from this survey will be compared to survey results after 511 is implemented. Analysis of the current survey indicates that some of the questions need to be altered before the next iteration to ensure understandability. The alterations include shortening Question 1 to one option for answering, eliminating Questions 15 and 16, adding more options for answers to Question 19, adding a question regarding zip code, and clarifying instructions for continuing with Question 4 or skipping to Question 12.

A comparison of #SAFE users (Nebraska, Montana, North Dakota, and South Dakota) call volumes for November 2001 through March 2002 shows that where Montana calls reach an excess of 40,000 calls in some months, Nebraska’s 511 system reaches an excess of 100,000 calls in some months. Call volumes for North and South Dakota are low due to this system only being available through wireless phone. These systems are currently changing to 511 and will include wireless and wireline creating an opportunity for better comparisons to be drawn in the

next survey. Data from other states to compare the call volumes before and after switching to 511 were not available, but the next survey will allow researchers to make this comparison for Montana.

A comparison of #SAFE users (Nebraska, North Dakota, South Dakota, and Minnesota) web hits indicates Nebraska had the most web hits of any of the states even when the data was normalized by state populations. One possible factor for Nebraska's high amount of web hits may be that they are the only state with a direct link to the Meridian safetravelusa.com website which provides the same information as 511.

9 CONCLUSIONS

Although the survey respondents are not exactly representative of the population of the state of Montana, some valuable conclusions can be drawn from the analysis of the survey. These conclusions include:

- The majority of respondents used and preferred the statewide number. Some preferred the local numbers because the information provided is more specific. The new 511 service will allow them to access the same localized information currently available via the local phone numbers.
- Not all those surveyed were aware of the phone numbers. Awareness can be increased through marketing such as that planned for the new 511 service. As the majority of respondents tend to use the phone services before they leave for a trip, the majority of the marketing should reach people then.
- Respondents aware of the current services indicated that they are useful, people depend on them, and they are likely to have an affect on peoples' travel plans.
- Several areas for improvement in the current service. The messages are too fast paced, making them difficult to understand. The accuracy of the messages is also a concern, as they are delayed and not as accurate in the latter part of the day and on the weekends. The new service will address these issues, as messages will be read more slowly and updates to the information will be provided every half-hour or as major changes occur.
- Web volumes for #SAFE users indicated that one factor for Nebraska's high volume may be due to having a direct link on their traveler information web page for Meridian's safetravelusa.com website which provides travelers with the same information as 511.

In addition, the following considerations are indicated for future research:

- For better survey understandability and future analysis, two questions need to be altered, two questions eliminated, and two questions added.
- Better call volume comparisons for #SAFE users will be available during the next survey.

REFERENCES

- 1 Cuehlo, E., J. Ryan, and W. Ralph. #SAFE Evaluation Annual Report 2001. Western Transportation Institute/Montana State University-Bozeman, June 2001.
- 2 Weiss, Neil A. Elementary Statistics Third Edition. Addison-Wesley Publishing Company, Inc, Massachusetts, 1996.
- 3 U.S. Census Bureau 2000 Data. August 2002.
<http://www.census.gov/main/www/cen2000.htm/>
- 4 Federal Statistics. August 2002. <http://www.fedstats.gov>

APPENDIX A: SURVEY INSTRUMENT

1. HOW OFTEN do you travel on U.S. or Interstate highways in Montana? *(Fill in only one blank)*

- _____ times per day
- _____ times per week
- _____ times per month
- _____ times per year

2. When traveling in Montana, WHAT RESOURCES do you NORMALLY use to determine road conditions or to hear a weather forecast report? *(Check all that apply)*

- | | |
|---|---|
| <input type="checkbox"/> Television | <input type="checkbox"/> www.mdt.state.mt.us/travinfo |
| <input type="checkbox"/> Radio (FM/AM) | <input type="checkbox"/> Internet |
| <input type="checkbox"/> Telephone | <input type="checkbox"/> Highway Advisory Radio |
| <input type="checkbox"/> Cell Phone | <input type="checkbox"/> Observations of Existing Conditions |
| <input type="checkbox"/> *ROAD (*7623) | <input type="checkbox"/> Notices at Truck Stops, Convenience Stores, Rest Areas |
| <input type="checkbox"/> 800-226-ROAD (7623) | <input type="checkbox"/> Communication with Other Drivers |
| <input type="checkbox"/> Local Montana Department of Transportation Phone Numbers <i>(see question 3 c through n)</i> | <input type="checkbox"/> Other <i>(please specify)</i> _____ |

3. HOW OFTEN do you use the following services to determine road and/or weather conditions? *(Check only one box for each item)*

<u>Service</u>	<u>Location</u>	<u>Always</u>	<u>Sometimes</u>	<u>Never</u>	<u>Didn't know about it</u>
a) *ROAD (*7623)	Montana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) 800-226-ROAD (7623)	Montana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) 657-0209	Billings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) 586-1313	Bozeman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) 494-9646	Butte	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) 377-2314	Glendive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) 453-1605	Great Falls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) 265-1416	Havre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) 444-9424	Helena	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) 751-2037	Kalispell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) 538-1358	Lewistown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) 233-3638	Miles City	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m) 728-8553	Missoula	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n) 653-1692	Wolf Point	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you HAVE NOT USED the services in Question 3 in the past 12 months, please skip to Question 12 on the back.

Otherwise

Answer Questions 4-11 based on the service most frequently used, as indicated in Question 3.

4. Do you **TYPICALLY** use this service to access road conditions or hear a weather forecast report...

- Before you start a trip?
 While on the road?
 Both

5. When trying to access this service, **HOW AVAILABLE** is it? (*Check only one*)

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Very Available | | Neutral | | Very Unavailable | Don't Recall |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

6. **HOW EASY** to understand are the road condition reports and weather forecasts provided by this service? (*Check only one*)

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Very Easy | | Neutral | | Very Difficult | Don't Recall |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

7. **HOW ACCURATE** are this service's road condition reports and weather forecasts? (*Check only one*)

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Very Accurate | | Neutral | | Very Inaccurate | Don't Recall |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

8. **HOW LIKELY** are this service's road condition reports and weather forecasts to affect your travel plans? (*Check only one*)

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Very Likely | | Neutral | | Very Unlikely |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

9. Overall, **HOW USEFUL** is this service's road condition reports and weather forecasts? (*Check only one*)

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Very Useful | | Neutral | | Very Useless |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

10. Which of the road condition and weather forecast phone numbers do prefer?

- Statewide number, either *ROAD (*7623) or 800-226-ROAD (7623)
 Local Montana Department of Transportation Phone Numbers (*see question 3 c through n*)

11. Why do you prefer the phone number in Question 10? (Check all that apply)

- Contains statewide information
- Contains more localized information
- Shorter message
- More accurate information
- Easier to use
- Know the phone number
- Other _____

The following information is needed to ensure that your responses are properly represented in this survey. It will be used for the purposes of this survey ONLY. (Check only one box per question)

12. What is your current state of residence?

- Montana
- Other _____

13. What is your gender?

- Male
- Female

14. What is your age?

- 15– 24 years
- 25 – 44
- 45 – 64
- 65 or older

15. What is the PRIMARY PURPOSE for the majority of your vehicle travel on highways in Montana?

- Work
- School
- Shopping
- Medical
- Recreation
- Visit family or friends
- Vacation
- Other _____

16. What is the AVERAGE number of miles traveled for the trip purpose in Question 15?

- 0 – 24
- 25-49
- 50 – 99
- 100 – 300
- 300+

17. Do you have a cellular phone in your household?

- Yes _____ Service Provider
- No

18. What is your approximate annual household income?

- under \$20,000
- \$20,000 - \$39,999
- \$40,000 - \$79,999
- \$80,000 or more

19. What TYPE of vehicle do you PRIMARILY drive on the highways in Montana?

- Automobile
- Commercial (Truck, bus)
- Other _____

General comments/suggestions:

APPENDIX B: SURVEY DISTRIBUTION**Survey Respondent Zip Code Analysis Based on MDT Districts:**

	Count	Percent	Population per District	Percent
Billings	24	6.90	164240	18.20
Bozeman	28	8.05	89842	9.96
Butte	61	17.53	70125	7.77
Glendive	35	10.06	24249	2.69
Great Falls	27	7.76	155668	17.25
Havre	23	6.61	50778	5.63
Kalispell	24	6.90	103535	11.48
Lewistown	20	5.75	22513	2.50
Miles City	36	10.34	27134	3.01
Missoula	20	5.75	165093	18.30
Wolf Point	25	7.18	29018	3.22
Unknown	24	6.90		
Other state	1	0.29		
N =	348		902195	

APPENDIX C: TABULAR RESULTS

The following parts to this appendix show the survey question layout, the summary statistics, as well as the comments for each particular question. The statistical results shown include: frequencies, percentages, means and standard deviations. The abbreviation “N” represents the total number of respondents who answered the question, and “*” indicates the number of individuals who skipped a particular question or whose answers were omitted as explained in Section 1.3 Statistics. The abbreviation “StDev” represents the standard deviation of the specific question.

1. **HOW OFTEN do you travel on U.S. or Interstate highways in Montana? (Fill in only one blank)**

- _____ times per day
 _____ times per week
 _____ times per month
 _____ times per year

Times/year	Count	Percent
1	1	0.326
2	2	0.651
3	3	0.977
4	3	0.977
5	5	1.629
6	2	0.651
8	2	0.651
10	3	0.977
12	6	1.954
15	1	0.326
20	2	0.651
24	17	5.537
25	1	0.326
30	1	0.326
36	16	5.212
48	8	2.606
50	1	0.326
52	11	3.583
55	1	0.326
60	5	1.629
72	1	0.326
104	24	7.818
120	1	0.326
144	1	0.326
156	22	7.166
192	1	0.326
208	19	6.189
240	2	0.651
260	17	5.537
298	1	0.326
312	3	0.977
360	2	0.651
364	4	1.303
365	12	3.909
416	2	0.651
480	1	0.326
520	6	1.954
624	2	0.651
728	1	0.326
730	61	19.870
1095	4	1.303
1460	17	5.537
1825	6	1.954
2190	2	0.651
2555	1	0.326
2920	1	0.326
3650	1	0.326
7300	1	0.326
N =	307	
* =	41	
Mean	448.30	
St Dev	657.85	

2. When traveling in Montana, WHAT RESOURCES do you NORMALLY use to determine road conditions or to hear a weather forecast report? (Check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Television | <input type="checkbox"/> www.mdt.state.mt.us/travinfo |
| <input type="checkbox"/> Radio (FM/AM) | <input type="checkbox"/> Internet |
| <input type="checkbox"/> Telephone | <input type="checkbox"/> Highway Advisory Radio |
| <input type="checkbox"/> Cell Phone | <input type="checkbox"/> Observations of Existing Conditions |
| <input type="checkbox"/> *ROAD (*7623) | <input type="checkbox"/> Notices at Truck Stops, Convenience Stores, Rest Areas |
| <input type="checkbox"/> 800-226-ROAD (7623) | <input type="checkbox"/> Communication with Other Drivers |
| <input type="checkbox"/> Local Montana Department of Transportation Phone Numbers (see question 3 c through n) | <input type="checkbox"/> Other (please specify) _____. |

	Yes	Percent	No	Percent	Count	*
TV	229	65.80	119	34.20	348	0
Radio	236	67.82	112	32.18	348	0
Telephone	66	18.97	282	81.03	348	0
Cell Phone	23	6.61	325	93.39	348	0
*ROAD	19	5.46	329	94.54	348	0
800-226-ROAD	101	29.02	247	70.98	348	0
Local MDT numbers	46	13.22	302	86.78	348	0
www.mdt.state.us/travinfo	59	16.95	289	83.05	348	0
Internet	81	23.28	267	76.72	348	0
Highway Advisory Radio	26	7.47	322	92.53	348	0
Observation of existing conditions	155	44.54	193	55.46	348	0
Notices at Truck Stops	17	4.89	331	95.11	348	0
Communication w/ other drivers	73	20.98	275	79.02	348	0
Other	21	6.03	327	93.97	348	0

Question # 2 comments:

- Aviation radio
- Newspaper
- Check other vehicles and see how much snow is on them and how fast traffic is moving.
- Newspaper
- Weather band radio
- Roadside condition signs either side of the Bozeman pass
- Newspaper
- Newspaper
- I weigh the importance and look out the window.
- Scanner
- Two way radio weather CB
- Highway patrol and "gates"
- Daily paper
- Newspaper
- Watch the sky
- Weather radio

Others	Count
Aviation Radio	1
Newspaper	6
Check vehicles for snow	1
Weather Band Radio	2
Road condition sign	1
Check weather outside	2
Two way radio weather CB	1
Scanner	1
Highway Patrol	1

**3. HOW OFTEN do you use the following services to determine road and/or weather conditions?
(Check only one box for each item)**

<u>Service</u>	<u>Location</u>	<u>Always</u>		<u>Sometimes</u>		<u>Never</u>	<u>Didn't know about it</u>
a) *ROAD (*7623)	Montana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) 800-226-ROAD (7623)	Montana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) 657-0209	Billings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) 586-1313	Bozeman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) 494-9646	Butte	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) 377-2314	Glendive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) 453-1605	Great Falls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) 265-1416	Havre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) 444-9424	Helena	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) 751-2037	Kalispell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) 538-1358	Lewistown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) 233-3638	Miles City	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m) 728-8553	Missoula	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n) 653-1692	Wolf Point	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	5. Always Use	%	4	%	3. Sometimes Use	%	2	%	1. Never Use	%
*ROAD	7	2.92	0	0.00	40	16.67	10	4.17	75	31.25
800-226-ROAD	18	7.03	9	3.52	81	31.64	20	7.81	56	21.88
Billings	5	2.40	0	0.00	17	8.17	5	2.40	104	50.00
Bozeman	5	2.48	0	0.00	7	3.47	2	0.99	112	55.45
Butte	8	3.88	2	0.97	8	3.88	2	0.97	109	52.91
Glendive	5	2.44	5	2.44	13	6.34	3	1.46	102	49.76
Great Falls	6	2.88	0	0.00	20	9.62	2	0.96	105	50.48
Havre	3	1.52	1	0.51	6	3.05	1	0.51	111	56.35
Helena	3	1.45	2	0.97	16	7.73	1	0.48	107	51.69
Kalispell	1	0.49	2	0.98	11	5.39	2	0.98	110	53.92
Lewistown	1	0.50	1	0.50	12	6.00	1	0.50	108	54.00
Miles City	6	2.94	2	0.98	16	7.84	2	0.98	100	49.02
Missoula	4	1.94	0	0.00	16	7.77	3	1.46	107	51.94
Wolf Point	5	2.49	2	1.00	5	2.49	3	1.49	111	55.22

Didn't Know	%	Count	*	Mean	StDev.
108	45.00	240	108	1.89	1.16
72	28.13	256	92	2.53	1.25
77	37.02	208	140	1.45	0.99
76	37.62	202	146	1.29	0.89
77	37.38	206	142	1.43	1.10
77	37.56	205	143	1.50	1.08
75	36.06	208	140	1.50	1.05
75	38.07	197	151	1.23	0.79
78	37.68	207	141	1.40	0.93
78	38.24	204	144	1.27	0.75
77	38.50	200	148	1.26	0.73
78	38.24	204	144	1.51	1.09
76	36.89	206	142	1.39	0.93
75	37.31	201	147	1.31	0.93

	Use #	%	Never use	%	don't know #	%	didn't answer	%	Total	Mean
*ROAD	57	16.38	75	21.55	108	31.03	108	31.03	348	1.8939
800-226-ROAD	128	36.78	56	16.09	72	20.69	92	26.44	348	2.5272
Billings	27	7.76	104	29.89	77	22.13	140	40.23	348	1.4504
Bozeman	14	4.02	112	32.18	76	21.84	146	41.95	348	1.2857
Butte	20	5.75	109	31.32	77	22.13	142	40.80	348	1.4341
Glendive	26	7.47	102	29.31	77	22.13	143	41.09	348	1.5000
Great Falls	28	8.05	105	30.17	75	21.55	140	40.23	348	1.4962
Havre	11	3.16	111	31.90	75	21.55	151	43.39	348	1.2295
Helena	22	6.32	107	30.75	78	22.41	141	40.52	348	1.3953
Kalispell	16	4.60	110	31.61	78	22.41	144	41.38	348	1.2698
Lewistown	15	4.31	108	31.03	77	22.13	148	42.53	348	1.2602
Miles City	26	7.47	100	28.74	78	22.41	144	41.38	348	1.5079
Missoula	23	6.61	107	30.75	76	21.84	142	40.80	348	1.3923
Wolf Point	15	4.31	111	31.90	75	21.55	147	42.24	348	1.3095
Local Number	129	37.07	83	23.85	74	21.26	62	17.82	348	1.86

	Use #	Respondents	Norm. by resp.
*ROAD	57	323	0.18
800-226-ROAD	128	323	0.40
Billings	27	24	1.13
Bozeman	14	28	0.50
Butte	20	61	0.33
Glendive	26	35	0.74
Great Falls	28	27	1.04
Havre	11	23	0.48
Helena	22	61	0.36
Kalispell	16	24	0.67
Lewistown	15	20	0.75
Miles City	26	36	0.72
Missoula	23	20	1.15
Wolf Point	15	25	0.60

4. Do you TYPICALLY use this service to access road conditions or hear a weather forecast report...

- Before you start a trip?
- While on the road?
- Both

	Count	Percent
(1) Before trip	125	70.62
(2) During trip	2	1.13
(3) Both	50	28.25
N =	177	
* =	171	

5. When trying to access this service, HOW AVAILABLE is it? (Check only one)

Very Available Neutral Very Unavailable Don't Recall

	Count	Percent
(5) Very available	51	28.81
(4) Somewhat available	58	32.77
(3) Neutral	42	23.73
(2) Somewhat unavailable	15	8.47
(1) Very unavailable	2	1.13
(0) Don't recall	9	5.08
	N =	177
	* =	171
	Mean	3.8393
	StDev.	0.9990

6. HOW EASY to understand are the road condition reports and weather forecasts provided by this service? (Check only one)

Very Easy Neutral Very Difficult Don't Recall

	Count	Percent
(5) Very easy	78	44.32
(4) Somewhat easy	51	28.98
(3) Neutral	29	16.48
(2) Somewhat difficult	12	6.82
(1) Very difficult	3	1.70
(0) Don't recall	3	1.70
	N =	176
	* =	172
	Mean	4.0925
	StDev.	1.0245

7. HOW ACCURATE are this service’s road condition reports and weather forecasts? (Check only one)

Very Accurate Neutral Very Inaccurate Don't Recall

	Count	Percent
(5) Very accurate	29	16.76
(4) Somewhat accurate	81	46.82
(3) Neutral	44	25.43
(2) Somewhat inaccurate	12	6.94
(1) Very inaccurate	1	0.58
(0) Don't recall	6	3.47
	N =	173
	* =	175
	Mean	3.7485
	StDev.	0.8482

8. HOW LIKELY are this service’s road condition reports and weather forecasts to affect your travel plans? (Check only one)

Very Likely Neutral Very Unlikely

	Count	Percent
(5) Very likely	82	46.86
(4) Somewhat likely	55	31.43
(3) Neutral	29	16.57
(2) Somewhat unlikely	4	2.29
(1) Very unlikely	5	2.86
	N =	175
	* =	173
	Mean	4.1714
	StDev.	0.9793

9. Overall, HOW USEFUL is this service’s road condition reports and weather forecasts?
(Check only one)

- Very Useful Neutral Very Useless

	Count	Percent
(5) Very useful	78	45.61
(4) Somewhat useful	72	42.11
(3) Neutral	17	9.94
(2) Somewhat useless	3	1.75
(1) Very useless	1	0.58
	N =	171
	* =	177
	Mean	4.3041
	StDev.	0.7677

10. Which of the road condition and weather forecast phone numbers do prefer?

- Statewide number, either *ROAD (*7623) or 800-226-ROAD (7623)
- Local Montana Department of Transportation Phone Numbers (*see question 3 c through n*)

	Count	Percent
Statewide number	114	68.26
Local MDT number	53	31.74
	N =	167
	* =	181

Question # 10 comments:

- Statewide when leaving the central MT area, local when traveling to nearby towns.

11. Why do you prefer the phone number in Question 10? (Check all that apply)

- Contains statewide information
- Contains more localized information
- Shorter message
- More accurate information
- Easier to use
- Know the phone number
- Other _____

	Yes	Percent	No	Percent	Count	*
Contains statewide info	85	50.90	82	49.10	167	181
Contains more localized info	53	31.74	114	68.26	167	181
Shorter message	9	5.39	158	94.61	167	181
More accurate info	19	11.38	148	88.62	167	181
Easier to use	27	16.17	140	83.83	167	181
Know the number	48	28.74	119	71.26	167	181
Other	11	6.59	156	93.41	167	181

Question # 11 comments:

- Didn't know about statewide.
- Didn't know about a-b.
- The only one I'm aware of.
- These are the ones I could find in the phone book – hard to find.
- Did not know about others.
- Toll free
- Didn't know the others.
- I travel through entire state so don't want to remember multiple numbers.
- Toll free
- The only one I knew about.

Question # 11 comments omitted from tally due to related question omission:

- I don't use the numbers, I use the computer.
- My opinion is that statewide info that is accurate is necessary. I don't like communication games that endanger lives in any way. Get it? Do no harm first.

12. What is your current state of residence?

- Montana
- Other _____

	Count	Percent
(1) Montana	343	99.13
(2) Other	3	0.87
	N =	346
	* =	2

Question # 12 comments:

- California
- North Dakota
- Nevada

13. What is your gender?

- Male
- Female

	Count	Percent
(1) Male	208	60.29
(2) Female	137	39.71
	N =	345
	* =	3

14. What is your age?

- 15– 24 years
 25 – 44
 45 – 64
 65 or older

	Count	Percent
(1) 15 to 24 years	5	1.45
(2) 25 to 44 years	75	21.68
(3) 45 to 64 years	177	51.16
(4) 65 and older	89	25.72
	N =	346
	* =	2

15. What is the PRIMARY PURPOSE for the majority of your vehicle travel on highways in Montana?

- Work
 School
 Shopping
 Medical
 Recreation
 Visit family or friends
 Vacation
 Other _____

	Count	%
Work	123	52.56
School	4	1.71
Shopping	26	11.11
Medical	12	5.13
Recreation	30	12.82
Visit family or friends	33	14.10
Vacation	2	0.85
Other	4	1.71
	N =	234
	* =	114

Question # 15 comments:

- U of M football
- Fishing
- Airport
- Church travel
- Travel to winter home
- Meetings
- Haul livestock
- Hauling children to schools, universities; before lots of sports travel
- Weddings, funerals
- Child custody visitations
- Errands

16. What is the AVERAGE number of miles traveled for the trip purpose in Question 15?

- 0 – 24
- 25-49
- 50 – 99
- 100 – 300
- 300+

	Count	%
0 to 24 miles	49	20.85
25 to 49 miles	38	16.17
50 to 99 miles	33	14.04
100 to 300 miles	86	36.60
300 and above miles	29	12.34
	N =	235
	* =	113

17. Do you have a cellular phone in your household?

- Yes _____ *Service Provider*
- No

	Yes	Percent	No	Percent	Count	*
Cell phone	203	58.33	145	41.67	348	0

	Count	Percent
Cellular 1	75	50.00
Cellular plus	1	0.67
Verizon	57	38.00
Quest	5	3.33
Three Rivers	4	2.67
Valley Telecom	1	0.67
Sagebrush	7	4.67
Mid Rivers	5	3.33
Triangle Telephone	1	0.67
Vicom	1	0.67
Blackfoot comm.	1	0.67
World Com	1	0.67
Cingular	2	1.33
Comm net	1	0.67
	N =	150

18. What is your approximate annual household income?

- under \$20,000
 \$20,000 - \$39,999
 \$40,000 - \$79,999
 \$80,000 or more

	Count	Percent
(1) Under \$20,000	58	17.90
(2) \$20,000-\$39,000	102	31.48
(3) \$40,000-\$79,000	124	38.27
(4) \$80,000 and above	40	12.35
	N =	324
	* =	24

19. What TYPE of vehicle do you PRIMARILY drive on the highways in Montana?

- Automobile
 Commercial (Truck, bus)
 Other _____

	Count	Percent
(1) Automobile	330	95.93
(2) Commercial	14	4.07
(3) Other	0	0.00
	N =	344
	* =	4

APPENDIX D: TABLE OF CHI-SQUARED COMPARISONS

INFORMATION	1. Highway Use	4. Use Before/ During	10. Service Preference	12. Residence	13. Gender	14. Age	15. Trip Purpose	16. Miles Traveled	17. Own Cell Phone	18. Household Income	19. Vehicle Type
1. Highway use	X	X	X	X	X	X	X	X	X	X	X
2. Source = Tv	X	X				X					
2. Source = Radio	X	X		X		X	X				
2. Source = Telephone	X	X		X		X	X				
2. Source = Cell Phone	X	X	X	X		X	X				X
2. Source = *ROAD (*7623)	X	X	X	X		X	X				X
2. Source = 800-226-ROAD (7623)	X	X				X					
2. Source = Local MDT Numbers	X	X		X		X	X				
2. Source = www.mdt.state.mt.us/travinfo	X	X		X		X	X				
2. Source = Internet	X	X		X		X	X				
2. Source = HAR	X	X		X		X	X				X
2. Source = Observation	X	X				X					
2. Source = Notices	X	X	X	X		X	X	X			X
2. Source = Other Drivers	X	X		X		X	X				
2. Source = Other	X	X	X	X		X	X				X
3a. *ROAD (*7623)	X	X	X	X		X	X	X		X	X
3a. Didn't Know About It	X	X		X		X					
3b. 800-226-ROAD (7623)	X	X	X	X		X	X	X		X	X
3b. Didn't Know About It	X	X	X	X		X	X				
3c. 657-0209 (Billings)	X	X	X	X		X	X	X		X	X
3c. Didn't Know About It	X	X		X		X	X				
3d. 586-1313 (Bozeman)	X	X	X	X	X	X	X	X	X	X	X
3d. Didn't Know About It	X	X		X		X	X				
3e. 494-9646 (Butte)	X	X	X	X	X	X	X	X	X	X	X
3e. Didn't Know About It	X	X		X		X	X				
3f. 377-2314 (Glendive)	X	X	X	X		X	X	X		X	X
3f. Didn't Know About It	X	X		X		X	X				
3g. 453-1605 (Great Falls)	X	X	X	X	X	X	X	X	X	X	X
3g. Didn't Know About It	X	X		X		X	X				
3h. 265-1416 (Havre)	X	X	X	X	X	X	X	X	X	X	X
3h. Didn't Know About It	X	X		X		X	X				

	Chi-squared Analysis Passed
X	Chi-squared Analysis Invalid
	No Chi-Squared Analysis
	Chi-squared Differences Found

INFORMATION	1. Highway Use	4. Use Before/During	10. Service Preference - statewide	12. Residence	13. Gender	14. Age	15. Trip Purpose	16. Miles Traveled	17. Own Cell Phone	18. Household Income	19. Vehicle Type
3i. 444-9424 (Helena)	X	X	X	X	X	X	X	X	X	X	X
3i. Didn't Know About It	X	X		X		X	X				
3j. 751-2037 (Kalispell)	X	X	X	X	X	X	X	X	X	X	X
3j. Didn't Know About It	X	X		X		X	X				
3k. 538-1358 (Lewistown)	X	X	X	X	X	X	X	X	X	X	X
3k. Didn't Know About It	X	X		X		X	X				
3l. 233-3638 (Miles City)	X	X	X	X	X	X	X	X	X	X	X
3l. Didn't Know About It	X	X		X		X	X				
3m. 728-8553 (Missoula)	X	X	X	X		X	X	X		X	X
3m. Didn't Know About It	X	X		X		X	X				
3n. 653-1692 (Wolf Point)	X	X	X	X	X	X	X	X	X	X	X
3n. Didn't Know About It	X	X		X			X				
4. Use before or during trip	X		X	X	X	X	X	X	X	X	X
5. Service availability	X	X	X	X	X	X	X	X	X	X	X
5. Don't recall availability	X	X		X		X	X	X			X
6. Service understandability	X	X	X	X		X	X	X		X	X
6. Don't recall understandability	X	X	X	X		X	X	X		X	X
7. Service accuracy	X	X	X	X	X	X	X	X	X	X	X
7. Don't recall accuracy	X	X	X	X		X	X	X		X	X
8. Likelihood of affect on travel plans	X	X		X		X	X	X		X	X
9. Service usefulness	X	X	X	X	X	X	X	X	X	X	X
10. Service preference	X	X		X		X	X				X
11. Preference = statewide info	X	X		X			X				
11. Preference = localized info	X	X		X		X	X				
11. Preference = shorter message	X	X	X	X		X	X			X	X
11. Preference = more accurate info	X	X		X		X	X				X
11. Preference = easier to use	X	X		X		X	X				
11. Preference = know phone number	X	X		X		X	X				
11. Preference = other	X	X	X	X		X	X				X

	Chi-squared Analysis Passed
X	Chi-squared Analysis Invalid
	No Chi-Squared Analysis
	Chi-squared Differences Found

APPENDIX E: COMMENTS FROM SURVEY PARTICIPANT

General comments:

1. Resources Normally Used to Determine Road Conditions or Hear Weather Reports (5)

- Travel 31 miles to work every day – Travel to meetings around the state – I like the signs in the Livingston area – I only use road info travel and radio info.
- Need better weather alert system, i.e. NOAA. Need radar warning system on construction/accident areas.
- I use the Internet site always.
- We can only get 2 ND TV stations. They forget we're a border town so our situation is left for us to figure out. Wish we could get MT TV for our area.
- Our daughter goes to school in WY and will transfer to Bozeman next year. We use the MT weather in the Internet primarily to see what the road conditions are before we travel.

2. Non-user Comments (5)

- I am 89 years old and very seldom drive on the highway. Most of my driving is around town.
- Never use the road numbers, when traveling I always watch the weather channel and listen to the radio, have found road conditions reported on web page are not always right.
- I don't normally have reason to use this service but I think it's a good service.
- We don't travel as we are elderly and stay at home as much as possible. Just necessary things to do.
- I haven't ever used the Montana traveler info.

3. "Didn't know about it" Comments (4)

- I wish I had known about the MDOT road system – I will use it from now on. Travel on MT roads can be hazardous when you don't know what you are heading into and may be unprepared – especially 2 lane highways, such as from Three Forks to Helena.
- I didn't know many of these phone numbers existed until I searched the phone book to help answer some of these questions. I would like to see these numbers all in one easy to find location.
- It would be helpful if you let the public know about these numbers in a more public manner.
- None. Except that I really need to know about this information.

4. Understandability of Number Comments (2)

- I think the road service I use talks to fast; I have a hard time keeping up. I have a hearing problem.
- Hire a person who can read slowly and who can articulate. Readings typically sound as if they are read by the lowest paid clerical worker in the office. You know, the one who empties the waste baskets and who leaves the office last at the end of the day.

5. Accuracy of Number Comments (11)

- Needs improvement on weekend updates on weather reports.
- After years of driving I find the road reports fairly accurate in the morning, after that they get very lax. During nighttime you are pretty much on your own. The big signs on Interstates are nice but they need to update them better, too.
- We often find the conditions aren't as bad as the road reports say, or sometimes the opposite is true because the weather can change so fast.
- Service is good but it's not always current in the day.
- Road reports are often delayed and not very accurate.
- Update the info on the statewide number more often.
- Road condition reports tend to be somewhat worse than actual conditions. However, better safe than sorry.
- Major problem with recorded weather report is how fast it becomes untimely. Surely the Internet site is better. Too bad I don't have access yet. Soon will however.
- State wide number needs to be updated more often during the day. Calling # at 10 am still the same info from 7 am.
- The roads in southeastern MT are terrible and hard to get reports on.
- When I called it said Butte pass was icy/slushy. When I got there the road was bare and dry (this time).

6. Usefulness of Number Comments (7)

- Really count on updated road reports before starting on trips.
- Info was valuable to direct travelers around fires last summer.
- I have 1-332-6171 written down. Is that the old state #? A road report last May allowed me to change my rout across the state. Someone gave me a number when I was in the driveway and I called from the gas station. Knowledge is power.
- The bus scheduling makes other vehicular transportation necessary and I think weather information service is imperative for on-the-road travelers. Many checkpoints with information are needed at places besides convenience stores and truck stops. More rest areas or just more reader boards.
- Road system is a waste of money.
- How does this type of thing benefit the colleges in MT? I would like money better be spent on education.
- I work for an ambulance service, we travel in all kinds of conditions and reg. call 800-266-ROAD.

7. Primary Purpose for Majority of Travel on Montana Highways Comments (2)

- When working I traveled the roads of our state constantly. Now, however, being retired that changed drastically.
- Automobile is used on a rural mail contract 6 days a week and will be terminated June 30, 2002.

8. Miscellaneous Comments (10)

- I feel that the roads throughout MT are very well maintained. When storms do occur, I feel that MDT is on top of getting the roads clear.
- Weather has little to do with my travel. If I'm determined to go I go but I'm prepared with chains, tow rope, blanket, flashlight, etc.
- A good survey.
- I work for the road department.
- I have been in a lot of states that have better highways and most of these roads are paved. So I think that as much tax that are paid we could have better highways and roads.
- Highway travel is about 95 % interstate.
- I don't travel at all if the weather is bad.
- More restrooms OPEN for use.
- Some of the radio ads recently are not needed.
- Keep up the good work.