Greater Yellowstone Regional Traveler Weather Information System

511 Evaluation Summary

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EXECUTIVE SUMMARY

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 #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, and pass closure information. 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, Kansas, and Montana, but with 511 as the number to call. North and South Dakota have also changed to the 511 dialing number. The Western Transportation Institute (WTI) is leading the evaluation of this deployment. This report summarizes the evaluation component.

Three thousand surveys were distributed to Montanans with the distribution matching the maintenance division population. 675 surveys were returned by April 2003 for a response rate of 23 percent. This report also compares these survey responses to the responses from the pre-511 survey that was completed in June 2002.

Major conclusions from the analysis and comparison of the two surveys include:

- The majority of respondents had not heard of 511 prior to this survey and felt they had not received enough information about 511. Prior to this survey, MDT's deployment marketing consisted of television and radio interviews; press releases to radio, newspaper, and television; blue highway signs at the Montana borders; billboards across the state; public service announcements on the radio; articles in the Montana Travel magazine and the Fall Rediscover Magazine, information on MDT's traveler information website; and information provided to the public through the Transportation Awareness Program at fairs, parades, and driver education classes (although the greatest impact of TAP is during the summer and this survey was completed in April).The responses suggest marketing practices that should continue include the free press (i.e., radio, television, newspaper interviews/press releases; and word of mouth by family and friends) and public service announcements. The responses also suggest MDT should increase the number of 511 highway signs. Furthermore, the Transportation Awareness Program (TAP) will reach significant amounts of people during the summer of 2004.

- The majority of respondents who had used 511 preferred it to the previous system. Overall, respondents who had used the 511 system before rated the service between good and excellent.

- Respondents generally access the information prior to a trip. If poor conditions were reported on 511, respondents are most likely to alter their travel plans by changing travel times, taking an alternate route, canceling their trip, or stopping at a nearby town.

- The majority of respondents felt that the best way to identify their location for the 511 system is by highway number and name of the community. The respondents also felt that the most important features on 511 were winter road conditions and weather forecasts. Of the additional features suggested by respondents, MDT has already implemented a quarter of them prior to summer of 2004. Half of the suggested system enhancements were new suggestions falling into the categories of menu structure, weather information, general department of transportation information, general transportation information from other organizations and tourism information.

- Respondents were between very satisfied (5.0) and satisfied (4.0) with all of the 511 capabilities including: availability of the system, ease of understanding the information, ease of accessing information you want, accuracy of weather forecast, accuracy of reported road conditions, usefulness of service, and quality of service.

- Fifty seven positive comments were recorded on the survey. Examples include:

    - "As I previously said, I get the information that I want and need from 511 – keep up the good work;"

    - "511 is the best source of travel information to come out in a long time – updates constantly, no waiting for information, weather changes constantly but the reports given are very good;" and

    - "I think the 511 number is a timesaver and very useful program."

- Based on the results of this survey and previous plans, the next steps for 511 in Montana are to enhance the system with an Alert system to include AMBER Alerts, Homeland security alerts, and general transportation alerts; the regional weather and road condition reports, a link to Travel Montana (the local tourism bureau); and a link to the surrounding National Parks. The 511 Deployment Plan will continue to be developed and MDT will continue to market 511 to potential users.

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, and pass closure information. 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, Kansas, and Montana, but with 511 as the number to call. North and South Dakota have also changed to the 511 dialing number.

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. This report is a component of the evaluation task.

1.3. Evaluation Task

The purpose of this task is to determine the 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 the existing road and weather traveler information system.
- Perceived usefulness of 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) implemented 511, the nationwide traveler information number, on January 8, 2003.

Prior to 511, MDT's legacy systems included an 800 number, *ROAD, and eleven local traveler information numbers (the twelfth was disabled after a reorganization of MDT maintenance divisions in 2003). As the 511 system was implemented, MDT had to decide what to do with the legacy systems. At the time, MDT decided that the 800 number would still be in use, but would connect callers with the 511 system information, making the 800 number and 511 synonymous. The 800 number would allow motorists in other states to access the Montana 511 information toll free. It was also decided that *ROAD would no longer exist as a number to gain travel information and that the eleven local phone numbers would remain as they were. At the time of this evaluation, MDT is integrating the information provided by the local phone numbers into 511 as a feature called a geo-report. Therefore by 2005, the eleven local numbers may no longer exist.

The objective of this survey and assessment is to determine users' perceptions of MDT's new traveler information system, 511. The outcome of the survey and assessment will serve two purposes. First, it will provide guidance to MDT about motorists' perceptions of the phone number and will help determine future upgrades to the systems. Secondly, it will serve as the "after" study used to compare users' perceptions of the new 511 travel information number with the "before" study or baseline study completed in 2002. This document reports the results of the "after" traveler information study and the comparisons with the "before" 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) and the "before" 511 traveler information survey from 2002 (2). 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 and 2);
- System Features (Questions 3, 4, and 5);
- System Marketing (Questions 6 and 7);
- Functional measures i.e. frequency of service use, accuracy of system, availability of system, etc. (Questions 8 through 13); and
- Demographic information (Questions 14 through 20).

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.

2.2. Survey Distribution

This survey, shown in Appendix A, was mailed in March 2003 to a sample of 3000 Montana residents. Because 511 is a statewide traveler information number, the 3000 surveys were distributed to residents across the state based on the state population distribution (Qwest provided WTI with the randomly selected the addresses). Figure 1 and Appendix B shows the distribution of the surveys based on MDT maintenance divisions (there are 10 maintenance divisions: Billings, Bozeman, Butte, Great Falls, Havre, Kalispell, Lewistown, Miles City, Missoula, and Wolf Point) as compared to the population in that area. As can be seen, the share (or portion) of surveys distributed to each of these divisions is very close to the population distribution. Montana residents receiving the survey were allowed four weeks to respond and were offered the chance to be included in a drawing for two $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 3000 surveys distributed, 675 surveys were completed and returned with valid responses, which equals a return rate of 23 percent. This is an n average response rate. Typically WTI had response rates of 15 percent without an incentive and between 20-25 percent with an incentive.

Figure 1: Survey Distribution Compared to State Population by Maintenance Division

2.3. Statistics

After tabulating the survey results and calculating the means and standard deviations (shown in Appendix C), the survey responses were analyzed using percentages, frequencies, and chi-squared values. Percentages were based on the total responses for each question and not on the survey total, because respondents sometimes did not answer every question. In addition, they were asked to fill out questions 9 through 13 regarding their opinion and use of the 511 system only if they had used the 511 system. As a result, only 28 percent of respondents answered Questions 9 through 13.

Differences between demographic characteristics and survey question answers are important to note trends and relationships 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, then this information could be used to plan a marketing campaign that targets the other ages and gender to better inform them of the service. This information could also help to identify upgrades that would make the system easier to use for targeted populations. The best way to get this information is to look at trends in a data set for the state population to determine if any correlation exists 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 is used to determine if two sets of data are statistically independent (non-associated). If two sets of data are independent, we would expect that the probability of the two sets of data occurring would be equal to the product of the proportion of one set multiplied by the proportion of the other set of data, and would be nearly equal to the actual proportion. (Nearly equal is a predetermined measure that the analyst determines before conducting the test.) Minitab software was used to analyze the chi-square relationships. Appendix D shows the outcomes of the chi-square independence test. 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, 11, 12 and 13) were analyzed by assigning a numerical value to each option with five representing the most positive answer and one representing the most negative answer.

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 to that particular question for that individual 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.

3. DEMOGRAPHICS

The following demographic information was included in the survey: residence (zip code), gender, age, cellular phone ownership, trip purpose, and education completed. This information was recorded in order to determine if users' responses in the survey were a result of one or more of the demographics. If differences were found in a chi-square test, this indicated that the demographic played a part in user's response.

3.1. Residence

One objective of this study was to determine how the travel information phone number is used by Montanans. 3000 surveys were sent out with 675 responses received. Of these, 657 (97.3%) responded that they were from Montana.

According to the 2000 census, the total population of Montana was 902,195; of which 672,133 are in the 18-65^{+} age group that received this survey (3). Therefore, approximately 0.10 percent of Montana's population was represented in the survey responses.

Figure 2 and Appendix B show the percentage of respondents per MDT maintenance division compared to the population in that area. The response share for MDT divisions ranged from 3.3 percent in Lewistown to 16.3 percent in Billings while the population distribution ranged from 2.5 percent in Lewistown to 18.2 percent in Billings.

The figure shows that the responses received back are similar to the population, but are slightly more varied than the difference in the distribution versus the population as shown in Figure 1. The rural/eastern areas of the state (Lewistown, Miles City, and Wolf Point) had higher response rates than expected due to their population distribution. Bozeman also had a higher response rate than the population. The rest of the areas had smaller response rates than was expected due to their population distribution.

The other information to note is that 0.7 percent of respondents were from another state. Although these surveys were distributed to Montana residences this may have occurred if people had moved, but had their mail forwarded out-of-state or if people have a summer/winter house here but have their permanent residence out-of-state. Also, 1.9 percent of respondent's residences were unknown. This is either due to the respondent not supplying their zip code or the zip code they provided was non existent (i.e. they may have written it in incorrectly).

Figure 2: Survey Respondents Compared to State Population by Maintenance Division

3.2. Gender

Of the survey respondents, 63 percent were male and 37 percent were female. The survey was randomly distributed among the population of Montanans. Because of this, we would expect that the distribution of responses by gender would closely match the population by gender in the state. However closer analysis of the survey distribution and population distribution shows that this is not the case. According to the 2000 census, Montana residents aged 18-65^{+} were 49 percent male and 51 percent female (3). 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 from the random sample chosen by Qwest, 67 percent of the surveys were distributed to males and 30 percent were distributed to females, with 2.6 percent unknown (i.e., it was not discernible from the first name). Therefore, more males responded to the survey, because more surveys were sent to males. This is also true of the pre-511 survey; seventy percent of the surveys were sent to males and 28 percent to females (with 2 percent unknown). Of the respondents, sixty one percent were males and 39 percent were females.

Figure 3 displays the gender comparison for the pre-511 and 511 surveys. This is not an exact comparison as the pre-511 survey's youngest age category was 15-24 and the 511 survey's youngest category was 18-24. The age for this category originally reflected driving age in Montana, but due to University restrictions on survey participants, was changed to 18 and older in the subsequent survey. The specific categories shown in the table include: the 2000 Montana census data for ages 15-65^{+}, the pre-511 survey respondents, pre-511 survey distribution, the 2000 Montana census data for ages 18-65^{+}, the 511 survey respondents, and the 511 survey distribution.

Figure 3: Gender Comparison

3.3. Age

Of the 676 individuals who completed the 511 survey, 1.8 percent were aged 18-24 years, 28 percent were aged 25-44 years, 49 percent were aged 45-64 years, and 21 percent were aged 65^{+} years. The age comparison of pre-511 survey and 511 survey is shown in Figure 4. This is not a direct comparison because of the differences in the lower age limit of the surveys, as explained in section 3.2. The figure illustrates that the majority of pre-511 and 511 survey participants were in the age category of 45-64 years.

Figure 5 shows a comparison of the 511 survey data to the MT census and US census data. In the 45-64 years aged category, the results for the 511 survey are much greater than the actual population from the census data. It would be helpful to know the age distribution of the people

receiving the surveys to determine the reason for this result. Unfortunately that information is not available so the reason for this result cannot be studied.

Figure 4: Pre-511 and 511 Age Comparison

Figure 5: 511 and Census Data Age Comparison

3.4. Mobile Phone Ownership

Mobile phone ownership may increase the use of the system, as drivers may want to learn about conditions during their drive (MDT strongly urges motorists to dial before they drive or to pull over when using their cell phones). Sixty-three percent of 511 survey respondents own a mobile phone while 37 percent do not.

Figure 6 shows the comparison for the pre-511 and 511 surveys. This figure shows that slightly more 511 respondents owned a mobile phone then pre-511 survey respondents. A 2002 study conducted by Scarborough Research shows that nearly two-thirds (62 percent) of American adults own a cell phone and that the number of adults owning a cell phone is increasing by 29 percent annually (4). This indicates that the mobile phone ownership shown in this survey is representative of Montana as a whole and the nation.

Figure 6: Mobile Phone Ownership

3.5. Trip Purpose

Travelers were asked about the purpose of the majority of their vehicle trips on highways in Montana. They could choose between six categories: personal trips (excluding tourism), business trips, tourism, long-distance commercial vehicle operator, local fleet operator (school bus, parcel delivery, etc.), and other. The results, shown in Figure 7, illustrate that the majority of these drivers (64%) travel with the purpose of personal trips, followed by those traveling for business (28%).

Direct comparison with the results from the pre-511 survey was not possible as the categories for travel reasons differ between surveys. The pre-511 category ‘work’ can be compared with the 511 category ‘business trips’ and the combination of the pre-511 categories ‘school’, ‘shopping’, ‘medical’, ‘recreation’, and ‘visit family and friends’ can be compared to ‘personal trips.’ There are sizable differences between ‘business trips’ (with 53% from pre-511 versus 28% from 511 survey) and ‘personal trips’ (with 45% from pre-511 versus 64 % from 511). This is probably due to the change of categories between the two surveys.

Figure 7: Comparison of trip purpose

3.6. Highest Level of Education

Drivers responding to the 511 survey were asked what level of education they had completed. Thirty three percent of respondents had completed high school, but had not completed an advanced degree, whereas 64 percent had finished an advanced degree (i.e. associates, bachelors, or post-graduate degree). Figure 8 displays the results of this question. This question was not asked in the pre-511 survey.

Figure 8: Education Level Completed

4. TRAVELER CHARACTERISTICS

To better understand traveler characteristics, questions one and two of the 511 survey investigated how often drivers used Montana highways and how they obtained travel information.

4.1. Frequency Of Travel

Question 1 of the 511 survey asked survey participants to estimate how often they travel on highways in Montana by filling in the number of times per week. As shown in Figure 9, forty six percent of respondents travel on the highways five or more times per week in Montana. The average (mean) number of times 511 survey drivers traveled on Montana highways per week was 5.0 and the median was 4 times per week. Chi-squared analysis for the 511 survey found differences in the responses to this question with regard to the MDT divisions. For example, respondents in the Missoula and Butte divisions who traveled 5 or more times per week traveled more than was statistically expected. However, in the Great Falls and Billings division, participants who traveled 2-4.9 times per week traveled more than statistically expected, and in the Billings and Glendive division, participants who traveled 0-1.9 times per week traveled more than statistically expected. "Statistically expected" refers to the expected outcome as opposed to the actual outcome.

Travelers responding to the pre-511 survey were asked to fill in one of the following: times per day, times per week, times per month, or times per year. For the analysis, all pre-511 survey responses were converted to the number of times traveled per week. Almost half (48%) of pre-511 drivers travel on the highways five times or more per week in Montana. For the pre-511 survey drivers, the average (mean) number of times traveled on Montana highways per week was 8.6 with a median of 4. This indicates that pre-511 survey respondents drive more times per week on average than the 511 survey respondents.

Figure 9: Times Traveled Per Week As Indicated in Survey

4.2. Road And Weather Resources Used

This question (question 2) was asked to determine what types of resources Montana travelers most frequently use to obtain road conditions and hear weather forecasts. Participants were asked to choose all resources that apply, and they were provided a list of the following resources:

- Television
- Radio (FM/AM)
- Telephone
- 511 travel information phone number[1]
- (800) 226-ROAD (7623)
- Local Montana Department of Transportation phone numbers
- www.mdt.state.mt.us/travinfo
- Other Internet
- Highway advisory radio (HAR)
- Observations of existing conditions
- Notices at truck stops, convenience stores, rest areas
- Communication with other drivers
- Other
- Cell phone[2]
- ROAD[2]

[1] 511 Survey Option Only

[2] Pre-511 Survey Option Only

The resources used most often by Montana travelers in the 511 survey, as shown in Figure 10, were television (68% of 511 survey respondents) and radio (65% of 511 survey respondents). 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, 22 percent used the 511 phone number, 18 percent used (800) 226-ROAD, 14 percent used MDT local phone numbers, and 19 percent used the MDT website as a normal resource to determine road conditions or to hear a weather forecast report. 'Other' resources that were named included:

- NOAA
- Newspaper
- Check vehicles for snow
- Weather band radio/bureau
- Road/highway condition signs
- Check weather outside
- Two way radio/CB
- Scanner
- Highway patrol/sheriff

Survey respondents may still be using the 800 number rather than 511 for several reasons including that this survey was conducted only three months after 511 was available in Montana and therefore respondents may not have heard of the new number yet. Also, both the 800 number and 511 provide you with the exact same information; therefore callers may use either number. The 800 number was kept in place so that out-of-state callers would still be able to listen to the system (i.e. if they called 511 from their home state, they would get their 511 system if one exists).

Chi-square differences were found when comparing the resources normally used to demographic categories. Chi-square differences were noted when comparing telephone as a resource and mobile phone ownership. Those participants who did not own a mobile phone used the telephone as a resource more than was statistically expected. Other chi-square differences were found by travelers who normally use the television as a resource and the number of times per week they travel highways in Montana, the districts they live in and their education level. For chi-square differences found between the resources normally used to determine conditions and the education level of participants, those with more education use resources more than is statistically expected. See Appendix D for complete table of results.

Comments from users included that they liked using 511 and especially liked that the number is very easy to remember. Many commented that they had not heard of 511 and felt that it needed

to be advertised more so that people would begin to become aware of it. One user commented that he or she uses the Internet to see pictures of the destination and does not use 511 unless the conditions are different than expected. All survey respondent comments can be found in Appendix E.

The resources used most often by Montana travelers in the pre-511 survey were very similar to the 511 survey, and included television (66% rather than 68%) and radio (68% rather than 65%). For the MDT travel information resources, the results show that more pre-511 respondents used the (800) 226-ROAD number than 511 respondents (29% and 18% respectively). This is due to the 511 system being implemented between these two surveys. The old 800 number is still in use, but as 511 is a shorter number and they both call into the same traveler information system, more people now use the 511 number (22%). The responses for the local phone numbers (13% and 14% respectively) and websites (17% and 19% respectively) were also similar. The 'Other' resources that were named in the pre-511 survey included all of those listed in the 511 survey except NOAA, but also included Aviation radio.

Figure 10: Comparison of Information Resources

5. SYSTEM FEATURES

These three questions (3-5) were asked to determine what users want on a 511 system. They were asked to determine if the current information and method of use being provided are adequate and what additional features they would like to see. Similar questions were not asked as part of the pre-511 survey.

5.1. Importance of Features on Travel Information Phone Number

Travelers were asked (question 3) to rate the features they feel are important when calling a travel information phone number. Figure 11 displays the results for each option travelers were asked to rate. The most important feature travelers identified for use on a travel information phone number was winter road conditions on highways. The mean value for respondents was 4.9 out of 5 with a standard deviation of 0.50. The second most important feature they identified was weather forecasts, which received an average rating of 4.2 with a standard deviation of 0.98. These two features are consistent with the 2001 survey conducted by the Gallup Organization for ITS America on 511 which found that survey respondents felt that the most critical elements for 511 systems to provide were weather-related and road surface condition information (40% of those surveyed) (5).

Figure 11: Mean Values of Features on Travel Information Phone Number

The remaining important options identified were, in descending order of their mean: construction information on highways (3.9 with a standard deviation of 0.99), regional road condition and construction reports (3.8), access to information in neighboring states (3.4 with a standard deviation of 1.22), accident information (3.2 with a standard deviation of 1.12), information about conditions on city roads (3.1 with a standard deviation of 1.29), hands-free voice activation (2.5 with a standard deviation of 1.28), opportunity to record comments and give feedback (2.4 with a standard deviation of 1.18) and public transit information (2.3 with a standard deviation of 1.45).

Of these ten options for a 511 system, Montana has already included six of them on the system. The status for activation of these features on the Montana 511 system is shown in Table 1. As can be seen, the three most important features, according to survey respondents, were already a part of Montana's 511 system prior to this survey. These results also confirm that the priority of Montana's enhancements is correct as the two planned enhancements (regional reports and accidents) were ranked by survey respondents just after the current features.

Table 1: Date's Features Deployed on MT's 511 System

511 Features	Date Activated for Montana's System
Winter road conditions on highways	System deployment (Jan. 8, 2003)
Weather forecasts	System deployment (Jan. 8, 2003)
Construction information on highways	System deployment (Jan. 8, 2003)
Regional road condition and construction reports	Planned enhancement (short-term)

Access to information in neighboring states	At ND and SD deployment on Meridian's new system (Feb. 2003)
Accident information	Planned enhancement (long-term)
Information about conditions on city roads	Currently not applicable
Hands-free voice activation	October 14, 2003
Opportunity to record comments and give feedback	System deployment (Jan. 8, 2003)
Public transit information	Currently not applicable

5.2. Other Features Respondents' Would Like to See on 511 Montana

Question 4 was an open-ended question asking users to comment on additional features they would like to see on a travel information phone system. Of the 220 suggestions made, sixteen respondents felt that the system did not need any changes, four felt that the system should not be overloaded with information, and thirty-five respondents felt that the system should be updated more frequently to reflect accuracy of conditions.

Fifty of the suggestions users made have been implemented into the 511 system. These are shown in Table 2.

Table 2: Suggestions Already Implemented

Feature	#	Description
Weather Information and Road Conditions	9	Provided since system deployment on January 8, 2003.
Timestamp	8	Added April 18, 2003
Road Closures	7	Winter closures and emergency travel only are currently provided. A new alert system will allow road closures due to fires to be reported as well. Road Closures due to incidents will be reported on the system at a later date.
Landmarks versus mile markers	5	Updated on June 24, 2003 to give information to users via landmarks rather than mile markers for road condition and forecast information.
Construction Information	3	Provided on the system April through October.
Conditions for Neighboring States	3	Currently North and South Dakota information is available. Phone numbers to obtain information for Wyoming and Idaho are also provided.
Temperature	3	Temperature is reported as part of the weather forecast.
Options so you don't have to listen to entire message	3	511 has given motorists this option. You no longer have to listen to an 11-minute recording of all the roads in the state. You can now choose the road you want and a segment and therefore receive only the information you require.
More phone lines	3	The 511 system has never given a caller a busy signal due to not enough phone lines as we can "borrow" phone lines from neighboring states when we are experiencing high call volumes.
Chain Requirements	1	Chain requirements are posted as part of the road conditions.
Wind Conditions	1	The wind speed is part of the weather forecast.
Free Phone Call	1	Free to landline phone users; however, normal roaming and minute charges apply for cellular users.
TTY Number	1	MT's 511 system also has a TTY Number for callers who are hearing impaired. This number is: (800)-335-7592;
Ability to bypass the instructions	1	If you are a regular 511 user, MT's system has been setup as an interruptible system, so you can press the numbers you need and get the information without listening to all of the options. The only time this will not work is if the Alert system has been activated.
Voice activation	1	Voice activation was deployed on October 14, 2003. Due to challenges with the feature, it became optional on February 29, 2004 (i.e. a caller must turn it on).
Repeat information	1	The 511 system allows you to press 1 after hearing road conditions and weather forecasts for a segment to repeat this information.

There were 115 suggestions that have not been implemented into the system. These suggestions fit into five main categories including: menu structure, weather information, general department of transportation information, general transportation information from other organizations and tourism information. It should be noted that although these improvements were suggested, they will not necessarily occur as some of them are not possible. These suggestions will be used as input to the 511 Deployment Plan which will provide recommendations for what enhancements should be made to the 511 system and the appropriate timeframe.

Table 3 was created to show a condensed version of the suggestions provided. This table includes survey respondents' top priorities for 511 enhancements. The full list of system enhancements follow the table and are listed by category.

Table 3: Survey Respondents Top Priorities for 511 Enhancements

Category	#	Feature
Menu Structure	10	Regional information
Menu Structure	6	Quicker and easier access to information with less choices and quicker dialogue
Menu Structure	5	Live person to talk to
Menu Structure	5	Additional secondary and rural routes including: Mill Creek Pass between Anaconda and Big Hole, Germin's Ranch near Marysville, and Highway 279
General Department of Transportation Information	5	Information on rest areas (i.e. hours and seasons of operation, facilities available)
Menu Structure	4	A date stamp
Weather Information	4	Snow plow and sanding activity (i.e. when and how often)
General Department of Transportation Information	4	More detailed construction information (i.e. delay times and days/hours of active work)
Menu Structure	3	Voice be slower, articulate, and clear diction
Weather Information	3	Conditions on mountain passes in Montana (i.e. Monida, Lolo, etc.)
Weather Information	3	High water/flood related information including washed out culverts
Weather Information	3	Fire information (i.e. especially if affecting State/National Parks)
General Department of Transportation Information	3	Recommended alternate routes, best route available during conditions
Tourism Information	3	Basic points of interest in the area
Tourism Information	3	Notification of special events in communities along the route (i.e. College Rodeo)
Tourism Information	3	Service information such as gas (i.e. where the best gas price is, self serve versus full serve stations and hours of operation), restaurants

5.2.1. Menu Structure

There were 48 suggested improvements that fit into this category. They include:

- Regional information (10);
- Quicker and easier access to information with less choices and quicker dialogue (6);
- Live person to talk to (5);
- Additional secondary and rural routes including: Mill Creek Pass between Anaconda and Big Hole, Germin's Ranch near Marysville, and Highway 279 (5);
- A date stamp (4);
- Voice be slower, articulate, and clear diction (3);
- Information collected from drivers on the roadway (2);
- An option to access more then one section of road, without having to start over. "Example" at end of report (list) would like more information on a another roadway, if so press x (2);
- Easy and quick access without long messages and "for x, press 1, etc. (2)";
- Information on additional states including: Idaho, Oregon, and Washington (2);
- Be able to ask, "What are the road conditions between city x and city x" (i.e. Glasgow and Havre);
- A way to get information if you do not know highway number;
- The ability to enter a numerical code for highways (i.e. Enter 93 for hwy 93; or 931 for hwy 93 N and 932 for hwy 93 S) instead of having to listen to information that is not needed;
- Make system compatible at moving from highway to highway (i.e. I-90 to US 287);
- When I'm looking at road reports I'm interested in specifics, i.e. road from Red Lodge – Helena, each portion – RL-Columbus-Interstate-Three Forks-Helena
- The caller number you are; and
- The ability to "rewind" instead of listening to the entire message again.

5.2.2. Weather Information

There were 20 suggested improvements that fit into this category. They include:

- Snow plow and sanding activity (i.e. when and how often) (4);
- Conditions on mountain passes in Montana (i.e. Monida, Lolo, etc.) (3);
- High water/flood related information including washed out culverts (3);
- Fire information (i.e. especially if affecting State/National Parks) (3);
- Future forecasts 24 hours in advance by area (2);
- Extended conditions as there is too little information given on a section of road currently (2).
- Snowfall already received;
- Visibility warnings; and
- The exceptions reports say the same things as the general report on road conditions it is a waste of time to report them.

5.2.3. General Department of Transportation Information

There were 16 suggested improvements that fit into this category. They include:

- Information on rest areas (i.e. hours and seasons of operation, facilities available) (5);
- More detailed construction information (i.e. delay times and days/hours of active work) (4);
- Recommended alternate routes, best route available during conditions (3);
- Time related information for problem conditions (i.e. fog on I-90 between X city and Three Forks, should lift by 9 a.m.) (2);
- Border crossing status (i.e. open 24 hrs, etc.); and
- Any information on major accidents on highways.

5.2.4. General Transportation Information from Other Organizations

There were 13 suggested improvements that fit into this category. They include:

- Animal hazards on road (i.e. wildlife and ranch animals) (2);
- Phone numbers or access to tow trucks and non-emergency police/sheriffs (2);
- Global Positioning System (GPS) and compass information (2);

- Information on whether the road is dirt or paved;
- Identify bad areas on highway;
- Street cleaner information;
- Safe driving hint of the day such as defensive driving principles;
- Radio stations in the area for where you are calling. This is for those people that do not have cell phones or if the cell phones are "not in service;"
- Instructions pertaining to what to do in case of emergency with a vehicle; and
- City conditions.

5.2.5. Tourism Information

There were 18 suggested improvements that fit into this category. They include:

- Basic points of interest in the area (3);
- Notification of special events in communities along the route (i.e. College Rodeo) (3);
- Service information such as gas (i.e. where the best gas price is, self serve versus full serve stations and hours of operation) (3), restaurants (3), lodging (2);
- River flow stages during peak runoff season;
- Ski reports;
- Where wildlife can be viewed from the highway; and
- Interesting places to visit or a "hot spot" of the month.

5.3. Preference to Identify Location

Drivers were asked to state their preference in identifying their location to access travel information in that area. As shown in Figure 12, the majority of respondents, fifty-one percent, would prefer to identify their location by highway number and the name of the communities they are between. The Montana 511 system has been set-up this way.

Possible enhancements to the system that have been discussed include obtaining information by region (similar to Montana's current local numbers) and origin/destination. Four percent of respondents would prefer location identification by region and nineteen percent would prefer origin and destination. Although at first glance these percentages seem low and would lead one to believe they should no longer be considered as system enhancements, this question asked respondents to choose only one option. Therefore, these location identification options may still be positive enhancements to the system; however, they should not replace the location identification option of highway number and community name, only supplement it. No chi-square differences were found when analyzing this question. Drivers from the pre-511 survey were not asked this question so there is no data available to compare these responses.

Figure 12: Travel Information Location Preference

6. SYSTEM MARKETING

These questions (6-7) were asked to determine which of MDT's marketing approaches were most effective, in order to identify which methods should be tried again in the future. Prior to this survey, MDT's deployment marketing consisted of television and radio interviews; press releases to radio, newspaper, and television; blue highway signs at the Montana borders; billboards across the state; public service announcements on the radio; articles in the Montana Travel magazine and the Fall Rediscover Magazine, information on MDT's traveler information website; and information provided to the public through the Transportation Awareness Program at fairs, parades, and driver education classes (although the greatest impact of TAP is during the summer and this survey was completed in April).

6.1. Methods of Becoming Aware of 511 Travel Information Phone Number

Travelers were asked to select the different ways they have become aware of the 511 traveler information phone number. Respondents could 'check all that apply.' Forty-two percent of respondents were 'Not aware of 511 before this survey'. Of the respondents who had heard of 511 prior to this survey[3], the methods used are shown in Figure 13.

Radio (47.4%) was the most common method by which drivers have become aware of 511; followed by TV (40.3%); public service announcements (26.7%); newspaper (25.4%); and family and friends (24.7%). Therefore, of MDT's paid marketing, the public service announcements were the most effective (26.7%) followed by highway signs (13%) which are currently only on the borders, and then billboards (12.6%). The radio ads cost approximately $8800, the highway signs cost approximately $6000 (with less than half that have been paid for out on the roadway), and the billboards cost approximately $12,000.

The promotional flyers (i.e. rack cards) were only seen by 3 percent of respondents, but this is due to the fact that they are mainly handed out by staff in the Transportation Awareness Program (TAP) and they had not yet hit their "peak season." TAP reached 120,000 or one eighth of the Montana population through "hand-to-hand" contact in 2003, but has its greatest impact during the summer. Nonetheless, TAP reached 12 percent of survey respondents through transportation booths, and other DOT functions 'Other' ways people responded that they have become aware of 511 include the Christmas parade, transportation winter driving seminar, local phone book, police department and rest stops.

The responses show that marketing practices that should be continued include the free press (i.e. radio, television, and newspaper interviews and press releases; and word of mouth by family and friends) and public service announcements. As the highway signs reached 13 percent of respondents while only being at the borders, MDT should consider expanding their locations. Since TAP personnel and programs reached 12 percent of respondents, MDT should consider continuing these marketing activities through TAP's peak season.

[3] Note that 5 respondents who chose 'not aware of before survey' also checked other methods of learning about 511 and are therefore in the aware of before survey count as well.

Chi-square differences were found when looking at certain demographics. In particular, users' living in Great Falls and Billings divisions were made aware of the 511 system more than statistically expected through the radio, television and public service announcements. This may be due to known television interviews occurring in Helena and Billings; radio interviews occurring in Lewistown, Helena, and Billings; and significant newspaper articles occurring in Great Falls, Helena, and Billings.

Those living in Missoula and Butte divisions were not aware of the 511 system more than statistically expected. Another difference was found with those aged 45-64. This age group was less aware of the 511 system than statistically expected. Because the pre-511 survey asked about travel information phone numbers other than 511, no comparisons between the data can be made.

Figure 13: Methods of Becoming Aware of 511

6.2. Quantity of Information Regarding 511 Travel Information Phone Number

After the question about how they had learned of 511, respondents were asked whether or not they had received enough information. This will help MDT to determine if they need to continue with their marketing efforts or not. Almost 60 percent of respondents felt they have not received enough information about the 511 travel information phone number. This is not surprising as 42 percent of respondents in the last question said they had not heard of 511 prior to the survey. Thus MDT should continue the marketing effort to inform residents of 511 and how to utilize it.

7. FUNCTIONAL MEASURES

The travel information phone numbers were evaluated with regard to frequency of use and qualitative assessment of the service. Question 8 measured how much travelers used 511. Participants who had used 511 were then asked to complete questions 9 through 13.

7.1. Frequency Of 511 Use Since January 2003

Question 8 measured the number of times participants have used 511. Their choices included: 'Have not used 511', '1–3 times', '4–6 times', '7–10 times' and 'More than 10 times'.

As shown in Figure 14, the majority of participants (71%) responded that they 'have not used 511', 17 percent have used it '1-3 times', 8 percent have used it '4-6 times,' and 2 percent have used it '7-10 times' and 'more than 10 times'. Therefore, although 58 percent of respondents were aware of 511 at the time of this survey and 41 percent of respondents felt they had enough information about 511, only 29 percent (196 participants) had used 511.

Figure 14: Frequency of 511 Use

7.2. Use Of Number Before Or During A Trip

The purpose of Question 9 was to find out whether service number users typically used the service prior to leaving on a trip or enroute. The data in Figure 15 shows that the majority of service users (68.4%) accessed the service before a trip. Only 6.8 percent accessed this information during a trip and 24.7 percent accessed this information both before and during. The chi-squared analysis found no differences in the responses to this question with respect to the various demographic questions.

Pre-511 survey respondents were in agreement with 511 survey respondents. The majority of respondents use the service before a trip (70.6% and 68.4% respectively), while some respondents used the service both before and during a trip (28.3% and 24.7% respectively).

Figure 15: Use of service before or during a trip

7.3. Preference Of 511 to Previous System

Question 10 was asked to obtain the user's preference for travel information phone number comparing the previous travel information numbers (800-226-ROAD, *ROAD, or local MDT numbers) to 511. Users could choose '511', 'Previous MDT system report', 'No preference', or 'I have not used the previous system'. They also were given space to make comments.

Participants' preferences are shown in Figure 16. Sixty-eight percent of respondents prefer 511, with 23 percent reporting no preference, 3 percent preferring MDT system reports and the remaining 6 percent having stated they 'have not used the previous system'.

Of the previous systems, 69 percent of pre-511 survey users preferred the statewide numbers with the remaining 31 percent preferring the local MDT numbers. No chi-square differences were found for either survey results.

Comments from 511 survey participants included the following:

- "226-ROAD was incomplete, confusing or disconnected when I tried it;"
- "…Mile marker means nothing. Liked when cities / landmarks were used;"
- "I never had any trouble accessing the 511 like I did 800-226-ROAD. Also its easier to remember;"
- "I think it is great! I would prefer to use community names and distances from each instead of mile marker #'s;"
- "511 is excellent, but the mile marker stuff is tedious- towns easier though, like marker is good specific information while traveling;"
- "511 gives information in too small distances;"
- "I like the way the highways are divided into sections;"
- "It uses long distance minutes on my cell phone;" and
- "The 800 number is easy, some phones don't take 511."

Figure 16: Number Preference

7.4. Likelihood To Affect Travel Plans

Question 11 was asked to determine how likely respondents are to alter their travel plans when they hear of poor conditions on 511. Users were asked to answer this question for the following travel plan alterations: 'stop at a nearby town', 'change travel times', take an alternate route', 'cancel the trip', 'continue on regardless' and 'seek an alternate mode of travel'.

As shown in Figure 17, if poor conditions were reported on 511, respondents would be most likely to alter their plans by changing travel times (mean is 4.2 between very likely and likely with a standard deviation of 1.11), taking an alternate route (mean is 3.7 between likely and neutral with a standard deviation of 1.22), canceling the trip (mean is 3.3 between likely and neutral with a standard deviation of 1.47), or stopping at a nearby town (mean is 3.3 between likely and neutral with a standard deviation of 1.28).

Chi-square differences were found in the 511 survey results with respect to age and mobile phone ownership. Those 45 and older were more likely than statistically expected to change travel times. This may be due to older drivers feeling less comfortable with driving in bad weather conditions. It was also found that those with mobile phones were less likely than

statistically expected to change their travel times. This may be due to drivers with mobile phones feeling more secure than someone without one. This question is different from the question asked in the pre-511 survey and therefore, no comparison can be made.

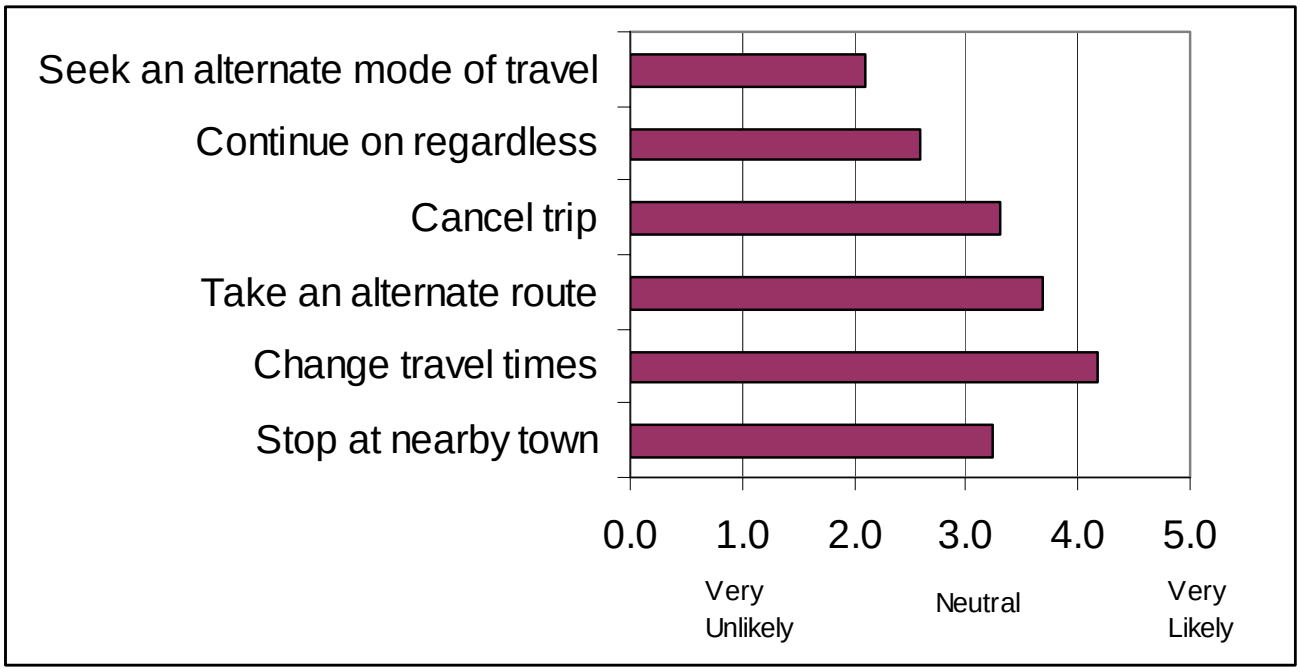

Figure 17: Mean Response Values for Likelihood

7.5. Satisfaction with 511 Capabilities

Question 12 was asked to determine how satisfied 511 users are with the capabilities of the service and to see if there are any enhancements that need to be made. In this question, users were asked how satisfied they are with the following capabilities: 'quality of the service,' 'usefulness of the service,' 'accuracy of the reported road condition,' 'accuracy of the weather forecast,' 'ease of accessing the information you want,' and 'availability of the system (system is working/no busy signals'). As can be seen in Figure 18, overall respondents are between very satisfied and satisfied with the 511 system capabilities. The capabilities are discussed in more detail below in descending order of how respondents rated them.

Figure 18: Satisfaction with 511 Capabilities

7.5.1. Usefulness of the Service

Respondents are most satisfied with the usefulness of the service (mean is 4.5 with a standard deviation of 0.70). As shown in Figure 19, the service usefulness was rated as very satisfying by 56.8 percent of 511 survey users while 33.5 percent thought it was satisfying. The chi-squared analysis found no differences in the responses to this question with respect to the various demographics.

The pre-511 survey respondents felt that the previous traveler information numbers were slightly less useful (mean is 4.3) than 511. This supports the finding that 68 percent of respondents prefer 511 to the previous systems.

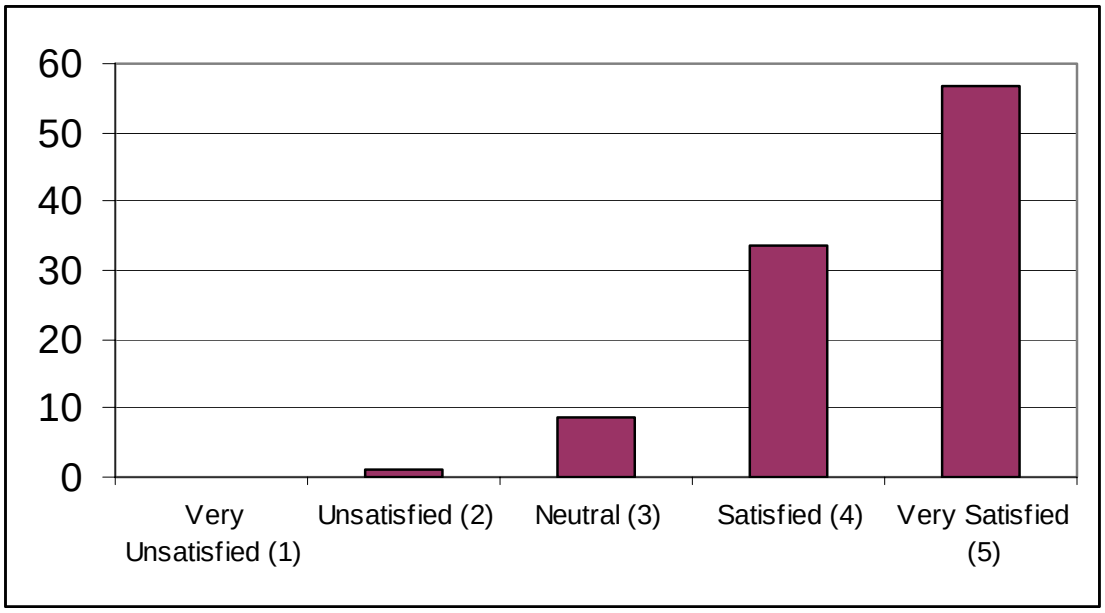

Figure 19: Usefulness of Service

7.5.2. Quality of the Service

Respondents' mean response for satisfaction with the quality of service is 4.3 with a standard deviation of 0.81. As shown in Figure 20, the service quality was rated as very satisfying by 47 percent of 511 survey users while 36.8 percent thought it was satisfying. The chi-squared analysis found differences in the responses to this question with respect to age and education level. This question was not asked on the pre-511 survey.

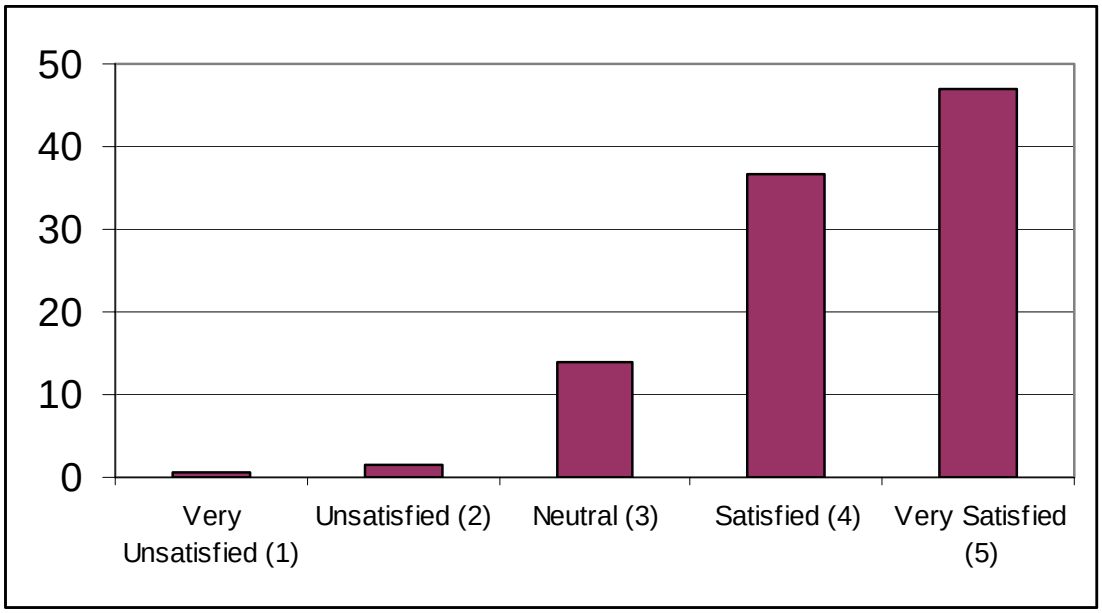

Figure 20: Quality of the Service

7.5.3. Ease of Understanding the Information

Understandability is critical because messages may contain information that could change travel plans. In addition, if users do not understand the system or message the first time they use it, they may not be willing to try again. Respondents mean response for satisfaction with the ease of understanding the information was 4.3 with a standard deviation of 0.91. As shown in Figure 21, the service's ease of understanding was rated as very satisfying by 50 percent of 511 survey participants, while 32 percent found it somewhat satisfying. The chi-square analysis found no differences in the responses to this question with respect to the various demographics.

The pre-511 survey respondents felt that the previous system was less understandable (mean is 4.1) than the new 511 system.

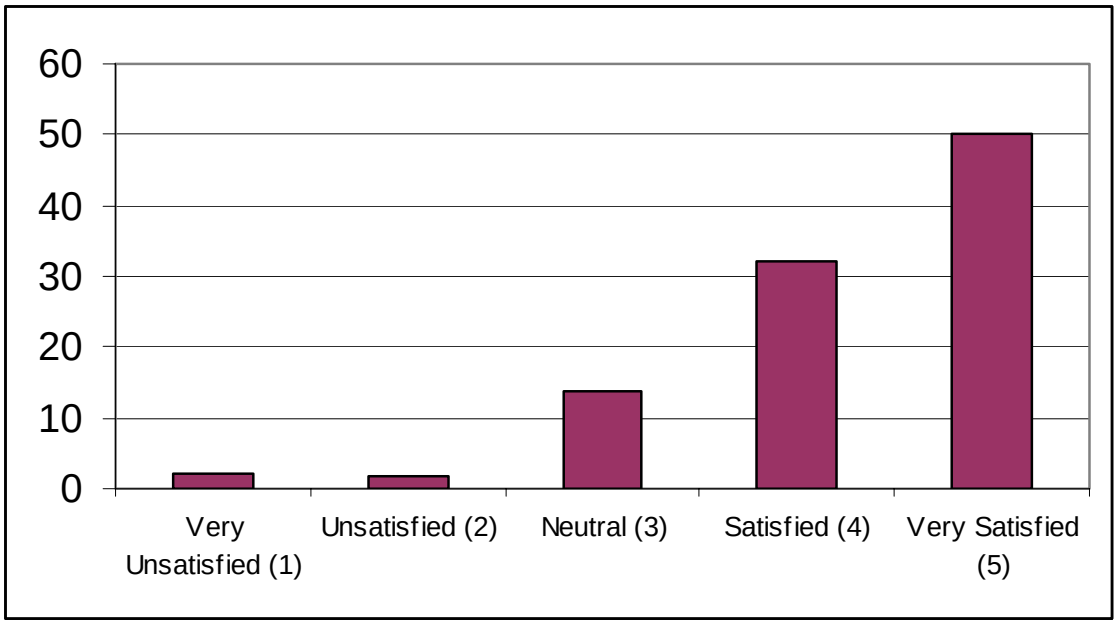

Figure 21: Ease of Understanding the Information

7.5.4. Availability of the System

The future use of a service is often tied to its availability. If users experience difficulties accessing the service due to high call volumes or too few phone lines, they might not try to use it again. With Meridian Environmental as Montana's 511 vendor, the MT 511 system will never have a busy signal due to high call volumes. The Meridian system is set-up so the five states in this coalition can "share" other states phone lines if needed. The mean response for satisfaction with the system availability is 4.2 with a standard deviation of 0.94. As shown in Figure 22, 46.8 percent of survey respondents were very satisfied with the availability of the system, 31.2 percent were satisfied and 17.2 percent were neutral. The chi-squared analysis found no differences in the responses to this question with respect to the various demographics.

Pre-511 system respondents felt that the previous system was less available (mean is 3.8) than the 511 system.

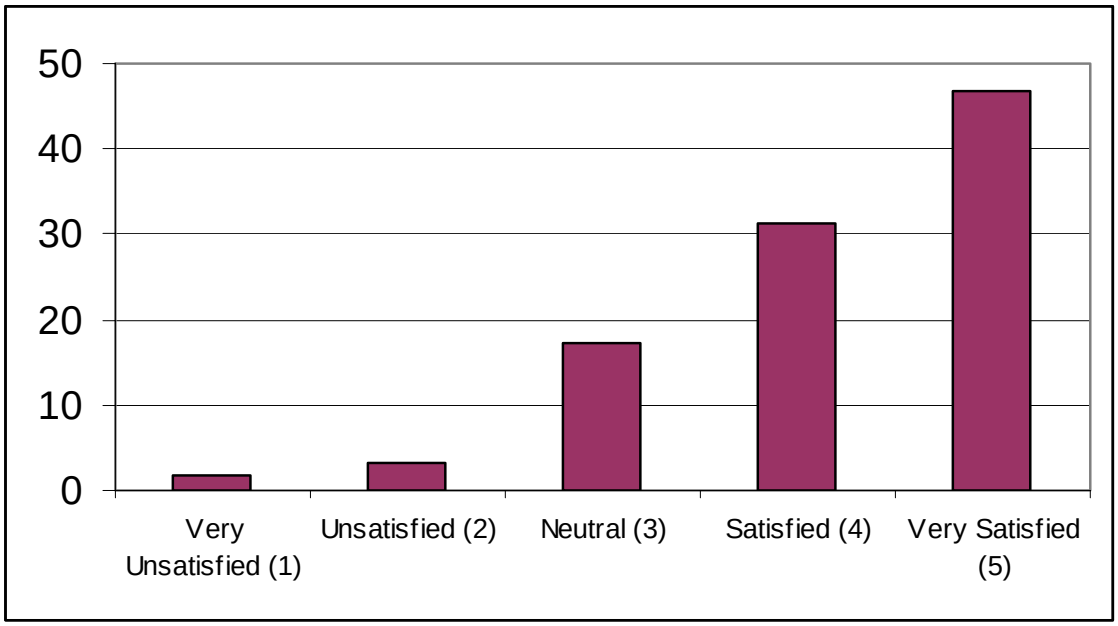

Figure 22: Availability of the System

7.5.5. Accuracy of Reported Road Conditions

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. The mean response for user's satisfaction with the accuracy of reported road conditions is 4.1 with a standard deviation of 0.87. As shown in Figure 23, 38.7 percent of respondents are very satisfied with the accuracy of reported road conditions while 41.9 are satisfied. The chi-square analysis found no differences in the responses to this question with respect to the various demographics.

The pre-511 respondents felt that the previous system was less accurate (mean is 3.75) than 511.

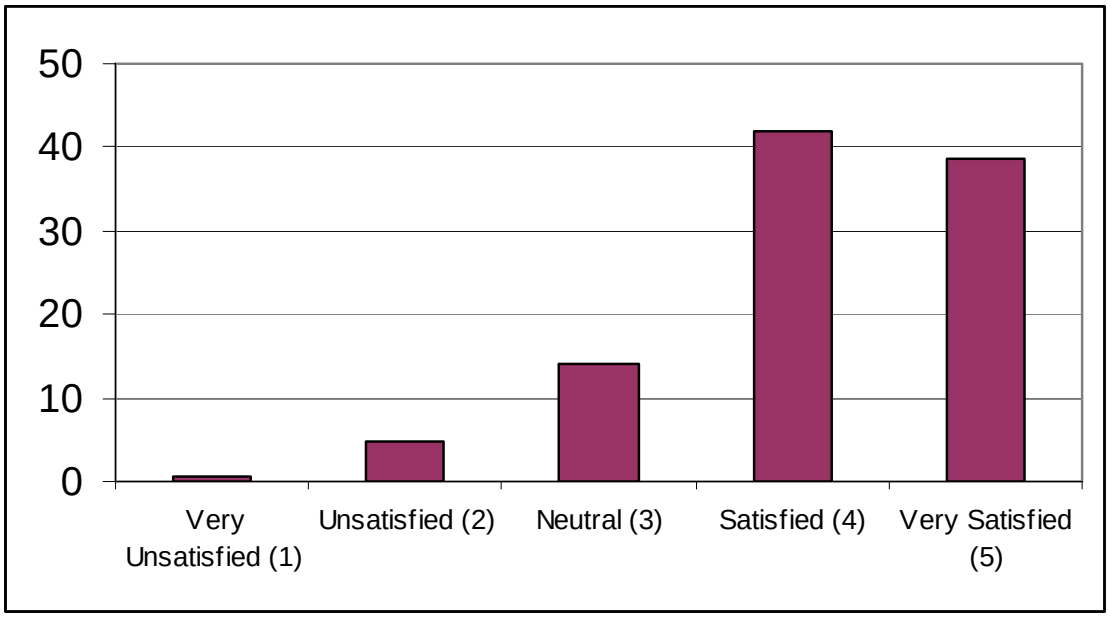

Figure 23: Accuracy of Reported Road Conditions

7.5.6. Ease of Accessing the Information You Want

The mean response for users' satisfaction with the ease of accessing the information they want is 4.1 with a standard deviation of 1.17. As shown in Figure 24, 52.4 percent of respondents are very satisfied with the ease of accessing information on 511 while 24.3 are satisfied. The chi-square analysis found no differences in the responses to this question with respect to the various demographics. This question was not asked in the pre-511 survey.

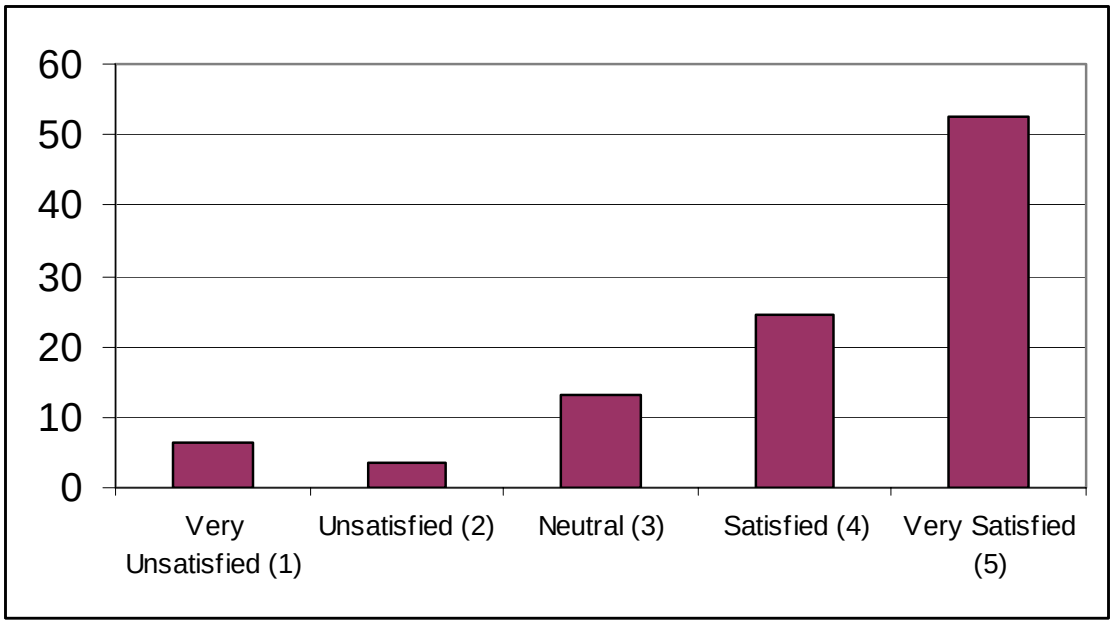

Figure 24: Ease of Accessing the Information you Want

7.5.7. Accuracy of the Weather Forecast

Respondents were asked about the accuracy of the weather forecasts as well as the road conditions. The results from this question cannot be linked to actual accuracy of the data because they only take into account users' impressions of accuracy. The mean response of 511 survey respondents' satisfaction about the accuracy of the weather forecast was 4.0 with a standard deviation of 0.90. As shown in Figure 25, the service's accuracy of weather forecasts was rated very satisfying by 33.3 percent and satisfying by 39.9 percent of respondents. The chi-square analysis found no differences in the responses to this question with respect to the various demographics. As weather forecasts were not available in the previous system, this question was not asked in the pre-511 survey.

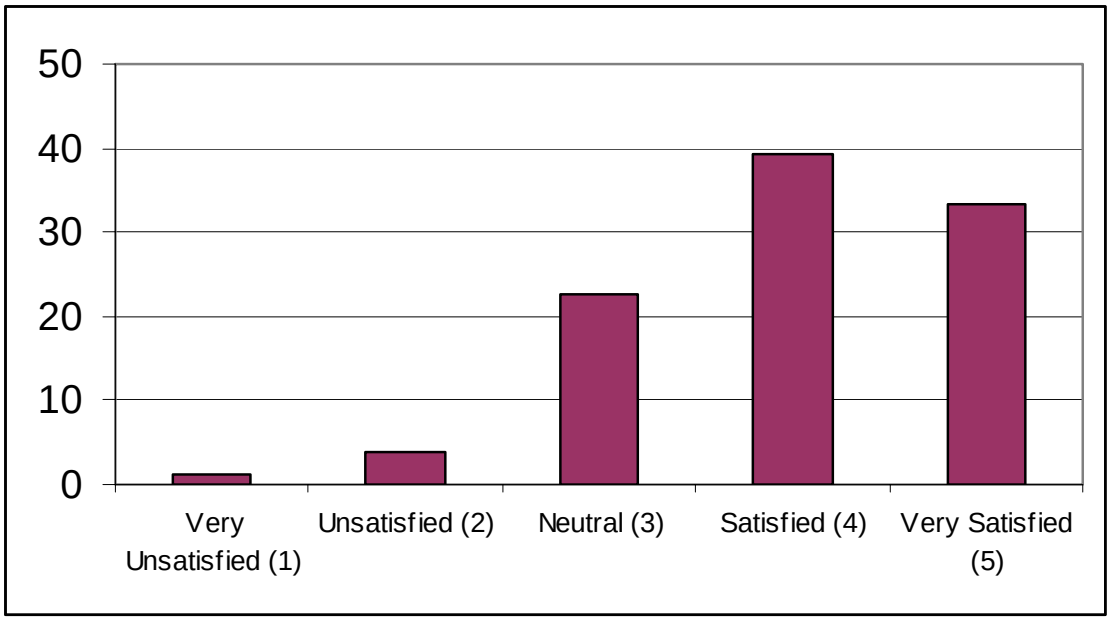

Figure 25: Accuracy of Weather Forecasts

7.6. Overall Montana 511 rating

Question 13 was asked to determine the overall rating participants would give the 511 service. Five options for responses ranged from 'Excellent' to 'Average' to 'Poor'. The mean response for this question was 4.1 corresponding to between good and excellent with a standard deviation of 0.77. As shown in Figure 26, 35.1 percent of users gave the 511 system an overall rating of excellent while 45.6 percent rated it good and 18.3 percent rated it average. Chi-Square differences were found when comparing responses to this question and respondents' education level. Respondents who had finished '4-year college/university' and 'post-graduate college/university' gave an overall rating lower than what was statistically expected while those who 'did not finish high school' and 'high school graduate or equivalent' gave a rating of 'excellent' more than was statistically expected.

The general comments on the 511 system were sorted. There were 57 positive comments about the system, 18 negative comments, and 27 miscellaneous comments. Positive comments include:

- "I think the 511 number is a timesaver and very useful program;"
- "511 is a number you can remember. It's quick and easy;"
- "I have had very positive feedback from my out-of-state relatives;"
- "The service is very helpful. Please keep up the good work;"
- "As I previously said, I get the information that I want and need from 511 – keep up the good work;" and

- "511 is the best source of travel information to come out in a long time – updates constantly, no waiting for information, weather changes constantly but the reports given are very good."

Negative comments include:

- "The first and only time I called 511 it was three days behind the calendar date, therefore, I have not used the system again[4];"

- "The 511 information differed from the online information so we followed the internet information, which was definitely more accurate[4];"

- "Winter road conditions can change so rapidly, how are you going to update often enough;"

- "Remove it and reduce taxes;"

- "Due to past experiences, we tend not to rely heavily on these reports, i.e., accuracy vs. timeliness;" and

- "Most of the information I have received is not current, in the early morning you get [information] from the day before[5].

[4] There were a couple times when updating the computers at MDT caused the road condition information to not update. The MDT website was still able to update though. This may be the reason for this comment.

[5] Road conditions are updated twice a day or as conditions change. The two times a day are at 6:30 am and 3:30 pm. As the conditions are reported from snow plow drivers, and even during the winter time they do not work twenty four hours, there is a chance that travelers calling before 6:30 am are getting road conditions that have not been updated since the night before.

Figure 26: Overall 511 Rating

8. SYSTEM USAGE STATISTICS

The Meridian Environmental (#SAFE) Coalition consists of five states. They include Montana, North Dakota, South Dakota, Nebraska, and Kansas. The first of these states to deploy 511 was Nebraska in October 2001 and the last was Kansas in January 2004. The following section compares 511 call information and web site hit information. It should be noted that in January 2003, Meridian Environmental upgraded their #SAFE system to be a shared system. Meridian owns all of the telephonies needed for the five states; each state has a set number of phone lines they rent, but if their call volumes exceed the number of lines they pay for, then they can borrow phone lines from one of the other states that is not utilizing them. The statistics that are analyzed in this section are from the new system only; therefore, for example, even though Nebraska deployed in October 2001, the call statistics that are analyzed are from March 2003 on (when they were added to the shared system). Populations for these states estimated for 2003 (3) along with 511 deployment date and the date they were upgraded to Meridian's shared system are shown in Table 4.

Table 4: Information by State

	Population	511 Deployment Date	Upgrade to Meridian Shared System
Montana	917,621	January 2003	January 2003
North Dakota	633,837	February 2003	February 2003
South Dakota	764,309	November 2002	February 2003
Nebraska	1,739,291	October 2001	March 2003
Kansas	2,723,507	January 2004	January 2004

Figure 27 shows the total call volumes by state for January 2003 through May 2004. Total call volumes include both those when people receive information and do not receive information. As can be seen, the greatest call volumes occur during the wintertime (November through March) when road conditions are bad and weather forecasts are needed. This graph also shows that Montana had the largest monthly call volume (109,043) in December 2003 and Nebraska had the second largest (107, 194) in February 2004.

Based on the fact that it is expected that a state with a greater population, such as Nebraska, would have a greater call volume, the call volumes were normalized by state population to provide a more accurate comparison of the call volumes. As can be seen in Figure 28, when this is done, Montana has significantly higher call volumes, even when compared to Nebraska. This indicates that a greater percentage of Montana's population uses the 511 system than any of the other Meridian states.

Figure 27: Comparison of State Total Call Volumes

Figure 28: Comparison of State Total Call Volumes Normalized by State Population

As mentioned earlier, Meridian's system can distinguish between calls that receive information and those that do not (i.e. hang up before getting any information). No information calls range from 3 percent of the total calls (during Montana's highest call volume month – December 2003) to 74 percent of the total calls (during Nebraska's smallest call volume month – September 2003). The average monthly amount of no information calls was 41 percent[6] of total calls. Figure 29 shows the comparison of informational calls per state. Montana has the highest call volumes (105,507 in December 2003; 89,328 in March 2003; and 82,682 in January 2004) with Nebraska next (83,829 in February 2004). Again when this information is normalized by population, as shown in Figure 30, Montana's call volumes are significantly higher than Nebraska's.

Figure 29: Comparison of State Informational Call Volumes

Figure 30: Comparison of State Informational Call Volumes Normalized by State Population

Along with the call volume information, the number of transactions is an important statistic as well. This will indicate whether callers get one piece of information and hang up or if they obtain more information. The number of transactions ranges from 30 percent more than the number of informational calls to 103 percent more with the average being 62 percent[6].

As can be seen in Figure 31, Montana (206,585 in December 2003 and 157,193 in January 2004) and Nebraska (142,703 in February 2004 and 129,384 in January 2004) had the greatest number of transactions. As shown in Figure 32, when normalized by population, Nebraska's number of transactions becomes similar to the other states, while Montana is still above the ordinary. This again supports the findings of the Gallup Poll which indicated that weather and road condition information is most important to 511 users.

[6] This was calculated by taking the average for each state then averaging the states together.

Figure 31: Comparison of State Transaction Volumes

Figure 32: Comparison of State Transaction Volumes Normalized by State Population

Figure 33 shows the comparison of web hits (number of times people got information from the site) on the safetravelusa.com website per state from January 2003 through May 2004. As shown below, Nebraska has by far the greatest number of web hits. Their largest month was February with 144,612 hits. This was also the same month that Nebraska had the largest total call volume and informational call volume. On average, Nebraska's web hits are 12 percent more than their total call volume and 125 percent more than their informational call volume.

As can be seen in Figure 34, when normalized by state population, it still shows that Nebraska residents utilize the website much more than the residents of other states.

Figure 33: Web Hits by State

Figure 34: Web Hits Normalized by State Population

9. CONCLUSIONS

Certain conclusions can be made based on the analysis of the survey, including:

- The majority of respondents had not heard of 511 prior to this survey and felt they had not received enough information about 511. Therefore more marketing needs to occur. Prior to this survey, MDT's deployment marketing consisted of television and radio interviews; press releases to radio, newspaper, and television; blue highway signs at the Montana borders; billboards across the state; public service announcements on the radio; articles in the Montana Travel magazine and the Fall Rediscover Magazine, information on MDT's traveler information website; and information provided to the public through the Transportation Awareness Program at fairs, parades, and driver education classes (although the greatest impact of TAP is during the summer and this survey was completed in April).The responses show that marketing practices that should be continued include the free press (i.e. radio, television, and newspaper interviews and press releases; and word of mouth by family and friends) and public service announcements. The locations of the highway signs should be increased and the TAP program will reach significant amounts of people during the summer. It was also shown that Missoula and Butte were significantly unaware of 511, and therefore the marketing in this area should be increased.

- The majority of respondents who had used 511 preferred it to the previous system and overall, respondents who had used 511 before rated the service between good and excellent. Therefore, this was a worthwhile change for the department.

- Respondents generally access the information prior to a trip and if poor conditions were reported on 511, respondents are most likely to alter their travel plans by changing travel times, taking an alternate route, canceling their trip, or stopping at a nearby town. This information should be considered when choosing the menu structure and information provided on the 511 system, as this helps define who the users are and what type of information they are seeking.

- The majority of respondents felt that the best way to identify their location for the 511 system is by highway number and name of the community and that the most important features that could be offered on 511 were winter road conditions and weather forecasts. Of the additional features suggested, a quarter of them have already been implemented. This indicates that the system is providing users with the information they want and need.

- Respondents were between very satisfied and satisfied with all of the 511 capabilities including: availability of the system, ease of understanding the information, ease of accessing information you want, accuracy of weather forecast, accuracy of reported road conditions, usefulness of service, and quality of service. Again, this shows that respondents are being provided the information they want and need.

- Half of the suggested system enhancements were new suggestions falling into the categories of menu structure, weather information, general department of transportation information, general transportation information from other organizations and tourism

information. These suggestions should be examined to see if any are worthwhile and applicable to Montana's 511 system. Theses suggestions will be used as input to the 511 Deployment Plan.

- Based on the results of this survey and previous plans, the next steps for 511 in Montana are to enhance the system with an Alert system to include AMBER Alerts, Homeland security alerts, and general transportation alerts; the regional weather and road condition reports, a link to Travel Montana (the local tourism bureau); and a link to the surrounding National Parks. The 511 Deployment Plan will continue to be developed and MDT will continue to market 511 to potential users.

10.REFERENCES

1. Cuehlo, E., J. Ryan, and W. Ralph. #SAFE Evaluation Annual Report 2001. Western Transportation Institute/Montana State University-Bozeman, June 2001.

2. L. Ballard, J. Helmuth and Y. Wachutka. Greater Yellowstone Regional Traveler Weather Information System, Pre-511 Evaluation Summary, Version 1.0. Western Transportation Institute/Montana State University-Bozeman, August 2002.

3. U.S. Census Bureau 2000 Data. August 2002. http://www.census.gov/main/www/cen2000.htm/

4. Scarborough Research. (March 18, 2002). Cell Phone Ownership Grows 29 Percent From 1999-2001 According to New Scarborough Study. *Scarborough Press Release*. Retrieved June 8, 2004 from the World Wide Web: http://www.scarborough.com/scarb2002/press/pr_cellphone.htm

5. "511 Market Research: Here's What Consumers Want." Intelligent Transportation Society of America, Washington, D.C. 2002.

APPENDIX A: SURVEY INSTRUMENT

APPENDIX B: SURVEY DISTRIBUTION/RESPONDENTS

Maintenance divisions' zip codes and populations (taken from the 2000 Census) were calculated by Montana State University's GAIC for the pre-511 survey. At that time, MDT had 11 maintenance divisions. MDT has since removed Glendive as a maintenance division and the following information has been updated.

Montana's estimated total population is 902,195.

Billings Division

Estimated Population is 164,240

County	Zip Codes	Population
Sweet Grass	All	3609
Stillwater	All	8195
Yellowstone	All	129352
Treasure	All	861
Carbon	All	9552
Big Horn	All	12671

Bozeman Division

Estimated Population is 93,267.5

County	Zip Codes	Population
Meagher	All	1932
Broadwater	All	4385
Gallatin	All	67831
Park	All	15694
Madison	59735 59729 59745 59720	162,840;?;? therefore 6851/2= 3425.5

Butte Division

Estimated Population is 124,564.5

County	Zip Codes	Population
Beaverhead	All	9202
Deer Lodge	All	9417
Silver Bow	All	34606
Jefferson	All	10049
Powell	59731 59722	112+3421= 3533
Lewis & Clark	All except 59410, 59639, and 59648	55716-1384= 54332
Madison	59751 59747 59754 59749 59755	?,?,400,659,130 therefore 6851/2= 3425.5

Great Falls Division

Estimated Population is 93,361

County	Zip Codes	Population
Teton	All	6445
Cascade	All	80357
Chouteau	All except 59520 and 59460	5970-795= 5175
Lewis & Clark	59410 59639 59648	284+1100= 1384
Judith Basin	59469	?

Havre Division

Estimated Population is 51,573

County	Zip Codes	Population
Glacier	All	13247
Toole	All	5267
Liberty	All	2158
Hill	All	16673
Blaine	All	7009
Pondera	All	6424
Chouteau	59520 59460	703+92= 795

Kalispell Division

Estimated Population = 126,185

County	Zip Codes	Population
Lincoln	All	18837
Flathead	All	74471
Sanders	All except 59831	10227-216= 10011
Lake	All except 59864 59824 59865 59821	26507-3641 22866

Lewistown Division

Estimated population is 22,513

County	Zip Codes	Population
Fergus	All	11893
Petroleum	All	493
Musselshell	All	4497
Golden Valley	All	1042
Wheatland	All	2259
Judith Basin	59447 59479 59462 59452	2329
Phillips	59546	?

Miles City Division

Estimated Population is 39,550

County	Zip Codes	Population
Powder River	All	1858
Carter	All	1360
Fallon	All	2837
Custer	All	11696
Rosebud	All	9383
Wibaux	All	1068
Prairie	All	1199
Garfield	All	1279
Dawson	All except 59259	9059-189= 8870

Missoula Division

Estimated Population is 146,090

County	**Zip Codes**	**Population**
Mineral	All	3884
Missoula	All	95802
Ravalli	All	36070
Granite	All	2830
Sanders	59831	216
Lake	59864 59824 59865 59821	1812+439+788+602= 3641
Powell	59854 59843 59733	7180-3533= 3647

Wolf Point District

Estimated Population is 40,851

County	Zip Codes	Population
Valley	All	7675
Daniels	All	2017
Sheridan	All	4105
Roosevelt	All	10620
Phillips	All except 59546	4601
McCone	All	1977
Richland	All	9667
Dawson	59259	189

The survey distribution analysis was calculated with the zip codes provided by Qwest.

The survey respondent analysis was calculated with the zip codes provided by respondents in question 14.

APPENDIX C: TABULAR RESULTS

The following parts to this appendix show the survey question layout and the summary statistics. 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 2.3 Statistics. The abbreviation "St Dev" represents the standard deviation of the specific question.

1. **HOW OFTEN do you travel on highways in Montana (U.S. routes, Interstates, or state routes)?**

   ____ times per week

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)***

- ☐ Television
- ☐ Radio (AM/FM)
- ☐ Telephone
- ☐ 511 travel information phone number
- ☐ 800-226-ROAD (7623)
- ☐ Local Montana Department of Transportation road conditions phone numbers
- ☐ www.mdt.state.mt.us/travinfo
- ☐ Other Internet sites
- ☐ Highway advisory radio
- ☐ Observations of existing conditions
- ☐ Notices at truck stops, convenience stores, rest areas
- ☐ Communication with other drivers
- ☐ Other (*please specify*)

3. If you were to call a travel information phone number, how important are the following features? ***(Check only one response for each item)***

	Very Important		Neutral		Very Unimportant
a) Winter road conditions on highway	□	□	□	□	□
b) Construction information on highways	□	□	□	□	□
c) Weather forecast	□	□	□	□	□
d) Accident information	□	□	□	□	□
e) Public transit information	□	□	□	□	□
f) Information about conditions on city roads	□	□	□	□	□
g) Access to information in neighboring states	□	□	□	□	□
h) Regional road condition and construction reports	□	□	□	□	□
i) Hands-free voice activation	□	□	□	□	□
j) Opportunity to record comments and give feedback	□	□	□	□	□

4. What other features would you like to see on a travel information phone system?

These responses are in Appendix E.

5. **If it were necessary for you to identify your location to access travel information, which methods would you prefer?** ***(Check only one)***

    - ☐ By highway number and mile marker
    - ☐ By highway number and names of communities you are between (for example, I-90 between Bozeman and Butte)
    - ☐ By region (for example, Southwest Montana, Northeast Montana, etc
    - ☐ By community (for example, near Billings, near Helena, etc)
    - ☐ By origin and destination (for example, from Kalispell to Bozeman)
    - ☐ Other _____

6. How have you been made aware of the 511 travel information phone number? *(Check all that apply)*

- ☐ Radio
- ☐ Television
- ☐ Public service announcement/advertisements
- ☐ Newspaper articles
- ☐ Department of Transportation
- ☐ Family/Friends
- ☐ Internet
- ☐ Blue highway information signs
- ☐ Billboard
- ☐ Phone/cell phone provider
- ☐ Promotional flyers
- ☐ Transportation booths at fairs
- ☐ Other _____
- ☐ I was not aware of 511 before this survey

7. In your opinion, have you received enough information about the 511 travel information phone number?

- ☐ Yes
- ☐ No

8. How often have you used 511 since January 2003? ***(Check only one)***

- ☐ Have not used 511
- ☐ 1-3 times
- ☐ 4-6 times
- ☐ 7-10 times
- ☐ More than 10 times

If you <u>HAVE NOT USED</u> the 511 travel information phone number, please skip to <u>Question 14</u>.

9. When do you USUALLY access 511? ***(Check only one)***

☐	Before I start a trip
☐	During a trip
☐	Both before and during a trip

10. If you were to compare the previous travel information phone numbers (800-226-ROAD, *ROAD, or local Montana Department of Transportation phone number) to 511, WHICH DO YOU PREFER? ***(Check only one)***

- ☐ 511
- ☐ Previous MDT system report
- ☐ No preference
- ☐ I have not used the previous system

Comments:

_____

11. When you hear of poor travel conditions on 511, HOW LIKELY are you to…

(Check only one response for each item)

	Very Likely		Neutral		Unlikely
a) stop at a nearby town?	☐	☐	☐	☐	☐
b) change travel times?	☐	☐	☐	☐	☐
c) take an alternate route	☐	☐	☐	☐	☐
d) cancel the trip?	☐	☐	☐	☐	☐
e) continue on regardless	☐	☐	☐	☐	☐
f) seek an alternate route?	☐	☐	☐	☐	☐

12. How satisfied are you with the following 511 capabilities?

(Check only one response for each item)

	Very Satisfied		Neutral		Very Unsatisfied
a) The quality of the service	□	□	□	□	□
b) The usefulness of the service	□	□	□	□	□
c) The accuracy of the reported road conditions	□	□	□	□	□
d) The accuracy of the weather forecast	□	□	□	□	□
e) The ease of accessing the information you want	□	□	□	□	□
f) The ease of understanding the information	□	□	□	□	□
g) The availability of the system (system is working/no busy signals)	□	□	□	□	□

13. Overall, how would you rate the Montana 511 travel information system?

Excellent		Average		Poor
□	□	□	□	□

14. What is your home zip code? _____

15. What is your gender?

- Male
- Female

16. What is your age?

- 18-24 years
- 25-44
- 45-64
- 65 or older

17. Do you own a mobile phone?

- Yes
- No

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

(Check only one)

- □ Personal trips (excluding tourism)
- □ Business trips
- □ Tourism
- □ Long-distance commercial vehicle operator
- □ Local fleet operator (school bus, parcel delivery, etc)
- □ Other _____

19. What is the highest level of education you have completed?

- □ Did not finish high school
- □ High school graduate or equivalent
- □ 2-year college (community/technical)
- □ 4-year college/university
- □ Post-graduate college/university

20. General comments/suggestions:

_____

APPENDIX D: TABLE OF CHI-SQUARED COMPARISONS

APPENDIX E: COMMENTS FROM SURVEY PARTICIPANT

It should be noted that comments that did not make sense were deleted, comments that discussed a topic different from the question they were originally written for were moved to the appropriate comment, and general comments were distributed to the question they best fit under.

10.1. Other Resource Comments (Question 2)

10.1.1. Other Resources

- Newspaper (8)
- Check weather outside (7)
- Weather Band/Bureau Radio (4)
- Road condition/highway signs
- NOAA (3)
- Highway patrol/sheriff (3)
- Scanner
- CB radio

10.1.2. General Comments

- We use the internet because we mostly worry about visibility and it helps to be able to see the conditions
- I have not used the phone system but have found the MDOT web page to be very useful!
- I usually check the internet before traveling, but it would be nice to have access to road conditions while driving. You need to get the word out about this service
- Being a very independent fifth generation of Montana, I just look at the sky and decide to go or not to go. Besides, I've always owned a four-wheel drive. The radio has been the major source for information in the a.m. I wake to it everyday
- I usually access the road reports by computer
- I have On Star in my car, so really don't need a mobile phone
- I prefer to use the website prior to departure. I won't use 511 unless I encounter conditions that were not expected while in route

- If I were to travel a long distance I would call 511. Very important, for sure
- I hardly ever use it except during extreme conditions when I have to travel

10.2. Other Features for Travel Information System (Question 4)

These comments were reorganized for a better understanding of the overall picture. If a single comment had more than one idea, these ideas were split to fit into the reorganized break down.

10.2.1. Great the way it is (16)

- Weather and construction reports are the most important and valuable information
- You have covered just about all areas
- No problem with service
- Nothing, already has all I need to know
- OK as is
- The current system provides me with the information I want or need – keep up the good work!
- Road conditions and forecast would be enough information for me to make a decision about traveling
- Its fine the way it is
- Road info seems to be ok for my needs
- It is now pretty well covered
- It's fine as it is
- I feel that what is there now is good
- Its fine the way it is
- Nothing, everybody seems fine!
- I feel the service is good
- I think they do a great job

10.2.2. Simple is better (4)

- Do not overload it!
- None. Limit it to pertinent info!
- Keep it simple, what, where, and weather
- Just road information

10.2.3. More Updates/Accuracy (35)

- Faster Updates
- More frequent up-dates on road / weather conditions
- Updated more often
- Accuracy, timeliness
- Regular updates as often as possible for the greatest accuracy possible
- Updated hourly – many are too old or any benefit
- Just keep current on weather and construction conditions!
- To keep up the conditions as soon as possible
- 30 minute updates
- I am pleased with the system – one suggestion, more frequent updates
- Up to the minute reports
- Up to date information – within past 4 hours
- Updated more often
- More frequent updates
- Very current road conditions info not much help if its 12 hrs previous
- The actual true info. Many times when I have called and they give info then I call to cancel something the road report is in error
- How current is information
- More frequent updates

- Accurate- up to date information
- Hourly updates
- More updated information- at least every 4 hours
- More accurate reports- I travel from Rowaq to Missoula daily (5) had 3 emergency only reports (wrong)
- Accuracy and relevance
- Accurate, up to date information
- Hour by hour update for winter road conditions
- ½ hour updates on road and weather conditions
- Updated more frequently
- Updates as quickly as possible
- Very current information. Updated frequently
- More regularly noticed and reported
- Accurate updates
- Regular update
- Info must be timely updated continuously several times per hour
- Most information is 12 hours late
- Way more frequent updates

10.2.4. Already In 511

10.2.4.1. Timestamp (8)

- Time
- Time
- Time
- What time was the info last updated?

- Time of last update
- When the last update is
- Time of road report
- Time

10.2.4.2. Construction (3)

- Construction
- Construction
- Road construction

10.2.4.3. Road Closures (7)

- Road closures
- Road closures
- Closures
- Road closures
- Road closure information
- Road closures
- Road closures

10.2.4.4. Weather Info and Road Conditions (9)

- Weather related information
- Weather
- Weather (Winter Storms)
- Weather forecast
- More detail with winter road reports
- General winter road conditions
- To see if there any road conditions and so I can be on time

- Weather and snow conditions in certain area
- I would like to be able to get weather information for certain areas

10.2.4.5. Chains and Wind (2)

- Special conditions like areas where chains are required
- Wind conditions

10.2.4.6. Neighboring States Conditions (3)

- Travel conditions into neighboring states i.e. WY, ND, SD
- Conditions beyond state lines
- When traveling to other states a method to check on their road conditions (checked and you have this feature)

10.2.4.7. Free (1)

- Free

10.2.4.8. Temperature (3)

- Temp
- Temp. outside
- Temperature

10.2.4.9. TTY # (1)

- I'm hearing impaired-511 does not have TTY TT

10.2.4.10. Options So You Do Not Have To Listen To The Entire Message (3)

- Extensions so you can get just your area and don't have to listen to all of it. I don't call because I got bored and I figure I have to drive anyway
- Ability to select option without waiting for message
- The most important to me would be to get the info I need without having to listen to other areas 1st

10.2.4.11. Ability To Bypass The Instructions (1)

- If you use the system frequently, the ability to select your options without waiting for the end of a message – I know I need to select 1, then 2, then 1

10.2.4.12. Landmarks Versus Mile Markers (5)

- Use towns as identifiers or landmarks, mile markers mean nothing to the average traveler. Make it as easy to use as previous number. Use city names / landmark instead of mile markers

- Change the description of the area by mile markers to be in selection towns. Example – Homestake pass to Cardwell not mile marker "x" to "y"

- When calling 511 before a trip I am confused by mile marker reporting. If on a trip mile marker makes sense because I see them as I pass them and figure out what's ahead

- Leave out mile marker numbers

- To be more clear on what highways are do not use mile marker information instead of town names

10.2.4.13. Voice Activation (1)

- Voice Activation would be great also

10.2.4.14. More Phone Lines (3)

- I have heard 511 is sometimes busy when there seems to be a storm that is either hitting or going to hit

- Not such a long wait, more lines

- More lines, seems it is busy often

10.2.4.15. Repeat Information (1)

- To repeat info by pressing a # key on the phone – it repeats the tape

10.2.5. Suggestions for Improvement

10.2.5.1. Information Collection (2)

- Would like to see updates to the system form people driving on the roads, because like me, I'm on the road usually be 4:00 am and the road conditions change hourly

- Reports from people experiencing in that they have experienced the conditions

10.2.5.2. *Date Stamp (4)*

- Date
- Date
- Date
- Date is very important in your recorded message

10.2.5.3. Voice (3)

- People giving info have clear, crisp, diction
- Fast response, clear diction
- Have the announcer speak more slowly and/or articulate

10.2.5.4. Live person to talk to (5)

- A live person to answer my questions
- Speak to a person
- A real person to answer questions not a recording
- Live person to talk to
- Live person to talk to

10.2.5.5. Regional Information (10)

- Easy access to regional information
- Easier access to sectional info (Polson to Kalispell rather than just highway 93 North/South)
- More thorough regional information (feeder highways, i.e.), rest areas: open/close info (local attraction open/close information would be nice, too!)
- Regional road conditions
- More specific information on areas within state in less general terms
- Separate reports by area. This would be less confusing
- Perhaps include a region option instead of all of I-90 for instance eastern, central, and western

- I have called 511 about once but I really do not like having to punch in road numbers. I would prefer a recording of roads by region. Maybe divide MT into four or six regions and have a recording of weather and roads in that region

- More localized reports

- Definitely have a phone line. Extensions for local areas

10.2.5.6. Additional States (2)

- Travel often on personal trips to Idaho, Washington, and Oregon. If information on main routes/areas of Idaho and Washington could be included it would be great

- Would like to hear more information on Western states of Idaho, Oregon, Washington (especially Washington)

10.2.5.7. Additional Routes (5)

- Add small routes like Mill Creek Pass between Anaconda and the Big Hole (2)

- More detail info especially on secondary and rural routes

- I feel 511 is very useful the only flaw is it does not have information on highway I travel on my bus route. I drive to Marysville MT two times a day and in winter it would be nice to know road conditions on the highway since road conditions can be different once you set out by Germin's Ranch road conditions can be bad in one spot and nice in another

- More secondary road conditions, I call 511 to check highway 279 but could not get any information invalid # highway

10.2.5.8. Menu Options (17)

- Be able to ask "What are the road conditions between Glasgow and Havre" (example)

- Something if you don't know highway number

- The ability to enter a numerical code for hwys (ex. Enter 93 for hwy 93; or 931 for hwy 93 N and 932 for hwy 93 S) instead of having to listen to info I don't need.

- 511, if you could access more then one section of road, without having to start over. "Example" at end of report (list) would like more information on a another roadway, if so press (?)

- 511- I would like to see it- if you enter a highway number, and you need more than one section of road, I don't want all the information of all the other sections repeated

- Use a number to get to a certain area quicker

- Quick road conditions, ease of access to find roads of interest… no long messages
- If you could find a way to limit the number of choices to get specific information and speed up the dialogue it would be more useful
- User-friendly options
- Easier to use
- A faster way to get to highway area I want to know about
- Easy and quick access… none of this "for… press 1 for…"
- Quick access, not lots of long messages and press "x" lots of times
- Make system compatible at moving from highway to highway (i.e. I-90 to US 287)!
- When I'm looking at road reports I'm interested in specifics. I.e. road from Red Lodge-Helena, each portion- RL-Columbus- Interstate- Three Forks- Helena
- What number caller you are
- The ability to "rewind" instead of listening to the entire message again

10.2.5.9. Weather/Winter Info (20)

- Conditions on mountain passes in Montana (i.e. Monida, Lolo, etc.)
- Mountain pass information
- More information needed on mountain passes on I-90
- When and how often the road department is plowing and sanding the roads
- When and how often roads are plowed
- Information on snow plows
- Information on snowplow activity
- Future forecasts 24 hours in advance
- Future forecasts by area
- Snowfall already received
- High water related information

- Fire information if affecting traffic or access to National/State Parks
- Notice of National/State Parks and roads being closed due to disasters
- Floods in area
- Fires in area
- Visibility warnings
- Winter conditions in local areas are very important but also major year round weather such as flooded roadways, washed out culverts etc.
- Extended conditions
- Currently too little information given for a stretch of road
- The exceptions reports say the same things as the general report on road conditions it is a waste of time to report them

10.2.5.10. General Department of Transportation Information (16)

- Border crossing status (i.e. open 24 hrs, etc.)
- Information on rest areas (i.e. if they are open or not)
- Rest stops available
- Rest areas in the area or on the route
- Location of restrooms and maps
- Location of rest stops and if they are open or closed
- Estimation of time span of problem conditions
- Time related information, (i.e. fog on I-90 between X city and Three Forks, should lift by 9 a.m.)
- Delay times for major road construction
- Estimated delay times in areas of construction
- Road construction delays
- Construction- days of active workers vs. days off or hours off
- Detours

- Route Access
- Recommended alternate routes, best route available during conditions
- Any information on major accidents on highways

10.2.5.11. General Transportation Information from Other Organizations (13)

- City conditions
- Activity such as cattle on roads
- Animal hazards
- Information on whether the road is dirt or paved
- Identify bad areas on highway
- Street cleaner information
- G.P.S. and compass
- G.P.S.
- Safe driving hint of the day such as defensive driving principles just to remind callers of things they learned in High School drivers education, but forgot
- Radio stations in the area for where you are calling. This is for those people that do not have cell phones or if the cell phones are "not in service"
- Instructions pertaining to what to do in case of emergency with a vehicle
- Towing service or non-emergency phone number
- Access to emergency help such as tow trucks, police, sheriff, etc.

10.2.5.12. Tourism Info (18)

- Interesting places to visit or a "hot spot" of the month
- More information about area, to and from area
- Basic points of interest in the area
- Information on attractions
- River flow stages during peak runoff season

- Ski reports
- Important events like College Rodeo, etc.
- Notification of special events in communities along the route
- Events going on in cities so travelers can plan stops on their vacation
- Where wildlife can be viewed from the highway
- Where the best gas price is
- Information on various route stops such as gas (self serve versus full serve and hours)
- Information on food
- Services available such as lodging
- Services available such as restaurants
- Services available such as gas
- Restaurants information
- Motel information

10.3. Method for Location Identification on Traveler Information System (Question 5)

- None
- 60 mile commute
- Cell phone

10.4. How Made Aware of Service (Question 6)

- Card that were at c.o.
- Co workers
- Christmas Parade
- Can't Recall – radio or TV
- Work

- Transportation winter driving seminar
- Local phone book
- Aware if it, but never used it
- Police department
- Rest stop
- Knew there was #. Didn't know it was 511.
- This notice
- This survey

10.5.Have You Received Enough Information About 511 (Question 7)

- You need to disseminate this info or advertise. This is the first I've heard of any changes to the system. Unfortunately – The only weather info we get is either from Idaho or Butte – Not Here!!
- Where was this 511 system advertised?
- We need to be more aware of this service. I thinks there a lot of people who do not know about this.
- 511 is news to me. We have not read about it or seen it covered in the news.
- Sorry I couldn't be more specific on some answers, but I've never used Montana 511 yet.
- 511 need to here more new to me
- This survey has made me aware of the Montana 511 travel system. I am interested in using the system.
- You need to make the 511 number more widely seen; ie road signs, billboards
- I have used this system in other states – was not aware it was available in Montana.
- Please send information about "511"
- I called 511 just prior to filling out survey (for the 1st time) I will use it in the future
- Now that I am aware of the 511 # I will start to use it.
- This sounds easy to access and a system I would often use, but we were totally unaware of it. Road conditions are important to us as we have a motor home!

- Will use service in near future.

- The general public needs to be made aware of 511. Send out flyers or make a public service announcement.

- I was not aware of 511- must have been in a fog?

- Thank you for this opportunity- I think 511 should be more widely advertised.

- It sounds like a good program but you need to work harder to get the word out! For instance- I have just renewed my drivers license- an excellent time to receive a brochure on the program, same for when I purchased my state parks permit, etc…

- Include 511 information in utility bills or car registration notices.

- More information about 511 needs to be out and how much it costs the user etc…

- We will use 511 now – it is easier to remember this number than the 800 number and faster. Thank you

- Maybe some kind of advertising to let people know this service exists.

- Advertisement of its availability

- More advertising that it is there

10.6. How Often Have You Used 511 (Question 8)

- My wife travels to work by way of the interstate every week day. She uses the system more than I do. My son also travels more often than I do to college and uses the 511 system

- I have not used 511, I don't travel very often

10.7. Prefer 511 or Previous System (Question 10)

- I found the voice on 511 irritatingly slow paced. It took too long to get the information. I haven't used 511 enough – the timing was just not right once I was aware and it wasn't open winter

- I like the way the highways are divided into sections

- "Timeliness" of info is often questionable

- Simple and easy to remember!

- I really think 511 is more efficient and informative

- Easy to understand
- It uses long distance minutes on my cell phone
- The 800 number is easy, some phones don't take 511
- I became frustrated with road numbers. It would help to say Hwy xx between Missoula and Gamson.
- 226-ROAD was incomplete, confusing or disconnected when I tried it
- I drive a school bus and therefore it's important I know road before I start
- Less to remember or look up
- This mile marker designation is terrible, I travel very much but don't key off mile markers before I make a trip
- Ease of using the previous and because mile markers were not used. Mile marker means nothing. Liked when cities / landmarks were used.
- I wish they would tell you more about roads between Billings and Miles City
- I never had any trouble accessing the 511 like I did 800-226-ROAD. Also its easier to remember!
- Those other #'s I always forget while I'm driving
- I think it is great! I would prefer to use community names and distances from each instead of mile marker #'s
- 511 is brief and to the point
- 511 is excellent, but the mile marker stuff is tedious- towns easier though, lile marker is good specific information while traveling
- Whatever one is first selected
- Both provide me with enough information (Thank you!)
- More accurate
- Easier to remember!
- Need to include secondary highways
- Better information

- 511 gives information in too small distances
- I haven't ever used 800-226-ROAD
- Dialing 3 # instead of 10 will be very nice
- Work in motel business and 511 much nicer/easier to tell guests seeking road information. I do go to N Oak once a month (kids live there)

10.8. How Likely is 511 to Change Your Travel Plans (Question 11)

- I may not change my plans, but knowing the conditions helps me prepare, and add to or seduce safety equipment taken
- If conditions are poor, we stay at home. We are retired

10.9. Primary Purpose for Travel (Question 18)

- VA hospital
- NA- I don't go anywhere in state
- I live here, business and leisure
- Work and vacation
- MHP
- Necessity and emergency travel only- too expensive in this state to travel much
- Short trip (9 miles) to horses

10.10. General Comments/Suggestions (Question 20)

10.10.1. Positive Responses (57)

- Sounds like a good Idea!
- Sounds good – well use it
- Thanks for the information!!
- The service is very helpful. Please keep up the good work.
- It is a good service and has been helpful

- I think 511 is a good thing. And plan to use it when I'm on the highway. Thank you for this survey

- As I previously said, I get the information that I want and need from 511 – keep up the good work!!!

- Good survey – and I will be checking out 511 now

- 511 is very good and useful

- Road and weather information is very helpful, especially for winter travel

- Thanks for the opportunity to participate in this survey

- Keep up the good work

- 511 is a good idea (no brainer)

- The concept is a good idea and hope it will remain in service

- System is a nice addition

- Have a good day!

- 511 is the best source of travel information to come out in a long time- updates constantly, no waiting for information, weather changes constantly but the reports given are very good

- Thank you for selecting me as a surveyor

- I think this service will be a good and valuable one to the drivers of Montana and surrounding states

- I am very satisfied with every time I used the transportation phone #

- I appreciate the availability of 511 information

- Keep up the good work!

- Pleased to have this excellent 511 service

- Overall the state of Montana does a good job informing the traveling public of current road conditions

- You are doing a good by having the survey. I like the 511 number system

- A good service!

- Your system is great
- Thank you for sending me this survey. Now I will have the phone number written down
- Please try to continue this service!
- You seem to be doing a fine job
- For the few people in our state, I think the Department of Transportation does a good job on out highways – Keep up the good work
- Good job, good questionnaire
- I'm sure I will use 511 often - Thank you
- Sounds like a great idea – wish I'd known about it
- 511 is great!
- I'm glad to learn of 511's existence for future trips!
- Thanks for the info on 511
- Good program!
- Thanks for trying to improve and update the system
- I'm looking forward to your current updates!
- Appreciate the 511 system! We live in the Deerlodge National Forest- in the mountains. The weather between here and 20 miles away can differ greatly
- I'm very satisfied with the 511 system, realizing the immediate conditions are impossible to tell
- This is an essential service in our state. I look forward to using the 511# esp. in the winter
- Nice to have some road information before a trip. Montana needs more rest areas. I like identified Mountains / Rivers / Historic areas
- I appreciate having this system available to ease my mind when I have to travel
- 511 appears to be a good vehicle for road information. Will certainly make use of it in the future
- Keep up the good work. I like the information and Video of The Montana Passes (Lookout-Rogers, etc.)

- I like internet maps

- The combination of general weather advisories and forecast information is more than adequate to deforming the potential for hazardous condition. The regional advisories have always be very good

- It's a nice survey/ you could explain how 511 is being funded

- MDOT, Idaho DOT, and Utah DOT web sites are useful when we return to N.W. MT in March from wintering in S. Utah. Thanks

- I like the idea of 511 – easy dialing – Anything quick and easy to remember

- As we live on a ranch it is very important to know the road conditions – our closest town is 5 miles away

- 511 is a number you can remember. Its quick and easy

- Works Great. Easier # to remember – don't have to look up

- I have had very positive feed back from my out of state relatives!

- I think the 511 number is a timesaver and very useful program

10.10.2. Negative Comments (18)

- Dump 511 system before it becomes another "points" scam?

- Prefer to use previous number. Easier to use.

- I've lived in Montana all my life. Anyone who has driven in Montana year round for 10 years or more and survived has no need for this type of information. Save our tax dollars and get rid of this kind of B.S. Don't guess I'll win any $50, but you asked- so there it is.

- Remove it and reduce taxes.

- You assume too much – Here's a better question – Do you think this new phone system is really needed? (NO)

- Elimination

- Because weather conditions change so fast in MT during the winter the 511 should be changed ASAP

- Due to past experiences, we tend not to rely heavily on these reports, i.e., accuracy vs. timeliness.

- Winter road conditions can change so rapidly, how are you going to update often enough?

- Accurate info a must. Most are not aware of highway numbers – exclude I-15-90 Give number and towns to callers

- I usually find that roads are never as bad as people tell me they are but this does give me another source of info so I know when to drive with more caution.

- Info must be timely- continuous updates.-

- Update the information more frequently! Things change around here within the hours, we saw it going to ND. There should be signs MT as you enter.

- Early updates important.

- Most of the information I have received is not current, in the early morning you get from the day before.

- The 511 information differed from the online information so we followed the internet information, which was definitely more accurate.

- Travel information is only useful if updated often

- The first and only time I called "511" it was three days behind the calendar date. Therefore, I have not used the system again

10.10.3. Miscellaneous Comments (27)

- I filled this out with my job in Mind Mostly- that is when we do the most transports

- We live on an Indian Reservation and are forgotten all the time. So I would like to thank the transportation dept. for thinking of us

- I haven't traveled much this year

- Our cell phone does not work North of Hamilton. We live South of Hamilton & cannot get 511 on our phone!

- Hope the frequent travelers will use this and avoid unnecessary winter travel

- My first winter in Montana so feel less qualified to provide good information on any of the systems available than a long term resident

- We need more travel in eastern Mont. Mostly winter

- I had to leave… because I have yet to use 511

- There are 2 assumptions for travel outside of Bozeman: 1) during summer, there will be construction and 2) beyond Bozeman, I … the roads typically are not snow packed

- What does your level of education have to do with this survey? I have driven highway 93 between Hamilton and Kalispell over 600,000 miles in the last 36 years with no accidents and it didn't take a college degree

- 19: Hard Knocks and experience

- I travel very little use the phone a lot and have help that does the travel

- Usually travel with a family member or friend, so seldom go any place on the highway alone

- Either 3/25 or 3/26 snow storm: 3/26/03 information on 511 was not accurate, roads over Butte Pass were not reported accurately. Snow, poor visibility not reported on 511!

- I would like traffic notified of road construction and roads down for 2 or 3 hrs, back far enough to go around

- Due to age- I use highways infrequently. Use city streets almost every day

- More road cams around Montana for the more traveled highways

- No cell phones while driving

- More local staff

- Get more plows on the road and not "bankers hours." Finally, the "sludge" ice melter they squirt doesn't work? More sand! More sand! More Sand!

- In my travels the highways have greatly improved. There are some narrow routes out there but they are becoming fewer. Service on highways and information are much better. I would like more signs when distances are greater indicating miles to a city or town. It's pretty good but sometimes it seems long

- Information radio could be better

- Because the past three years have been so open, roads have not been a concern- hard for me to comment

- I am retired and do little traveling now

- We are retired and do not travel much. When we do we travel to Billings or Oregon or Washington

- This survey has wasted considerable money by being printed in two colors on heavy, coated paper. If this survey is sponsored by the US DOT, why does it not have an OMB form clearance number?

- You selected the wrong person for a survey.