

511 Statistics Analysis Update for July 2004 to December 2004

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EXECUTIVE SUMMARY

The Montana Department of Transportation (MDT) deployed Montana's 511 system on January 8, 2003. The 511 system allows callers to select a road segment on a Montana, North Dakota, and South Dakota highways and listen to information regarding current road conditions, weather forecasts, and construction activities. Since the deployment, Montana has conducted several survey analyses of motorists' perceptions of the 511 system. All of these surveys provide MDT with qualitative information on the features that callers like or do not like and the enhancements they would like to see on the 511 system.

The purpose of this report is to provide MDT with quantitative information about use of the 511 system. The Western Transportation Institute at Montana State University conducted the analysis, using statistics compiled by Meridian Environmental Inc., the Montana 511 vendor. This report analyzed the data as recommended by the 511 National Deployment Coalition and is a six month update to the original report on Montana's 511 system statistics. Therefore the first section of this report focuses on the most recent six months of data (i.e. July to December 2004), and the second section focuses on the cumulative statistics for the entire period that Montana's 511 system has been operational (i.e. January 2003 to December 2004).

This analysis for the July to December 2004 period has led to the following conclusions:

- From July to December 2004 there were more than 88 thousand informational calls;
- Callers have accrued almost 4200 hours of call time to the system;
- The peak usage occurred in the winter with multi-day storms having the greatest impact on the call volume;
- The peak usage tended to occur on Thursdays and in the morning hours;
- The average caller spent almost three minutes on the phone and received information on two roadway segments; and
- Without the vendor that Montana uses and its ability to share phone lines, over 550 people would have received a busy signal.

The analysis for the entire deployment period (January 2003 to December 2004) has led to the following conclusions:

- From January 2003 to December 2004 there were more than 500,000 informational calls;
- The new 511 system is used more than the previous system;
- Callers have accrued almost 29,000 hours of call time to the system;
- The peak usage occurs in the winter with multi-day storms having the greatest impact on the call volume;
- The peak usage tends to occur on Saturdays and in the morning hours;
- The average caller spends two and a half minutes on the phone and receives information on two roadway segments; and

- Without the vendor that Montana uses and its ability to share phone lines, over 47,000 people would have received a busy signal.

1. INTRODUCTION

The Montana Department of Transportation (MDT) deployed Montana's 511 system on January 8, 2003. The 511 system allows callers to select a road segment on a Montana, North Dakota, and South Dakota highways and listen to information regarding current road conditions, weather forecasts, and construction activities. Since the deployment, Montana has conducted several analyses of motorists' perceptions of the 511 system. There was a pre-511 survey completed June 2002 (1), a post deployment survey completed April 2003 (2), and a maintenance survey that included questions about 511 completed October 2004 (3). All of these surveys provide MDT with information on the features that callers like or do not like and the enhancements they would like to see on the 511 system. These analyses are qualitative in nature.

The purpose of this report is to provide MDT with quantitative information about use of the 511 system. The Western Transportation Institute at Montana State University conducted the analysis, using statistics compiled by Meridian Environmental Inc., the Montana 511 vendor. This report analyzes the data recommended by the 511 National Deployment Coalition (4) including:

- Calls per month (section 3.1 and 4.1);
- Peak call day (section 3.3 and 4.3);
- Peak call day count (section 3.3 and 4.3);
- Peak call day reason (section 3.3 and 4.3);
- Peak call hour (section 3.3 and 4.3);
- Peak call hour count (section 3.3 and 4.3);
- Peak call hour date (section 3.3 and 4.3);
- Peak call hour reason (section 3.3 and 4.3);
- Capacity Utilization (section 3.4 and 4.4);
- Number of dropped calls (section 3.5 and 4.5);
- Average call length (section 3.6 and 4.6);
- Total minutes per month (section 3.6 and 4.6); and
- Number of transactions per call (section 3.7 and 4.7).

This report is a six month update to the original report on Montana's 511 system statistics (5). Therefore the first section of this report focuses on the most recent six months of data (i.e. July to December 2004), and the second section focuses on the statistics for the entire period that Montana's 511 system has been operational (i.e. January 2003 to December 2004).

2. JULY THROUGH DECEMBER 2004 CALL VOLUME ANALYSIS

2.1. Calls per Month

The total number of informational calls recorded by Meridian Environmental, Inc from July 2004 through December 2004 was 88,616. (“Informational” calls are defined as those in which the caller stays on the line long enough to receive information from the system.)

As shown in Figure 1, the monthly call volumes are the highest in winter, with the peak months being December 2004 with 47,265 informational calls.

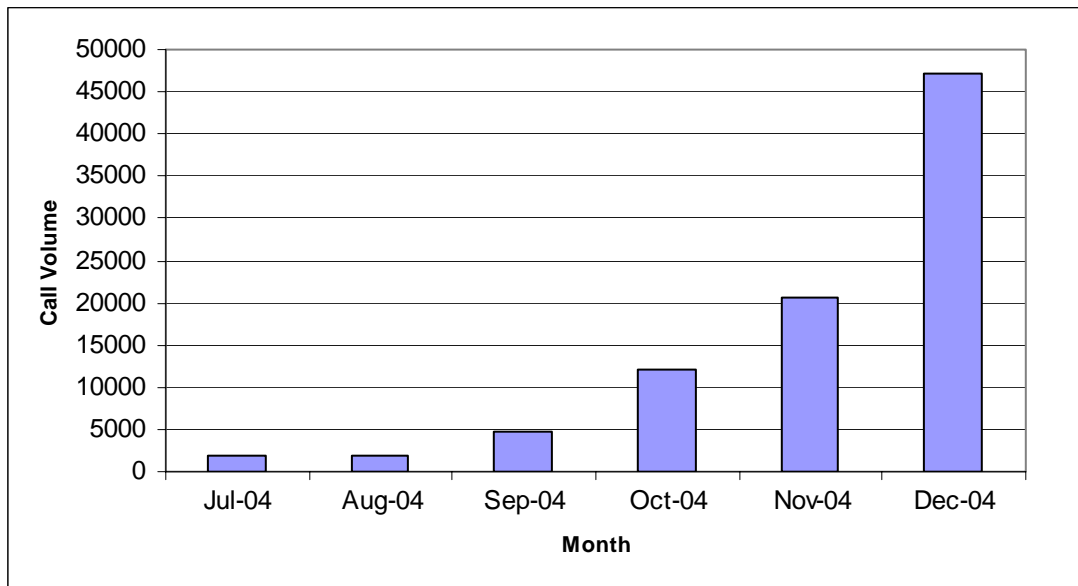


Figure 1: Calls per Month

2.2. Pre- versus Post-511

Prior to the deployment of the 511 system, MDT provided road and traveler information through an answering machine that could hold up to eleven minutes of information for the entire state. The total calls to the system prior to 511 for July through December of 2002 were 76,243. The total number of informational calls to 511 for July through December 2004 was 88,616 or a 16 percent increase in call volumes from 2002 to 2004. As can be seen in Figure 2, both the pre-511 and 511 systems received the most calls during the winter (i.e. November and December).

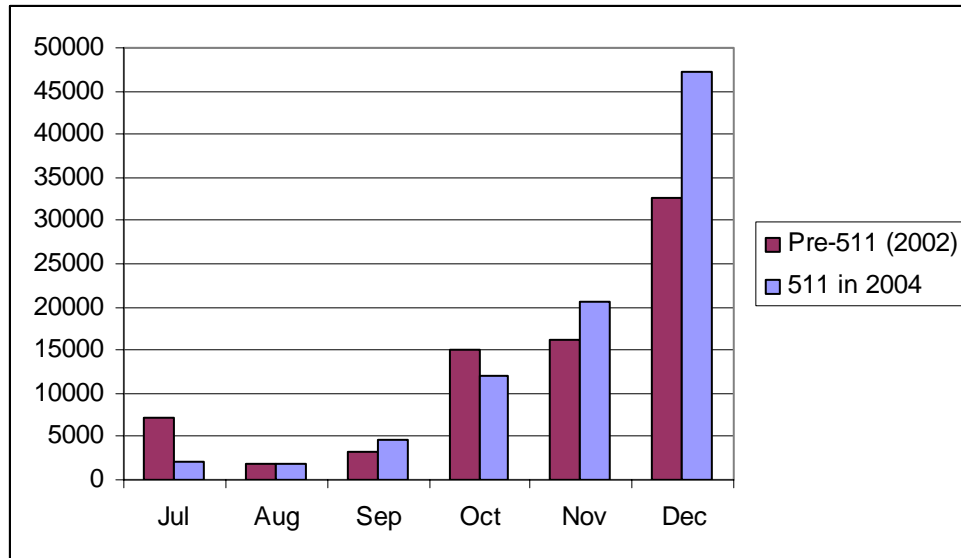


Figure 2: Comparison of Pre- and Post-511 Call Volumes

2.3. Peak Calls

For July through December 2004, the peak day is Thursday with the largest day being Thursday December 30, 2004 with 8,235 calls. The reason for the peak is winter storms.

Peak hours are 7 to 9 am. The peak hour is 9 am with a total of 10,991 calls from July 2004 through December 2004 as shown in Figure 3. The average number of calls for 9 am is 60 as shown in Figure 4.

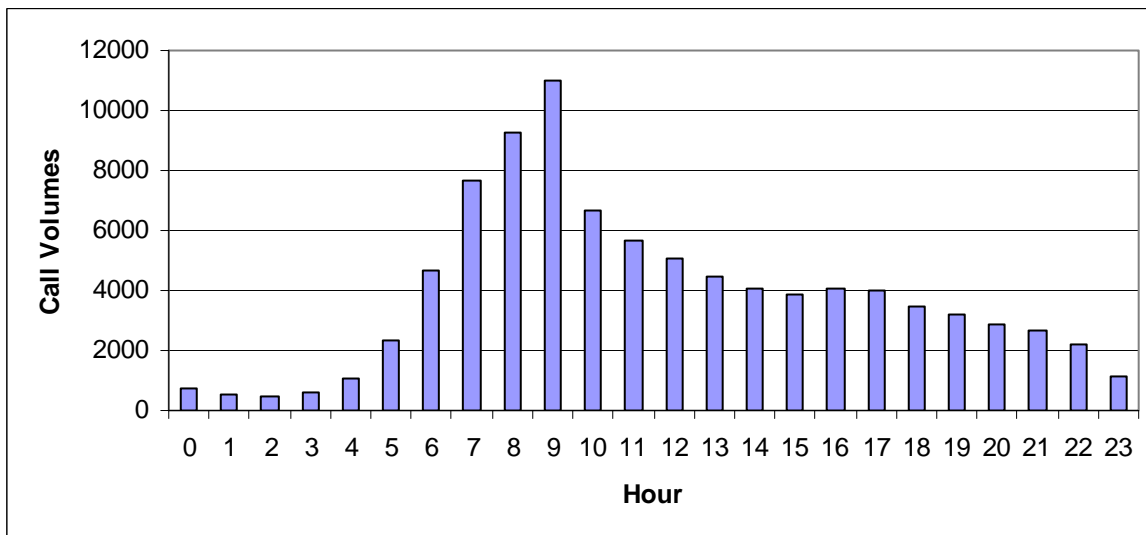


Figure 3: Total Hourly Call Volumes

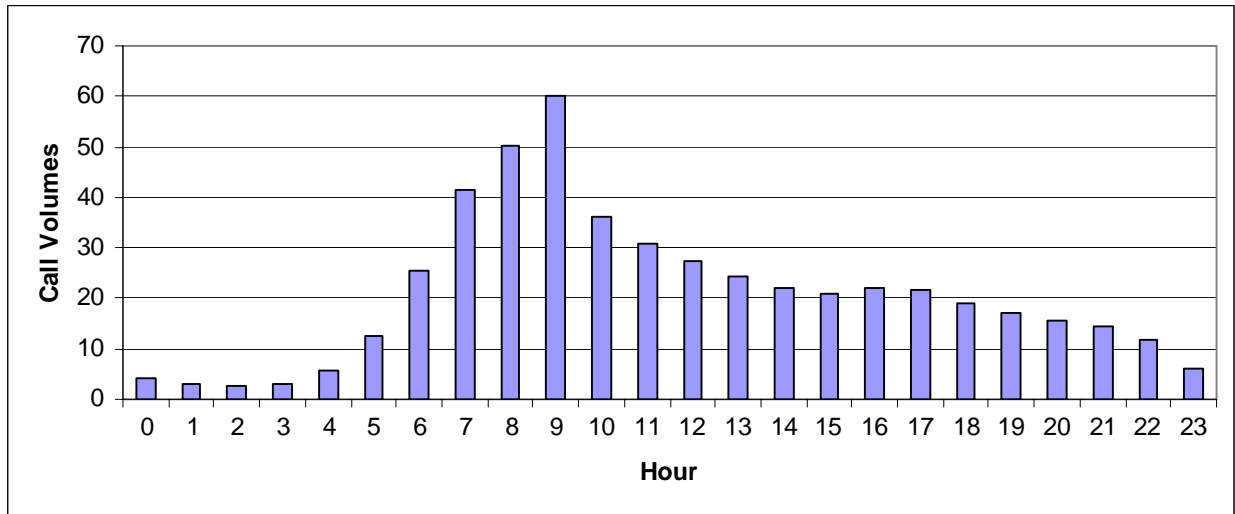


Figure 4: Average Hourly Call Volumes

2.4. Capacity Utilization

The Montana 511 system has 48 phone lines available to take calls. If all of these lines are being used, Montana “borrows” a phone line from one of the other Meridian states (i.e. North Dakota, South Dakota, Nebraska, or Kansas) to prevent callers from receiving a busy signal.

From July 2004 through December 2004, there were 2 separate days (for a total of 553 calls and 24 hours, 18 minutes, and 20 seconds) where the number of calls coming into Montana’s phone lines was more than could be handled. Rather than callers getting a busy signal, Montana “borrowed” phone lines from the other four Meridian states. The greatest number of calls that were shared was 329 on one day and the most amount of time shared was 14 hours, 45 minutes and 59 seconds. This sharing experience occurred during a multiple day winter storm (i.e. December 30-31, 2004).

2.5. Dropped Calls

Although the number of informational calls to the system was 88,616, the total number of calls was 124,820. This number includes callers that hung up before receiving any information from 511 (i.e. dropped calls). Therefore, 29 percent of callers hung up before receiving any information.

2.6. Call Length/Total Call Time per Month

In the past six months (i.e. July through December 2004), the informational calls to 511 have accrued 4192 hours 47 minutes and 24 seconds of call time. The average call lasts 2 minutes and 50 seconds.

As shown in Figure 5, the total minutes per month, like the call volumes, are highest in the winter. December 2004 was the month with the greatest total call times (2430 hours, 32 minutes, and 56 seconds). The peak day was December 30, 2004 with a call time total of 397 hours, 15 minutes, and 03 seconds. The maximum call time per day ranges from four minutes and 34

seconds to 18 minutes and 18 seconds with an average maximum call time of 10 minutes and 29 seconds.

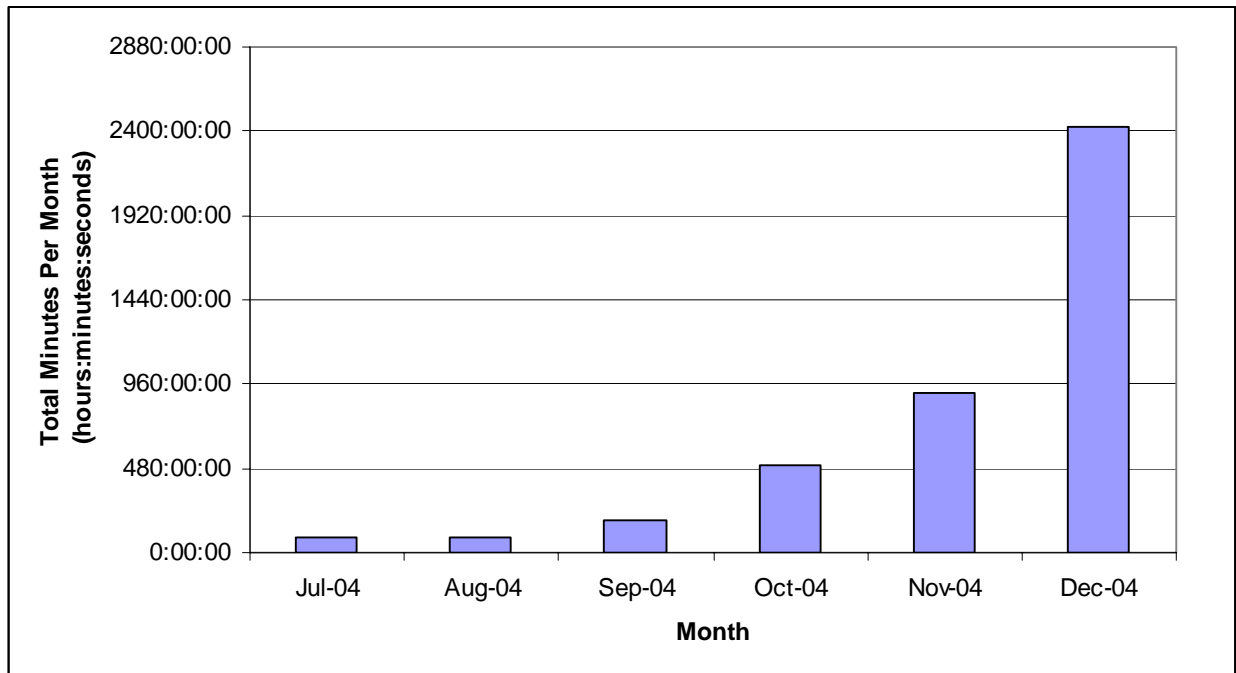


Figure 5: Total Minutes per Month

2.7. Category Chosen/Transactions

Although many 511 systems are set up in a way that the traveler can receive information on different categories (i.e. transit, tourism, road conditions, etc), Montana's system is set up so that the caller chooses a specific road segment and receives information on the weather, road conditions, and construction for that location. Therefore, there is no way to know exactly how many people obtained information on construction rather than weather. However, the Montana system can tell how many transactions (i.e. the number of roadway segments) chosen by a caller. Callers are allowed up to 8 transactions or roadway segments on the Montana system.

There were 156,224 total transactions for the 88,616 informational calls. The least number of transactions in a day was 48 on July 26, 2004 and the most number of transactions were 15,075 on December 30, 2004.

The total number of transactions increases as the number of calls increases; therefore, there are more transactions in the winter than summer. The peak day for transactions is Thursday and the average number of transactions per call is two. The majority of callers (59 percent) only request information about one roadway segment (or have one transaction). As shown in Figure 6, 34 percent of all transactions made are callers only requesting one roadway segment.

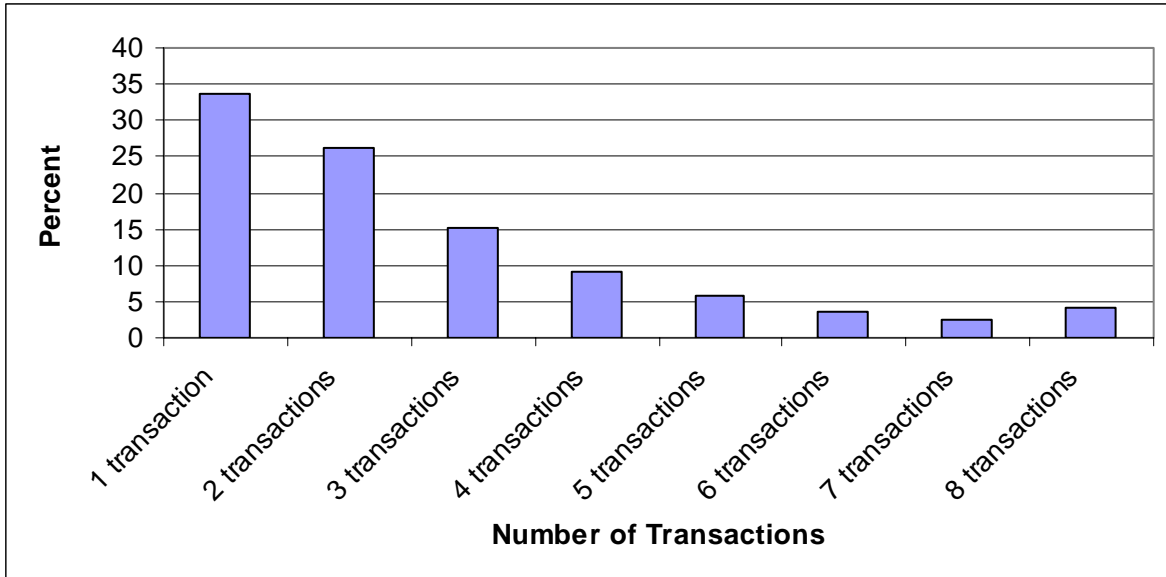


Figure 6: Number of Segments (Transactions) chosen per call as a Percent of Total Transactions

3. JANUARY 2003 TO DECEMBER 2004 CALL VOLUME ANALYSIS

3.1. Calls per Month

The total number of informational calls recorded by Meridian Environmental, Inc from January 2003 through December 2004 was 657,622. (“Informational” calls are defined as those in which the caller stays on the line long enough to receive information from the system.)

As shown in Figure 1, the monthly call volumes are the highest in winter with the peak months being December 2003 with 105,507 informational calls and March 2003 with 89,328 informational calls.

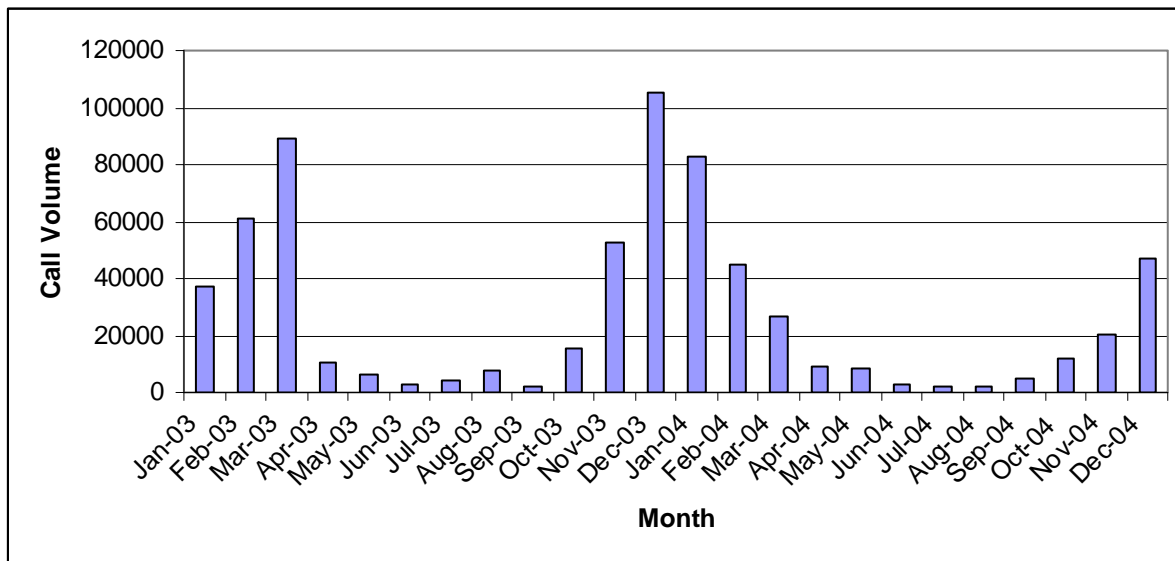


Figure 7: Calls per Month

3.2. Pre- versus Post-511

Prior to the deployment of the 511 system, MDT provided road and traveler information through an answering machine that could hold up to eleven minutes of information for the entire state. The total calls to the system prior to 511 for the year of 2002 were 207,790. The total number of informational calls to 511 in 2003 was 394,475 or a 90 percent increase in call volumes from 2002 to 2003. The total number of informational calls to 511 in 2004 was 263,147 or a 27 percent increase from 2002 to 2004, but a 33 percent decrease from 2003 to 2004. As can be seen in Figure 2, both the pre-511 and 511 systems receive the most calls during the winter (i.e. November through March) and the severity and number of storms affect the call volumes.

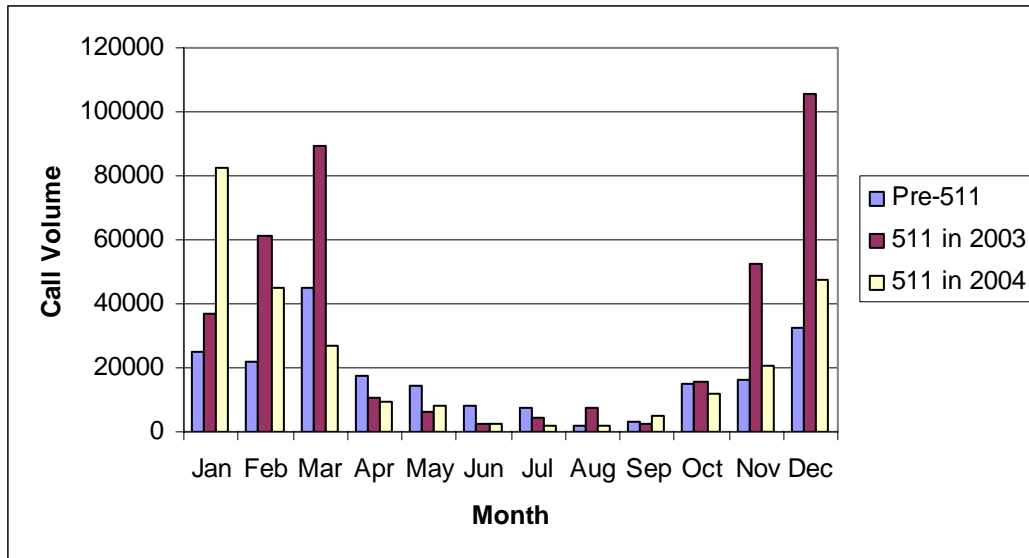


Figure 8: Comparison of Pre- and Post-511 Call Volumes

3.3. Peak Calls

Peak days are Saturdays with the largest day being Saturday, December 27, 2003 with 26,246 calls. The reason for the peaks is winter storms.

Peak hours are 7 to 9 am. The peak hour is 8 am with a total of 71,328 calls from January 2003 through December 2004 as shown in Figure 3. The average number of calls for 8 am is 98 as shown in Figure 10.

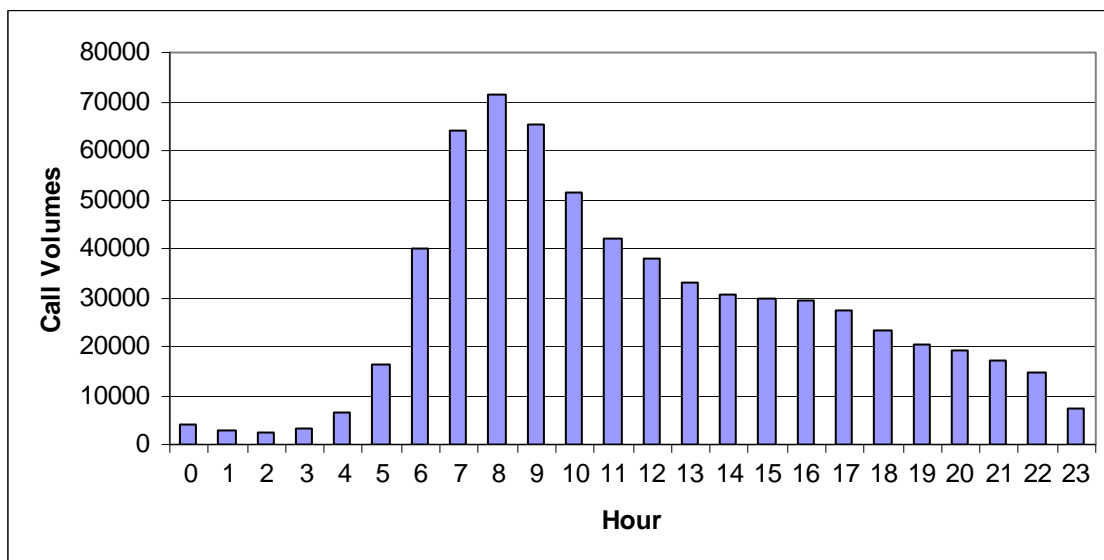


Figure 9: Total Hourly Call Volumes

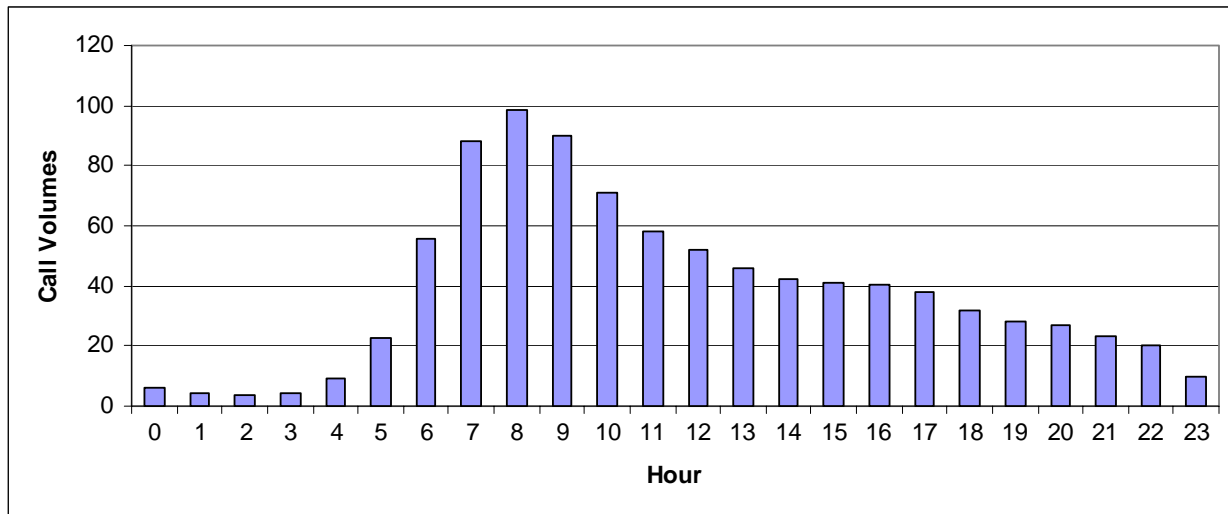


Figure 10: Average Hourly Call Volumes

3.4. Capacity Utilization

The Montana 511 system has 48 phone lines available to take calls. If all of these lines are being used, Montana “borrows” a phone line from one of the other Meridian states (i.e. North Dakota, South Dakota, Nebraska, or Kansas) to prevent callers from receiving a busy signal.

There have been 27 separate days (for a total of 47,826 calls and 1957 hours, 16 minutes, and 06 seconds) where the number of calls coming into Montana’s phone lines was more than could be handled. Rather than callers getting a busy signal, Montana “borrowed” phone lines from the other four Meridian states. The greatest number of shared calls was 14,079 on one day and the greatest amount of time shared was 608 hours and 49 seconds. The majority of these sharing experiences occur during multiple day winter storms; for example, February 22-23, 2003; March 6-9, 2003; December 26-30, 2003; January 2-4, 2004; and December 30-31, 2004.

3.5. Dropped Calls

Although the number of informational calls to the system was 657,622, the total number of calls was 887,302. This number includes callers that hung up before receiving any information from 511 (i.e. dropped calls). Therefore, 26 percent of callers hung up before receiving any information.

3.6. Call Length/Total Call Time per Month

In two years, the informational calls to 511 have accrued 28,998 hours, 22 minutes and 8 seconds of call time. The average call lasts 2 minutes and 39 seconds.

As shown in Figure 5, the total minutes per month, like the call volumes, are also highest in the winter. December 2003 was the month with the greatest total call times (5135 hours, 32 minutes, and 42 seconds). The peak day was December 27, 2003 with a call time total of 1280 hours, 33 minutes, and 54 seconds. The maximum call time per day ranges from one minute and 40 seconds to two hours, 12 minutes, and 36 seconds with an average maximum call time of 11 minutes and 38 seconds.

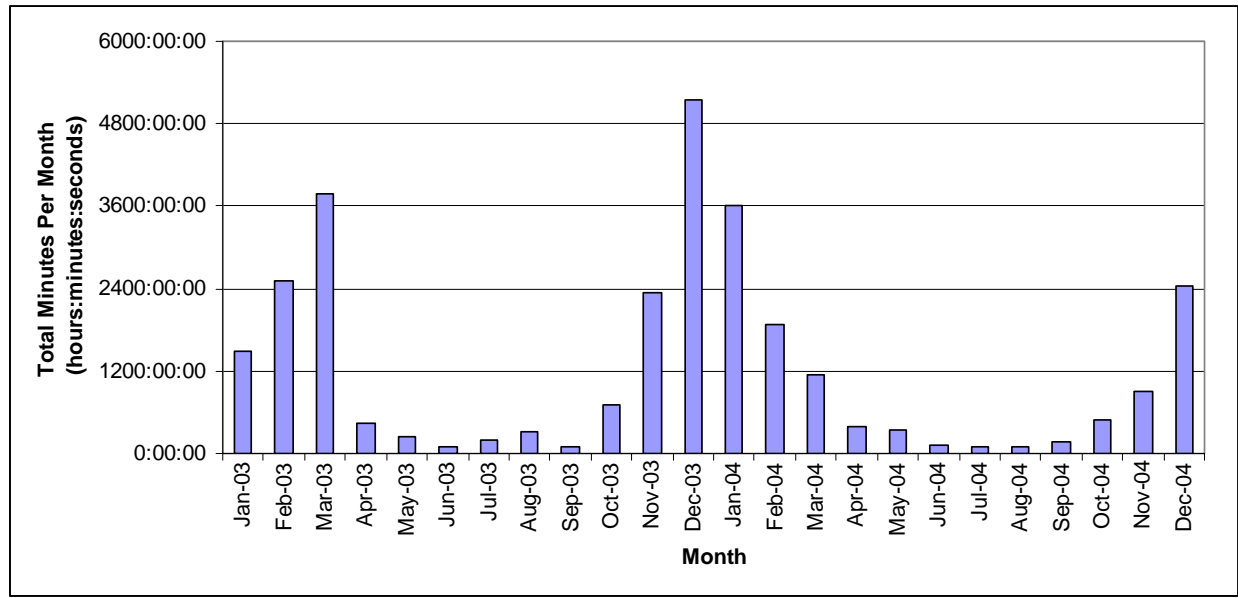


Figure 11: Total Minutes per Month

3.7. Category Chosen/Transactions

Although many 511 systems are set-up in a way that the traveler can receive information on different categories (i.e. transit, tourism, road conditions, etc), Montana's system is set-up so that the caller chooses a specific road segment and receives information on the weather, road conditions, and construction for that location. Therefore, there is no way to know exactly how many people obtained information on construction rather than weather. However, the Montana system can tell how many transactions (i.e. the number of roadway segments) chosen by a caller. Callers are allowed up to 8 transactions or roadway segments on the Montana system.

There were 1,169,335 total transactions for the 657,622 informational calls. The least number of transactions in a day was 19 on January 12, 2003 and the most number of transactions were 49,927 on December 27, 2003.

The total number of transactions increases as the number of calls increase; therefore, there are more transactions in the winter than summer. The peak day for transactions is Saturday and the average number of transactions per call is two. The majority of callers (58 percent) only request information about one roadway segment (or have one transaction). As shown in Figure 6, 33 percent of all transactions made are callers only requesting one roadway segment.

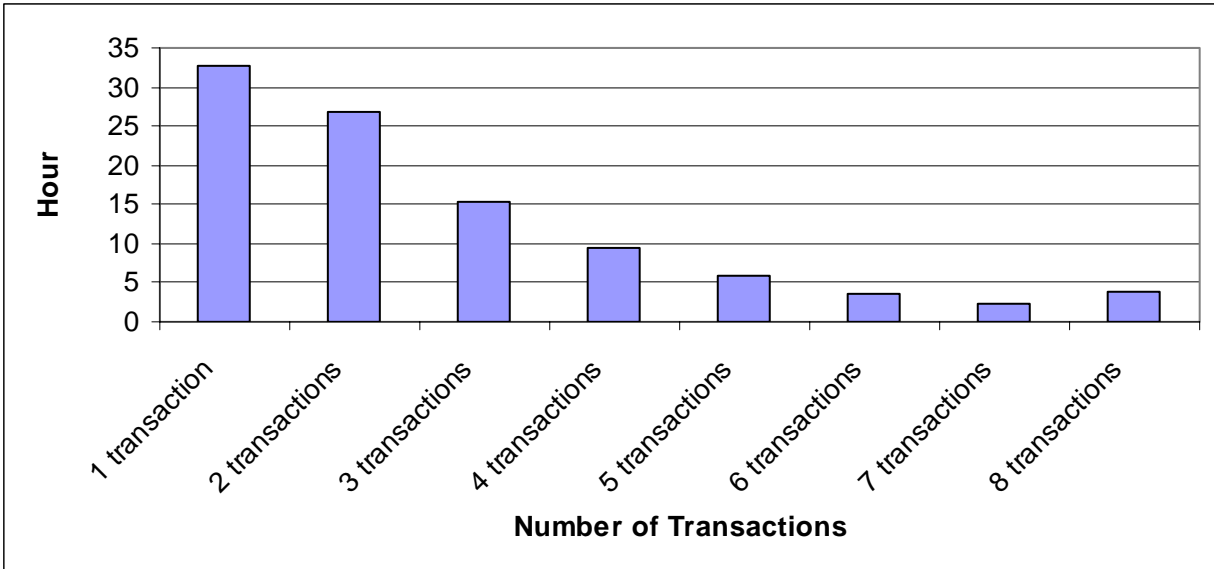


Figure 12: Number of Segments (Transactions) chosen per call as a Percent of Total Transactions

4. CONCLUSIONS

This analysis for the July to December 2004 period has led to the following conclusions:

- From July to December 2004 there were more than 88 thousand informational calls;
- Callers have accrued almost 4200 hours of call time to the system;
- The peak usage occurs in the winter with multi-day storms having the greatest impact on the call volume;
- The peak usage tends to occur on Thursdays and in the morning hours;
- The average caller spends almost three minutes on the phone and receives information on two roadway segments; and
- Without the vendor that Montana uses and its ability to share phone lines, over 550 people would have received a busy signal.

The analysis for the entire deployment period (January 2003 to December 2004) has led to the following conclusions:

- From January 2003 to December 2004 there were more than half a million informational calls;
- The new 511 system is used more than the previous system;
- Callers have accrued almost 29,000 hours of call time to the system;
- The peak usage occurs in the winter with multi-day storms having the greatest impact on the call volume;
- The peak usage tends to occur on Saturdays and in the morning hours;
- The average caller spends two and a half minutes on the phone and receives information on two roadway segments; and
- Without the vendor that Montana uses and its ability to share phone lines, over 47,000 people would have received a busy signal.

5. REFERENCES

- 1 Wachutka, Y., J. Eidswick, and L. Ballard. "Greater Yellowstone Regional Traveler Weather Information System Pre-511 Evaluation Summary Version 1.0." Western Transportation Institute October 31, 2002.
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- 4 Costello, P. "511 Deployment Coalition Performance Measures." www.deploy511.org/docs/511-coalperformmont.ppt. January 2003.
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