511 Virginia Evaluation

January 2004

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TRANSPORTATION INSTITUTE

EXECUTIVE SUMMARY

This document presents the results of the evaluation of the 511 Virginia Advanced Traveler Information System (ATIS), a system that operates on the I-81 corridor in Virginia. The evaluation focused on The Virginia Department of Transportation's (VDOT) three ITS goals for the 511 Virginia service:

- Productivity
- Customer Satisfaction
- Mobility and efficiency

Methods of collecting data for the evaluation included the following:

- Focus groups to obtain preliminary information about traveler behavior and to help create the phone survey
- A web and phone survey to obtain data directly from users of the service about their levels of satisfaction with the service and how it affected their behavior
- An awareness survey to measure general awareness of the service in the coverage area and across Virginia
- A retroactive data analysis of past performance measures to identify trends in user behavior and system performance, as well as factors affecting the service

Due to the small number of participants, please note that the findings of the focus group and the web survey are not necessarily representative of the general population. Moreover, it is important to note that the 511Virginia website was modified before the final report was delivered. Some findings and recommendations may not apply or have already been implemented.

FINDINGS

Below are the major findings for each of the methods conducted in this evaluation.

Focus Group

Major findings from the focus group included the following:

- Pre-trip information
  - Participants want, in particular, pre-trip information about weather and directions.
  - Participants are also interested in travel times, road conditions, construction, and tourism information.
  - Focus Group participants would change their travel plans if they received pre-trip information about weather, construction, traffic, accidents, and road conditions.
  - Commercial Vehicle Operators (CVO) participants wanted unique pre-trip information.

- En-route information
  - Participants primarily want en-route information about gas and rest stops.
  - Participants are also interested in distances to destinations, road conditions, and food locations. Information about hotels, attractions, weather, and congestion is also desired.
  - En-route information that is likely to affect the participants' travel includes weather and congestion.
- Other findings
  - Most participants travel with a cell phone (34 of 41 particpants, or 83%).
  - Fourteen of 41 participants had heard of 511 Virginia, and only 4 participants had ever called the service.
  - Residents were the most likely to have heard of 511, and tourists were the least likely to have heard of 511.
  - Those who did not call the service did so for the following reasons: there was no reason to call; they were satisfied with current information sources; or they did not know what it was.
  - Most participants were aware of 511 from VDOT signage.
  - CVO participants desire a channel specifically tailored to the trucking community.

Web Survey

Major findings from the web survey included the following:
- Eighty-nine of the 108 respondents (82%) live in Virginia.
- Forty-seven respondents (44%) were first time users of 511Virginia.org.
- Seventy-seven respondents (71%) were looking for travel conditions on the day that they filled out the survey.
- Sixty-three respondents (58%) indicated that they were satisfied with the Travel Conditions page.
- Seventy-five respondents (69%) indicated that they were likely to revisit 511Virginia.org on a regular basis.
- Satisfaction levels were high for 511Virginia.org among those surveyed, particularly for the home and the travel conditions pages.
- Over half of the respondents said that they are likely to visit the site again.

Phone Survey

The phone survey resulted in the following findings:
- Ninety-three percent of callers felt that they had increased awareness of available traveler information through access to 511.
- The majority of participants (233 of 377, or 62%) found out about 511 from the blue road signs on the interstates.
- The phone system did provide enough information and was generally timely enough for users to change their travel behavior based upon what they heard. Forty-nine percent of all callers indicated that they had changed their plans based upon what they had heard on 511

Virginia, and 166 of 212 callers (or 78%) indicated that they altered their plans by changing their route.

- Sixty-three percent of participants reported that they perceived the I-81 Region as either *very safe* or *somewhat safe*. In addition, having access to 511 Virginia has had little effect on users' opinions of the safety of the I-81 Region.
- Ninety percent of the survey respondents felt that 511 Virginia was *somewhat useful* or *very useful*.
- Ninety-nine percent of respondents indicated that they would call 511 Virginia again.

Awareness Survey

The awareness Survey produced the following results:
- Nineteen percent of participants report having heard of 511 Virginia.
- Of those who have heard of 511 Virginia, 8% (or 6 of 73) have used the service.
- Of those who have heard of 511 Virginia, 32% (or 23 of 73) are familiar with the services 511 Virginia provides.
- A majority of the respondents who have heard of 511 Virginia associate the following types of information with the service: road conditions, lodging, traffic/construction, and places to buy food.
- A majority of all respondents are most likely to use 511 Virginia for: emergency services, accidents/construction, and road conditions.

Data Analysis

The analysis of the retroactive data yielded the following information:
- Call and minute volumes are steadily increasing, lasting approximately 1 minute and 52 seconds.
- Peak simultaneous port use was 45 ports.
- The peak call date is Sunday between 2 and 3 pm. 511 Virginia calls peak at 2 pm and 4 pm. Winter months have the highest demand.
- Calls to the 511 number directly account for 91% of total calls. Wireless calls have decreased but still remain the majority of calls to the service. Approximately 26% of calls have been from out-of-state registered phones.
- The system provides an average of 172 events per month.
- Sixty-nine percent of all callers are seeking traffic information, and the remaining percentages are fairly evenly distributed amongst Construction, Weather, Road Conditions, and Services.
- 0.4% of all callers currently utilize the transfer function of the system.
- Traveler Services, predominantly lodging and food requests, has maintained 8% of all requests
- Bookmarks and repeat users are the significant users of the website.
- The website has shifted to being primarily traffic oriented year round.

RECOMMENDATIONS

Focus Group

The primary recommendations for the focus group results include the following:
- Marketing should be focused on education as well as awareness.
- Detours/alternate routes should be added to the system, if possible.
- A truck channel should be created on 511 Virginia.

Web Survey

The web survey data led to the following recommendations:
- Travel condition information needs to be moved to a more prominent place on the website, as it was found to be the most desired information.
- The travel conditions page needs to provide more and better information on road conditions, accidents, and delays.
- More cameras need to be provided.
- Marketing efforts need to be increased to reach people who are looking for travel condition information.

Phone Survey

Based upon the phone survey findings, the evaluation team has the following recommendations:
- More research should be done into both the CVO community's needs and usage of the 511 phone service.
- A permanent feedback loop on the phone system should be developed and monitored.
- More detailed traffic information should be provided to include the exact location and duration of road incidents.
- More usability research should be done regarding how to make the phone system easier to navigate.
- The timeliness of travel information available on 511 Virginia should be monitored and improved.
- The ratio of long-haul to short-haul drivers on I-81 should be determined, and travel information should be catered to the needs of the majority.
- The phone tree structure and information format should be tailored to better facilitate caller decision making, especially more in-depth alternate route information that can be more easily accessed from the traffic menu, if callers change their travel route.
- More research should be done into travel information that callers might desire if they do change their plans based upon information they hear on 511.
- A means to identify and record first time callers through the call software employed (e.g., Tellme, Inc. XML software) should be developed.
- The reasons behind some callers' perception that the voice recognition is not working should be investigated.
- The primary focus on the phone system should be providing timely traffic information.
- Callers' willingness to call 511 again should be investigated.
- More awareness marketing should be done.

- Efforts should be made to peak interest in the system along the road to increase calls, as 23% (87 of 383) of those surveyed indicated that they first called 511 out of curiosity or boredom.
- The marketing should slightly cater to males.
- 511 should be advertised on weather.com or weatherchannel.com (same site).
- Marketing should be directed to residents during work time (8am and 5pm, Monday – Friday) through either radio or billboards.
- In addition to I-81, I-77, and I-64, marketing should be focused along I-40, I-75, I-95, and I-65 welcome centers.
- Marketing or work should be focused within the top three states that use the 511 Virginia phone service (PA, NC, TN) to increase out-of-state awareness.
- To increase tourist awareness of the current 511 system, marketing should be focused within the top three tourist destinations (Blacksburg, Roanoke, and Harrisonburg), as well as the top tourist origination cities (Roanoke, Richmond, Fairfax, Woodbridge, and Winchester).

Awareness Survey

The awareness survey responses produced the following recommendations:
- 511 Virginia should go beyond awareness marketing. Awareness is found to be less than desired due to the gap between awareness and usage and between awareness and an understanding of the services provided.
- Current marketing efforts should be reevaluated, as usage and perception levels in the areas where marketing are focused are similar to areas where no marketing occurred.
- Travelers' perceptions and expectations for Emergency Services in 511 Virginia should be explored via focus groups or surveys.
- Categories not related to travel conditions should possibly be eliminated.
- 511 Virginia should be differentiated from other n11 services through enhanced brand recognition.

Data Analysis

The major recommendations stemming from the data analysis include the following:
- Implementing new changes during the winter should be avoided, as that is the highest usage and demand for the phone system. Better times are in April and September.
- A "Bookmark This Page" function should be built on the main page of the website.
- Trends in 511 call volumes and weather should be identified to help forecast peak usage day characteristics.
- A call data analysis function should be developed to automatically group calls using Nxx numbers.
- A provision for 511 data monitoring needs should be defined prior to awarding the state-wide RFP.
- In order to forecast minutes for the future state-wide 511 minute contract, a 1% adoption rate should be utilized for the first 18 months.
- The state-wide 511 system should be designed to coordinate with existing traveler data measures to better leverage 511 as an ITS investment.

- In order to monitor the wireless/land line ratio, the availability of ANI_II (e.g., ii digits) should be ensured by the state-wide provider.
- Radio time should be bought at the peak usage hours, which are 2pm-3pm and 4pm-5pm.
- Based upon the web site pages visited and surveyed interest, traffic information should be moved to the homepage for 511 Virginia. (This change occurred in September 2003.)
- Efforts should be made to ensure that the telecommunications provider can accommodate at least 45 simultaneous calls.
- More geographic gradation should be added to weather in the top three requested areas: Roanoke, Winchester, and Staunton.
- All link referrals to the new website (i.e., from travelshenandoah.com to 511.va.org) should be updated.
- New link referrals to 511virginia.org should be actively pursued, especially with weather and tourism sites, in addition to pages and information within VDOT's own website.
- Data on 511 Virginia should be updated more frequently during winter storms.
- If possible, post as specific information as possible (multiple incidents on I-81 from mm1 to 35 does not necessarily help travelers make better travel decisions).
- If desired, a quarterly contract for minutes should be negotiated with the telecommunications provider. This would allow VDOT to purchase access to fewer ports for the majority of the year and only purchase several dedicated ports during the peak months from December through March.
- While road signs have been successful with users as an initial source, marketing efforts should be focused upon the land-line users, which, at current rates, will soon overtake the wireless users.
- Further research should be done into the best methods for using CMS and 511 in conjunction.
- Since Hitbox Central no longer offers a free tracking service, a new log analysis software should be researched and implemented as soon as possible to allow for continuous trending.
- A web page rank increase on the top search engines under Virginia Travel (e.g., Google) should be actively pursued.
- The webpage should be configured to be able to accommodate 1024 x 788 screen resolutions, as well as the top Internet browsers.

Lessons learned during the course of the evaluation are presented at the conclusion of each section for the benefit of future evaluators.

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Chapter 1: Evaluation Approach

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CHAPTER 1: EVALUATION APPROACH

GENERAL APPROACH

511 Virginia is an Advanced Traveler Information System (ATIS) that is available along the I-81 corridor of Virginia. Deployed in February 2002, this service is available to users via landline and wireless phones by dialing 511. For a more complete look at the service and the history of its development, please refer to the Historical Development of the Travel Shenandoah Pilot Service report, available under ITS Reports at:
http://virginiadot.org/projects/constSTAN-I81proj-its-projects.asp

This evaluation of the 511 Virginia service was designed with the Virginia Department of Transportation's (VDOT) Intelligent Transportation System (ITS) goals for the 511 Virginia program in mind. VDOT managers determined these ITS goals from the I-81 ITS Framework, which was developed to guide the evaluations of VDOT's ITS projects. The Framework is available at:
http://www.itsdocs.fhwa.dot.gov//JPODOCS/REPTS_TE//13869.html

Objectives and measures of effectiveness were determined from the goals of productivity, customer satisfaction, and mobility and efficiency. Table 1 shows the identified goals, objectives, and measures of effectiveness, as well as the targeted methods for measurement.

Goal	Objective	Measure	Method
Productivity	Increase awareness of 511	Percentage of residents aware of 511	Focus Groups, Awareness Survey
Customer Satisfaction	Meet traveler needs, improve traveler experience	Percentage of residents using 511	Focus Groups, Awareness Survey
		Percentage of travelers using 511	Retroactive Data Analysis
		Travelers ability to access desired travel information	Focus Groups, Awareness Survey, Web Survey, Phone Survey
Mobility and Efficiency	Create corridor awareness of real-time condition information	Change in traveler awareness of travel information	Web Survey, Phone Survey, Retroactive Data Analysis
		Change in traveler confidence in safety of I-81	Phone Survey
	Reduce travel delays	Change in travel behavior	Focus Groups, Phone Survey

By employing a variety of data collection and measurement methods, the project team was able to triangulate, or come at the data from different angles, for the most comprehensive results.

Focus Group

The focus groups were undertaken primarily to gather information that could be used to enhance and refine the 511 Virginia phone survey. Information gathered focused on what information travelers desire and what sources they use to obtain it, as well as decision making factors during travel, cell phone usage, and awareness of 511 Virginia.

Web Survey

The Web Survey was administered to determine if the website was meeting user needs and achieving acceptable customer satisfaction levels.

Phone Survey

This survey was used to determine if the phone system was achieving acceptable customer satisfaction levels, as well as what effects the service has on user behavior.

Awareness Survey

This survey helped to measure the awareness level of 511 Virginia among the general population in Virginia, both within and outside of the 511 coverage area. This survey provided an understanding of what percentage of people are aware of the service, what percentage have used the service, and what their perception of the service is. This survey also gathered information about the types of information for which the respondents were likely to use the 511 Virginia service.

Data Analysis

This analysis was performed to document the actual user behavior patterns and to compare these finding to those of the awareness, phone, and web surveys.

A general discussion of the approach for each section of this evaluation is discussed below. For more specific details about the methodology, refer to the report for each specific section.

METHODOLOGY BY SECTION

Focus Groups

The Focus Groups were conducted across three of the major market segments on I-81; the market segments were identified through an analysis of 511 Virginia phone and web trend data. The market segments included residents, tourists, and commercial vehicle operators (CVO). Two focus groups were held with each market segment over a six-week period. The same questions were used across

all of the focus groups, with the exception of the tourist groups. A monetary incentive was given for participation.

Web Survey

Non-probability sampling methods were employed for the Web Survey. An open, unrestricted, self-selecting survey was posted on the 511Virginia.org website for six months, and users were invited to participate. The survey was accessed through a link posted on each page of the website. Incentives were not used to persuade visitors to complete the survey.

Phone Survey

The Phone Survey was conducted via phone interviews. Participants were recruited from the 511 phone system through an automated message informing users of the survey and the monetary incentive they would receive to participate. If users were interested in participating in the survey, they left their name and phone number. Project team members called the participants back and conducted the survey. The automated message was left on the system for two periods of approximately 20 days each.

Awareness Survey

The Awareness Survey was administered by the Center for Survey Research (CSR) at Virginia Tech. The Virginia Tech Transportation Institute (VTTI) purchased the placement of four questions on the Quality of Life in Virginia survey. CSR representatives conducted interviews with adult respondents in households across Virginia. The CSR employed a stratified disproportionate sampling design.

Data Analysis

The data for the Data Analysis was collected over an 18 month period and was analyzed for trends or other findings. Data was collected from three primary sources:
1. HitBoxCentral.com, which is used for website log analysis for website statistics.
2. Tellme Networks, Inc., which collects data for all calls to the 511 Virginia phone system.
3. VTTI administrative page for outputs from VTTI's specific data measurement needs.

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CHAPTER 2: FOCUS GROUP REPORT

EXECUTIVE SUMMARY

The primary purpose of these focus groups was to gather information that could be used to enhance and refine the 511 Virginia phone intercept survey. The main questions covered in the focus groups were:

- What types of information do travelers use pre-trip and en-route?
- What sources do travelers use to get this travel information?
- How does this information affect their travel decisions?
- How many people travel with cell phones, and how do they use them while traveling?
- Are travelers aware of 511 Virginia?
- What information do travelers want available on 511 Virginia?

The methodology used for these focus groups was very straightforward. The focus groups were conducted across three of the major market segments on I-81; the market segments were identified through an analysis of 511 Virginia phone and web trend data. The market segments included residents, tourists, and commercial vehicle operators (CVO). Two focus groups were held with each market segment over a six-week period. A total of 41 people participated in the focus groups. The same questions were used across all of the focus groups, with the exception of the tourist groups. Because time was limited with the tourist groups, several questions, of secondary importance, had to be excluded.

Appendix A contains raw results from the questions posed during the focus groups. The findings and recommendations presented in this focus group report were extrapolated from these raw results. While percentages are used in the findings and recommendations sections, *the numbers are not statistically significant.* There were several lessons learned during the design, recruitment, implementation, and analysis of the focus groups. The lessons learned are discussed in this report, as they may be helpful to others conducting similar evaluations.

Major findings from the focus group included the following:
- Pre-trip information
  - Participants want, in particular, pre-trip information about weather and directions.
  - Participants are also interested in travel times, road conditions, construction, and tourism information.
  - Focus Group participants would change their travel plans if they received pre-trip information about weather, construction, traffic, accidents, and road conditions.
  - Commercial Vehicle Operators (CVO) participants wanted unique pre-trip information.
- En-route information
  - Participants primarily want en-route information about gas and rest stops.
  - Participants are also interested in distances to destinations, road conditions, and food locations. Information about hotels, attractions, weather, and congestion is also desired.

- En-route information that is likely to affect the participants' travel includes weather and congestion.
- Other findings
  - Most participants travel with a cell phone (34 of 41 participants, or 83%).
  - Fourteen of 41 participants had heard of 511 Virginia, and only 4 participants had ever called the service.
  - Residents were the most likely to have heard of 511, and tourists were the least likely to have heard of 511.
  - Those who did not call the service did so for the following reasons: there was no reason to call; they were satisfied with current information sources; or they did not know what it was.
  - Most participants were aware of 511 from VDOT signage.
  - CVO participants desire a channel specifically tailored to the trucking community.

The primary recommendations for the focus group results include the following:
- Marketing should be focused upon education as well as awareness.
- Detours/alternate routes should be added to the system, if possible.
- A truck channel should be created on 511 Virginia.

METHODS

The approach used in conducting these focus groups followed a simple ten-step process. The steps included:
1. Determining the research purpose
2. Identifying the sample
3. Securing the locations
4. Recruiting the participants
5. Designing the interview guide
6. Testing the interview guide
7. Conducting the focus groups
8. Transcribing the data
9. Analyzing the data
10. Reporting the findings

A brief discussion of these steps is included below and is followed by the outcome of this process (i.e., findings and recommendations).

Research Purpose

The purpose of these focus groups was to provide input to refine and enhance the phone intercept survey, the centerpiece of the 511 evaluation. Though the focus groups are not statistically significant, useful and interesting qualitative information resulted from the focus groups that were used by the VTTI research team in evaluating 511.

Sample

Focus groups were conducted across the three major market segments on I-81 that were identified through an analysis of 511 Virginia phone and web trend data. The market segments included residents, tourists, and commercial vehicle operators. Participants for the resident and commercial

vehicle operator focus groups were selected randomly from lists of individuals willing to take part in transportation-related research compiled by VTTI. The sample frame for the tourist focus groups were people visiting Massanutten Resort ski lodge on March 7, 2003.

Though an effort was made to get a mix of participants for all of the focus groups (i.e., various ages and genders), the point of the groups was to gather opinions from each market segment in order to enhance the phone intercept survey; the purpose was not to generate quantitative data that could be generalized to the wider population.

Focus Group Location

The resident and commercial vehicle operation focus groups were held at VTTI. The main conference room at VTTI was free; it had the space and resources necessary to run the groups, and it was available after regular working hours. VTTI is also located near I-81, and it was thought that participants recruited in the local area were likely to have driven on I-81 for personal or professional reasons.

Massanutten Resort ski lodge was the location selected for the tourist focus groups. A ski resort was chosen because skiing is a winter tourist activity in Virginia, and skiers tend congregate in lodges for meal breaks throughout the day. Massanutten Resort was also an ideal site because of its location near I-81.

Tourists are a difficult audience to organize logistically because it is assumed that many of them are traveling from outside of Virginia or from different parts of Virginia. To reach such individuals, the focus group had to be brought to them. For this reason, VTTI secured permission from Massanutten Resort's management to conduct focus groups in the ski lodge.

Participant Recruitment

Participants were recruited in slightly different manners, depending upon the market segment within which they fell. Participants for the tourist focus groups were recruited on an ad-hoc basis at Massanutten Resort ski lodge on March 7, 2003. People visiting the ski lodge were asked if they would like to participate in a focus group. The only screening criteria was that they must be 18 years or older and licensed to drive.

Holding ad-hoc focus groups in a ski lodge was a difficult endeavor because tourists do not want to sacrifice much, if any, holiday time. Ski lodges also tend to be noisy places, where holding participants' attention may be difficult. Despite the challenges, it was important to secure the opinions of this market segment. The tourist focus groups, though more difficult to organize, produced some very useful information and were well worth the effort.

Other methods of recruiting were considered for the tourist groups (e.g., intercepting tourists at welcome centers, gathering their contact information, and holding conference calls at later dates). Conducting in-depth interviews at Welcome Centers was another alternative considered. Yet after careful consideration, holding the focus groups at a ski resort was the preferred option because of the research team's desire to have face-to-face interactions with a group of tourists.

To deal with the challenges of the ski resort setting, the sessions with the focus groups were short in length, and the number of participants was small. Typically, a focus group lasts 90 minutes and

includes 7-10 people[1]. However, these parameters were not realistic for the chosen setting. Instead, the focus groups were brief, only 30-40 minutes, as skiers did not want to give up more time than would be required for a lunch break. Also, only 4 participants were gathered for each session so that the major questions could be covered with enough time for each participant to comment.

The CVO and resident focus groups were more traditional in terms of recruiting, setting, and conduction. Participants were recruited via the phone from a list of individuals who have stated that they are willing to participate in transportation-related studies. This list is maintained by VTTI. Four sessions were held at VTTI: two with residents and two with commercial vehicle operators. Twelve participants were recruited for each session with the expectation that 7-8 participants would show-up. Each session lasted 90 minutes. The sessions were scheduled on different days to accommodate participants. Also, a back-up date was set in case of inclement weather.

An aggressive recruiting approach was used with the CVO and resident focus groups. Individuals who agreed to participate in the resident and CVO focus groups were sent a confirmation letter that included directions to the focus group site, the time of the session, the type of refreshments provided, and information about subject payment. Also, a day or two prior to their sessions, participants were called to confirm their attendance.

All participants, regardless of the market segment they fell within, had to be at least 18 years of age and licensed to drive. Those who did not fit these basic criteria were screened out. As an example of what was used to screen for the appropriate participants, the screening guide for the tourist focus groups is shown in *Appendix B*.

Focus Group Interview Guide

The focus group interview guide for the resident focus group is located in *Appendix C*. This serves as an example of what the focus group facilitator used during the sessions. The interview guide was developed directly from the research questions that were the impetus for the evaluation. The focus group guide was similar for each of the market segments, though the tourist interview guide was truncated to deal with the shortened time period.

The questions in the interview guide were similar to the questions in the preliminary phone intercept survey. The interview guide was designed so that the information gleaned from the focus groups could be used to strengthen the phone survey. The interview guide was pre-tested on two groups of graduate students who live in Blacksburg. This was done to make sure that the questions solicited the information needed for the phone intercept survey and to determine how long it would take to get through all of the questions in the focus group interview guide. The interview guides were revised after the pre-tests.

Transcribing and Analyzing Data

The focus group sessions were audio recorded so that the focus group facilitator could concentrate on the session and not on note taking. The facilitator also had the support of a VTTI staff member who took notes in case there were any problems with the tape, helped with various activities, and assisted in handing the subject payments.

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[1] Conducting Effective Focus Groups (2002). University Development Training Program, Donaldson Brown Hotel & Conference Center.

Tapes were made into transcripts, but no individual names were attached to comments. All personal information was coded.

Reporting Findings

The transcripts were used immediately by VTTI staff to enhance and refine the phone intercept survey. An in-depth analysis of the transcripts was conducted, and a written report was created noting useful qualitative information that arose from the focus groups. One of the most useful outcomes of the focus groups was that results were used to create pull-down menus for the phone survey. This focus group report is one of several inputs used to prepare the final evaluation of the 511 Virginia service.

Subject Privacy

Participants' privacy was honored throughout the entire study and will continue to be honored. At the beginning of each focus group session, participants were given an Informed Consent Form. The form used for the CVO focus groups is found in *Appendix D*. Participants were asked before the session to read the form carefully and to sign it. The focus group leader also assured participants that they could refuse to answer a question or dismiss themselves from the focus group at anytime.

VTTI staff have continued to uphold participant confidentiality. For instance, this report was written without the use of participant names or initials.

MAJOR FINDINGS

Pre-Trip Information

The first series of questions posed to focus group participants concerned pre-trip travel information. Participants were asked what types of information they seek before they travel, the sources they use to find travel information, the types of travel information that may affect their pre-trip travel decisions, and how the information affects their decisions. The evaluation team wanted to learn from these questions how people talk about pre-trip travel.

Participants from all of the focus groups identified weather and directions as specific types of information that they seek before a trip. Participants look for weather information on TV, particularly on the Weather Channel, and on the Internet at sites such as Weather.com and the VDOT website. Directions are gathered by participants via maps (i.e., VDOT State Map, Rand McNally, American Automobile Association (AAA), and Gazetteer), on the Internet (i.e., mapquest.com), or on destination websites (i.e., National Park System, Massanutten Ski Resort).

Participants from all of the groups, save one CVO group, said that they gather information on travel times and road conditions before departing on a trip. Participants look for travel times on the Internet at mapquest.com or on road maps. Road condition information is sought by participants on informational numbers (i.e., VDOT and VSP 1-800-numbers, 511 Virginia) as well as on the radio.

Other popular types of pre-trip information included construction and tourism information. Participants locate construction information by using the radio, TV, or by calling the department of transportation. Tourism information is found by participants on the Internet or by calling AAA.

CVO focus group participants had some unique types of pre-trip information that they look for including hazmat routes, special load routes, and low underpass information. They can find this information on special maps and by calling the department of transportation in whatever state they are going to travel through.

Participant responses varied when groups were asked what types of information, if any, would cause them to change their travel plans. Participants from most of the focus groups said that pre-trip information on weather, construction, traffic, accidents, and road conditions would cause them to vary their route or departure time.

En-Route Information

The second series of questions concerned the type of information participants seek en-route, the sources they use to gather this information, the types of information that may affect their travel, and how it may affect their travel. With this series of questions, the evaluation team wanted to learn how participants talk about the types of information they look for en-route. The team also wanted to find out if there were any patterns in the types of information participants seek, the sources they use, and how the information affects their travel decisions.

Participants in all but one CVO group said that they look for information about gas and rest stops while traveling. Other common types of en-route information included: distances to destinations, road conditions, and food locations. Participants in each of the focus groups said that they look for service information (i.e., gas, rest stops, and food) as well as distances on road signs, whereas road condition information is sought from overhead and roadside message boards as well as via informational numbers such as #77 and 511.

Information on hotels, attractions, weather, and congestion also were commonly mentioned. Hotel and attraction information is found by participants on road signs, billboards, and at rest stops. Participants said that they look for the more dynamic information (i.e., weather and congestion) on the radio. Congestion information also is sought by participants on message boards.

En-route findings indicate that static information is adequately provided to the traveling public via road signs and billboards. Dynamic information is addressed by several sources, including message boards, informational phone numbers, and the radio. It seems that 511 Virginia has the potential to become a major source for dynamic information as well as being used to supplement road signs as a source of static information.

All of the groups said that weather and congestion information were likely to affect their travel. Weather information causes participants to stop or change routes. If information is learned en-route about construction, traffic, accidents, and adverse road conditions participants also try to change their route.

Cell Phone Usage

The third series of questions concerned whether or not participants travel with cell phones and, if so, how they use them. The evaluation team wanted to determine whether or not most people travel with a cell phone and can access 511 to learn about travel conditions, tourism, and services. The evaluation team also wanted to find out if participants typically use their cell phones to gather the type of information provided by 511.

Most of the participants, 34 of 41 (83%), said that they travel with cell phones. The breakdown by market segment was 17 of 22 (77%) residents, 11 of 12 (91%) truckers, and 6 of 8 (75%) tourists. Several of the truckers said that their companies supply them with cell phones when they travel. Again, the percentages used in this focus group report are for the purpose of general comparison across the focus groups; the numbers the percentages are based upon are not statistically significant.

Some of the reasons participants said that they use their cell phones while traveling included:
- Letting people know they are running late,
- Getting directions and alternate route information,
- Making personal and business calls,
- Making hotel reservations,
- Checking road conditions,
- Communicating emergency and security information.

Several of these reasons could be satisfied by 511 (i.e., making hotel reservations and checking on road conditions).

511 Virginia Awareness and Usage

Overall, 14 of the 41 focus group participants (34%) had heard of 511 Virginia. Residents were the most likely to have heard (10 of 21, or 48%), and tourists were the least likely (0 of 8). This finding is probably due to the fact that all of the residents invited to the focus groups live near the I-81 Corridor, while none of the tourists involved live near I-81. Most of the tourists involved in the focus groups live in Eastern Virginia, around Richmond and Norfolk.

An interesting result of the 511 awareness questions was that out of the 14 who had heard of 511 Virginia, only 4 had ever called the service. Reasons given for not calling included:
- No reason to call,
- Satisfied with current information sources,
- Didn't know what it was.

These findings seem to indicate that marketing efforts need to move beyond awareness to education. The traveling public must be educated about the service so that they understand what the service provides and how it can meet their information needs.

Participant awareness of 511 Virginia was due in large part to VDOT signage. VDOT's 511 signs were noted in every focus group as a way people had learned about 511. Yet people were not sure what 511 was by only reading the sign. The signs appear to be doing a good job of raising awareness, but education is still required. Other avenues of learning about 511 mentioned by participants included the newspaper, friends, and co-workers.

When all of the participants were asked, regardless of if they had heard of 511 or not, what information they would like to have on a traveler information service, they had several suggestions, including:

- Restaurants
- Road Conditions
- Weather Conditions
- Accident Information
- Traffic Conditions
- Alternate Routes and Detours

Most of this information, with the exception of alternate routes and detours, is already provided on 511. Participants also said that, in general, they want the information to be quickly accessible and accurate.

When CVO participants were asked what would need to be on a traveler information service for them to call, they said that they want a channel specifically tailored to the trucking community. CVO participants do not want to wait through menus of information unrelated to their business travel. The CVO participants also identified some information (i.e., low underpass bridges) that they would like that is probably not of interest to residents or tourists. For a complete list of what participants said that they would like to have on 511, please see *Appendix A*.

RECOMMENDATIONS FOR THE 511 VIRGINIA SERVICE

The primary recommendations pulled from these focus group results include:
1. Focusing marketing on education as well as awareness,
2. Adding detours/alternate routes to the system if possible,
3. Creating a truck channel on 511.

The first recommendation is that those managing 511 Virginia focus resources on education and outreach. The awareness campaign seems to be working well; now resources also should be used to assist with education about what the service provides. This recommendation stems from the fact that while 14 focus group participants (34%) were aware of 511 Virginia, only 4 (29%) of those aware had called the service. Participants did not know what 511 was or understand its benefits. These results seem to indicate that 511 road signs should be followed closely and supplemented by educational and other promotional materials.

Another recommendation is that detour or alternate-route information be added to the information provided by 511 Virginia. In almost every case, pre-trip or en-route, participants said that travel information, such as accidents, may cause them to alter their route. Many participants seemed comfortable with just using maps or getting off the interstate and figuring out where to go. Yet it may be helpful to provide recommended routes to those who do not have a map on hand and are unfamiliar with the area. If route changing is a primary behavior in response to travel information regarding traffic, weather, and construction, it may be helpful to have some control over where travelers funnel off of the interstate. It is also notable that focus group participants mentioned detours and alternate routes as types of information they would like on 511.

A final recommendation is that 511 Virginia should include a channel specifically for truckers. Not only did one participant specifically request this, but several mentioned that they look for information such as low underpass bridges and hazmat routes that would likely not appeal to tourists or residents but that is essential to the safe and efficient movement of trucks through the I-81 Corridor.

METHODOLOGICAL LESSONS LEARNED

There were several lessons learned throughout the design, recruiting, implementation, and analysis stages of the focus groups that may be helpful to others conducting similar evaluations. These lessons are shown in the table below and are described in more detail in this section.

Table 1. Lessons Learned

Focus Group	Lesson Learned
Design	Have a back-up plan for those with difficulty reading and writing.
	Consider analysis while designing the interview guide.
Recruitment	Over-recruit commercial vehicle operators.
Implementation	Keep good flip chart notes throughout each session to help with analysis.
Analysis	If focus group are being used as an input to the creation of a survey, leave ample time between the completion of focus group transcripts and the design of the survey.
	Transcripts and flip chart results are very helpful in the creation of pull-down menus for a survey.

There were several lessons learned during the design phase of the focus groups. The first lesson is to be sure to have a back-up plan in case participants have literacy problems. Facilitators should be aware that more than 20 percent of adults in America read at or below a fifth-grade reading level[2]. During these focus groups, it was discovered that at least one or two people had trouble with writing activities. Adjustments were made so that written activities could be done verbally. Everything discussed by participants was captured in writing by the facilitator and was then verbalized several times. This switch was not a problem as the activities lent themselves to either method (i.e., participant or facilitator written). Yet this experience is a reminder that back-up plans should be in place and that activities should be flexible so that everyone can participate comfortably.

In the design stage, the facilitator should also consider carefully the type of analysis that will be done. If outcomes are considered thoroughly during design, results will be obtained in a format that is easier to analyze. For example, the facilitator for these focus groups needed to quickly compare results across all of the focus groups because the team designing the survey instrument was on a tight schedule and needed the results. To achieve this goal, the facilitator designed the process so that participant responses were structured and captured in the form of a matrix on flip chart paper. Afterwards, it was easy to look across all six matrices to see where groups had answers that

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[2] Office of Adult Education and Literacy, Virginia Department of Education.
http: //www.pen.k12.va.us/VDOT/Instruction/Adult/facts.html

overlapped and where they came up with unique responses. This design enabled the facilitator to produce key focus group results quickly for the team that was designing the survey.

A pre-test is also a good design tool. Some helpful information was gleaned during the two pre-tests conducted by VTTI. The results enabled the facilitator to eliminate or collapse together questions that did not result in useful findings. Pre-testing is critical for the focus groups not only for question design, but also to assess how much time each question takes to explore and to determine how to capture responses. The time spent in designing a solid interview guide and focus group process will benefit the implementation and analysis stages.

An interesting lesson learned during the recruiting process was that CVO participants should be over-recruited. Only 12 of the 24 commercial vehicle drivers who agreed to attend a focus group session participated. This occurred despite an aggressive recruiting approach.

During the recruiting process for the CVO groups, participants were called from a list of those people who had indicated that they were willing to take part in research at VTTI. Once a participant was contacted and agreed to participate, a letter was sent providing directions to the focus group facility as well as a confirmation of the date and time. Finally, the day before each session, all participants were called and reminded of their commitment.

Over recruitment is not recommended for the resident focus groups because 21 of the 24 residents who experienced the same recruiting approach as the CVO group attended their sessions. Recruiters should bear in mind that truckers are a wonderful resource, but a hard one to secure. However, this does not mean that they should be overlooked because those who did attend were easy to work with and were very informative.

In addition, the CVO and tourist focus groups were the hardest to organize because the populations are transient. One method of dealing with mobile or transient groups is to take the focus group to where participants congregate. This approach worked well with the tourists who were contacted, recruited, and used as participants while at Massanutten Ski Resort. The only adjustment in design with this type of group is that the session may need to be shorter to accommodate people who are on vacation or traveling and are thus not willing to give up more time than it takes to have a meal break.

It was very helpful during and after the focus groups to have detailed flip chart notes. The results were useful when it came time to conduct analysis and create reports. Keeping detailed flip chart notes also allows participants to reflect on what they have said and gives them an opportunity to restate things if they do not agree with the way something has been captured on the flip chart.

Another lesson learned is that transcripts should be completed with ample time for review by those using them for survey design. Transcripts were done in this case for each focus group, but the schedule was such that the focus groups ran close to the deadline set for the completion of the survey instrument. While transcripts were quickly created and used in the survey design and in this analysis, it would have been better to have had more time between focus groups and the survey design deadlines.

In terms of how the focus group transcripts and flip chart results were used, many of the responses were useful in the creation of pull-down menus in the survey. For example, the focus group question

on how certain types of information, such as traffic, affect travel behavior resulted in a pattern of answers across the focus groups. Most participants said that such information would cause them to change the time of their travel or to take an alternate route. The ideas provided by participants were tallied, and those that appeared most frequently were made into pull-down menus in the phone survey. This was probably one of the most helpful things about the focus groups in terms of its use in the phone survey design.

APPENDIX A: 511 EVALUATION FOCUS GROUP RESULTS

Findings by Question

This appendix contains the raw results from the questions that were posed during the focus. Results are broken down by focus group. Interviews were conducted with several types of groups, or market segments, including residents, commercial vehicle operators, and tourists. Two groups were conducted for each market segment.

Questions were posed during the focus groups about the following subjects: pre-trip and en-route traveler information, cell phone usage, and 511 Virginia awareness. Below are the results, by question, of each focus group.

Results for Pre-Trip Travel Information Questions

1. Before traveling what types of information, if any, do you seek?

Type of Information	Resident 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2
Weather	X	X	X	X	X	X
Directions	X	X	X	X	X	X
Travel Time/Distance	X	X	X		X	X
Road Conditions	X	X		X		X
Construction				X	X	X
Attractions/Tourist Information	X	X				X
Gas Prices/Fuel Locations	X			X		
Expenses (Tolls, Currency Exchange)				X	X	
Accidents				X	X	
Traffic					X	X
Events	X					
Food/Restaurants	X					
Alternate Routes		X				
Scenic Routes					X	
Hotels & Motels						X
DOT Inspection Information			X			
Low Underpass Information			X			
Attitude of States Passing Through			X			
Detours				X		
Hazmat and Special Load Routes				X		
Rest Stops				X		
Citizenship Information (Canada)				X		

INFORMATION IN SHADED AREA WAS IDENTIFIED BY AT LEAST THREE FOCUS GROUPS

2. What are your sources for pre-trip information?

	Sources	Resident 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2
WEATHER	TV (Weather Channel)	X	X	X	X		X
	Internet (Weather.com, VDOT website, Weather Underground, Destination websites)	X	X			X	X
	1-800 Numbers (VSP, VDOT)	X		X	X		
	National Weather Band Scanner		X	X			
	CB Radio			X	X		
	Radio	X					
DIRECTIONS	Maps (VDOT, Gazeteer, Rand McNally, AAA)	X	X	X	X	X	X
	Internet (Mapquest, Destination website)	X	X	X	X	X	X
	Knowledgeable Person (Company, Customer, Family, Destination)			X	X	X	X
	Dispatch (Trucking Company)			X	X		
	CB Radio			X			
TRAVEL TIME & DISTANCE	Maps (AAA, Rand McNally)	X	X	X			X
	Internet (Mapquest)		X			X	X
	Knowledgeable Person (Company, Destination)			X			X
	TV	X					
	Radio	X					
	Dispatch (Trucking Company)			X			
ROAD CONDITIONS	Information Numbers (DOT, VSP, 511 VA)	X	X		X		X
	Radio	X	X		X		X
	TV		X				X
	Internet		X				
	CB Radio				X		
	AAA						X
CONSTRUC-TION	Radio				X	X	X
	Informational Numbers (DOT)				X		X
	TV					X	X
	AAA						X
	CB Radio				X		
TOURISM	AAA	X	X				X
	Internet (Destination, Mapquest, State Parks)	X	X				X
	Maps (State Maps, Gazeteer)	X	X				
	Brochures (Rest Stops, Hotels)		X				
	Chambers of Commerce & Tourism Bureaus		X				
	TV		X				
	Family & Friends		X				

INFORMATION IN SHADED AREA WAS IDENTIFIED BY AT LEAST THREE FOCUS GROUPS

3. What if any pre-trip information would affect your travel plans? If so, how does it affect your travel?

	Affect on Travel	Resident 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2
WEATHER	Change route	X		X	X		
	Change departure time	X				X	X
	Cancel trip	X	X				X
	Reschedule trip	X	X				
	Change Vehicle	X	X				
	Drive instead of fly		X				
	Stay at a hotel	X					
	Put supplies in car	X					
CONSTRUCTION	Change route	X	X		X	X	X
	Change departure time	X	X			X	X
	Add buffer time	X	X				
TRAFFIC	Change departure time	X	X			X	X
	Stay home (event/holiday)		X				
	Change route					X	
ACCIDENTS	Change route	X	X		X	X	
	Change departure time	X	X			X	
	Add buffer time	X	X				
	Go shopping	X					
ROAD CONDITIONS	Change route		X		X		X
	Change departure time		X				X
	Add buffer time		X				
	Cancel trip						X
LOW UNDERPASS INFORMATION	Change route			X			
ATTITUDE OF STATE TOWARDS TRUCKS	Avoid trip			X			
TOLLS	Choose cheaper way					X	
DISTANCE	Take quickest route					X	

INFORMATION IN SHADED AREA WAS IDENTIFIED BY AT LEAST THREE FOCUS GROUPS

Results from En-Route Travel Information Questions

1. While you are traveling, what types of information, if any, do you use?

Type of Information	Resident 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2
Gas	X	X	X		X	X
Rest Stops	X	X	X		X	X
Distance	X	X			X	X
Road Conditions	X	X	X			X
Food	X	X	X			X
Hotels	X	X				X
Weather		X		X		X
Congestion (Rush Hour/Events/Traffic)		X		X	X	
Attractions (Things to Do/Tourism)	X	X				X
Speed Limits		X	X			
Directions	X					X
Construction			X		X	
Accidents			X			X
Truck Stops			X			
Alerts from VDOT				X		
Police					X	
Bridge/Tunnel Openings					X	
Emergency Stop Areas					X	

INFORMATION IN SHADED AREA WAS IDENTIFIED BY AT LEAST THREE FOCUS GROUPS

2. What are your sources for this en-route information?

	Sources	Resident 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2
GAS	Road Signs	X	X	X		X	X
	Billboards	X	X				X
	Exit Guide			X			
	CB			X			
REST STOPS	Road Signs	X	X	X		X	X
	Map		X				
	Radio			X			
DISTANCE	Mile Markers	X	X			X	X
	Road Signs (Airport, Exits)	X	X			X	X
	Billboards	X					
	Maps		X				X
ROAD CONDTIONS	Informational Numbers (VSP, 511 VA)	X	X	X			
	Message Boards (Overhead, Roadside VMS)	X	X				X
	Radio	X	X	X			
	CB Radio	X		X			
	Road Signs		X				X
	Rest Stops	X					
	Truck Stops	X					
FOOD	Road Signs	X	X	X			X
	Billboards	X	X				
	Brochures/Directory	X					
	Location Displays (Golden Arches)		X				
HOTELS	Rest Stop	X	X				
	Road Signs		X				X
	Welcome Center	X					
	Informational Numbers						
	GPS		X				
WEATHER	Radio		X	X			X
	CB			X			X
	Informational Numbers (511)		X				
CONGESTION	VMS Signs		X		X	X	
	Radio		X		X	X	
	CB				X		
ATTRACTIONS	Road Signs	X					X
	Billboards		X				X
	GPS		X				
	Maps		X				

INFORMATION IN SHADED AREA WAS IDENTIFIED BY AT LEAST THREE FOCUS GROUPS

3. What if any en-route information would affect your travel plans? If so, how does it affect your travel?

WEATHER	Affect on Travel	Resident 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2
	Stop (Get off road)	X	X				X
	Change route	X			X		
	Stay in hotel	X					
	Slow down	X					
	Put on 4 wheel drive	X					
	Call ahead to those expecting driver	X					
	Try to beat storm		X				
CONSTRUCTION							
	Change route	X	X			X	X
	Slow down	X					
	Get off at exit			X			
TRAFFIC	Change route	X			X	X	
	Call ahead to those expecting driver	X					
	Slow down	X					
	Stop to eat		X				
ACCIDENTS	Change route	X					X
	Stop to eat	X					
	Call ahead to those expecting driver	X					
	Slow down	X					
	Get off at exit			X			
ROAD CONDITIONS	Change route		X	X			X
TOURIST ATTRACTIONS	Stop and sight see	X					
FOOD	Stop and eat		X	X			
DETOURS	Change route					X	
BRIDGE/TUNNEL OPENINGS	Change route					X	
POLICE PRESENCE	Slow down					X	
	Change route					X	

Results from En-Route Cell Phone Usage Questions

1. How many of you travel with a cell phone?

Yes/No	Resident 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2	Totals
Yes	9	8	4	7	3	3	34
No	2	2	1	0	1	1	7
Totals	11	10	5	7	4	4	41

2. What do you use your cell phone for when you are traveling?
- Let people know I will be late
- Directions and alternate route information
- Emergencies (personal and to report other emergencies)
- Personal and business calls
- Make hotel reservation
- Check road conditions on 511 Virginia
- Security

Results from 511 Virginia Questions

1. How many of you have heard of 511 Virginia?

Yes/No	Resident 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2	Totals
Yes	5	5	1	3	0	0	**14**
No	6	5	4	4	4	4	**27**
Totals	11	10	5	7	4	4	**41**

Yes/No	Resident 1	Resident 2	Totals
Yes	5	5	**10**
No	6	5	**11**
Totals	11	10	**21**

Yes/No	CVO 1	CVO 2	Totals
Yes	1	3	**4**
No	4	4	**8**
Totals	5	7	**12**

Yes/No	Tourist 1	Tourist 2	Totals
Yes	0	0	**0**
No	4	4	**8**
Totals	4	4	**8**

2. For those of you said you are aware of 511, have you ever used it?

Yes/No	Resident 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2	Totals
Yes	2	2	0	0	N/A	N/A	4
No	3	3	1	3	N/A	N/A	10
Totals	5	5	1	3	N/A	N/A	14

3. How did you hear about 511?

Type of Information	Resident 1	Resident 2	CVO 1	CVO 2
Road Signs	X	X	X	X
Newspaper	X			X
Friends or Co-workers	X	X		
Smart Road Tour	X			
VDOT Website		X		
Radio				X

INFORMATION IN SHADED AREA WAS IDENTIFIED BY AT LEAST TWO FOCUS GROUPS

4. Why have those of you who have heard of 511 Virginia not called?

- No reason to call
- Satisfied with where I get my information
- Want trip routing and it doesn't provide
- It doesn't provide detailed directions
- Didn't want to deal with menus
- Didn't know what it was

5. For those of you who have not used 511, what would need to be on a traveler information service for you to become a user?

Type of Information	Residents 1	Resident 2	CVO 1	CVO 2	Tourist 1	Tourist 2
Road conditions		X	X			X
Weather conditions			X	X		X
Restaurants		X				X
Accident information (and delay)			X			X
Quickly accessible and accurate information				X	X	
Traffic conditions				X		X
Detours/alternate routes				X		X
Operator access for traffic information and emergencies			X	X		
Current conditions	X					
Directions		X				
School closings		X				
National alert information		X				
Emergency information			X			
Avenue to report drunk drivers			X			
Truck parking information at hotels			X			
Delay information				X		
Separate truck and car channels				X		
Lane closures				X		
Rest areas						X
Hotel information (with ratings)						X
Ability to specify location or region						X
Voice activated					X	
User friendly						X

INFORMATION IN SHADED AREA WAS IDENTIFIED BY AT LEAST TWO FOCUS GROUPS

APPENDIX B: 511 EVALUATION FOCUS GROUP SCREENING GUIDE

Tourist Recruitment and Screening Tool

Recruiter Directions: Begin recruitment by 11:00 on Friday morning.

Hello my name is _____ and I work for the Virginia Tech Transportation Institute.

Today we are giving $30 to people who agree to participate in a 40 minute focus group about traveler information.

We are conducting these focus groups as part of an evaluation of traveler information in Virginia. The evaluation is being sponsored by the Virginia Department of Transportation.

The information you share will be used strictly for research purposes. Your name and personal information will remain confidential and will not be shared with anyone.

Would you be interested in participating?

- *If the participant says no, thank the participant for his or her time.*

- *If the participant says yes, go on with the screening.*

To participate in our focus group, you must have a valid drivers license, you must be on vacation here today, and you must be 18 years or older.

Do you meet these criteria?

- *If the participant says no, thank the participant and let him or her know that he or she cannot participate.*

- *If the participant says yes, go on with the screening.*

Thank you for agreeing to participate. We are going to be convening two focus groups: one at 12:00 and another at 1:00.

Which time would you prefer?

Note that if not enough people are secured for either the 12:00 or the 1:00 session, then there is time to do another focus group at a later time.

Write down the participant's name and the time he or she wishes to participate. Point out the table where the focus group will take place, hand him or her a business card with the time of the session on the back, and go onto the next person. Keep going until six people have been recruited for each session. This number assumes that only four people will show up.

APPENDIX C: 511 EVALUATION FOCUS GROUP INTERVIEW GUIDE

RESIDENT INTERVIEW GUIDE (90 minutes)

<u>**Facilitator Introduction (*5 minutes*)**</u>
Hello, my name is Stephanie Baker and I am a facilitator at the Virginia Tech Transportation Institute. We are working on an evaluation of traveler information services in Virginia. This study is being sponsored by the Virginia Department of Transportation. There are no right or wrong answers; we are just interested in your opinions as residents of Virginia living along I-81.

This focus group is strictly for research purposes: **we are not selling anything,** and **we will not connect anything you say with your personal information**. If you feel uncomfortable at any time, you can refuse to answer a question or you can choose to leave.

Did everyone fill out one of these **informed consent** forms? Please make sure that you signed two copies of the signature page; keep one for yourself, and please pass the other to my colleague now.

There is a **tape recorder** in the room that will be used to create a transcript of this session. The information on the tape will not be associated with your personal information.

This session will run **90 minutes;** we are very appreciative of the time that you are spending with us and will honor it by not running over. Please stay after the session if you would like to receive the payment we have for your participation. This amount is **$40** per participant. Only participants who stay for the entire session will receive a payment.

The bathrooms are located around the corner to your left. There are also refreshments available in the back. If you would like something, please go ahead and help yourself before we get started, and then we will have a break later. Please turn off any cell phones/beepers unless you need to have it on for emergency reasons. This will help us to avoid distractions and to finish on time.

I would like us to observe several ground rules throughout the session. Please let me know if you are uncomfortable with any of them and we can change them. If not, let's agree to abide by them for the next 90 minutes. Are these o.k.? Are there others you want add?

<u>**Ground Rules**</u>
- Listen to Each Other
- Participate Fully
- No Side Conversations
- Spelling does not count
- Finish on time
- Criticism of others or their ideas is not allowed

Introductory Questions (*5 minutes*)—write introductory questions up on flip chart.
- **Facilitator Question**
  - Please write your first name on a name label. Write Big.
  - Lets go around the room and have everyone state your first name, where you are from, and how often and why you travel on I-81.
- **Activity**: Go around and have everyone introduce themselves; start with facilitator.

Travel Information (*30 minutes*)—draw matrix on flip chart ahead of time.
- **Facilitator Question**
  - Before traveling, what types of information, if any, do you seek?
  - Take a moment and write these down on colored paper. Write Big. Only one idea per sheet. Use five words or less.
  - Let's go around the table and have each person share one type of information (repeat).
- **Activity**: Conduct a round robin until all of the main ideas are up on the wall.

- **Facilitator Question**
  - Do you see ideas on the wall that we can cluster or duplicate ideas that we can take down?
  - Does the person who put the idea up agree that it should be clustered this way?
  - What should we call this cluster?
- **Activity**: Point to the wall of ideas. Cluster the ideas together and add labels to them if possible.

- **Facilitator Question**
  - What are your sources/where do you go for this information?
- **Activity**: Take each idea from the wall and transfer it to the matrix. Go through each major type of information the group listed, and through an open discussion add the source(s). Encourage open discussion.

PRE-TRIP TRAVEL INFORMATION

Type of Info	Sources of Info	Decision Making

- **Facilitator Question**
  - Would any of these types of information alter your travel if you found it out pre-trip?
- **Activity**: Put a check in the decision-making column next to those that would alter travel.

- **Facilitator Question**
  - How, if at all, would this pre-trip information change your plans? What would you do differently than you had planned, if anything?
- **Activity**: Open discussion: keep track in the decision-making column of what people say for each item on the flip chart.

- **Facilitator Question**
  - o Is there any other type of information, not up on the flip chart, that would alter your travel if you found it out before you left for a trip?
  - o How would this information alter your travel?
  - o Where would you get the information.
- **Activity**: Open discussion: in another color, add the types of information, where they would get the info, and how it would affect decision making.

En-route Travel Information *(30 minutes*)

- **Facilitator Question**
  - o While you are traveling, what types of information, if any, do you use?
  - o Take a moment and write down the types of information. Write Big. Only one idea per sheet. Use five words or less.
  - o It is o.k. if you don't have anything to write or if you have many ideas.
  - o Lets go around the table and have each person share one type of information (repeat).
- **Activity**: Conduct a round robin until all of the main ideas are up on the wall. Be sure to use a different color paper for this activity than was used for pre-trip information.

- **Facilitator Question**
  - o Do you see ideas on the wall that we can cluster or duplicate ideas we can take down?
  - o Does the person who put the idea up agree that it should be clustered this way?
  - o What should we call this cluster?
- **Activity**: Point to the wall of ideas. Cluster the ideas together and add labels if possible.

- **Facilitator Question**
  - o What are your sources/where do you go for this information?
- **Activity**: Go through each type of information listed and write the sources.

EN-ROUTE TRAVEL INFORMATION

Type of Info	Sources of Info	Decision Making

Facilitator Note: If people say "sign" or "radio," ask them to specify type of sign/radio station.

- **Facilitator Question**
  - o Would any of these types of information alter your travel if you found it out en-route?
- **Activity**: Put a check in the decision-making column next to those that would alter travel.

- **Facilitator Question**
  - How, if at all, would this en-route information change your plans? What would you do differently than you had planned, if anything?
- **Activity**: Open discussion: keep track in the decision-making column of what people say for each item on the flip chart.

- **Facilitator Question**
  - Is there any other type of information, not up on the flip chart, that would alter your travel if you found it out en-route?
  - How would this information alter your travel?
  - Where would you get the information.
- **Activity**: Open discussion: in another color, add the types of information, where they would get the info, and how it would affect decision making.

Facilitator Directions before Break

Let's take a five minute break. Before the break, I would like you to take three red dots and three green dots. Place your red dots on the types of information you think are the most important when planning a trip (column 1, matrix 1). I want you to place your green dots on the types of information you think are the most important en-route (column 1, matrix 2). The only rules are that you spend all of your dots and that you can't cut them in half or give them to someone else. You can put all three on one type of information (walk over to the matrix and show them) or you can spread them out and put one dot on three different things. Do this sometime over the break. Any questions?
- **Activity:** Hang each matrix on the wall and put a red circle around column one, matrix one. And put a green circle around column one, matrix two.

Five minute break: Prioritization Activity, Refreshments, Bathroom

Alternate Routes (*10 minutes*)
*VDOT Specific Interest
- If people say they would change their route while en-route, ask them the following question: when they take alternate routes is it just in familiar areas or also in unfamiliar areas?
- Probe for who route changers are and how they decide what route to take (carry maps)?
- Probe for who the folks are that won't take alternate routes and why. Find out what they would need in order to take an alternate route.

Cell Phone Usage En-Route (*10 minutes—if running over, cut this section*)
- **Facilitator Question**
  - How many of you travel with a cell phone? Please raise your hands.
- **Activity**: Count number of people who carry a cell phone when traveling.

- **Facilitator Question**
  - What do you use your cell phone for when you are traveling?

- **Activity**: Open discussion about how people use their cell phones.

- **Facilitator Question**
  - o Who would you call for these things? (i.e., if they say they use their cell phone for emergencies, find out who/what number they call).
- **Activity**: Open discussion about how people use their cell phones.

511 (20 minutes)—*If no one has heard of 511, stop after question one.*
- **Facilitator Question**
  - o In closing, I would like to know how many of you have heard of 511 Virginia? If so, please raise you hands.
- **Activity**: Count the number of people that have heard of 511. Note on flip chart.

- **Facilitator Question**
  - o For those of you who raised your hands, how did you learn about 511?
- **Activity**: Note on flip chart.

- **Facilitator Question**
  - o For those of you who raised your hands, how many of you have ever used 511? Did anyone try to access it and not get through?
- **Activity**: Count the number of people that have used it. Note on flip chart.

- **Facilitator Question**
  - o For those of you who raised your hands but have not used the service, tell me why you have not used it?
- **Activity**: Write down the reasons on flip chart.

- **Facilitator Question**
  - o For those of you who have used 511, did you access it from a landline or cell phone?
- **Activity**: Count the number of people who have used it. Note on flip chart.

- **Facilitator Question**
  - o For those of you who raised your hands, how many of you called back after the first time you used it?
- **Activity**: Count the number of people that have used it. Note on flip chart.

- **Facilitator Question**
  - o What would need to be on a traveler information phone service in order for you to use it?
  - o What would you need to know, or what would have to change?
- **Activity**: Open Discussion.

*Note any questions that people have about 511.

Closing Remarks/Payment

- Thank everyone for their time.
- Make sure that everyone has filled out all of the financial paperwork properly (2 forms).
- Give each participant his or her $40 payment.
- Offer participants the 511 materials and let them know that their participation is going to help improve 511 VA.

APPENDIX D: 511 EVALUATION FOCUS GROUP INFORMED CONSENT FORMS

INFORMED CONSENT FOR PARTICIPANTS OF THE RESIDENT AND
COMMERCIAL VEHICLE OPERATOR FOCUS GROUPS.

TITLE OF PROJECT: 511 Evaluation

INVESTIGATORS: Aaron Schroeder, Nicole Swan

FACILITATOR: Stephanie Baker

I.   PURPOSE OF THIS RESEARCH

You are invited to participate in a study concerning the evaluation of traveler
information services in Virginia.

II.   PROCEDURES

To accomplish the goals of this part of the study, you will be asked to participate in a
focus group in which your usage of traveler information will be explored.
Participation in this study will require approximately 90 minutes of your time. In
order to participate, you must be at least 18 years old and licensed to drive.

III.   RISKS

There are no apparent risks involved with participation in this study.

IV.   BENEFITS OF THIS PROJECT

A general benefit of this evaluation is the opportunity to provide information that
may ultimately lead to the improvement of traveler information in Virginia.

V.   EXTENT OF ANONYMITY AND CONFIDENTIALITY

The verbal responses collected in this study will be kept strictly confidential. At no
time will the researchers release any individual participant's responses. The
information you provide will be identified through the use of a randomly assigned
participant number; only this number (not your name) will be used during data
analysis and in any reports on this research.

VI.   COMPENSATION

A sum of $40 will be offered to you for participation in this evaluation project.

VII.   FREEDOM TO WITHDRAW

You are free to withdraw at any time without penalty.

VIII.   APPROVAL OF RESEARCH

This research project has been approved, as required, by the Institutional Review Board (IRB) for Research Involving Human Subjects at Virginia Polytechnic Institute and State University.

IX.   PARTICIPANT'S RESPONSIBLITIES

I voluntarily agree to participate in this study. I understand that I have the following responsibilities:

1. To listen to all of the focus group leader's instructions.

2. To provide responses to the focus group leader's questions.

X.   PARTICIPANT'S PERMISSION

I have read and understand the informed consent and conditions of this project. I have had all of my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this focus group.

If I participate, I understand that I may withdraw at any time without penalty.

_____

Participant's Signature and Date

Should I have any questions about this research or its conduct I may contact:

- Aaron Schroeder (Investigator) – (540) 231-1544

- Nicole Swan (Investigator) – (540) 231-1525

- Stephanie Baker (Facilitator) – (540) 231-1524

FACILITATOR NOTE: Please note that the participant will sign two copies of this informed consent form. One is to be given to the participant, and the other form will be retained by the investigator.

References

Conducting Effective Focus Groups (2002). University Development Training Program, Donaldson Brown Hotel & Conference Center.

Education, V. D. o. Office of Adult Education and Literacy. Retrieved DATE, from http://www.pen.k12.va.us/VDOE/Instruction/Adult/facts.html.

511 Virginia Evaluation

January 2004

Web Survey Report
Chapter 3

CHAPTER 3: WEB SURVEY REPORT

EXECUTIVE SUMMARY

An assessment of the 511 Virginia website was a necessary component of this 511 evaluation. The evaluation team at the Virginia Tech Transportation Institute (VTTI) wanted to determine if the website was meeting user needs and achieving acceptable customer satisfaction levels. To accomplish this assessment, VTTI developed and applied a web-based survey methodology.

Non-probability sampling methods were employed for this web-survey. A survey was posted on the 511Virginia.org website for six months and users were invited to participate. Though the sample included only 108 volunteers, the information gleaned from the survey is an interesting and useful compliment to the other research elements of the 511 Virginia Evaluation (e.g., focus groups, phone survey, etc.).

Appendix A contains the raw results from the questions posed in the web-survey. The findings and recommendations presented in this report were extrapolated from these raw results. Because these findings are based on a non-probability sample, the results are anecdotal and should not be used to generalize to the opinions of the entire population of 511 Virginia.org users.

The findings that emerged from the survey tend to fall into five categories: demographics, user awareness, website usage, user satisfaction, and user behavior. Some of the major findings are that:

- 89 of the 108 respondents (82%) live in Virginia.
- 47 respondents (44%) were first time users of 511Virginia.com.
- 77 respondents (71%) were looking for travel conditions on the day that they filled out the survey.
- 63 respondents (58%) indicated that they were satisfied with the Travel Conditions page.
- 75 respondents (69%) indicated that they were likely to revisit 511Virginia.org on a regular basis.

In sum, satisfaction levels were high for 511Virginia.org among those surveyed, in particular for the home and the travel conditions pages. Also, over half of the respondents said that they are likely to visit the site again—a solid indicator of customer satisfaction.

The results were mixed as to whether the website is meeting users' needs. In general, most participants indicated that they were looking for travel condition information and that they spent about as much time searching for the information they wanted on the website as they expected. However, the comments submitted by respondents indicate some frustration with the website. It seems that some users expected to find more information about travel conditions than is currently integrated into 511Virginia.org. Though most participants are satisfied with the website, there is room for improvement in the depth and scope of information provided. In particular, attention needs to be directed towards the area of the website regarding travel condition information.

There were several recommendations that resulted from these findings. First, travel condition information needs to be moved to a more prominent position on the website, preferably the home page. This is so that those looking for the information do not have to search far. The travel conditions page also needs to provide more and better information on road conditions, accidents, and delays. Respondents like the cameras and more camera images should be posted if resources allow. Finally, marketing efforts need to be increased to reach people who are looking for travel condition information in the 511 Virginia coverage area.

There were several lessons learned during the design, recruitment, implementation, and analysis of 511Virginia.org, which are discussed in this report as they may be helpful to others conducting similar evaluations. For instance, during the implementation phase of the web-survey, it was discovered that the placement of the link to the web-survey did not significantly change the number of users that volunteered to participate. Originally, the link was located in the area where banner advertisements would normally be, and later it was moved to the top of the home page, beneath the advertisements. The response rate did not significantly change after the movement of the link. These types of lessons may assist others who will implement similar web-based surveys in the future.

METHODS

Survey Development

The survey that was used to evaluate the 511Virginia.org website was created using survey maker software that was available for free to VTTI through Virginia Tech (http://www.survey.vt.edu).[1] The software not only provided for the creation of the survey, but it hosted the survey and supplied a database of the results. The survey was located on the 511 Virginia website via a link provided on each page. The benefit of using this site was that the survey was developed in a simple and cost-effective manner with no administrative overhead beyond that of one graduate assistant who was responsible for monitoring the survey responses. Use of this software also provided timely feedback to the evaluators. Survey results were downloaded periodically throughout the duration of the evaluation period. Only evaluation administrators had access to this information.

The survey was delivered to respondents through a link on the 511 Virginia website. After clicking on the link, visitors were sent to a web page containing the online survey. The survey asked users to fill out a form consisting of 28 questions, which took approximately 5 minutes to complete. The full survey can be seen in Appendix B. The survey asked users basic demographic questions, what triggered them to go to the website, what information they were looking for on the site, and how satisfied they were with the website. Responses were collected during the period of Friday, February 6, 2003 – Friday, August 1, 2003.

Incentives were not used to entice visitors to complete the survey because they were cost prohibitive and have been shown to cause at least three methodological concerns: response bias, multiple entries, and unwanted entries.[2] Incentives have been shown to cause response bias, as respondents

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[1] See also:
http://www.computing.vt.edu/internet_and_web/web_publishing/webmasters_toolkit/survey_maker/quickstart.html
[2] Patrick Tierney, "Internet-Based Evaluation of Tourism Web site Effectiveness: Methodological Issues and Survey Results," Journal of Travel Research, Vol.39, November 2000, p. 213.

change their answers based upon the incentive being offered. Additionally, respondents may complete the survey multiple times in order to obtain multiple incentives or to increase their odds of winning a prize-based incentive. Finally, with the proliferation of Internet contest websites that search the web to find prizes and then link to them, unwanted entries may abound with the offering of an incentive. Although increased traffic to the site is desirable, the bias inherent in the responses of incentive specific visitors outweighed the potential benefits and, therefore, was not used.

Subject Privacy

In accordance with university policy, Internal Review Board (IRB) approval for this survey was obtained before it went live on the website. The introduction of the survey informed individuals that the information they provided would remain confidential and would not be sold. Individuals were further guaranteed of their privacy because the site does not collect cookies. Cookies are markers set by a server on a visitor's browser to identify the user. The cookie allows the server to remember the visitor[3]. Because the site does not collect cookies, there was no way for 511Virginia.org to collect personally identifying information or link specific survey responses to individuals.

Subject Recruitment

The survey was an open, unrestricted, self-selecting survey. This meant that the survey was open to every visitor to the site and that individuals chose whether or not they wanted to participate in the survey. Every visitor to 511Virginia.org was a potential recruit for the survey and respondents were all unpaid volunteers.

Since January 2002, the average number of visitors per month to the 511 Virginia website has been 5,092. It is these visitors the evaluation team was targeting with the survey. The survey was designed to extract honest feedback regarding the website from respondents. 108 surveys were completed during the six month period that the survey was active on the website.

Sampling

Non-probability sampling procedures were used for this survey because there was no way to bar a user from responding numerous times to the survey. Non-probability sampling methods are "sampling methods in which the probability of selection of population elements is unknown" and can be used in quantitative studies when "researchers are unable to use probability selection methods."[4] Although a probability sample would have been desirable, non-probability methods were useful since multiple submissions were not restricted.[5]

A non-probability sample was used for several reasons. The primary reason is that it is the policy of 511 Virginia not to collect cookies or personal data from visitors to the website. Thus, evaluators could not ensure that each respondent was a unique participant. This issue was noted in the literature as a problem for those conducting web-based surveys. Because "IP addresses are unique to

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[3] Whalen, David. "The Unofficial Cooke FAQ: Version 2.6" http://www.cookiecentral.com/faq/ (accessed on 8/8/03)

[4] Russell K. Schutt (2001). Investigating the Social World. Third Edition: The Process and Practice of Research. Thousand Oaks, California: Pine Forge Press. Pages 130 and Index 13.

[5] Ibid, p. 131

machines, not people" an evaluator "will not know if he or she is having one person respond several times at different machines or if one machine is being used by multiple individuals."[6]

The use of a non-probability sample limits the use of these results, as they can not be generalized to the population of all users of 511Virginia.org. However, the results are still an interesting supplement to the other parts of the evaluation (e.g., focus groups, phone survey).

MAJOR FINDINGS

There were many interesting findings from this web-survey. As was mentioned previously, 108 511Virginia.org users voluntarily filled in the survey that was linked to the website. The findings from the survey tend to fall into five categories: demographics, user awareness, website usage, user satisfaction, and user behavior. Below is a summary of these findings. The complete list of findings are located in Appendix A.

Demographic

The first series of questions on the web-survey were demographic in nature, dealing with such things as age, gender, and income. One of the major demographic findings is that at least 93, or 86%, of the participants were from the United States, and of that 93, 89, or 96%, live in Virginia. All of the states bordering Virginia, with the exception of Kentucky, had participants who completed the survey (i.e., NC, MD, TN, and WV).

The age and income of respondents varied. The largest number of participants (31 or 29%) were between the ages of 50 and 59 and the smallest number of participants (5 or 5%) were 70 or older. The largest number of participants (19 or 18%) said that they have a household income before taxes of $36,000-$50,000, while the smallest number (3 or 3%) earned $20,000 or less.

Awareness

The survey queried participants about how they learned about 511Virginia.org. The largest number of participants (42 or 39%) learned about 511Virginia.org while on-line, via a search engine or a link from another website. Participants also heard about 511 while watching TV or by word of mouth.

Figure 1. How respondents heard about 511Virginia.org (Survey Question 12).

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[6] Tuten, Tracy L. and Michael Bosnjak (August 5, 2001). National Academy of Management Briefing: Web-based Survey Methods: Professional Development Workshop. http://www.or.zuma-mannheim.de/aom2001/
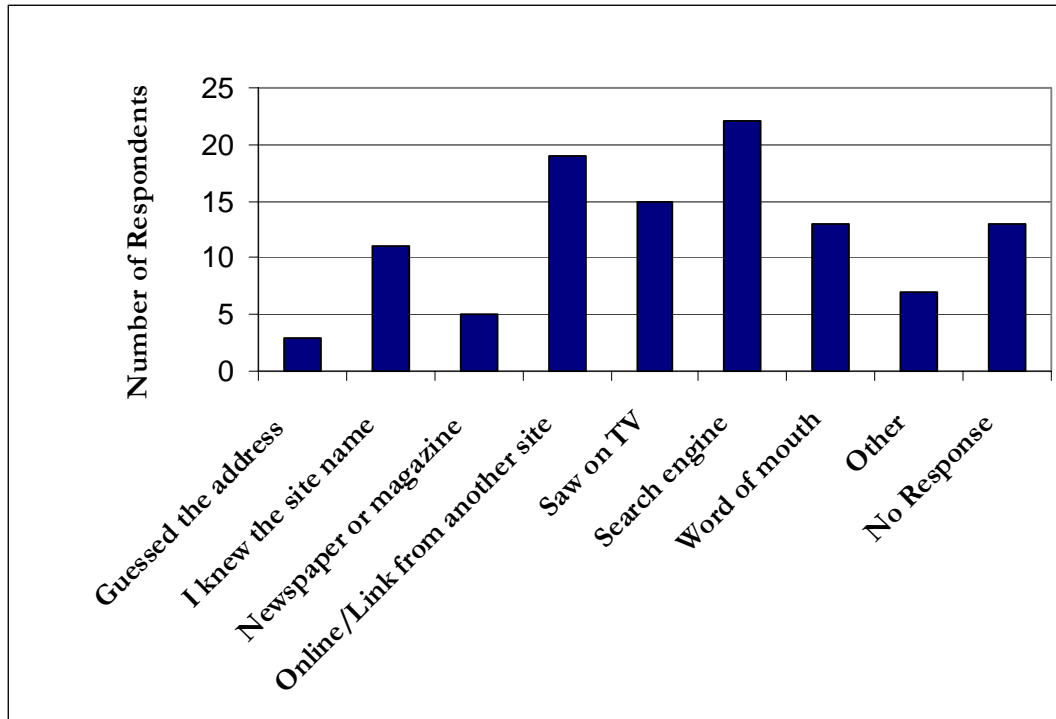
Usage

In terms of usage, 47 (or 44%) of the respondents said that they were first time users of the website. While most of the respondents (66 or 61%) said that they were able to find what they were looking for on the website with as much effort or less effort than they expected, 22 (or 20%) participants said that it took them longer than they expected to find what they were looking for.

Figure 2. The effort required by participants to find the information they wanted on 511Virginia.org (Survey Question 15).
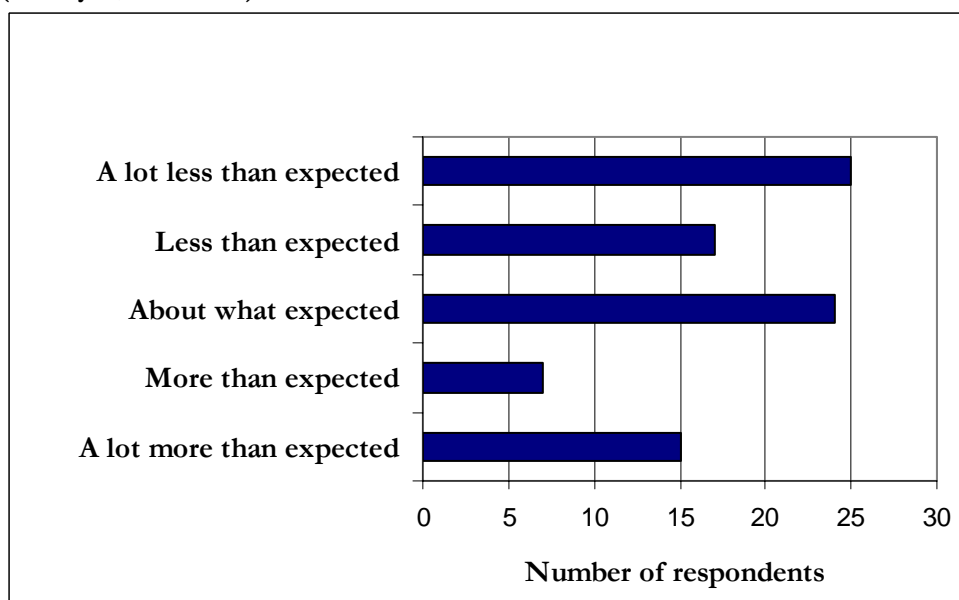
One issue that was apparent in the comments section of the web-survey was that some participants were trying to find information that was not available on 511Virginia.org. The absence of information was due either to technical difficulties or a lack of data. For instance, several respondents complained that the cameras on Afton mountain or in Winchester were not working when they checked the website. One respondent said, "Please do the best you can to make sure the cameras are working when the weather is bad (rainy/foggy). Today (March 18) it is rainy and may be foggy, and neither the Afton nor the Winchester cameras are working."

Respondents also commented on the lack of information available for certain areas (e.g., Interstate 66 and Interstate 95). These users did not seem to be aware of the coverage area of 511 and/or they wanted to request that these areas be covered in the future. For example, one respondent said that she "wanted to check the site out for road conditions since I travel 81 and 66 every day to go to work in Northern Virginia. Also, my husband is a truck driver so we check for his work travel also."

Participants also expected more information related to travel conditions than was provided. Respondents want current, accurate travel condition information. For instance, one respondent said that the website "needs to be updated more frequently" and that it "doesn't seem to reflect current conditions."

Respondents' comments, shown in Appendix A, reflect frustration with technical problems and with gaps in travel condition and other information that they felt should be on the website. Yet there were also many comments that reflected satisfaction with the website. One respondent said that 511Virginia.org "is one of the best sites I have found for travel information" and that those who are running the system should "keep up the good work."

Level of Satisfaction

Over half of the participants (68 or 63%) said that they were satisfied with the 511Virginia.org Home Page and with the Travel Conditions page (63 or 58%).

Figure 2. Participant Satisfaction with the 511 Virginia Home Page (Survey Question 8a).
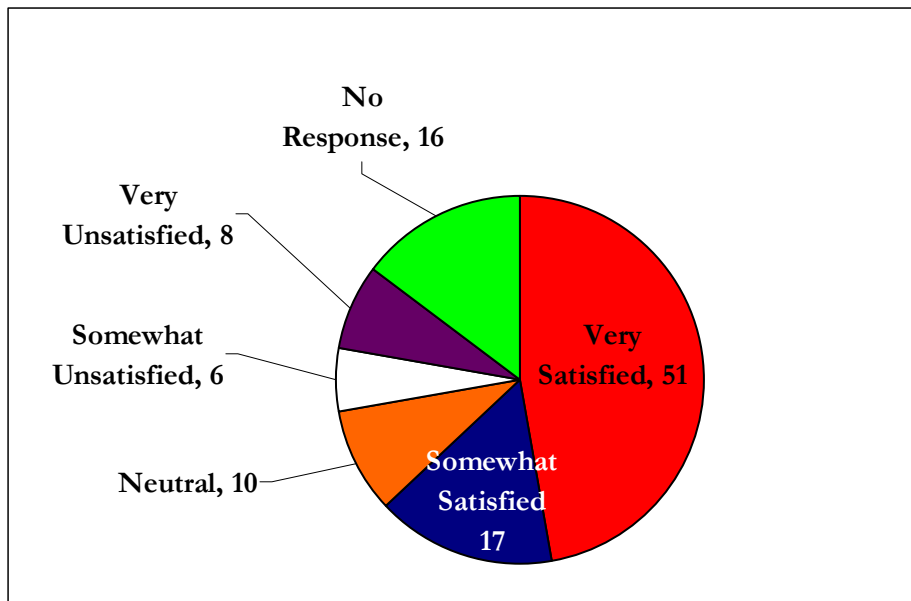
Figure 3. Participant Satisfaction with the 511 Virginia Travel Conditions Page (Survey Question 8b).
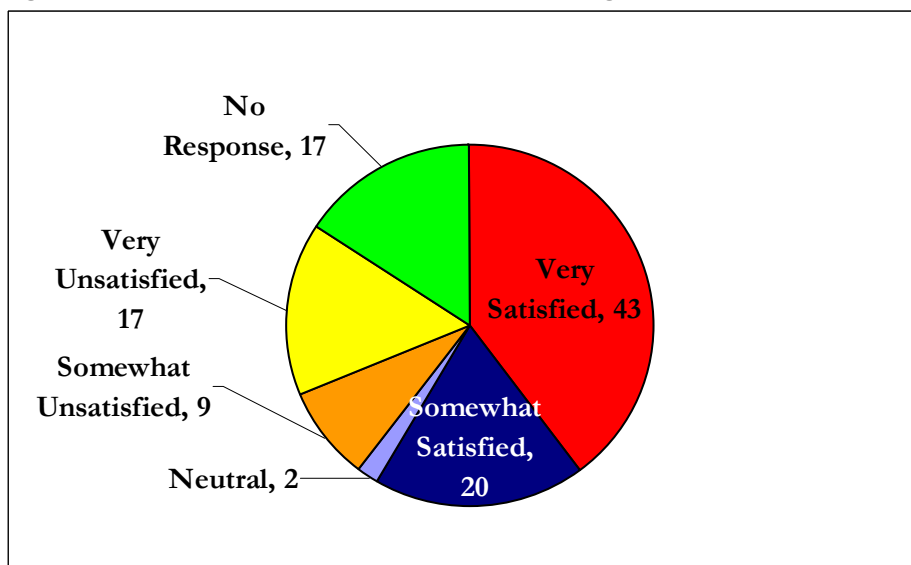
Respondents made more comments related to the travel conditions than any other area of the website. Possibly because responding to the website was voluntary and anonymous, participants tended to voice strong criticism or high praise as can be seen from the comments below:

- "Travel conditions are sketchy and accidents are slow in appearing on the web. There is more than enough information on road construction. The site needs a lot of improving!".
- "Please continue your great work. More web-cams please, and if you could create an e-mail system to send alerts regarding accidents to my inbox!!"

Not as many participants were satisfied with the Emergency Services (51 or 47% satisfied), the Food and Lodging (48 or 44% satisfied), the Shopping and Services (45 or 42% satisfied), the Trip Mapping (52 or 48% satisfied), and the Tourism and Attractions (46 or 43% satisfied) pages.

Also, many participants did not answer the questions related to the above mentioned pages, and there were few comments about the pages. This non-response may be taken as an indication that participants did not use these pages enough to be either satisfied or dissatisfied. This lack of response regarding the pages listed above is in contrast to the responses concerning the travel conditions page, which solicited more definite responses from participants about their satisfaction.

Figure 4. Satisfaction with the 511 Virginia Tourism and Attractions Page (Survey Question 8e).
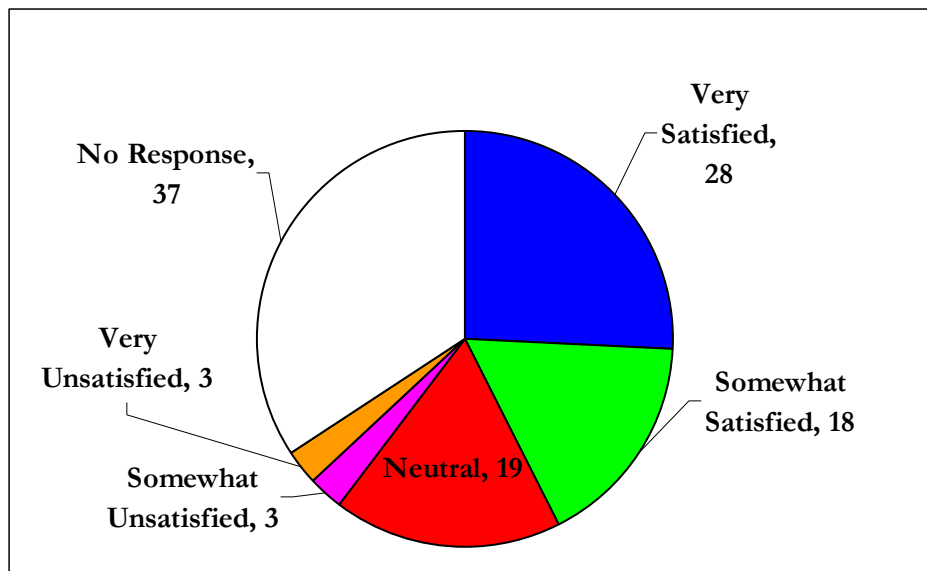
Participants were also asked, as an indicator of their satisfaction, how likely they were to revisit the website or to recommend it to others. Many participants (75 or 70%) said that they were likely to revisit the website or to recommend the site to others (64 or 60%).

Figure 5. Likelihood of Respondents Revisiting 511 Virginia website (Survey Question 10).
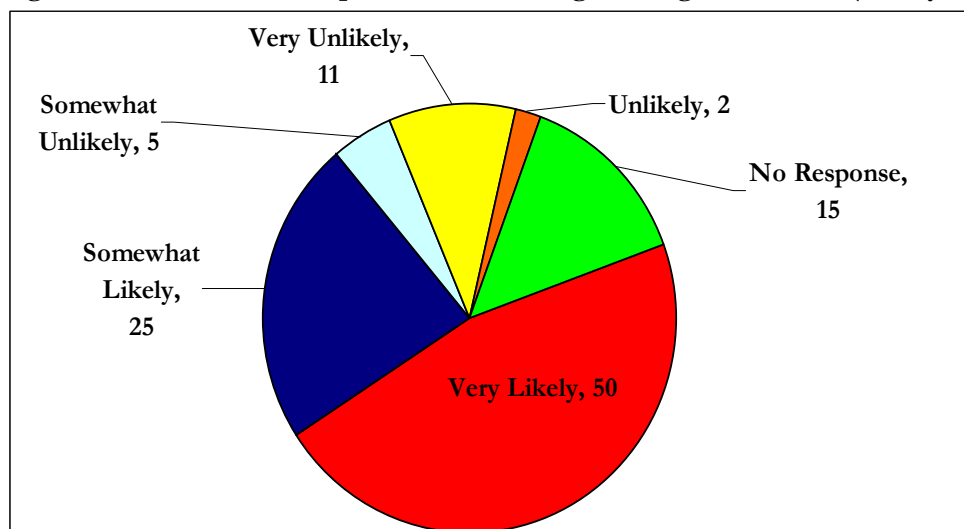
Behavior

The graph below shows respondent's answers to a question about why they visited 511Virginia.org on the day they filled out the survey. Over two thirds of the participants (77 or 71%) said that they visited the website to find travel condition information (e.g., traffic delays and winter weather advisories). Tourism and attractions was the second most noted type of information that participants were seeking on the day that they took the survey.

Figure 6. Reason for visiting 511 Virginia website (Survey Question 9).
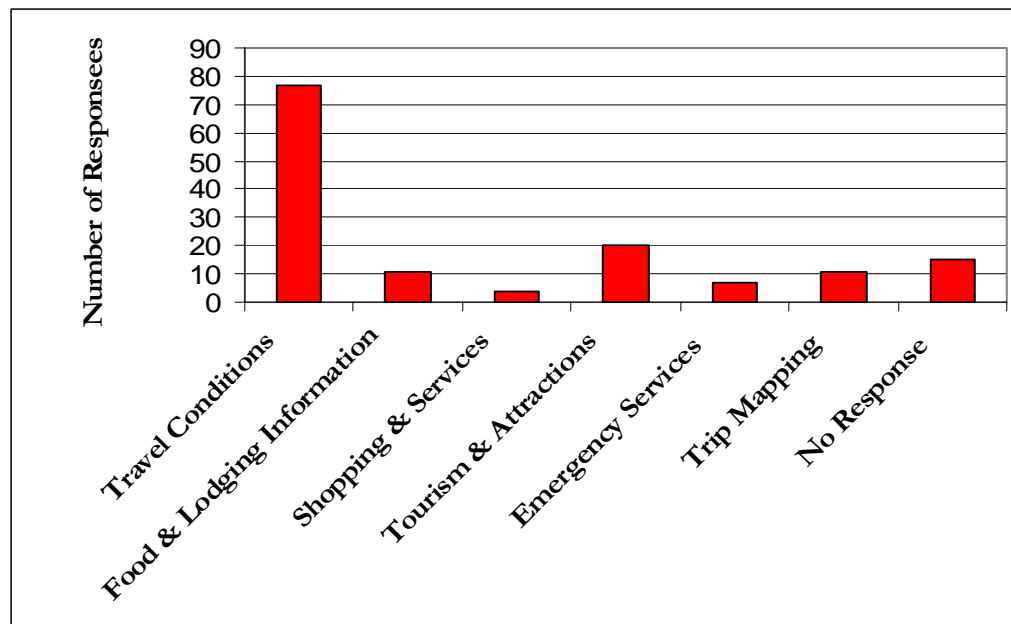
Another interesting question that was posed to participants dealt with when they were planning to travel along the I-81 Corridor. Over half of the participants (65 or 60%) were checking 511Virginia.org either immediately before leaving to travel on I-81 or within the next week from the time they were filling in the survey.

Figure 7. When participants plan to travel along the I-81 Corridor (Survey Question 20).
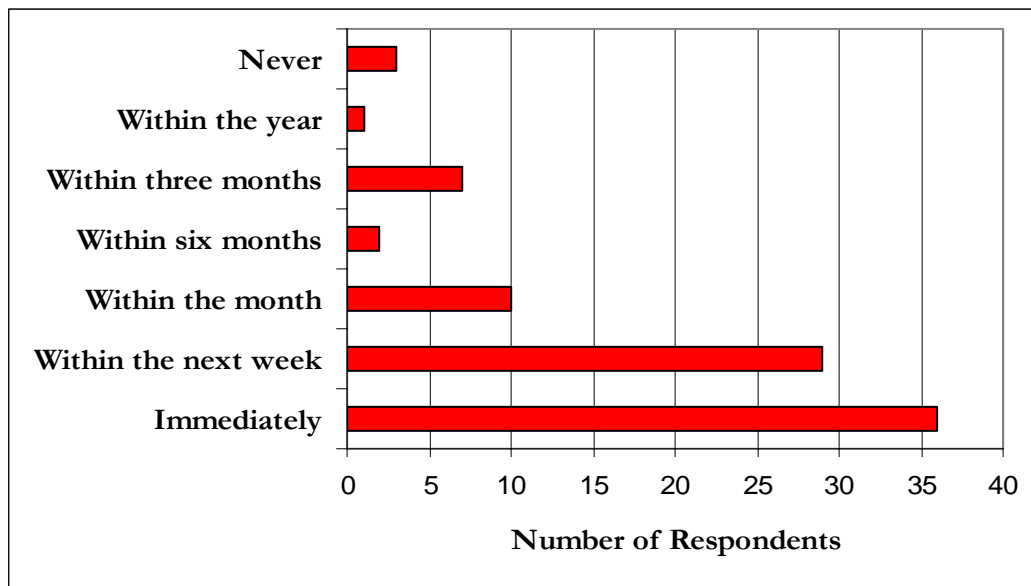
These responses appear to indicate that people are checking the website; either immediately before or within a few days of leaving on a trip and that they are checking the site for travel condition information.

Several comments were collected that exemplify the type of information that users are searching for, as well as the time in which they are looking for the information in relation to their travel. For example, one respondent said, "I live in Charlottesville and just started working in Staunton, which means traveling over Afton Mountain to work. There are frequently problems on Afton Mountain with traffic and it would be good to add a section of road with more current information (perhaps more in depth)."

In sum, the findings indicate that most of the respondents live in Virginia and that travel condition information is the primary item that they are looking for on the 511Virginia.org website. Participants also said that they were looking for this information fairly soon before traveling on the I-81 Corridor. A majority of these users indicated that they are satisfied with the 511Virginia.org travel conditions page where information on accidents, construction, and winter road advisories is located.

The information presented in this major findings section is just a portion of the overall findings from the web-survey. As was mentioned earlier, the complete raw findings are presented in Appendix A of this document.

RECOMMENDATIONS

Based on these major findings there are several recommendations that can be made for 511Virginia.org. The first recommendation is that the site be redesigned to cater to those looking for travel condition information. This could be done in a variety of ways, but in particular by making the home page focused on travel condition information. Emergency services, shopping, food and lodging, and trip mapping appear to be of less importance to those surveyed. These types of information (e.g., emergency services, shopping, food and lodging, and trip mapping) should be placed deeper in the website, or taken off of the website, depending upon the resources available to maintain the site.

Travel condition information should also be enhanced and expanded. More and better travel condition information on the 511 system is what these respondents were asking for. In particular, some respondents requested access to more camera images along the major interstates in Virginia and in potentially dangerous areas such as Afton Mountain.

Another recommendation is that resources be invested in marketing the website. Many participants found the website via online searches or links from other websites. It is possible that more marketing for the website would increase people's knowledge, therefore limiting the need to search for it. Since travel condition information is what users appear to be looking for, marketing could be targeted towards this audience.

Respondents also made some general recommendations for 511Virginia.org; a few are noted here, and a complete list of participants' comments is located in Appendix A:
- "If you put school, plant, and business closings on this site, you will have more interest."
- "Expand it to cover all Virginia Interstates."
- "Specify the road conditions in more detail and perhaps show current pictures of major highways/interstates."
- "Put exit numbers next to hotels and food vendors."

METHODOLOGICAL LESSONS LEARNED

During the design, implementation, and analysis of the web survey, several lessons were learned that may be helpful to others attempting to evaluate travel-related websites. The following table summarizes the lessons that will be discussed in this section.

Table 1. Lessons Learned

Web Site Survey	Lesson Learned
Design	Consider using alternative collection and survey creation software.
	Take a more proactive approach to data collection.
Implementation	The placement of the link to the survey does not make a significant difference.
	The use of incentives is not helpful.
Analysis	It is important to coordinate demographic data with the phone survey.
	Account for visitors who will use the comments portion of the survey instead of the contact link on the website to comment on technical difficulties with the website.
	Limit web-usage questions, instead place emphasis on customer satisfaction questions.

Design Lessons Learned

During the design phase of the website survey, several lessons were learned. First, alternate collection and survey creation software could have been used. Free software available though Virginia Tech was used because of limited time and resources. Using the Virginia Tech free software meant that the web survey could be developed and implemented in a short period of time with limited staff and software-related costs. The university-based software included an online database function for the collection of data. Hence, the only programming required was the placement of a link to the survey on the 511 website. Had additional time or funding been allotted to the web portion of the evaluation, alternate collection and survey creation software could have been considered. Alternate software would have permitted for the creation of a survey that was more visually appealing and, perhaps, easier to use.

The second lesson learned was that during the design phase a more proactive approach to data collection could have been considered. For example, the use of cookies or an alternate identifier (e.g., e-mail addresses, IP addresses, a unique URL or passwords) should have been considered. The use of cookies or alternate identifiers would be beneficial in two ways: first, to increase response rates; and second, to eliminate duplicate responses. The balance between maintaining adequate user privacy and collecting high quality evaluation results must be weighed carefully by every evaluator and sponsor.

The use of an e-mail invitation that invited individuals to complete the on-line survey may have increased the number of survey responses gathered. Using this technique, visitors to the site would be asked if they were willing to provide feedback on the 511Virginia.org site. If individuals were willing, their e-mail addresses would have been collected. Each individual demonstrating interest (by submitting his/her e-mail address) would have been sent an e-mail inviting them to complete the short web-survey. In order to encourage a higher response rate, follow-up e-mails would also have been sent to those who had not initially responded to the e-mail. After individuals completed the survey, an e-mail thanking them for their participation in the survey would have been sent. The software used in this evaluation would have allowed for this type of invitation-driven evaluation.

Use of an e-mail invitation would also have addressed the duplication of responses. Because 511Virginia.org does not collect cookies and because an e-mail password was not required to complete the survey, there was no way to limit the number of times individuals completed the survey. Future surveys of the 511Virginia.org website should consider the benefits of cookies and other delimiters and how they can be used without compromising the privacy of visitors to the site. Additional disclaimers may have to be employed to ensure visitors that personal information will not be sold and that any personal information collected will be destroyed and not maintained.

Implementation Lessons Learned

During the implementation phase of the survey, two findings emerged. First, changing the placement of the survey link on the website did not make a significant difference in the response rate. Initially, the survey link was listed in the banner section of the website and the response rate was less than one percent. This response rate was comparable with the response rate of web-based ads on the 511Virginia.org site during the same time period.

Due to the initial low response rate, the web-survey invitation was moved from the banner ad section of the website to the site's main body, directly below each page's header. This move

occurred in the beginning of April 2003, approximately two months into the evaluation phase. No noticeable increase in the response rate occurred after the move.

It is interesting to note that, without incentives, 511Virginia.org's completed survey rate was shown to be consistent with the site's click through rate for banner advertisements. This may be a good gauge for future evaluations (i.e., to expect the response rate for surveys to be similar to the click through rate of banner advertisements). If securing a response rate comparable to that of advertisements is an obtainable target, then the evaluation team can plan to leave the survey up on the website for the amount of time required to secure the desired number of responses.

The second lesson that emerged during this period was that incentives would not have been helpful. As noted, 511Virginia.org currently does not collect cookies or other personal information. Using incentives for the survey would necessarily require the collection of a personal identifier. Personal information is needed to inform individuals that they have won a prize and also to limit individuals to one entry. If there is no limit on the number of entries, the site risks being susceptible to websites that inform members of currently running contests.

Analysis Lessons Learned

In considering the analysis, one of the lessons learned became immediately apparent. During the design phase of the survey, the evaluation team failed to coordinate the demographic questions in the web-survey with the demographic questions in the phone survey. Future evaluators should coordinate these questions so that comparisons of users can be made more easily.

The second lesson learned is that many website visitors chose to use the comments portion of the evaluation tool instead of the contact link on the website to comment on technical difficulties with the website. While the website evaluation was intended to elicit user's honest feedback, had users chosen to use the "Your Comments" link on the website, their concerns would have been addressed directly and in a timelier manner. Possibly at the beginning of the survey, mention of the "your comments" link on the 511 website should have been made so that there was no confusion about where participants should voice their concerns with technical problems.

The third lesson pertains to the collection of general web-usage habits. During the design phase, it was believed that collecting such information would help site administrators tailor the site to more specifically address the needs of users. The following questions were asked:
- "How frequently do you surf the Web?"
- "What do you regularly use the Web for?"
- "What is your access speed to the Internet?"

However, the inclusion of these questions may have made the survey appear too long to respondents, and several respondents chose to skip these questions. Also, the questions did not glean very useful information for the analysis.

The following questions were found to provide better insight into user's perceptions of the website and should be included in future evaluations:
- "How likely are you to revisit this site on a regular basis?"
- "How likely are you to recommend our site?"

These questions are good indicators of whether or not individuals like the services provided and if they find the services useful. If individuals find the website useful, they are likely to revisit the site on a regular basis or recommend the site to others.

In conclusion, this web-survey was meant to determine if users were satisfied with the website and if they were receiving the information that they needed. The results of this survey indicate that most of the users surveyed were satisfied with the travel conditions information that they were seeking but that it could be improved to better meet their needs. Also, many lessons were learned during the design, implementation, and analysis process. For instance, evaluators can expect a response rate for a web-survey that is similar to that of the click-through rate for a website's banner advertisements. These findings, recommendations, and lessons should benefit others conducting similar evaluations.

APPENDIX A: WEB FINDINGS

Question 1: What was your age on your last birthday? All information is strictly confidential. If you are under 18, we ask that you immediately stop completing this survey.

	Respondents
19 to 99 years old	24
40 to 49 years old	22
50 to 59 years old	31
60 to 69 years old	12
70 or older	5
Don't know/Refused	3
No Answer	11

Question 2: From which part of the world are you visiting the 511 Virginia web site?

	Respondents
United States	93
Canada	0
Mexico	0
Other	2
No answer	13

Question 3: If you are visiting the 511 Virginia web site from the United States, what is your five-digit zip code? *Unless otherwise noted, respondents' number equals one.

Web Zip codes*	City	State	Totals
24941	Gap Mills	WV	1
22308	Alexandria	VA	1
22201	Arlington	VA	1
22810	Bayse	VA	1
24060	Blacksburg	VA	3
24064	Blue Ridge	VA	1
20136	Bristow	VA	1
22815	Broadway	VA	1
22901, 22902, 22903	Charlottesville	VA	5
23322	Chesapeake	VA	1
23831	Chester	VA	1
24073	Christiansburg	VA	2
20124	Clifton	VA	2
24422	Clifton Forge	VA	1
24228	Clintwood	VA	1

Web Zip codes*	City	State	Totals
22821	Dayton	VA	1
24084	Dublin	VA	1
24085	Eagle Rock	VA	1
22824	Edinburg	VA	2
22827	Elkton	VA	1
23847	Emporia	VA	1
22031, 22039	Fairfax	VA	2
22652	Fort Valley	VA	2
22630	Front Royal	VA	2
23060	Glen Allen	VA	1
23065	Gum Spring	VA	1
22801, 22802, 22807	Harrisonburg	VA	3
20169	Haymarket	VA	1
20171	Herndon	VA	1
24343	Hillsville	VA	2
24104	Huddleston	VA	1
22835	Luray	VA	1
22840	Massanutten	VA	1
22644	Mauertown	VA	1
23111	Mechanicsville	VA	1
24138	Pilot	VA	1
24141	Radford	VA	2
24018, 24019	Roanoke	VA	2
22740	Sperryville	VA	1
22851	Stanley	VA	1
24401	Staunton	VA	5
24477	Stuarts Draft	VA	3
22853	Timberville	VA	1
24175	Troutville	VA	1
22890	UNK	VA	1
24486	Weyers Cave	VA	1
23185	Williamsburg	VA	1
22601, 22602	Winchester	VA	3
22191	Woodbridge	VA	1
37047	Cornersville	TN	1
18704	Kingston	PA	1
19066	Merion	PA	1
17976	Shenandoah	PA	1
14075	Hamburg	NY	1
13492	Whitesboro	NY	1
28278	Charlotte	NC	1
27012	Clemmons	NC	1
27284	Kernersville	NC	1
28589	Williston	NC	1

Web Zip codes*	City	State	Totals
22003	Annadale	MD	1
20783	Hyattsville	MD	1
20851	Rockville	MD	1
90805	Long Beach	CA	1
91335	Reseda	CA	1
	Missing		4
	Total		**93**

*Some cities had more than one zip code noted by participants.

Question 4: Are you:

	Respondents
Female	40
Male	55
No answer	13

Question 5: What is your access speed to the Internet?

	Respondents
33.6K or Less	**7**
56K	**29**
Cable/ISDN	**13**
DSL	**17**
T1	**13**
Don't Know	**17**
Other	**0**
No Answer	**12**

Question 6: Since tourism is so important to the economic livelihood of the I-81 region, we would like to collect a general idea about the incomes of those who drive on I-81 and visit the 511 Virginia web site. Would you be willing to share the range of your 2002 household income before taxes?

	Respondents
Under $20,000	3
$20,000 to $35,000	9
$36,000 to $50,000	19
$51,000 to $65,000	10
$66,000 to $80,000	8
$81,000 to $100,000	11
Over $100,000	12
Don't Know/Refused	21
No Answer	15

Question 7: What do you do for a living?

	Respondents
Student	7
Commercial Vehicle Owner/Operator	4
Employee – non-government	27
Employee – government	18
Military	0
Other	26
No Answer	26

Question 8a: Please rate your level of satisfaction with the 511 Virginia Web site Home Page:

	Respondents
Very Satisfied	51
Somewhat Satisfied	17
Neutral	10
Somewhat Unsatisfied	6
Very Unsatisfied	8
No Answer	16

Question 8b: Please rate your level of satisfaction with the 511 Virginia Web site Travel Conditions:

	Respondents
Very Satisfied	43
Somewhat Satisfied	20
Neutral	2
Somewhat Unsatisfied	9
Very Unsatisfied	17
No Answer	17

Question 8c: Please rate your level of satisfaction with the 511 Virginia Web site Shopping & Services:

	Respondents
Very Satisfied	27
Somewhat Satisfied	18
Neutral	23
Somewhat Unsatisfied	3
Very Unsatisfied	2
No Answer	35

Question 8d: Please rate your level of satisfaction with the 511 Virginia Web site Food & Lodging:

	Respondents
Very Satisfied	29
Somewhat Satisfied	19
Neutral	22
Somewhat Unsatisfied	3
Very Unsatisfied	2
No Answer	33

Question 8e: Please rate your level of satisfaction with the 511 Virginia Web site Tourism and Attractions:

	Respondents
Very Satisfied	28
Somewhat Satisfied	18
Neutral	19
Somewhat Unsatisfied	3
Very Unsatisfied	3
No Answer	37

Question 8f: Please rate your level of satisfaction with the 511 Virginia Web site Emergency Services:

	Respondents
Very Satisfied	36
Somewhat Satisfied	15
Neutral	16
Somewhat Unsatisfied	4
Very Unsatisfied	3
No Answer	34

Question 8g: Please rate your level of satisfaction with the 511 Virginia Web site Trip Mapping.

	Respondents
Very Satisfied	32
Somewhat Satisfied	20
Neutral	12
Somewhat Unsatisfied	6
Very Unsatisfied	4
No Answer	34

Question 9: So that we can match the right information with the needs of our visitors to the site, please tell us why you visited our site today.

	Respondents
Travel conditions, including traffic delays and winter weather advisories	77
Food & Lodging information	11
Shopping & Services	4
Tourism & Attractions	20
Emergency Services	7
Trip Mapping	11

Question 10: How likely are you to revisit this site on a regular basis?

	Respondents
Very Likely	50
Somewhat Likely	25
Unlikely	2
Somewhat Unlikely	5
Very Unlikely	11
No Answer	15

Question 11: How likely are you to recommend our site?

	Respondents
Very Likely	51
Somewhat Likely	13
Unlikely	6
Somewhat Unlikely	8
Very Unlikely	11
No Answer	19

Question 12: Where did you hear about our web site (please check all that apply)?

	Respondents
I knew the site name	11
Search engine	23
Guessed the address	3
Online or link from another web site	19
Saw on TV, heard on the radio	17
Newspaper or magazine	5
Word of mouth	16
Other	11

Question 13: How often do you visit the 511 Virginia web site?

	Respondents
Every day	7
Several times a week	8
About once a week	7
Several times a month	13
About once a month	7
Less than once a month	7
This is my first visit here	47
No Answer	12

Question 14: When browsing the 511 Virginia web site, how long do you typically spend here?*
*Non-numeric comments/criticism not included (8 such answers)

Time Spent on Site	Respondents
Less than 5	4
5 Minutes	9
5 to 10 Minutes	2
10 Minutes	10

Time Spent on Site	Respondents
10 to 15 Minutes	1
15 Minutes	14
20 Minutes	3
30 Minutes	3
30 to 45 Minutes	1
45 Minutes	2
60 Minutes	1

Question 15: How much effort did your search on this site require before you found what you were looking for? (Did it take a long time? Did you have to try several times?)

	Respondents
A lot less than I expected	25
Less than I expected	17
About what I expected	24
More than I expected	7
A lot more than I expected	15
No Answer	20

Question 16: How frequently do you surf the web?

	Respondents
Every day	62
Several times a week	15
About once a week	6
Several times a month	3
About once a month	0
Less than once a month	2
This is my first visit to the web	3
No Answer	17

Question 17: What do you regularly use the web for? (Please check all that apply -- This information will let us know what additional information you would like to see, if possible, on our site.)

	Respondents
News	64
Work Research	48
Personal Research	62
Investments	20
Shopping	45
Auctions	11
E-mail	67
Chat/communities	11
Web-based address book/calendar	7
Banking	30
Other	9

Question 18: How often do you use the web to find traffic information?

	Respondents
Every day	12
Several times a week	18
About once a week	8
Several times a month	7
About once a month	12
Less than once a month	8
This is my first visit here	22
No Answer	21

Question 19: How often do you use the web to find traveler information (i.e., information on tourist attractions, vacation packages, trip routing, etc.)?

	Respondents
Every day	3
Several times a week	4
About once a week	12
Several times a month	11
About once a month	15
Less than once a month	21
This is my first visit here	19
No Answer	23

Question 20: When do you plan to travel along the I-81 Corridor?

	Respondents
Immediately	36
Within the next week	29
Within the month	10
Within three months	7
Within six months	2
Within the year	1
More than one year	0
Never	3
No Answer	20

Question 21: What is your primary use of the 511 Virginia web site?

	Respondents
Business	22
Leisure	35
Education	5
Other	19
No Answer	27

Question 22: Respondent Suggestions and Feedback

Comments have been clustered into categories based on the type of information that the individual was seeking (i.e., travel conditions, tourism and attractions, trip mapping, etc.). Please note that comments addressing multiple categories have been listed under each area. Grammar is included exactly as entered on the survey. Names have been deleted to ensure the privacy of respondents.

Travel Conditions (Accidents, Construction, Road Conditions, etc.)

- Love the camera and weather on Afton! Accident reports very helpful

- Please continue your great work. More web-cams please, and if you could, create an e-mail system to send alerts regarding Accidents to my Inbox!!

- I love the cameras, especially the one on Afton Mountain. I wish the pictures were larger. If I see fog or there are reports of fog/snow/ice, I may alter my travel plans. I would like access to similar information in other parts of Virginia. This is a valuable tool for me. Thanks for this great website and for keeping it up to date.

- I feel that you should cover a little more of the I64 travel conditions. My son has an appointment at UVA this morning and I just could not find what I needed on your website. But it did a great job for I81. Thanks

- I came on here because a girlfriend is stuck in traffic on 81. By going to www.mamma.com and putting in "Traffic"+"I-81" I was able to go to find your site and could tell her while on the phone what she was being stalled for. Thank you SO much!!! I only wish you had a radio station listing so I could have her tune in and know up to the minute information without running up her cell phone minutes. Again, thank you so much for what you *have* done. I have a friend stuck on 81 behind construction and an accident who is grateful this information was readily available because all she could see were the back of cars!!!

- I use the site to obtain current travel conditions during weather events such as snow & flooding (like today). I only see 2 reports of flooding on the site right now in the Roanoke area however even the national weather service is reporting more. My suggestion is that the site be more updated to all areas with traffic issues as quickly as possible. I really like the site when it is updated. I need the information to pass on to our staff to help keep them safe on their travel to and from work. Thanks!

- This is one of the best sites I have found for travel information. Thanks and keep up the good work.

- Needs to be updated more frequently -- doesn't seem to reflect current conditions. The road conditions and accidents need a lot of improvement. Road information from other sources showed a lot of accidents due to snow/ice - you showed one accident. Tractor trailer drivers rated highway conditions worse than you did. You don't seem to update timely and accurately.

- It is February 16 "the snow storm." Why don't you post on the website I-81 driving conditions? Why do I have to call 511. I am stuck in Philadelphia and trying to get back to Roanoke where I live. West Virginia and Maryland did better than you all. The computer I am using at a friends house can to bring up your color coded map. Can't you type the information some where as well??

- You have not updated the site today even though we are having a snow storm. What I want to know is if there are any problems on the road. I have no idea what the answer to that question is after seeing your website.

- There should be current traffic information--although you say it is there, your maps do not give any information--there is an ice storm going on and I need to go from Blacksburg to Tazewell County and I can't find out the condition of 460--if you are going to offer this service you need to do better than the map with rollovers--find out what state is good at this and copy them

- No pictures of Afton Mountain 15 June 8:30 pm. Daughter stuck in traffic and 511/phone/VDOT website no help!

- When there are problems on 81 such as the one on June 24 between mile 257 & 264, please give more info than to call 511. NOT EVERYONE HAS A CELL PHONE!!! If the

variable message sign had said that the road was closed at 257, I would have taken 33 to 340 to 66.   Since the message only said accident and call 511, I did not know the road was closed (repeat NOT EVERYONE HAS A CELL PHONE). It took me 3 hours to go 7 miles.   I have never been in anything that bad in the DC metro area. As far as I am concerned, 511 is useless. P. S. We were returning home from VA Tech. Our daughter is considering Tech and had attended an info session at admissions. If she goes to Tech, we will be making many trips. There has to be a better way to warn of major road problems!

- Travel conditions are sketchy & accidents are slow in appearing on web. More than enough information on road construction. The site needs a lot of improving!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

- I wanted to check the site out for road conditions since I travel 81 & 66 every day to go to work in Northern Virginia. Also my husband is a truck driver so we check for his work travel also. I was disappointed because nothing showed up for road conditions.

- I desire to know the weather related travel conditions using I95,I64 and I81 and if possible, the road conditions from Fredericksburg to Orange then to Gordonsville and finally to Shadwell. Many of my questions are still unanswered so I'll call the State Police where I'll not get a runaround.

- Couldn't get ANY information regarding road conditions.

- Need to put your travel conditions for 1-81 in more detail especially in snowy weather.

- Your road conditions site SUCKS!!!!

- Specify the road conditions in more detail and perhaps show current pictures of major highways/interstates.

- I desire to know the weather related travel conditions using I95,I64 and I81 and if possible, the road conditions from Fredericksburg to Orange then to Gordonsville and finally to Shadwell. Many of my questions are still unanswered so I'll call the State Police where I'll not get a runaround.

- I live in Charlottesville and just started working in Staunton which means traveling over 64 (Afton Mt) to work. There is frequently problems on Afton Mt with traffic and it would be good to add this section of road with more current information (perhaps more in depth).

- A little bit more information about traffic congested areas similar to the "traffic watch service" available in larger cities.

- I would like to have updates in my email box. This would include accidents, etc. I can envision other traveling with portable web devices benefiting tremendously. My email is: *(VTTI deleted personal information for privacy reasons).*

- I would like to see an option under traffic conditions where I would be emailed if there were any incidents on I-81. I commute from Radford to Roanoke daily. It would be very useful.

- Yours is an excellent Website. The only fault I found was the dates were not listed immediately underneath the "Fairs and Festivals" listed.

- Today I was trying to find something about the Luray Caverns. I live in Front Royal and have visited Luray a number of times over the years. There must be some ways you can make this site far easier to use. I have to guess, and you seem to change it from time to time. I have not seen any improvement despite some changes. Thanks.

- I love the places you advertise, I have stayed at most. If the restaurant gave some type of coupon that could be printed off this site as other sites do that would be great.

- Put the exit numbers next to hotel and food vendors.

- Please have listing of campgrounds and RV support.

- Provide accurate weather predictions, especially in the winter, so that we know whether to travel or not.

- In the winter provide weather conditions!!!!! When we click on weather conditions, nothing comes up. Get busy!!!!!!

- I don't know what mile markers are at what city. It would be nice to have mile markers shown on the map on the web site. Also, by phone, say what cities are at what mile marker.

- SITE needs more connecting links. Needs to be advertised ... Bumper sticks, newspaper ads, merchants using the site, PHONE Book and Yellow Pages, etc.

- When I was visiting the Frontier Culture Museum recently I picked up one of the 511 litter bags at the Tourist Information Stand. I would like to know how I could obtain @400 of the these 511 plastic litter bags. We are organizing a RV Rally for Carriage Trailers in Virginia in September and would really like to give these bags out with information packed

in them. I would appreciate a message back by E-Mail or a telephone call to inform me of the possibility of getting these bags. If there is other information that would appropriate to include in the bags I would like to have information on that also. Thank you. *(VTTI deleted personal information for privacy reasons).*

Technical & Design Issues

- Keep it clean and simple, just like it is. Don't clutter it up with ads or pop ups. As a computer specialist, you have done a remarkable job. LOVE IT.

- Get the cams in working order. I know the one on Afton was hit buy lightening but not everyday. It is always out any more. My son lives right there and it is great to see his area. Over all this is a very pleasant site that is very easy to navigate. I never hit a dead link and except for the cam problem it is great!! Excellent job and this makes my day a little bit nicer. Thank you.

- Please do the best you can to make sure the cameras are working when the weather is bad (rainy / foggy). Today (4-18) it is rainy, may be foggy, and neither the Afton nor Winchester camera is working.

- No pictures of Afton Mountain 15 June 8:30 pm. Daughter stuck in traffic and 511/phone/VDOT website no help!

- I love the cameras, especially the one on Afton Mountain. I wish the pictures were larger.

- Every few seconds the page moves, which is very distracting.

- I tried to look at the traffic conditions, and it didn't load at all.

- When I was there NOTHING came up. I couldn't find out about the weather or how bad the roads were.

- Site is difficult to view due to the constant resizing of the window containing traffic incident information.

- This constant resizing makes it very difficult to read any of the textual portions on the site. Can anybody concerned with the website maintenance have actually tried to view it recently. My guess is no. Bad design but easily correctable by making fixed width window.

- Travel information never came up.

- I click on current traffic conditions and only a blank page comes up. The little window with accidents is to small and the lines scroll too fast.

- I have clicked on road conditions for I-81 over and over again and nothing comes up. HELLO!!! ARE YOU THERE????

- I have clicked on road conditions endlessly with no results. Is anyone there? Your service is terrible!! Anyone thinking about visiting Virginia would really be turned off.

- When I clicked on any of the road condition choices it would just come back to the same page without providing any information. Giving some information about road conditions would be an improvement.

- Road condition map nearly unreadable. Flashing items flash too fast.

- I find information such as weather in strange places. Your search engine is poor. There are not enough web links to properties on the site.

- Larger maps!!!

- Have the information available in an alternative format, i.e. tabular so it can be printed. The maps are pretty but have limited value if you want to take the data with you.

- I have a question? Why are the signs posted on the highway? I can't use it with my cell phone.

- 511 cannot be dialed from Verizon Wireless Network in Botetourt County. 511 is blocked.

General Comments & Criticisms

- Great site, wish all of the states had one

- This site is a very good idea.

- Great Resource, Thanks for the Help!

- This is a great site with great information, maps, etc. I wish more states would do this type of page.

- Do something with your time that you know something about.

- You can not find information on this site it is not worth getting on here

- What a VA Governmental Waste of Resources. This website should be shutdown. It should include Counties of Fairfax, Loudon, Arlington, and Prince William. What a disappointment.

- If you put school, plant, and business closings on this site you will have more interest.

- When you list cities you might also include a map or listing of the county. Thank you

- Expand it to cover all Virginia Interstates.

- I think that it would really be helpful to extend the 511 up a little to WV! That would be great for the loads of people who work in WV and live in VA!

APPENDIX B: 511 VIRGINIA WEB SITE SURVEY

511 Virginia Survey

Thank you for taking the time to complete our survey. The survey will take about five minutes. We will use the responses from the survey to evaluate and improve the functionality of the 511 Virginia website. This survey is being conducted by the Virginia Tech Transportation Institute for the Virginia Department of Transportation (VDOT). VDOT is interested in your opinions about traveler information available about I-81 in Virginia. This is strictly for research purposes; we are not selling anything and we do not collect personally identifying information. You are free to stop this questionnaire at any point and you can refuse to answer any particular question at any time. If you have already completed the survey once or if you would like to provide detailed comments and suggestions on how we can improve the site, please forward your comments at any time to the webmaster via our electronic submission page at: 511 Virginia Comments.

To view 511 Virginia's privacy policy, please click here: Privacy Policy.

Before you tell us what you think about our site, please tell us about yourself—remember, this information is private. We will not sell or share our information with anyone.

1. What was your age on your last birthday? All information is strictly confidential. If you are 18, we ask that you immediately stop completing this survey.
   - ☐ 19 to 39 years old
   - ☐ 40 to 49 years old
   - ☐ 50 to 59 years old
   - ☐ 60 to 69 years old
   - ☐ 70 or older
   - ☐ Don't know/Refused

2. From which part of the world are you visiting the 511 Virginia website?
   - ☐ United States
   - ☐ Canada
   - ☐ Mexico
   - ☐ Other: _____

3. If you are visiting the 511 Virginia website from the United States, what is your five-digit zip code? _____

4. Are you:
   - ☐ Male
   - ☐ Female

5. What is your access speed to the Internet?
- ☐ 33.6K or less
- ☐ 56K
- ☐ Cable/ISDN
- ☐ DSL
- ☐ T1
- ☐ Don't know
- ☐ Other

6. Since tourism is so important to the economic livelihood of the I-81 region, we would like to collect a general idea about the incomes of those who drive on I-81 and visit the 511 Virginia website. Would you be willing to share the range of your 2002 household income before taxes?
- ☐ Under $20,000
- ☐ $20,000 to $35,000
- ☐ $36,000 to $50,000
- ☐ $51,000 to $65,000
- ☐ $66,000 to $80,000
- ☐ $81,000 to $100,000
- ☐ Don't Know/Refused

7. What do you do for a living?
- ☐ Student
- ☐ Commercial Vehicle Owner/Operator
- ☐ Employee – non-government
- ☐ Employee – government
- ☐ Military
- ☐ Other: _____

8. Please rate your level of satisfaction with the 511 Virginia website:

8a. Home Page
- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Somewhat Unsatisfied
- ☐ Very Unsatisfied

8b. Travel Conditions
- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Somewhat Unsatisfied
- ☐ Very Unsatisfied

8c. Food & Lodging
- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Somewhat Unsatisfied
- ☐ Very Unsatisfied

8d. Shopping & Services
- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Somewhat Unsatisfied
- ☐ Very Unsatisfied

8e. Tourism & Attractions
- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Somewhat Unsatisfied
- ☐ Very Unsatisfied

8f. Emergency Services
- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Somewhat Unsatisfied
- ☐ Very Unsatisfied

8g. Trip Mapping
- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Somewhat Unsatisfied
- ☐ Very Unsatisfied

9. So that we can match the right information with the needs of our visitors to the site, please tell us why you visited our site today:
- ☐ Travel conditions, including traffic delays and winter weather advisories
- ☐ Food & Lodging
- ☐ Shopping & Services
- ☐ Tourism & Attractions
- ☐ Emergency Services
- ☐ Trip Mapping

10. How likely are you to revisit this site on a regular basis?
- ☐ Very Likely
- ☐ Somewhat Likely
- ☐ Unlikely
- ☐ Somewhat Unlikely
- ☐ Very Unlikely

11. How likely are you to recommend our site?
- ☐ Very Likely
- ☐ Somewhat Likely
- ☐ Unlikely
- ☐ Somewhat Unlikely
- ☐ Very Unlikely

12. Where did you hear about our website (please check all that apply)?
- ☐ I knew the site name
- ☐ Search engine
- ☐ Guessed the address
- ☐ Online or link from another website
- ☐ Saw on TV, heard on the radio
- ☐ Newspaper or magazine
- ☐ Word of mouth
- ☐ Other_____

13. How often do you visit the 511 Virginia website?
- ☐ Every day
- ☐ Several times a week
- ☐ About once a week
- ☐ Several times a month
- ☐ About once a month
- ☐ Less than once a month
- ☐ This is my first visit here

14. When browsing the 511 Virginia website, how long do you typically spend here? _____

15. How much effort did your search on this site require before you found what you were looking for? (Did it take a long time? Did you have to try several times?)
- ☐ A lot less than I expected
- ☐ Less than I expected
- ☐ About what I expected
- ☐ More than I expected
- ☐ A lot more than I expected

16. How frequently do you surf the web?
- ☐ Every day
- ☐ Several times a week
- ☐ About once a week
- ☐ Several times a month
- ☐ About once a month
- ☐ Less than once a month
- ☐ This is my first visit here

17. What do you regularly use the web for? (Please check all that apply—This information will let us know what additional information you would like to see, if possible, on our site?)
- ☐ News
- ☐ Work research
- ☐ Personal research
- ☐ Investments
- ☐ Shopping
- ☐ Auctions
- ☐ E-mail
- ☐ Chat/communities
- ☐ Web-based address book/calendaring
- ☐ Banking
- ☐ Other:_____

18. How often do you use the web to find traffic information?
- ☐ Every day
- ☐ Several times a week
- ☐ About once a week
- ☐ Several times a month
- ☐ About once a month
- ☐ Less than once a month
- ☐ This is my first visit here

19. How often do you use the web to find traveler information (i.e., information on tourist attractions, vacation packages, trip routing, etc.)?
- ☐ Every day
- ☐ Several times a week
- ☐ About once a week
- ☐ Several times a month
- ☐ About once a month
- ☐ Less than once a month
- ☐ This is my first visit here

20. When do you plan to travel along the I-81 Corridor?
   - ☐ Immediately
   - ☐ Within the next week
   - ☐ Within the month
   - ☐ Within three months
   - ☐ Within the year
   - ☐ More than one year
   - ☐ Never

21. What is your primary use of the 511 Virginia website?
   - ☐ Business
   - ☐ Leisure
   - ☐ Education
   - ☐ Other:_____

22. If you have a suggestion or recommendation to improve our site, please provide it below.

Thank you for taking the time to complete this survey! Your comments and remarks are greatly appreciated. Please visit 511 Virginia again soon!

SUBMIT

References

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511 Virginia Evaluation

January 2004

Phone Survey Report
Chapter 4

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CHAPTER 4 : PHONE SURVEY REPORT

EXECUTIVE SUMMARY

An assessment of the 511 Virginia phone system was a primary goal of this 511 evaluation. The evaluation team at the Virginia Tech Transportation Institute (VTTI) wanted to determine if the phone system was achieving acceptable customer satisfaction levels and making progress towards stated Virginia Department of Transportation (VDOT) Intelligent Transportation (ITS) goals, as well as meeting the National 511 quality goals for 511 phone service of accuracy, timeliness, reliability, consistency of presentation, and relevancy. To accomplish this assessment, VTTI developed and implemented a phone-based survey methodology to determine statistically significant findings among users. The key difference between the phone survey and the awareness omnibus survey was that the phone survey focused only on callers to 511 Virginia while the omnibus surveyed the general population of Virginia and did not include awareness or usage of 511 as a deciding factor for participation.

With regards to VDOT's ITS stated goals (as applicable to the 511 Evaluation), the 511 users surveyed indicated that:

<u>Customer Satisfaction</u>

1.) Callers felt that they had increased awareness of available traveler information through access to the new three digit traveler information number, 511 Virginia (365 of 393, or 93%).

<u>Mobility and Efficiency</u>

1.) The phone system did provide enough information and was, in general, timely enough for users to change their travel behavior based upon what they heard. But, the results included first time callers who had not had the opportunity to experience 511 Virginia enough to affect their travel behavior. However, with first time callers included, 49% of all callers indicated that they had changed their plans based upon what they had heard on 511 Virginia, and 166 of 212 indicated that they changed their plans by changing their route. See Figures 27 and 28 for more details.

2.) While no baseline survey work was conducted, a reasonable confidence level in the safety of the I-81 regional roads currently exists. The mean was Somewhat Safe, or 0.6 on a scale from -2 to 2, and 63% reported that they perceived the I-81 Region as either very safe or somewhat safe. In addition, having access to 511 Virginia has had little effect on users' opinions of the safety of the I-81 Region (i.e., 53% reported no change in their perception of the safety of the I-81 Region based on 511 Virginia alone). See Figures 19-21 for complete breakdowns of the results.

With regards to National 511 quality goals of accuracy, reliability, consistency of presentation, and relevancy, the incident inputs to 511 Virginia were analyzed for presenting three factors:

1.) What (Accident, Lane Closure, etc.)
2.) Where (Location)
3.) Action/Effect (Directions for Traveler)

It was found that 94% of all incident postings to 511 from August 1, 2002 through September 30, 2002 and from August 1, 2003 through September 30, 2003 (both periods, a total of 96 events) complied with this standard of transportation information.

Other findings of interest from the phone survey of 511 Virginia users were:

1.) Based upon a very small sample of only 19 drivers, findings indicated that commercial vehicle operators are neutral about the availability of truck parking for the I-81 Region. This may be due to the fact that over half of the CVOs surveyed were short-haul drivers who would not have a need for overnight parking. See Figure 16 for a complete breakdown of responses.

2.) To answer the most important question about whether or not 511 Virginia is meeting the public's travel information needs, the survey respondents were asked about the service's usefulness. The mean response was Very Useful (a score of 1.5 on a scale from -2 to 2). A full 90% ranked 511 Virginia as Somewhat Useful or Very Useful. See Figure 22 for a complete breakdown of responses.

3.) A good way to measure loyalty and satisfaction for a phone service is to determine whether or not a caller would indicate that he or she would call back. 511 Virginia was very successful in this area; 99% of the respondents indicated they would call 511 Virginia again. See Figure 29 for a breakdown of the remaining respondents.

4.) A large majority of respondents (73%) perceived VDOT in a more positive light based upon its offering 511 Virginia. See Figure 32 for more details.

Summary of Recommendations

The evaluation team recommends that:

1.) More research should be done into the CVO community's needs and usage of the 511 phone service.
2.) Develop and monitor a permanent feedback loop on the phone system.
3.) Provide more detailed traffic information to include the exact location and duration of road incidents.
4.) Do more usability research into how to make the phone system easier to navigate.
5.) Monitor and improve timeliness of travel information available on 511 Virginia.
6.) Determine the ratio of long haul to short haul drivers on I-81 and cater travel information to the majorities' needs.

7.) Tailor the phone tree structure and information format to better facilitate caller decision making (e.g., more in-depth alternate route information should be easily accessible from the traffic menu, if callers change their travel route).

8.) Do more research into travel information that callers might desire if they do change their plans based upon information they hear on 511.

9.) Develop a means to identify and record first time callers through the call software employed (e.g., TellMe, Inc. XML software).

10.) Investigate why some callers perceive that the voice recognition is not working.

11.) Focus primarily on providing timely traffic information.

12.) Investigate why callers are willing to call 511 again.

13.) Do more awareness marketing.

14.) Peak interest in the system along the road to increase calls. 23% (87 of 383) of those surveyed indicated that they first called 511 out of curiosity or boredom.

15.) Slightly cater marketing to males.

16.) Advertise 511 on weather.com or weatherchannel.com (same site).

17.) Focus marketing to residents during work time (8am and 5pm, Monday – Friday) radio or billboards.

18.) In addition to I-81, I-77, and I-64, focus marketing along I-40, I-75, I-95, and I-65 welcome centers.

19.) Focus marketing or work with the top three states (PA, NC, TN) to increase out-of-state awareness.

20.) Focus marketing in the top three tourist destinations (Blacksburg, Roanoke, Harrisonburg) to increase tourist awareness of the current 511 system, and focus marketing in Roanoke, Richmond, Fairfax, Woodbridge, and Winchester (Top tourist origination cities).

21.) Develop special travel information for business travelers

Summary of Lessons Learned

As a summary of lessons learned for future evaluation methodologies, the evaluation team recommends:

1.) If multiple team members will be responsible for different segments of the write-up, agree ahead of time on the formatting of the graphs and the methods of referring to statistics/parameters. For example, always indicating "n=xxx" for each statistic, if the responses are low enough to prevent accurate representation with a percentage alone (i.e., too small of a sample size to be statistically significant) or deciding whether or not to include the "Don't Know/Refused" category in each presented graph. This will save hours of revisions if done ahead of time and correctly.

2.) Make sure that response brackets match between the different instruments (i.e., using the same age brackets with the web survey as with the phone survey) for an easier comparison between instruments.

3.) Over-recruit the sampling frame. Expect a 1.5% response rate to the initial intercept, if attempting to intercept callers to the 511 phone system.

4.) In future 511 surveys, evaluation teams should find out whether or not the participant is a first time caller.

5.) For the most efficient use of resources, purchase questions on an omnibus - especially for general population awareness items.

6.) If appropriate, include business travelers as a category (in addition to residents, tourists, and CVO) to better assess their needs.
7.) For better CVO sampling, design an instrument and incentive exclusively for that segment.

BACKGROUND

Purpose

While the focus groups, which served as the question development forum for the phone survey, and the omnibus survey for measuring 511 awareness, drew from users and non-users alike, the phone survey drew only from current users of the system. The phone survey was used to derive statistically significant results of the users' demographics, associations between their reasons for travel and their usage behavior, the effect that the information they were able to access had on their travel behavior, what causes users to access the system, and finally, what other sources for traveler information the system competes against.

Objectives

Specifically, the phone survey was developed to meet the following 511 Evaluation goal areas and objectives:

Customer Satisfaction:
- Improve traveler's ability to access information

Mobility & Efficiency:
- Measure the change in traveler behavior (e.g., When provided with real time information about an accident, what effects does the information has on traveler behavior?)
- Measure the change in traveler confidence in the safety of I-81

METHODS

Approach

The phone survey consisted of developing an automated phone intercept that was placed in the global portion of the message that callers first hear when they call 511. This message would not be bypassed by the average caller. The system requested that the caller leave his or her name and number to be contacted at a later time for a survey. The participants would be paid ten dollars, if they were interested. The names and numbers were recorded to voice files. These were then listened to and entered into a sample frame database, which was the main entry page into a web-based survey software developed by VTTI for administering the survey. This software included a means of gathering payment information. The .wav files were deleted after being converted into the database. As far as the entered data, the callers who left their name and number but could not be reached were deleted, as were those who participated and did not wish to have their names and numbers remain on a list for VDOT's use in the future. The names and numbers of those willing to remain on a list for VDOT's use were delivered to the VDOT representative managing this evaluation through a separate, more secure means. All personally identifying information was removed before analysis was begun on the data.

Subject Recruitment

In order to develop a database of participants, each caller was offered (in the global portion of the phone system menu) an opportunity to leave his or her name and number for a survey administrator

to call him or her back at a time that was convenient. There was a $10 incentive offered to obtain a more neutral participant pool.

The following is the draft of the message that users heard in the global portion of the phone system, which asked callers if they would like to participate in a survey about the 511 system.

After the initial greeting and before the traffic information all users heard:
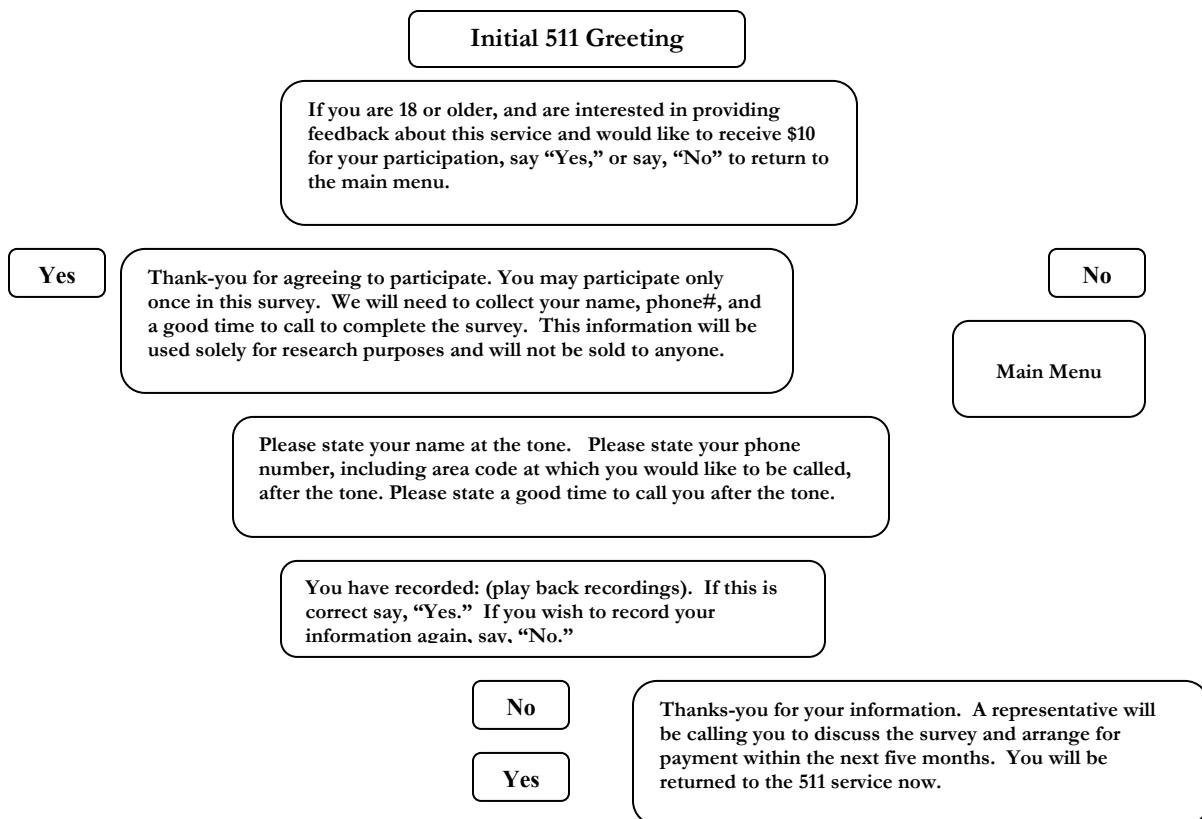
Figure 1: 511 Virginia Intercept Phone Tree.

Survey Development

<u>Instrument</u>

See Appendix A for a copy of the phone survey with instructions to administrators, all tables of raw data, and the associated graphs. The phone intercept message was active for two periods of time: one period in March for 21 days, and one period in May for 18 days. Each period, users who agreed to leave their information were contacted, and the survey was administered verbatim from the online survey administration web site by evaluation team members trained in phone survey techniques. The survey was revised based upon findings from the focus groups, and it received verbal approval from Virginia Tech's IRB. The results were coded and maintained in an Excel spreadsheet that was independent of the participants' personally identifying information. The personally identifying information was maintained in a separate database for accounting purposes.

<u>Data Management</u>

The names and information were initially stored as voice files. Every period, one member of the evaluation team accessed the voice files and transferred them to the web-based survey, permanently deleting the voice files after they had been recorded. The Excel file of responses was maintained on an independent computer that was password protected. From the website, the survey administrators called and administered the survey over the phone, collecting personally identifying information separately and only for the purposes of mailing the incentive to participants. Each respondent was assigned a sequential subject identification number, and this ensured that no personally identifying information was connected with survey responses. A separate area of the web-based survey was used to account for the incentive payments, and it did contain participants' names and address information. This file was deleted once all of the surveys were completed, and it was maintained in the interim only to resolve any incentive payment issues and to document the allocation of the incentive funds for Virginia Tech's Purchasing Department.

Subject Privacy

The introduction to the survey was developed to inform participants about the goal of the survey, as well as to assure them that personally identifiable information would not be connected with their answers and the survey administrators were not selling anything.

Below is the excerpt of the introduction:

> Hello, my name is *your first & last name* and I am administering a research survey about 511 for the Virginia Tech Transportation Institute for the Virginia Department of Transportation or VDOT (pronounced "vee-dot"). You previously indicated that you would be interested in answering a survey for 10 dollars regarding your experience with 511. This is strictly for research purposes; we are not selling anything, and we only collect personally identifying information in order to send you your payment. Personal information will not be connected with your responses in anyway. If you do participate, you are free to stop the survey at any point and you can refuse to answer any particular question at any time. The entire survey should only take about 10 minutes. Are you still interested in telling us your opinions about travel information in the I-81 region?

The screening questions were designed to ensure that each respondent was older than 18 years of age, and that he or she was in fact a driver on the roads of interest. It was also intended to give the survey administrator a chance to collect basic demographic information about the respondent. The screening questions ended with the reason for traveling question, in order to group the respondents into one of the three segments: resident, tourist, or commercial vehicle operator. Although the user already indicated his or her age once on the phone, the survey administrators asked once again before proceeding to the survey. This was used as a secondary precaution to ensure that minors were not questioned in the survey.

SAMPLING

Sample Frame

Before taking the sample, based upon a 95% confidence interval, maximum variability (50-50), and a + or - 5% error rate for a large population, the sample size, to be statistically significant, was

determined to be at least 384 responses. The phone system's average monthly call volume was 7,371 callers. Based upon an estimated 1.5% response rate, the intercept was expected to run for eighteen weeks. The timeline could be adjusted based upon the actual response rates once they could be determined. The users would be self-selecting, due to the fact that they were users of 511 to begin with and would possibly be acting out of interest in the monetary incentive or a desire to provide negative or positive feedback.

The sampling and final sample frame for this survey was broken into two periods:
1st Period: March 10, 2003 - March 31, 2003 (201, or 50.25% of the sample), and
2nd Period: May 2, 2003 – May 20, 2003 (199, or 49.75% of the sample).

During the first period, which was 21 days long, there were 13,139 total callers into 511 Virginia. 422 callers (or 3.2% of all callers) left their name, indicating that they might be willing to complete the survey for ten dollars. A total of 201 callers (or 1.5% of all callers, or 48% of those that left their name) completed the survey for ten dollars. The call duration was 1 minute and 12 seconds while the phone survey was active.

During the second period which was only 18 days long, there were 6,479 total callers into 511 Virginia. 322 callers (or 5% of all callers) left their name, indicating that they might be willing to complete the survey for ten dollars, and 199 (or 3.1% of all callers, or 62% of those that left their name) completed the survey for ten dollars. During the second call period, the call duration was one minute and 41 seconds.

The weather during these two periods varied significantly. During the first period, the weather included one severe thunderstorm warning and two winter storm warnings for the whole corridor, and in the Staunton District, there was also a flood warning. The following are the events that correlated with the first sampling period:

Figure 2: March 2003 Correlations on I-81.
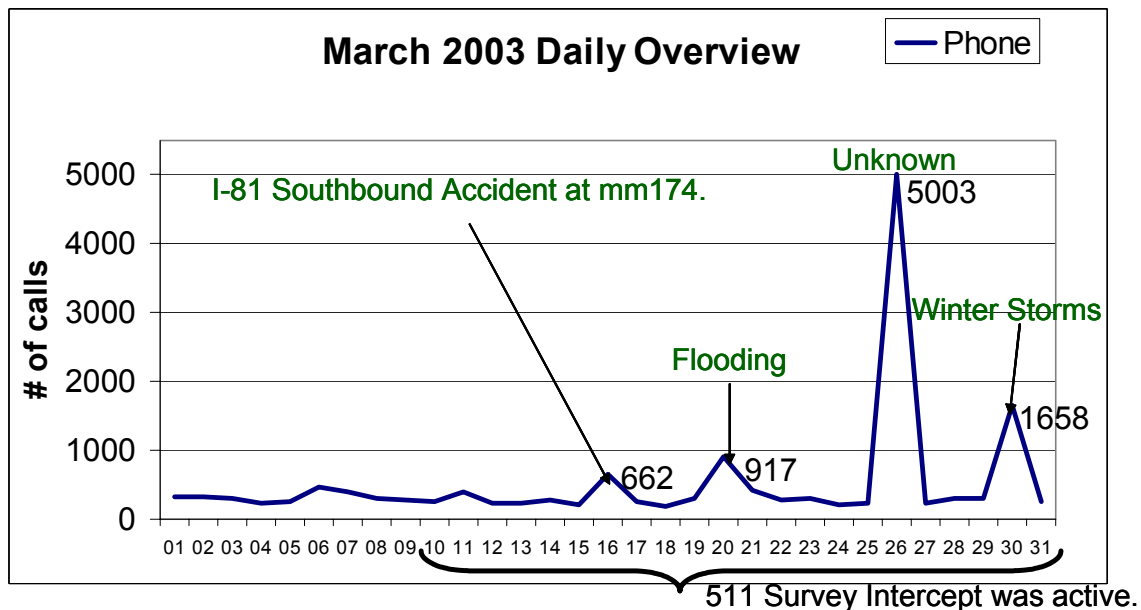
The weather during the second sampling period was more severe, with five severe thunderstorm warnings, high wind warnings, dense fog warnings, flood and flash flood watches, and one tornado warning that affected the entire corridor. The following are the events that correlated with the active intercept period:

Figure 3: May 2003 511 Correlations on I-81.
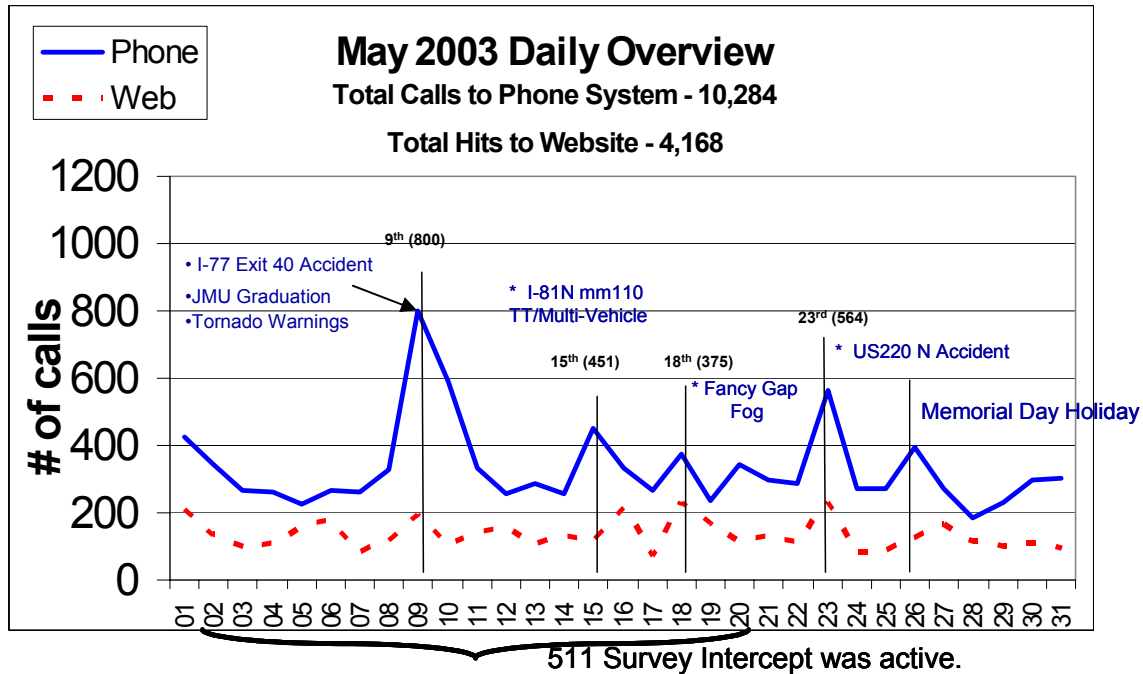
The survey response rate was based upon the 1982 approved Council of American Survey Research Organization (CASRO) formula for response rates[1]. The following is the final calculation for response rates, treating both collection periods for the sample as one set of data:

Table 1: Final Cumulative Response Rate Calculations.

Population:	Callers to 511 Virginia	
Sampling Frame:	Callers who left contact info on the phone system in March and May 2003	
Desired Sample Size:	400 callers	
Sample Plan:	Systematic sample, including over sampling in order to achieve the 400 desired completions.	
Eligibility of Respondents:	Sponsor wants only callers who have experience with 511	
Codes:	Response Rate = 29.75%	Totals
D	Disconnected	25
WT	Wrong Target	33

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[1] Burns, Alvin C., R.F. Bush. Marketing Research, 3rd Ed. Prentice Hall, Upper Saddle River: NJ, 2000, pgs. 471-472.

IR	Ineligible Respondent	0
R	Refusal	34
T	Terminate	25
C	Completed	390
BSY	Busy	0
NA	No Answer	915
CB	Call Back	183
Response Rate= Completions/[Completions + (completions/(completions + ineligible)) * (refusals + not reached)]		

The survey utilized a modified Likert-scale and lifestyle inventory questions. The survey questions were developed from focus group input and were tested prior to administering the survey for clarity of meaning.

MAJOR FINDINGS

Demographics/Screening Questions

The evaluation team asked seven screening questions to attempt to decipher who the average caller is that calls 511 Virginia. The seven screening questions were:

1. Are you at least 18 years old?
2. Do you travel on I-81, I-77, I-66, I-64, or in the areas around these interstates?
3. Recorded Gender
4. What was your age on your last birthday?
5. Since tourism is so important to the economic livelihood of the I-81 region, we would like to collect a general idea about the incomes of those who drive on I-81. Would you be willing to share the range of your 2002 household income before taxes? Please stop me when I get to the right range: (income ranges are then read to the participant)
6. To make sure we talk with a variety of people, in which county and state do you live?
7. What is your typical reason for traveling in the I-81 Region?

Based upon the demographic information collected from 511 callers who participated in the survey, all participants were 18 years or older, and had driven on the roads in the I-81 511 coverage area. The average caller was a male, in-state resident of the 511 region, between the ages of 18 and 29, with a household income between $51,000 and $65,000 a year. This differs from the Census Bureau's information for what the average resident of Virginia looks like, which is a female between the ages of 35 and 44, with a household income between $50,000 and $74,000.

Below is a comparison of demographic information for the 511 survey participants, the demographic data of just the 511 covered counties in Virginia, and that of all Virginians[2]:

	511 Virginia Survey Highest Frequency Categories	511 Virginia Counties - Census Data	All of Virginia - Census Data
Mean Travel Time to Work	30 minutes to 1 hour	26.5 minutes	27.0 minutes
Median Household Income	$51,000-$65,000	$32,330	$46,677
Male vs. Female	56% Male vs. 44% Female	49.6% Male vs. 50.4% Female	49.0% Male vs. 51.0% Female

	511 Virginia Survey Demographics
Age Brackets	18-29 years old
Commute Time of Day (Residents)	8am in the morning 5pm in the evening Monday-Friday
Travel to/from/in I-81 Region? (Tourists)	> 5 times a year
How far in advance do you decide to make the trip? (Tourists)	1 – 3 weeks in advance
Typical # in Party? (Tourists)	2

Within Virginia, not all callers were from the 511 coverage area. Based upon all participants in the survey (including out of state participants), 37% (or 148 of 400) were from the outside the 511 coverage area. Not all survey participants were from Virginia. A full 37% (148 of 400) of the respondents were from out-of-state, with Tennessee leading the way, as can be seen in Figure 4.

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[2] Census information from the 2000 Census for Virginia. Accessed 10NOV03 http://www.census.gov

Figure 4: Out-of-State Responses.
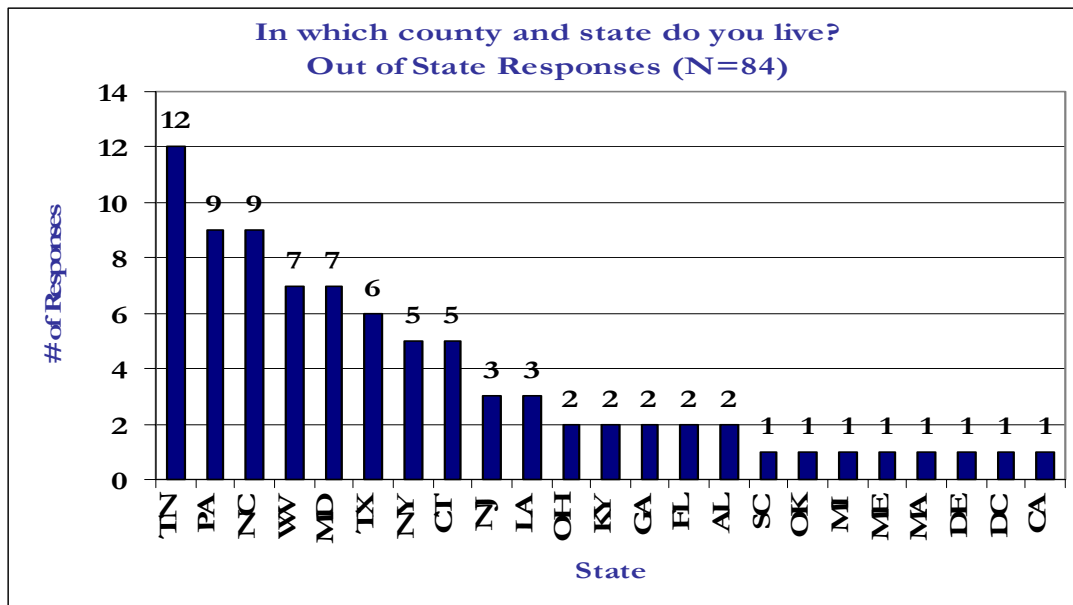
The complete break down of the genders, ages, income brackets, and residences of the callers is included in the phone survey in Appendix A.

The evaluation team decided to funnel the respondents into three categories by asking what their reason was for traveling in the I-81 Region. Respondents could choose from the following three categories:

1. Resident,
2. Tourist, or
3. Commercial Vehicle Operator.

The way in which respondents broke down into these three categories is shown in Figure 5.

Figure 5: Typical Reason for Traveling Survey Respondent Categories.
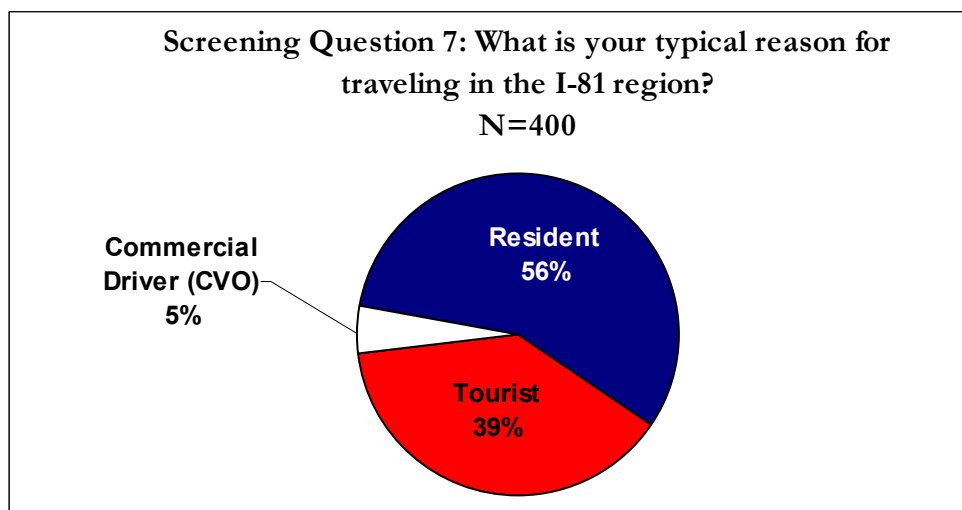
While these categories were convenient, in the future it is suggested that one more category be included: business travelers (i.e., if you suspect there is considerable through traffic in your 511 area). The business travelers surveyed in this survey were forced into the resident category, which did not adequately reflect different business travelers' behavior.

Path #1: Resident Questions

Residents were important because they have access to 511 on a more regular basis than do the other categories of users, and they represent the primary intended base of callers. Residents also represent both the interstate and commuting driver behavior, which is of interest in developing 511 Virginia for a statewide audience.

The evaluation team asked the 227 self-defined residents seven questions about their travel behavior:

1. On average, how many days a week do you drive a car or other vehicle?
2. What days do you drive on the interstates in the I-81 Region?
3. What is the primary reason you travel on the interstates?
4. Do you drive to either work or school on a regular basis?
5. What time of day do you commute?
6. Which days do you typically commute?
7. Normally, how long does it take you to commute to/from work or school?

These questions flushed out differences between residents' driving behavior when driving on the interstates versus when they commute on roads covered by 511. Specifically, interstate driving tended to be an everyday occurrence (61), peaking on Fridays (Figures 6 and 7). The primary reason that residents drove on the interstates was for work (Figure 8).

Figure 6: Days Driven on the Interstates by Category.
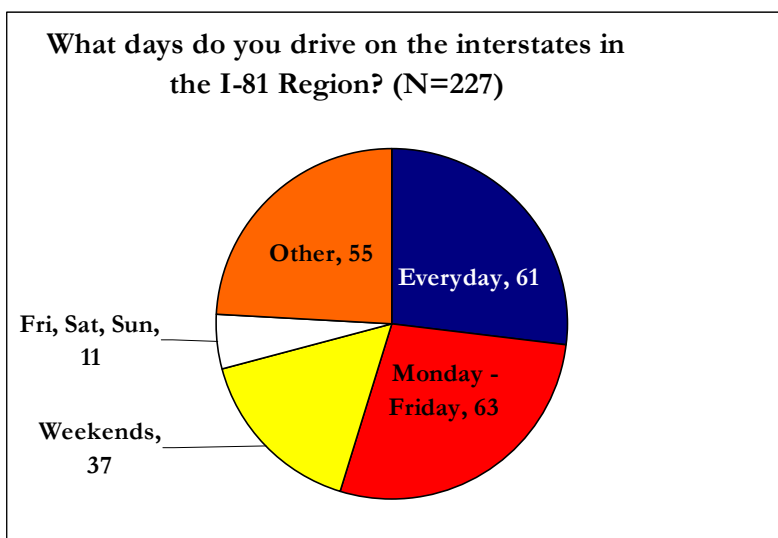
When all reported patterns are taken into account, a cumulative graph (Figure 7) shows that, based upon reported behavior, the traffic should peak on Fridays.

Figure 7: Cumulative Resident Days Driven on Interstates.
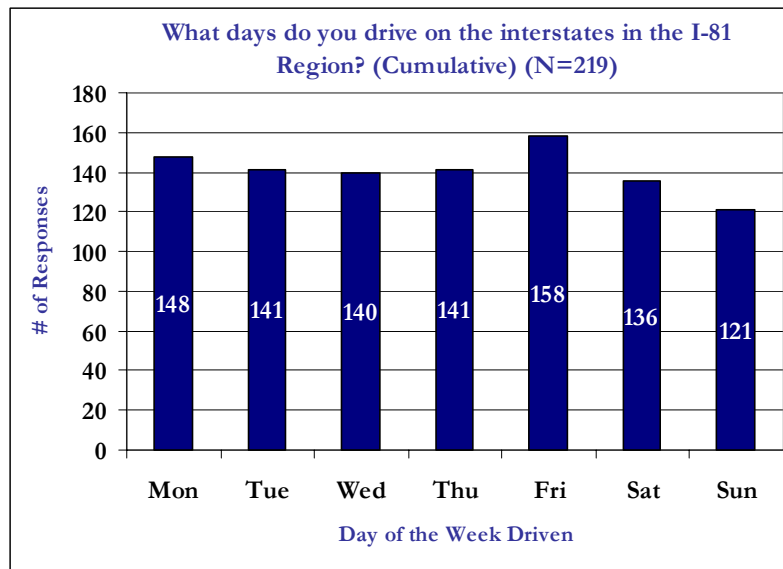
However, given the fact that the Commonwealth's largest universities and 20 other colleges line the 511 region, traveling to and from home by students was also a major reason for travel on the interstates (Figure 8).

Figure 8: Primary Reasons for Resident Travel on 511 Interstates.
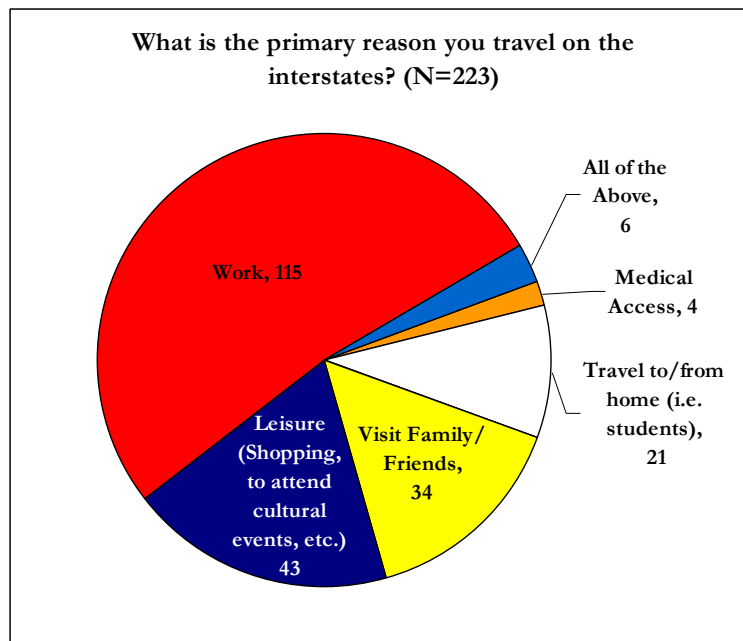
In the 511 region, it is apparent that commuter traffic corresponds with interstate travel, which peaks on Fridays as well. However, the commuting traffic on weekends is less than the weekend interstate travel reported by residents. The key commute times are 8am and 5pm, taking 30 to 60 minutes both morning and evening, with the majority of commuting taking place Monday through Friday (Figure 9).

Figure 9: Resident Cumulative Commute Days.

Which days do you typically commute? Cumulative (N=194)

Day	# of Responses
Sun	34
Mon	174
Tue	172
Wed	172
Thu	171
Fri	186
Sat	46

Cumulative Day Commuted

# of Responses
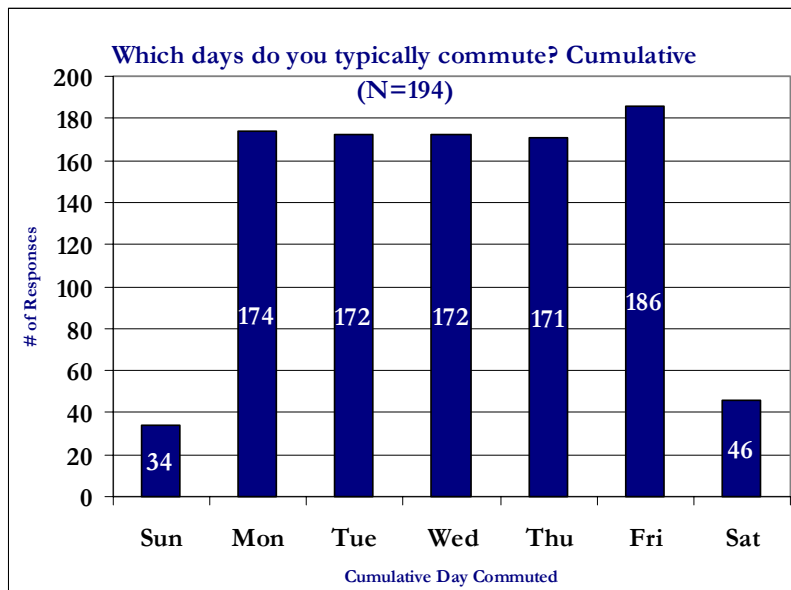
Path #2: Tourist Questions

Tourism is important to the I-81 region. Since 511 is a rural traveler information system that also provides tourism type information through advertisers, the behaviors of tourists were of special interest to this evaluation.

The evaluation team asked the 154 tourists six questions about their travel behavior:

1. On average, how many days a week do you drive a car or other vehicle?
2. From where do your trips to the I-81 Region in Virginia normally originate?
3. What is your typical final destination?
4. How often do you travel on I-81 en-route to (insert destination from Q3)? Stop me when I get to the right frequency?
5. How far in advance do you typically decide to make this trip? Please stop me when I get to the right time frame?
6. How many people are typically in your party for these trips?

In general, the tourists reported planning their trips to the I-81 Region 1-3 weeks ahead of time (51 of 152) or 2-3 days beforehand (42 of 152), traveling with two people in their party. Several of the tourists who participated in the survey originated their trips to the I-81 Region from inside Virginia (88 of 152). However, there were a number from out-of-state as well (Figures 10 and 11).

Figure 10: Tourist Origination States.

From where do your trips to the I-81 Region in Virignia normally originate?
N=154
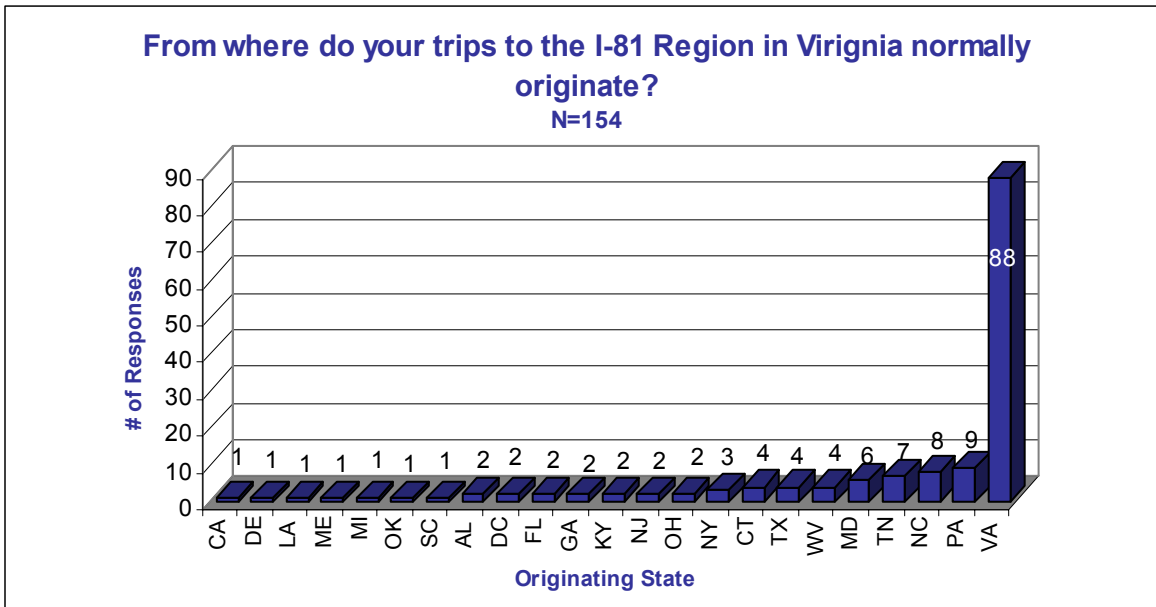
Figure 11: Tourist Origination Cities in Virginia.

From where do your trips to the I-81 Region in Virginia normally originate?
Cities in VA (N=57)
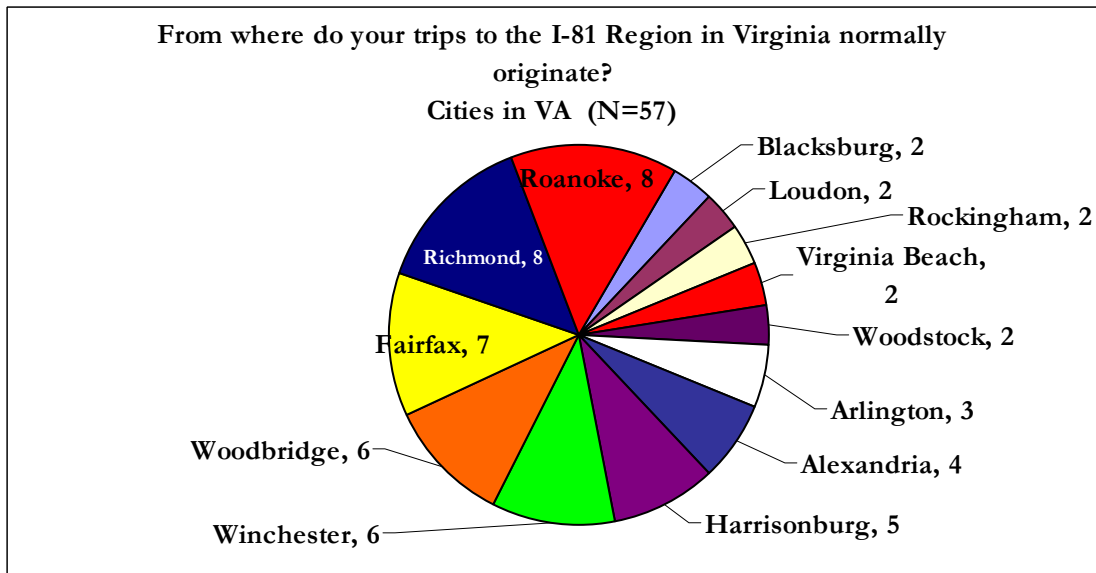
The top three states where trips originated from, other than Virginia, were Pennsylvania (nine different locations), North Carolina (Charlotte), and Tennessee (Chattanooga and Knoxville).

The typical destination for tourists was Virginia (Figure 12), the top three cities being Harrisonburg (15), Roanoke (14), and Blacksburg (9). See Figure 13 for the rest of the cities.

Figure 12: Tourist Typical Destinations by State.

What is your typical final destination? (N=152)
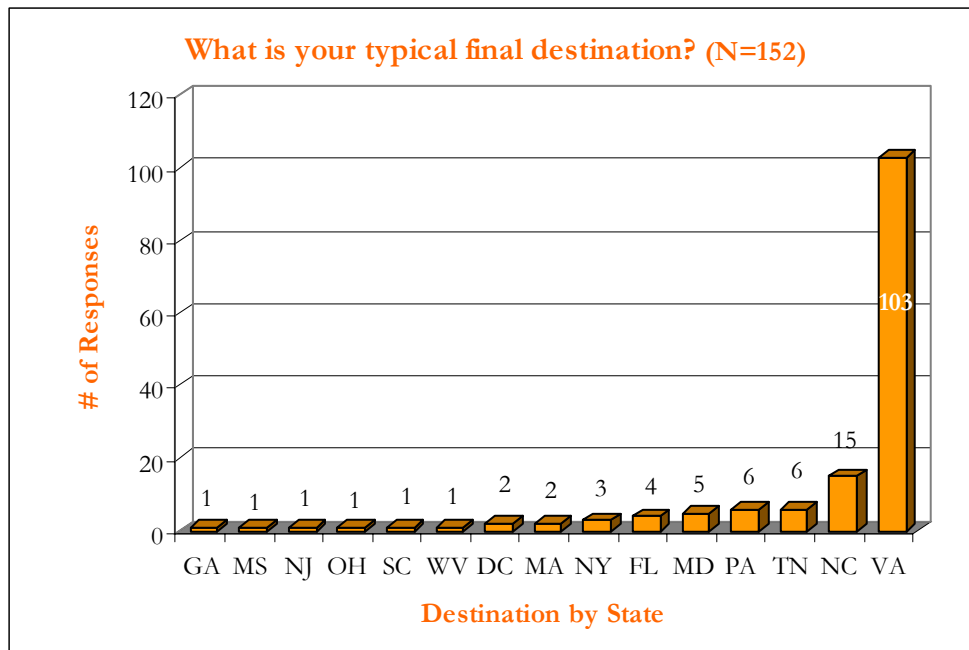
Figure 13: Tourist Typical Destinations by Cities in Virginia.

What is your typical final destination?
Cities in VA (N=103)
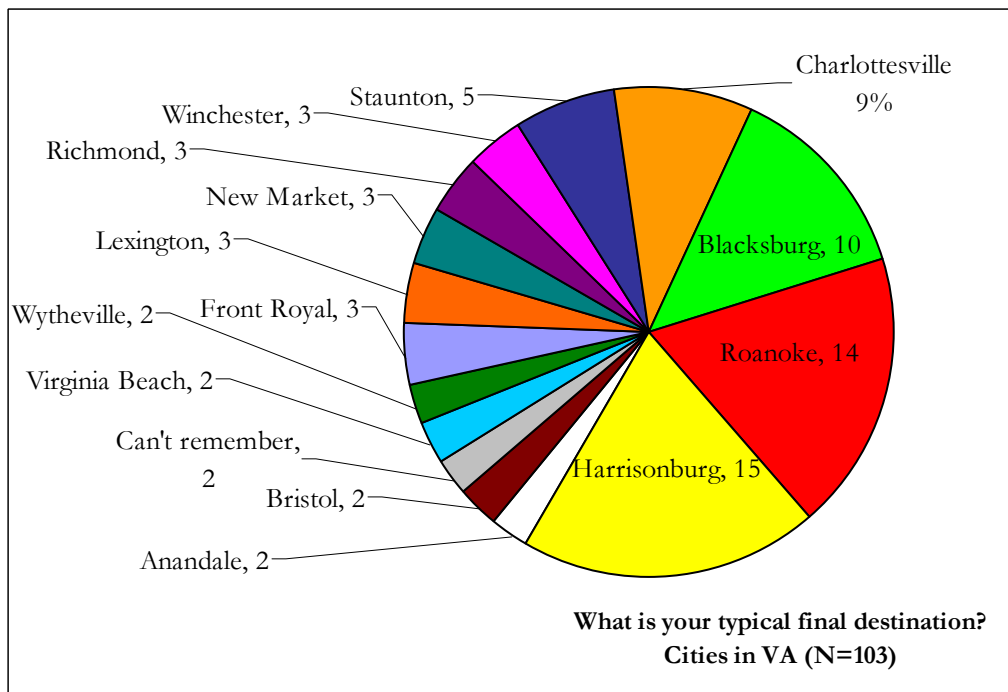
The top three states that also were destinations for 511 Virginia callers were North Carolina (predominately southbound on I-81 to Charlotte), Pennsylvania (northbound to six destinations), and Tennessee (southbound, mostly to Bristol).

Path #3: Commercial Vehicle Operators

Because there is upwards of 40% truck traffic on I-81, commercial vehicle drivers were of particular interest to this evaluation. However, only a very small sample of commercial vehicle operators actually completed the survey. As such, the findings from this group are very generic and should not be considered representative of all truckers on I-81.

The evaluation team asked 19 commercial vehicle operators nine questions about their travel information needs and behavior:

1. What type of Commercial Vehicle Operator are you?
2. How often do you travel in the I-81 region for CVO operations? Stop me when I get to the right frequency: (A range of frequencies is read to the participant)
3. On average, how many days a week do you drive a commercial vehicle?
4. Which routes do you drive commercially in the I-81 Region on a regular basis?
5. How accessible is truck parking in the I-81 Region?
6. If available, would you seek truck parking information in the I-81 Region?
7. Are you able to find truck parking information for the I-81 Region?
8. Where do you find it (truck parking information)?
9. Do you operate as a single or team driver?

The CVO respondents were mostly short haul (10 of 19), with a good portion also being long haul (7 of 19). See Figure 14. The CVO respondents drove mostly on I-81 and I-64 (see Figure 15). They reported that they generally travel in the I-81 region more than once a week and that they are commercial drivers seven days a week.

The neutrality that the truckers had towards the issue of truck parking may be due to the fact that over half of the commercial vehicle operators surveyed were short-haul drivers. A recent study on truck parking conducted by the Federal Highway Administration revealed similar results. The study found that short-haul drivers, when asked about truck parking, indicated that it was not a relevant issue for them *(Footnote)[3]*. Possibly if more long-haul truckers had been involved in the survey, the results would have been different on this question.

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[3] U.S. Department of Transportation Federal Highway Administration. Study of Adequacy of Commercial Truck Parking Facilities--Technical Report (FHWA-RD-01-158). http://www.tfhrc.gov/safety/pubs/01158/2.htm

Figure 14: Type Haul of CVO Survey Participants.

What type of Commercial Vehicle Operator are you?
N=19

- Short Haul, 10
- Long Haul, 7
- Both, 1
- Other: Dedicated Route, 1
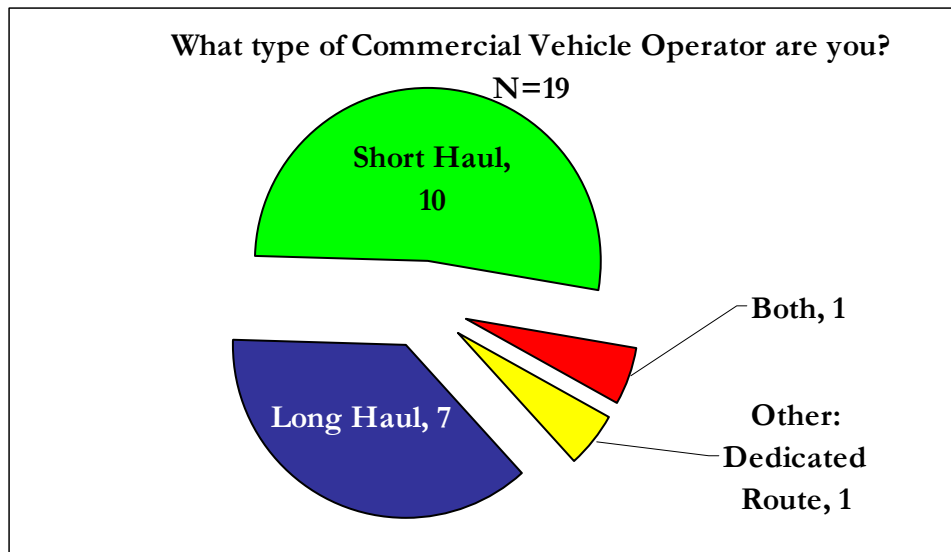
Figure 15: CVO Routes Driven in the I-81 Region.

Which routes do you drive commercially in the I-81 Region on a regular basis? Cumulative (N=19)

Route Traveled	# of Responses
I-81	17
I-64	8
I-66	8
US460	7
I-77	6
I-581	5
US220	5
US11	4
VA7	2
US250	2
US58	2
US221	2
VA8	1
US340	1
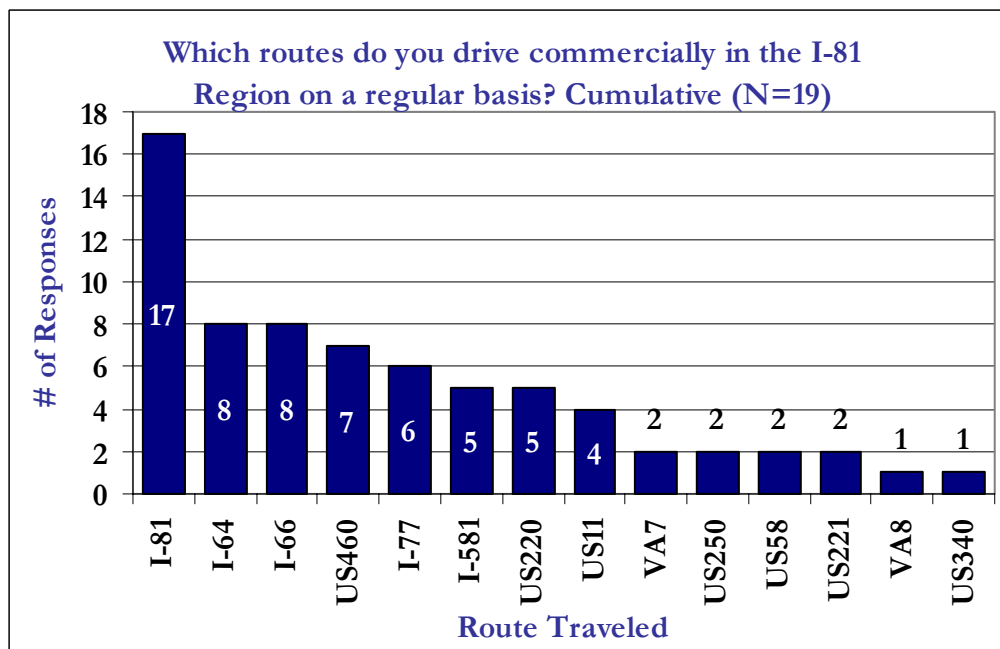
An issue of interest for further developing 511 Virginia for the state-wide implementation was the demand by CVO respondents for truck parking information. The majority (11 of 19) indicated that they would seek truck parking information if it was offered. However, when asked about the current accessibility of truck parking information, respondents were neutral. (See Figure 16 for the actual disposition of responses).

Figure 16: CVO Perception of Accessibility of I-81 Truck Parking Information.
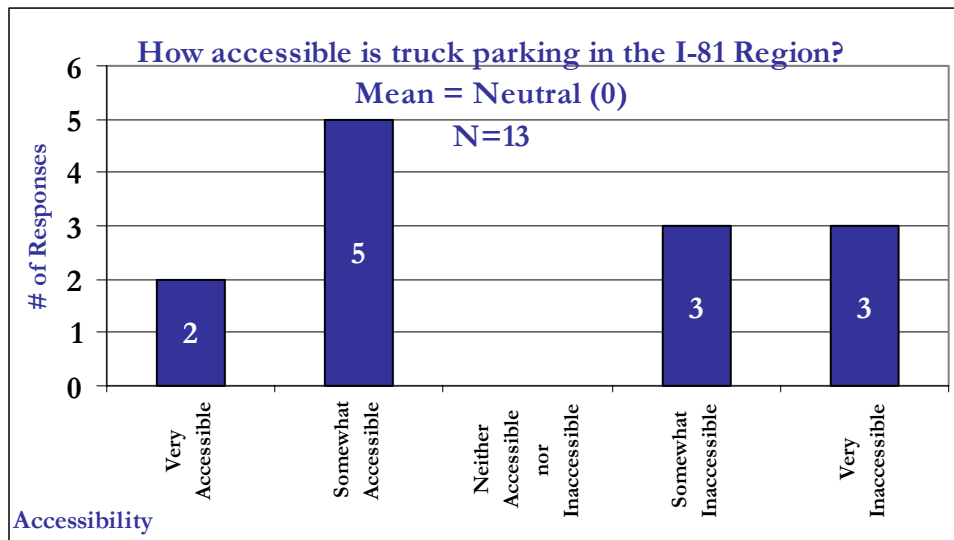
Access/Awareness Questions

At this point, all respondents, whether a tourist, resident, or CVO, were asked five access/awareness questions:

1. Do you currently have a cell phone?
2. Do you typically use a phone to get information?
3. Where did you hear about 511 Virginia?
4. Why did you first call 511 Virginia?
5. How did you first access 511 Virginia?

The respondents indicated that they did, in general, have a cell phone (96%), and 77% use a phone to gain access to information. Eight-eight percent, (352 of 398) reported that their first method for accessing 511 Virginia was using a cell phone. The primary source for 511 Virginia was the blue road signs (233 of 377), and the primary reason for calling the first time was for traffic issues like congestion and delays (138 of 383, or 36%). See Figures 17 and 18 for more sources and reasons for the first call to 511 Virginia.

Figure 17: First Source for 511 Virginia.
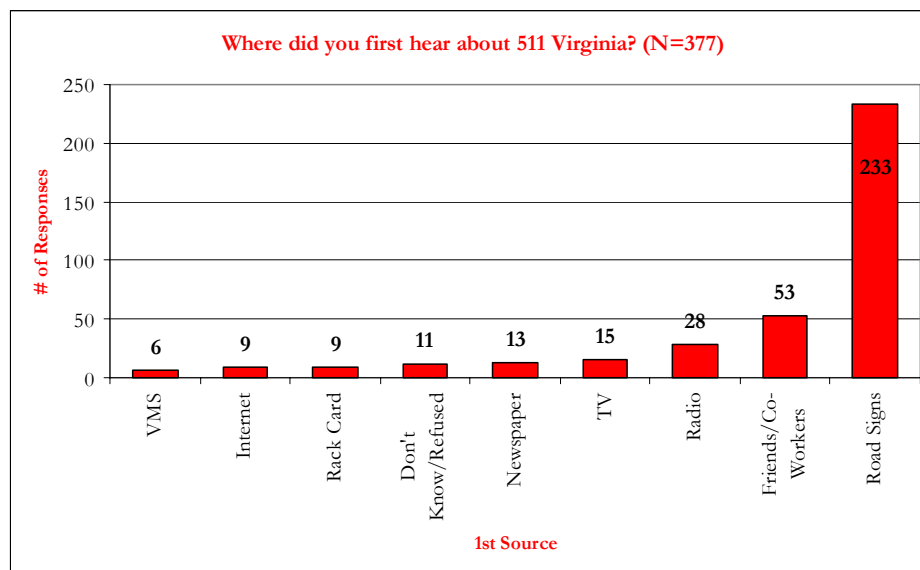
Figure 18: Reason for First Call to 511 Virginia.

Why did you first call 511 Virginia? (N=383)

Reason for 1st Call	# of Responses
Traffic (congestion/delays)	138
Curiosity; boredom, general interest	87
Weather	54
Accidents	45
Road Conditions (fog,ice,flooding)	20
Construction	18
Info on gas, food, lodging, rest stop	13
Directions (Maps/Routes)	8
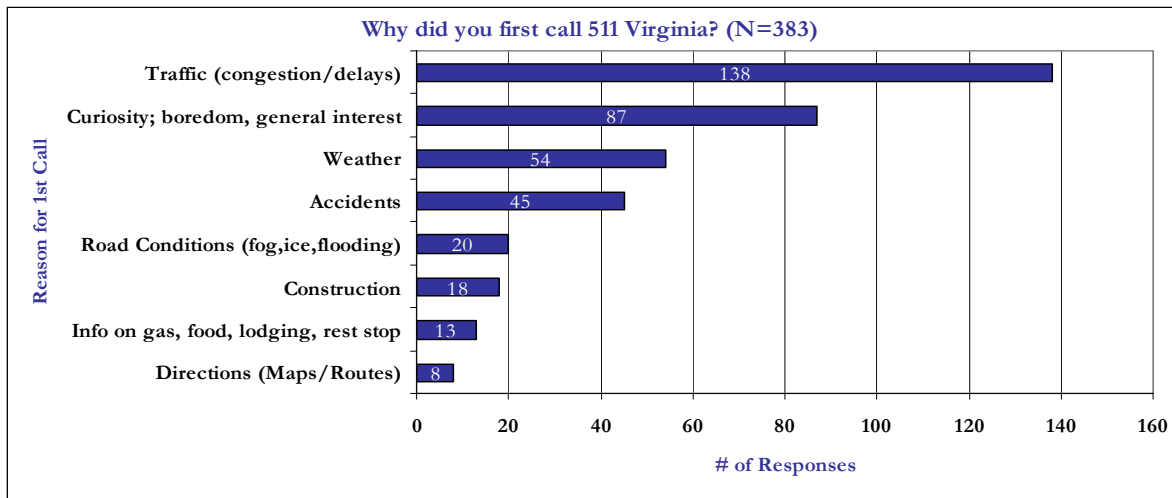
Needs/Usage Questions

The primary focus of the 511 survey was to determine if the service meets the Evaluation Framework goals, as well as to better understand how callers would like to use a travel information service for development of the service for future expansions of 511 state-wide. To reflect this, the majority of questions that were asked fell under this heading.

All 400 respondents were asked twelve needs/usage questions:

1. How safe do you feel on the roads in the I-81 Region?
2. Has having access to 511 Virginia changed your perception of the safety of the roads in the I-81 region?
3. Was that change positive or negative?
4. Has 511 Virginia increased your awareness of traveler information in the I-81 Region?
5. What information do you look for *before* you leave to travel in the I-81 region?
6. What sources do you use to plan for a trip to this region?
7. What information do you look for while traveling in the I-81 region?
8. What information were you looking for when you called 511 and left your name for this survey?
9. What information are you typically seeking when you call 511 Virginia?
10. How useful is the information you find?
11. What makes it useful?
12. What could be more useful?

Contrary to general media representation, the survey respondents (which were statistically significant) reported that they perceived I-81 to be Somewhat Safe (the mean was 0.6 on a scale from -2 to 2). Sixty-three percent (or 255 of 400) reported that they perceived the I-81 Region to be either Very Safe or Somewhat Safe. See Figure 19 for the rest for the results.

Figure 19: Perception of Safety of I-81.

How safe do you feel on the roads in the I-81 Region?
N=400

Neutral
13%

Somewhat
Safe
36%

Somewhat
Not Safe
16%

Mean =
Somewhat Safe
(0.6)

Very Safe
27%

Not Safe at
All
8%
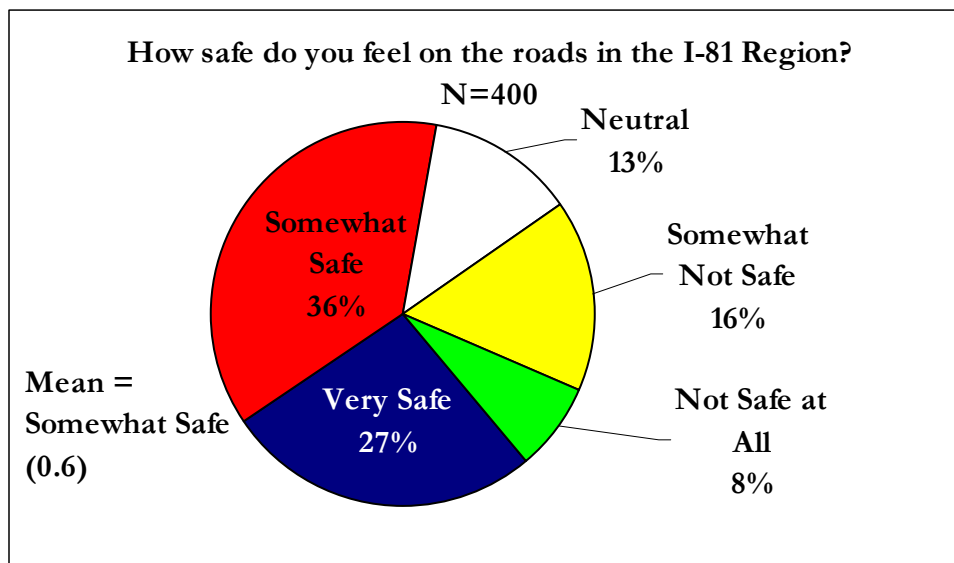
However, in general (53%), survey respondents did not feel as if having access alone to 511 Virginia was enough to change their perception of the safety of the I-81 Region. See Figure 20 for the rest of the results.

Figure 20: Changes in Perception about the Safety of I-81 based on having Access to 511 Virginia.

Has having access to 511 Virginia changed your perception of the safety of the roads in the I-81 Region?
Was that change positive or negative? (N=386)

Yes positive
change
42%

Don't Know
4%

Yes negative
change
1%

No
53%
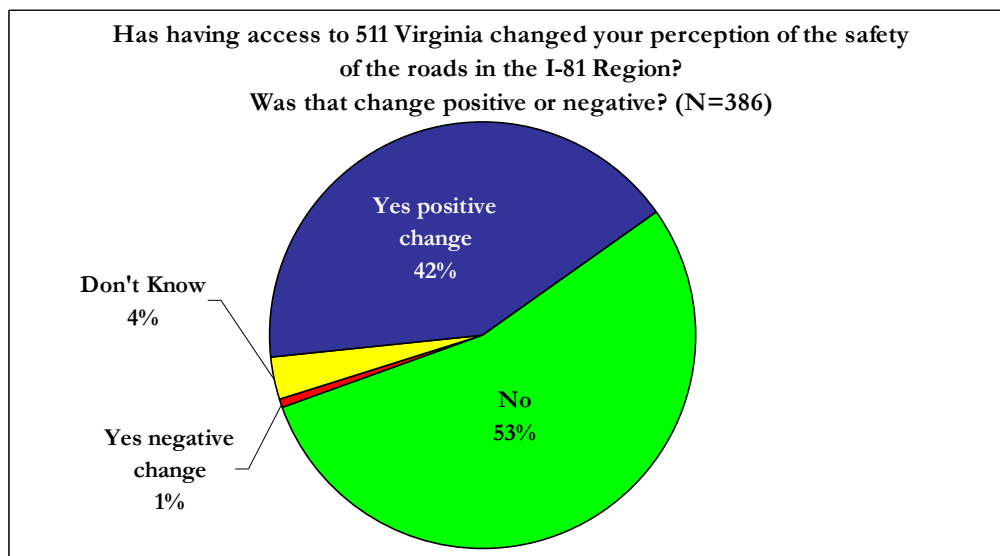
Despite not directly increasing the perception of safety of the I-81 Region, 511 Virginia has been extremely effective in increasing travelers' awareness of traveler information available in the I-81 Region (e.g., 93% indicated 511 Virginia produced a positive change in their awareness of traveler information in the I-81 Region). See Figure 21 for a complete breakdown of responses.

Figure 21: 511 Virginia's Affect on Awareness of Traveler Information

Has 511 Virginia increased your awareness of traveler information in the I-81 Region? (N=393)

- Yes 93%
- Don't Know/ Refused 2%
- No 5%
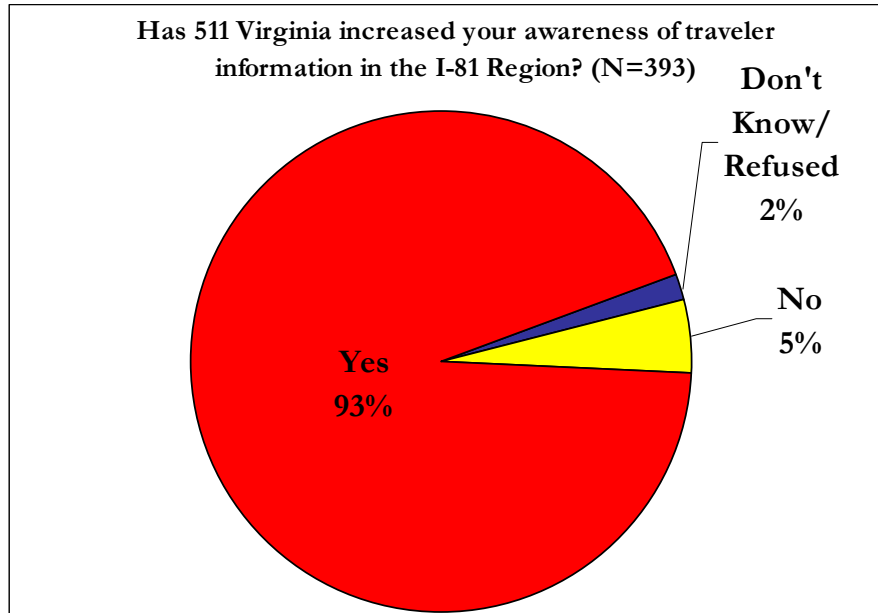
Respondents were then asked several questions about their travel information needs throughout the travel planning and travel process. The top three sources for planning for a trip to the I-81 Region were the Internet (45% or 179 of 400), 511 Virginia (36% or 144 of 400), and television (17% or 68 of 400). Respondents were also offered the opportunity to specify exactly which internet sources they used. This was done through the use of an "Other" category. Table 2 gives a break down of these responses.

Table 2: Internet Sources for Planning a Trip to the I-81 Region

Internet Sources Specified	Respondents
freetrip.com	1
hotel web sites	1
superpages.com	1
switchboard.com	1
Yahoo Travel	1
expedia.com	2
VDOT web site	6
mapquest.com	10
weather.com, weather channel	22
Total	**45**

Table 3 represents a large majority of the questions asked in the Needs/Usage section. The most unique finding was the difference between the amount of information travelers said that they were looking for and the amount that they were looking for when they actually called. The top identified needs centered on en-route travel information. However, several tourism/economic topics were also listed and can be found in the complete listing in Appendix A.

Table 3: Reported Information Sought Throughout Traveling Process

Before Traveling	While Traveling	Typically Seeking on 511 Virginia	Specifically Seeking for this Survey Call
75% had Multiple Information Needs	60% had Multiple Information Needs	54% had Multiple Information Needs	75% had a Single Information Need
1. Weather (179)	Traffic (199)	Traffic (123)	Traffic (171)
2. Traffic (124)	Accidents (143)	Accidents (166)	Accidents (120)
3. Accidents (117)	Other (161)	Construction (114)	Weather (92)
4. Construction (109)	Construction (91)	Weather (103)	Construction (75)

Finally, to determine whether or not the survey respondents felt like 511 Virginia was meeting their needs, they were asked about its usefulness. The mean response found it "Very Useful" (a score of 1.5 on a scale from -2 to 2). Ninety percent (or 358 of 395) ranked 511 Virginia as Somewhat Useful or Very Useful. See Figure 22 for a complete breakdown of responses.

Figure 22: Ranked Usefulness of 511 Virginia.
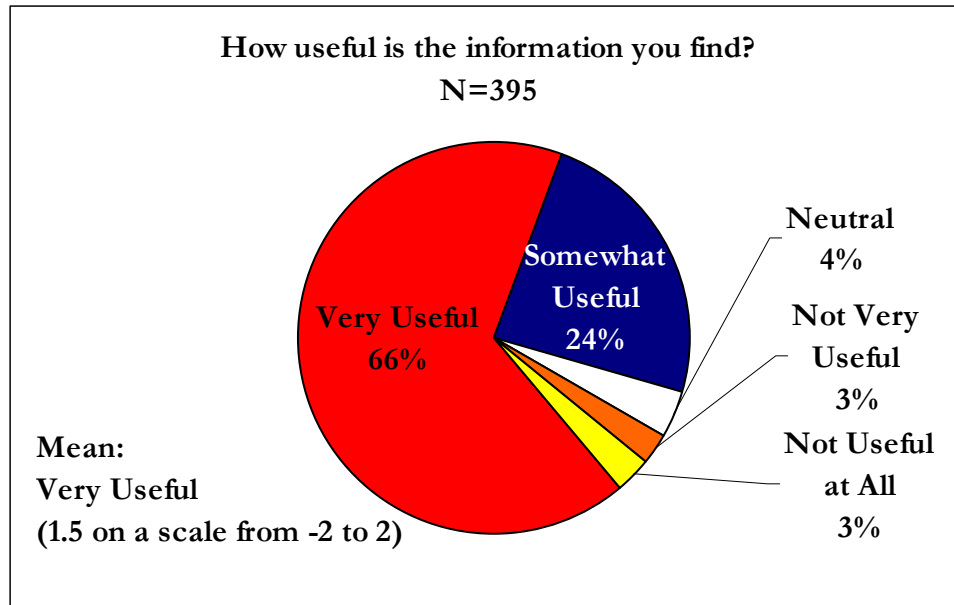
The most important benefit that survey respondents indicated was that 511 Virginia offered was help in making informed travel decisions. VDOT hypothesized that local area travelers made more informed decisions in the I-81 Region by deciding to shift to Route 11 when I-81 was experiencing back-ups. Several respondents indicated that they specifically used the information they found on 511 Virginia to help them decide to switch to Route 11 when they heard on 511 Virginia that I-81 was experiencing back-ups. See Appendix A for the actual responses in terms of what made 511 Virginia useful. Figure 23 shows the evaluation team's compilations of these free text responses.

Figure 23: How 511 Virginia is Useful.
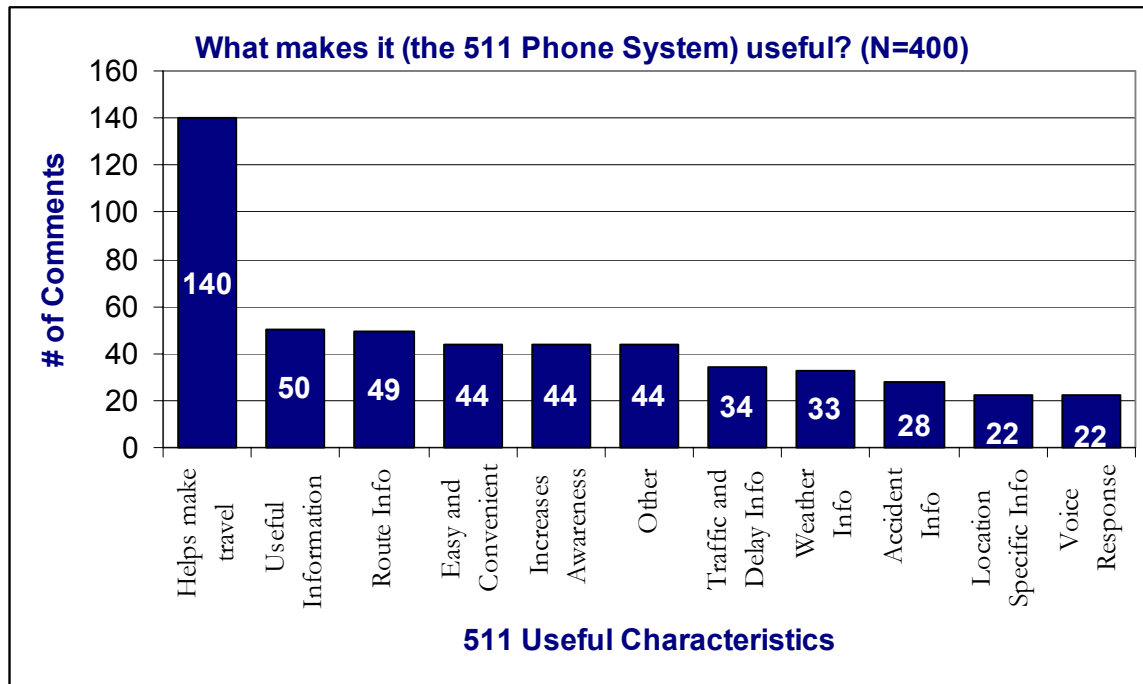
The other category of responses was significant (44 of 40), and the categories of those responses are included in Figure 24, led by saving time.

Figure 24: How 511 Virginia is Useful (Other Category).
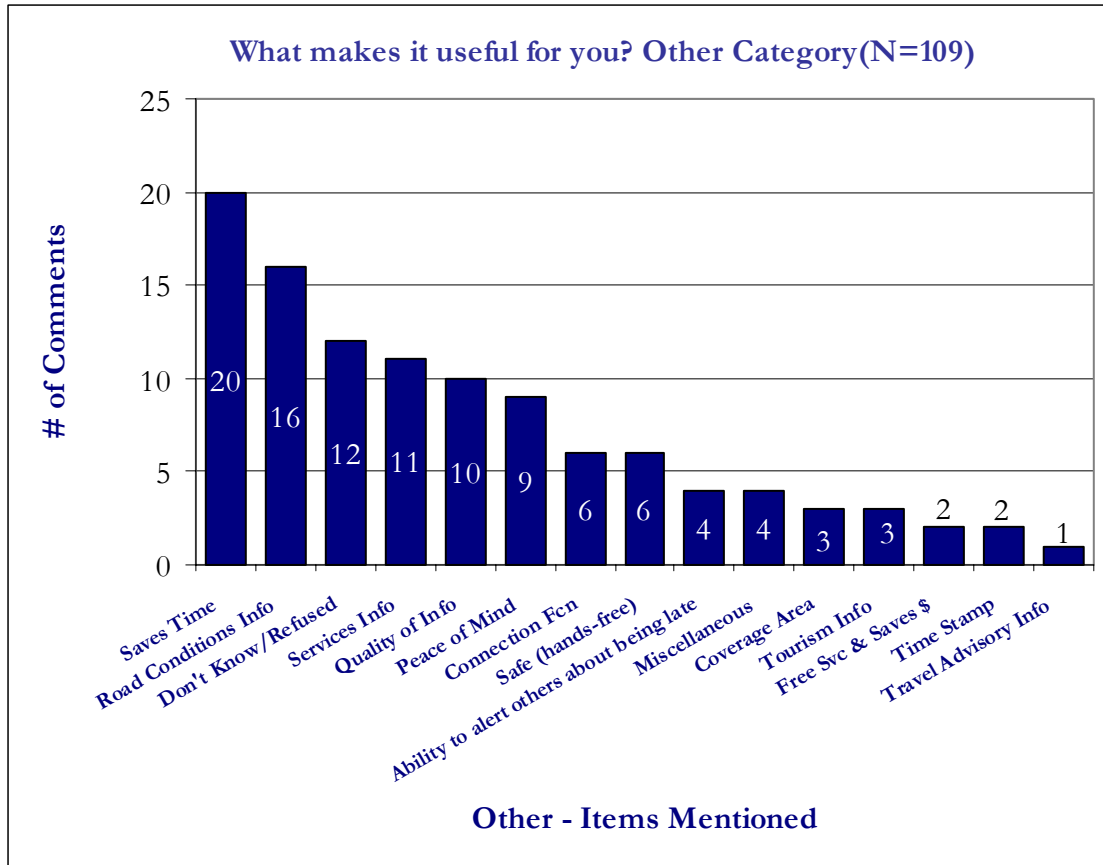
A great deal can be learned from deficiencies, especially in planning the development of the state-wide implementation of 511 Virginia. While a majority of participants were pleased with the system and could not think of anything for this free text response, the top three functions that could be improved to make 511 Virginia more useful were:

1. Difficulty of Navigation,
2. Timeliness of Information, and
3. Voice Recognition System perceived as not working.

Figure 25 summarizes all major suggestions for improvements.

Figure 25: How 511 Virginia Could be More Useful?
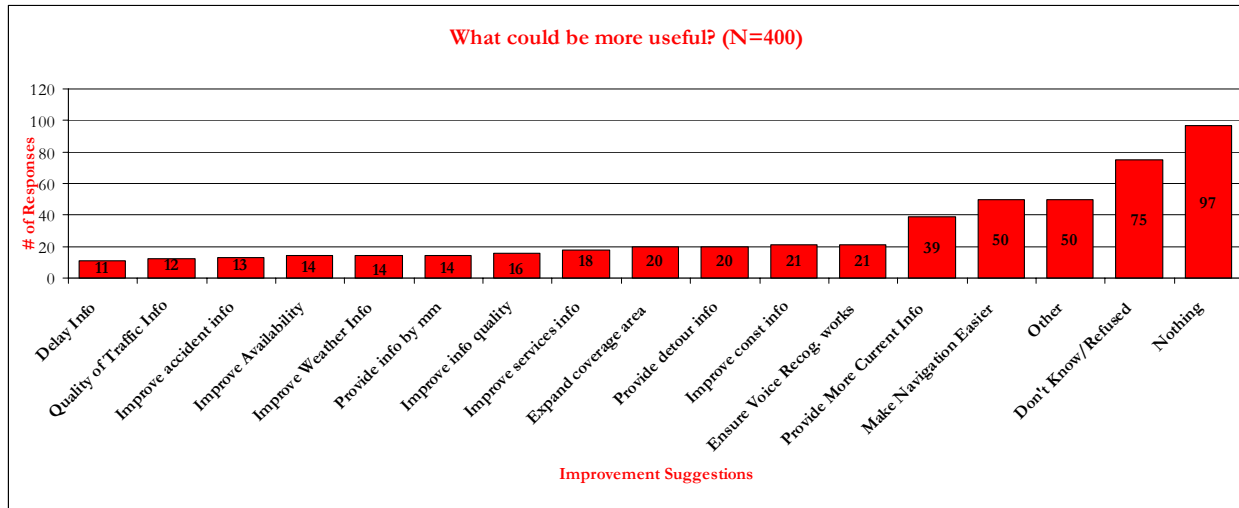
In this question, the other category was the third top response for usefulness (with 50 of 400 responses). The top three Other Category responses for improving 511 Virginia were:

1. Group the information differently,
2. Provide more information on exact location and length of reported incidents, and
3. Do more awareness marketing.

Figure 26 depicts these suggestions for improvements.

Figure 26: How 511 Virginia could be More Useful (Other Category).
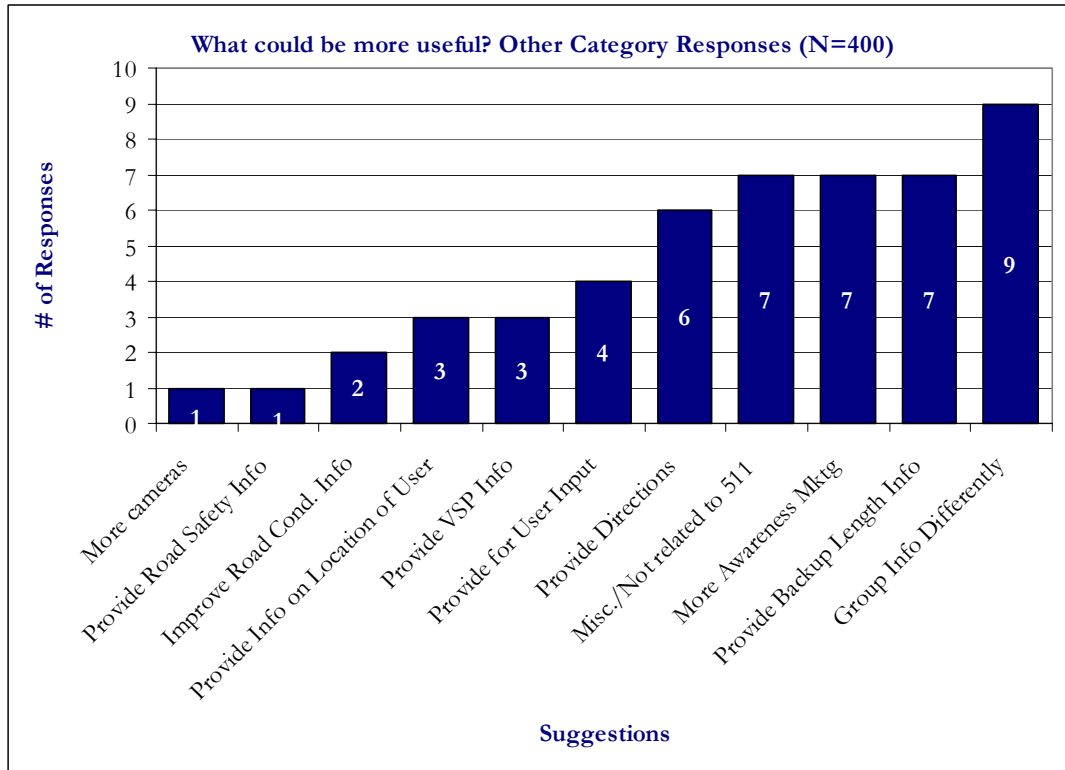
Level of Satisfaction/ Behavior/Decision Making Questions

Determining customer satisfaction is vital to any customer-based service. Being able to assist travelers in their decision process is a key component in successful ITS systems. These questions were asked to concisely pinpoint how 511 Virginia accomplished these goals.

We asked all 400 respondents three decision making questions:

1. Have you ever heard anything on 511 that caused you to change your travel plans?
2. How did you change your plans?
3. Would you call 511 Virginia again?

While 50% of all survey participants indicated that they had not yet heard anything on 511 Virginia that made them change their travel plans, several users were first time users. Unfortunately, the total number of first time users was not captured. Despite this fact, it is impressive that 49% of all respondents had heard something on 511 Virginia that made them change their travel plans. See Figure 27 for a complete breakdown of these responses.

Figure 27: Influencing Changes in Travel Plans.

Have you ever heard anything on 511 Virginia that caused you to change your travel plans? (N=400)

Don't Know/
Refused
1%

No
50%

Yes
49%
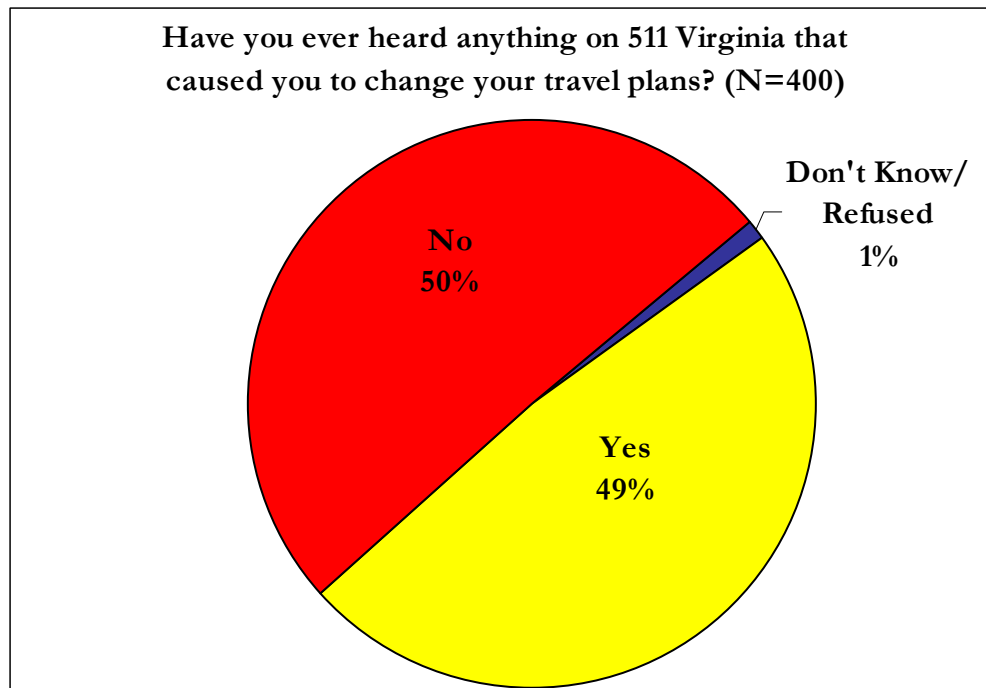
For those that did indicate that they changed their plans, the majority changed their route (166 of 212). See Figure 28 for more detail of how respondents changed their travel plans.

Figure 28: Making Informed Travel Decisions with 511 Virginia.

How did you change your plans?

N=212

# of Responses

| Slow Down/Change Speed | Modified Trip | Stop Along the Way and Wait | Don't Know/Refused | Changed Time (arrive, depart) | Cancel/Reschedule Trip | Change Route |

1   3   5   6   13   18   166

Change in Plans
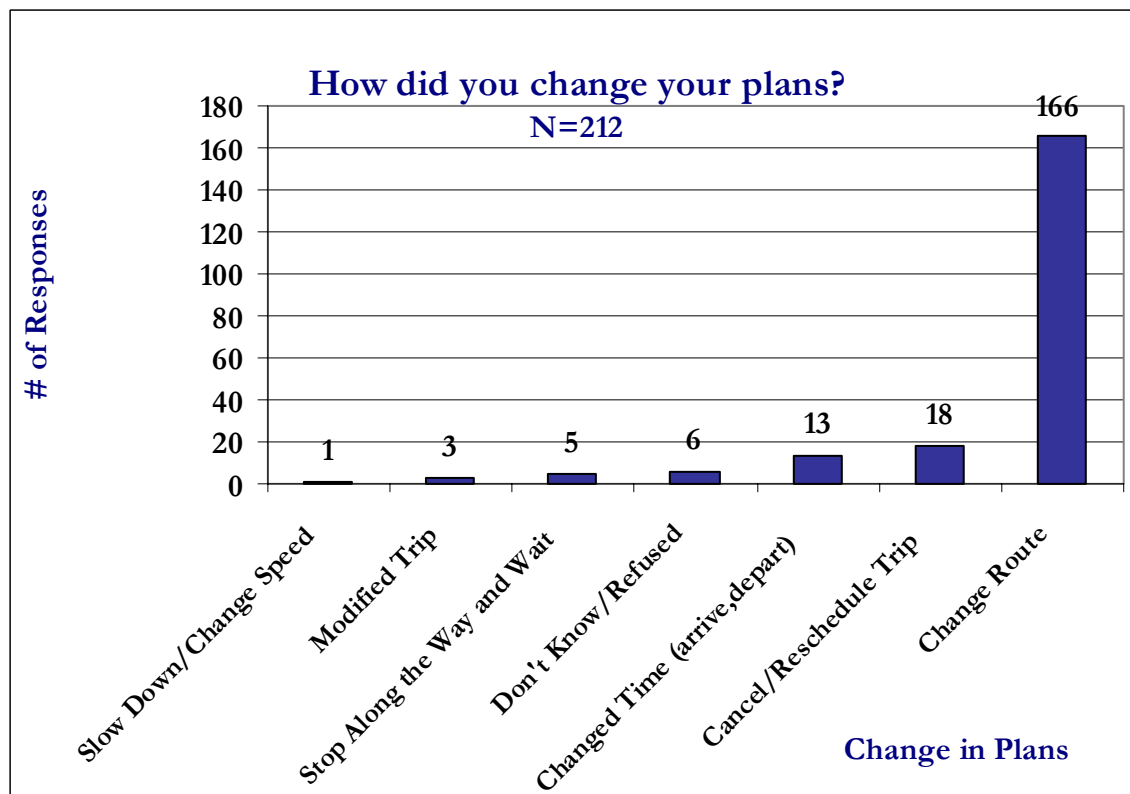
During national evaluation meetings, it was suggested that the best way to measure loyalty and satisfaction for a phone service was whether or not a caller would call back. 511 Virginia was very successful in this area - 99% of the respondents indicated that they would call 511 Virginia again. See Figure 29 for a breakdown of the remaining respondents.

Figure 29: Loyalty to the 511 Service.
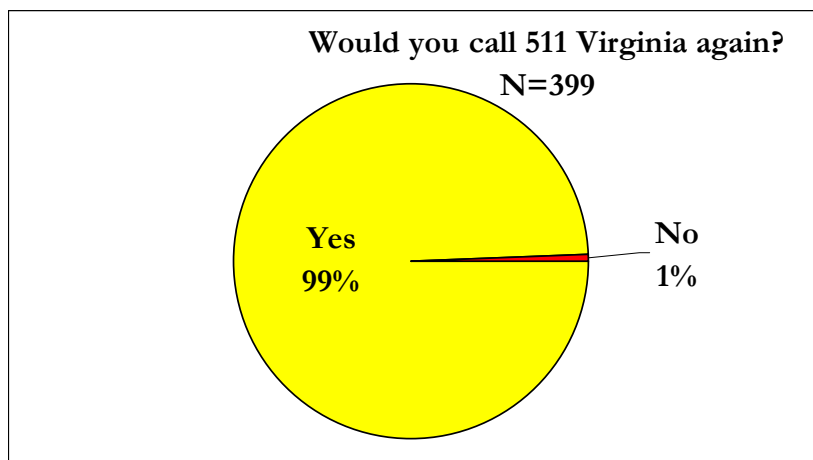
Who Should Run 511? Questions

One of the questions of interest to VDOT is, what agency was perceived by the public to be the appropriate provider of the 511 Virginia service?

To access these perceptions, all 400 respondents were asked four questions about who they thought should be responsible for 511 Virginia, even if they had indicated that they were tourists to the area:

1. As you probably know, there are any number of sources that can gather and offer to you information on Virginia roads. In your opinion, who should be responsible for providing this service?
2. And, in your opinion, which do you think would provide travel information that is more reliable?
3. Has access to 511 Virginia changed your perception of the services provided by the Virginia Department of Transportation?
4. Has this change been positive or negative?

Respondents were first read a description of the how the 511 Virginia service is organized, at the sponsor's request. This was beneficial in giving respondents a better idea of what was being asked and for marketing the value of the service to first time callers. However, it may have influenced the outcome of these questions. See the complete survey in Appendix A for the actual statement read to the survey respondents before answering these questions.

In general (55%), respondents felt that all agencies should work together to provide this service. See Figure 30 for the rest of the breakdowns.

Figure 30: Which Agency Should Provide 511 Virginia?

As you probably know, there are any number of sources that can gather and offer to you infomration on Virginia roads. In your opinion, who shuld be responsible for providing this service? (N=390)

- Govt 15%
- VDOT 19%
- Virginia State Police 5%
- Private Industry 4%
- PPT with VDOT 2%
- PPT with VSP 0%
- All 55%

PPT = Public/Private Partnership
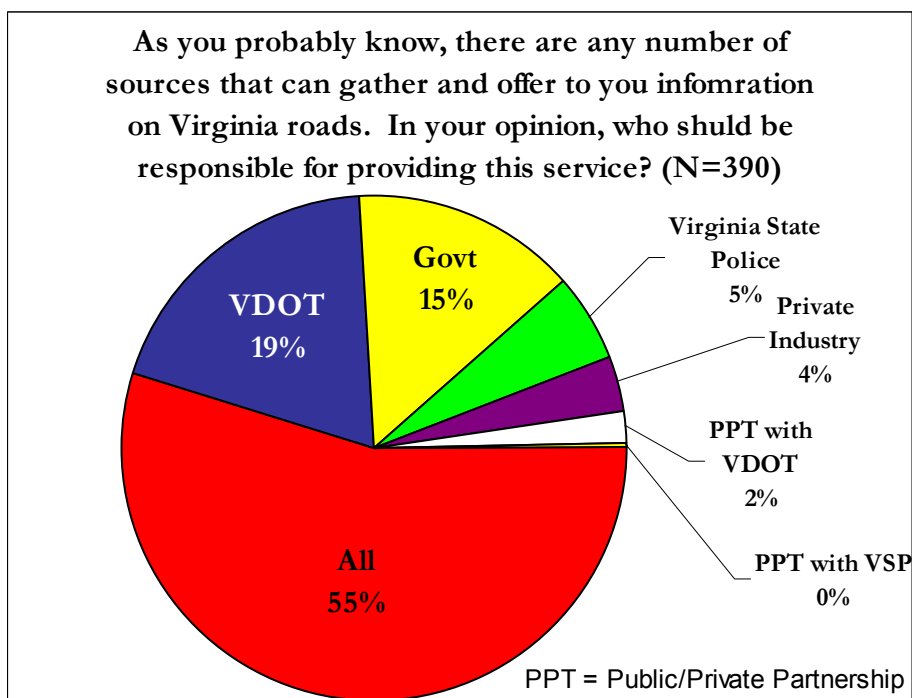
Respondents were more split about who provides the more reliable information between the Virginia State Police (37%) and all agencies (33%). See Figure 31 for more details.

Figure 31: Which Agency's Information is More Reliable?

And, in your opinion, which do you think would provide travel information that is more reliable? (N=385)

- Virginia State Police 37%
- PPT with VSP 1%
- PPT with VDOT 1%
- Private Industry 3%
- Don't Know/ Refused 5%
- Virginia Department of Transportation 20%
- All 33%

PPT = Public/Private Partnership

107
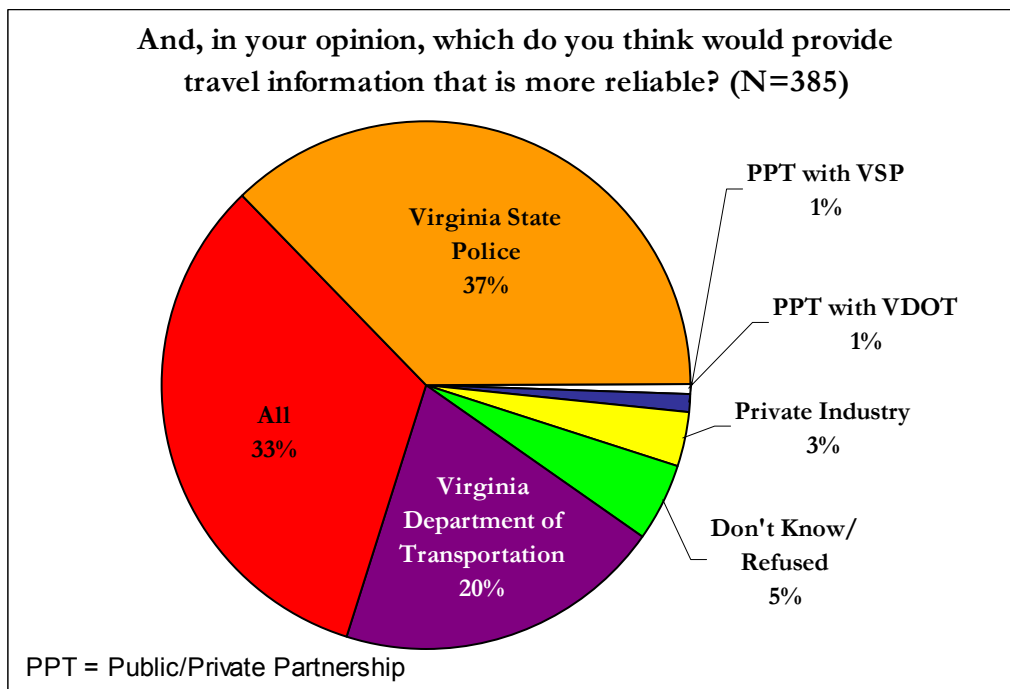
However, based upon its offering 511 Virginia, a large majority of respondents (73%) perceived VDOT in a more positive light.

Figure 32: Affect of 511 Virginia on VDOT's Reputation.

Has access to 511 Virginia changed your perception of the services provided by VDOT? Has this change been positive or negative? (N=383)

No
27%

Yes/
Negative
0%

Yes/Postive
73%
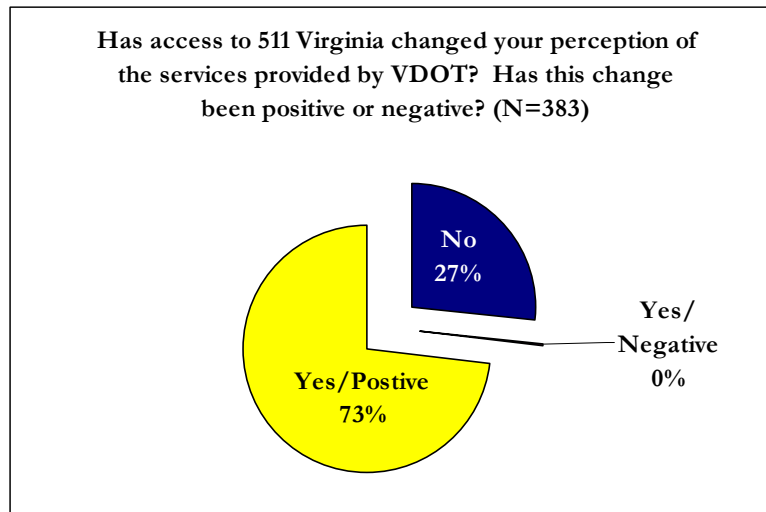
PHONE SURVEY CORRELATIONS

According to the results from the phone survey safety question, in general, Virginia residents feel less safe on roads in the I-81 region than do tourists to the region. More in depth research would need to be conducted to truly define the reasons for this perception. See Figure 14 for how drivers responded by their traveler type. Detailed SPSS tables are available in Appendix G.

Figure 33: How Safe Drivers Feel in the I-81 Region by Traveler Type.
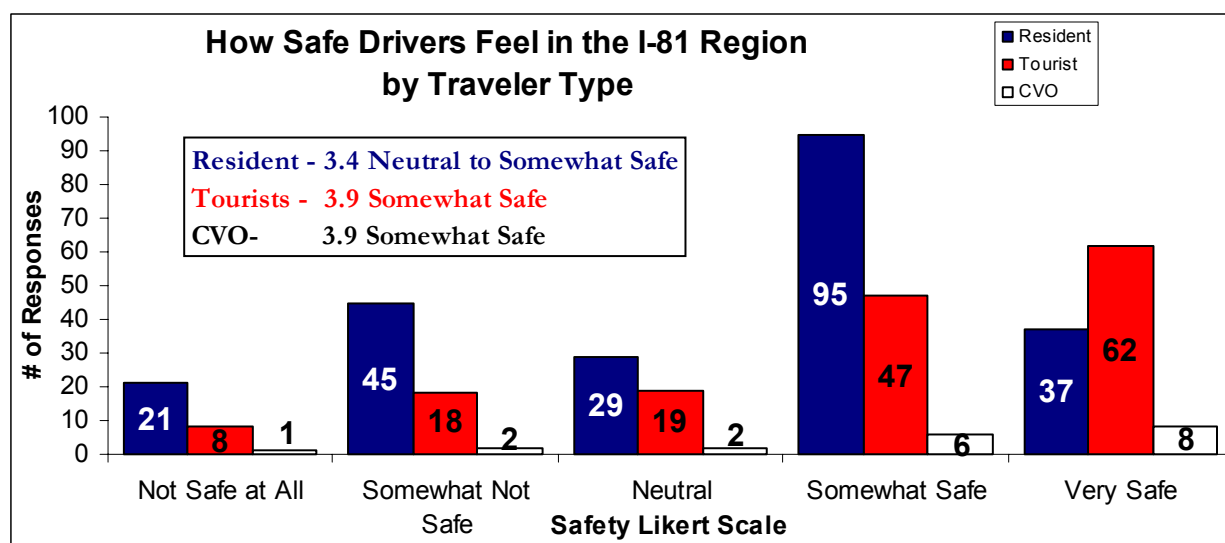
One area where local residents and commercial vehicle operators agree is in the usefulness of 511. Both found the service to be more useful to them than did tourists. This might be because of a familiarity with the road system in the area. Tourists might have more difficulty determining which routes to use and which routes detours are referring to.

Figure 34: 511 Usefulness by Traveler Type.

Traveler Type Means
Resident = 4.5
Tourist = 4.3
CVO = 4.6
Mean = 4.5
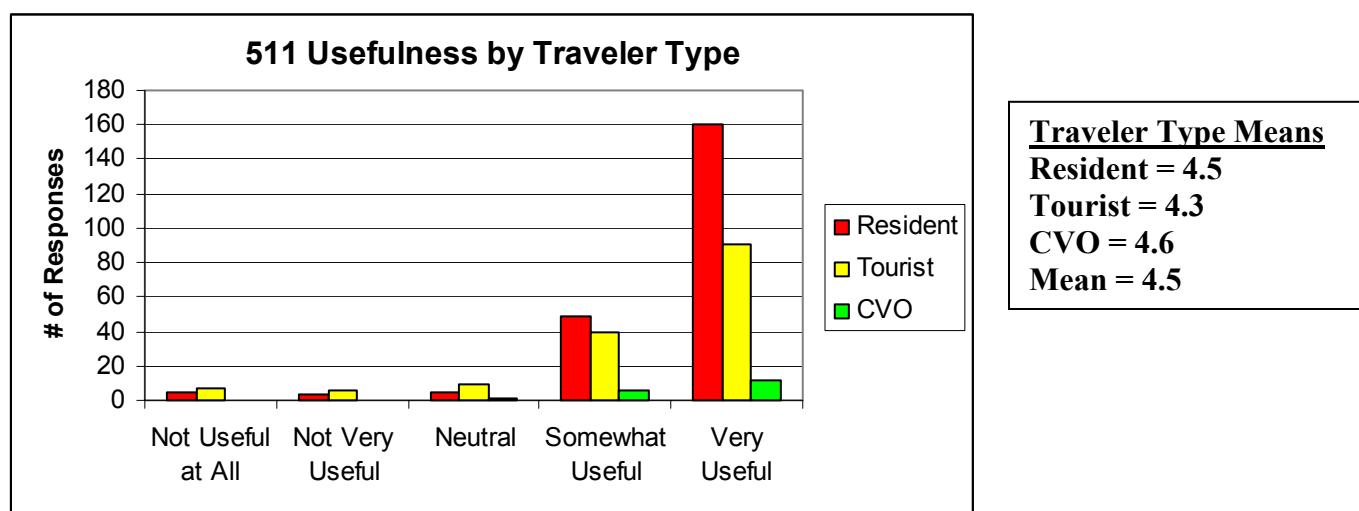
Both genders found 511 to be useful.

109

Overall, all ages found 511 to be useful. However, there is a slight drop off of usefulness based upon age, with progressive declines as the age groups increase. This could easily be attributed to general age group declines in acceptance and use of new technologies. However, a Somewhat Useful to Very Useful overall rating is a very positive indicator of 511 Virginia's success in its first 18 months.

Figure 35: 511 Usefulness by Age.
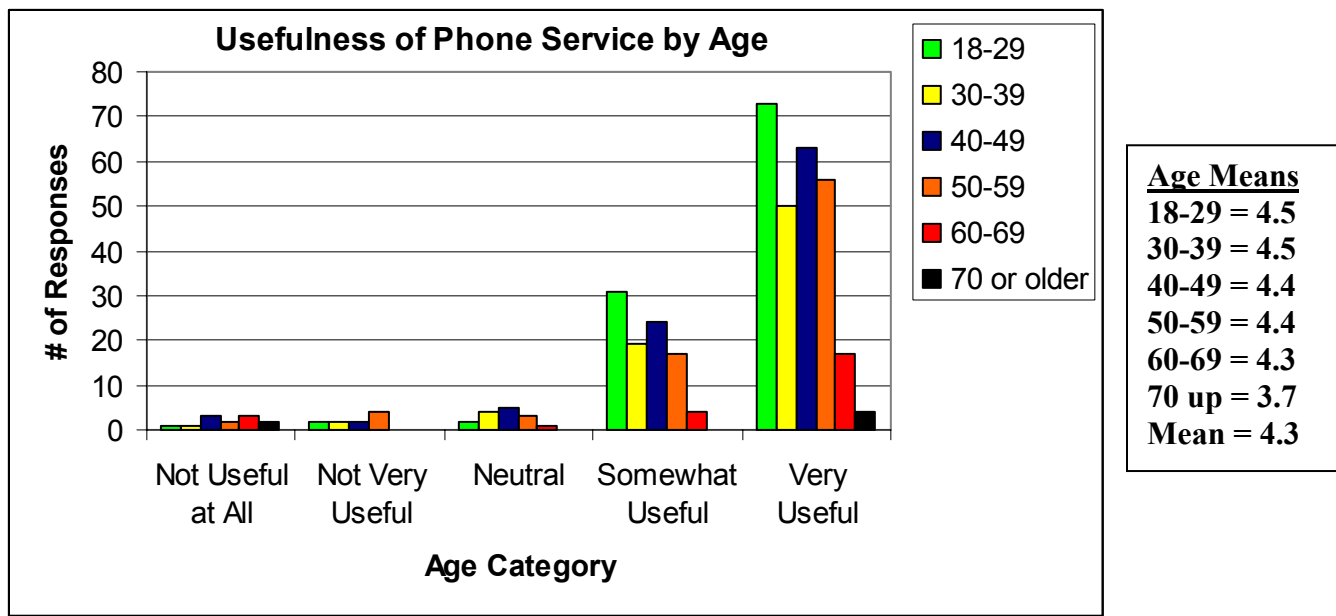
Figure 36: 511 Usefulness Means by Age.

110
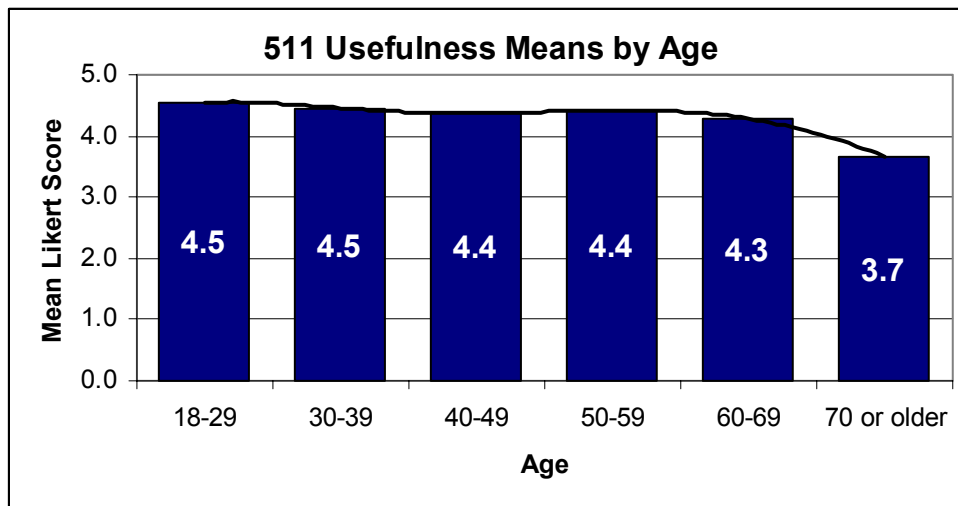
RECOMMENDATIONS

Based upon the phone survey findings, the evaluation team has the following recommendations:

1.) More research should be done into the CVO community's needs and usage of the 511 phone service.
2.) Develop and monitor a permanent feedback loop on the phone system.
3.) Provide more detailed traffic information to include the exact location and duration of road incidents.
4.) Do more usability research into how to make the phone system easier to navigate.
5.) Monitor and improve timeliness of travel information available on 511 Virginia.
6.) Determine the ratio of long haul to short haul drivers on I-81 and cater travel information to the needs of the majority.
7.) Tailor the phone tree structure and information format to better facilitate caller decision making (e.g., more in-depth alternate route information should be more easily accessible from the traffic menu, if callers change their travel route).
8.) Do more research into travel information that callers might desire if they do change their plans based upon information they hear on 511.
9.) Develop a means to identify and record first time callers through the call software employed (e.g., TellMe, Inc. XML software).
10.) Investigate why some callers perceive that the voice recognition is not working.
11.) Focus primarily on providing timely traffic information.
12.) Investigate why callers are willing to call 511 again.
13.) Do more awareness marketing.
14.) Peak interest in the system along the road to increase calls. Twenty-three percent (87 of 383) of those surveyed indicated that they first called 511 out of curiosity or boredom.
15.) Slightly cater marketing to males.
16.) Advertise 511 on weather.com or weatherchannel.com (same site).
17.) Focus marketing to residents during work time (8am and 5pm, Monday – Friday) radio or billboards.
18.) In addition to I-81, I-77, and I-64, focus marketing along I-40, I-75, I-95, and I-65 welcome centers.
19.) Focus marketing or work with the top three states (PA, NC, TN) to increase out-of-state awareness.
20.) Focus marketing in the top three tourist destinations (Blacksburg, Roanoke, Harrisonburg) to increase tourist awareness of the current 511 system, and in Roanoke, Richmond, Fairfax, Woodbridge, and Winchester (Top tourist origination cities).

LESSONS LEARNED

See Table 4 for a summary of lessons learned.

Table 4: Lessons Learned

Lessons Learned from the Phone Survey
1.   Provide a permanent feedback tool on the phone system.
2.   Don't use the customer satisfaction surveys as an awareness/marketing tool.
3.   Secure cooperation from all sources for 511 (telecommunications provider, manager, input providers, advertisers, etc.).
4.   Purchase questions on an omnibus for the most effective means to determine awareness.
5.   Develop the evaluation instruments from a list of performance measures, preferably in place before the system is implemented.
6.   Break out business travelers from residents, if you suspect there are large numbers on your roads.
7.   If you want a good CVO sample, you may want to sample separately or use different incentives.
8.   Expect a 1.5% response rate to your initial intercept
9.   With a $10 incentive, we experienced as high as a 50% response rate from those who left their name to participate in our survey. (Though, using the official marketing response rate formula, it was only 30%).
10. Record whether or not the caller is a first time caller.

As a summary of lessons learned for future evaluation methodologies, the evaluation team recommends:

1.) If multiple team members will be responsible for different segments of the write-up, agree ahead of time on the formatting of the graphs and the methods of referring to statistics/parameters. For example, always indicating "n=xxx" for each statistic, if the responses are low enough to prevent accurate representation with a percentage alone (i.e., too small of a sample size to be statistically significant); or deciding whether or not to include the "Don't Know/Refused" category in each presented graph. This will save hours of revisions if done ahead of time and correctly.

2.) Make sure that response brackets match between the different instruments (e.g., using the same age brackets with the web survey as with the phone survey for an easier comparison between instruments).

3.) Over-recruit the framing sample. Expect a 1.5% response rate to the initial intercept, if done over the 511 phone system.

4.) Based upon other state 511 surveys, a chance to win a sum of money or a prize has been reported to be as successful in incentivizing the surveys, as was paying $10 for each completed survey. In future 511 evaluations, administrators may choose not to incentivize to the level chosen for the 511 phone survey. However, the second reason for choosing this method was to balance negative respondents. In general, those with either positive or negative motives for answering are more likely to agree to participate. A method of using incentives is seen as a method for attracting more neutral respondents.

<u>Conclusion</u>
The phone survey served two purposes: determining whether or not 511 Virginia was meeting the applicable ITS Framework goals, and setting a baseline for future evaluations of 511 Virginia. The phone intercept with a call back at a later time proved to be both effective (for the administrators) and safe (for callers and drivers). The phone survey determined that the phone system is garnering repeat usage, is of value for those who call, is generally meeting customer satisfaction goals (99% indicated that they would call again), and is helping callers make more informed decisions (49% have changed their plans, and of those 212, 166 had changed their route because of information they

heard on 511 Virginia). 511 Virginia is reflecting well on VDOT: 73% indicated that having access to 511 Virginia has changed their opinion of VDOT in a positive way. While these findings are encouraging, they set a high benchmark for future comparisons as 511 Virginia prepares to expand state-wide.

References

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APPENDIX A: PHONE SURVEY RAW DATA

SCREENING QUESTIONS

Screening Question 1: All participants were at least 18 years of age

Screening Question 2: All participants had driven on the roads covered by 511

Screening Question 3: Male vs. Female Respondents		
Gender	**Responses**	**Percentage of Total**
Male	224	56%
Female	176	44%
Total	**400**	**100%**

Screening Question 4: Respondents Age Ranges		
Age Bracket	**Responses**	**Percentage of Total**
18-29	110	28%
30-39	77	19%
40-49	99	25%
50-59	83	21%
60-69	25	6%
70+	6	2%
Total	**400**	**100%**

Screening Question 5: Since tourism is so important to the economic livelihood of the I-81 region, we would like to collect a general idea about the incomes of those who drive on I-81. Would you be willing to share the range of your 2002 household income before taxes?		
Income Bracket	**Responses**	**Percentage of Total**
Under 20K	35	9%
21-35K	58	15%
36-50K	60	15%
51-65K	67	17%
66-80K	43	11%
81-100K	40	10%
100K +	57	14%
Don't Know/Refused	40	10%
Total	**400**	**100%**

Screening Question 6: To make sure we talk with a variety of people, in which county and state do you live?		
County	**Responses**	**Percentage of Total**
Augusta	32	8%
Bath	1	0%
Bedford	3	1%
Botetourt	11	3%
Carroll	2	1%
Clarke	2	1%
Floyd	5	1%
Franklin	5	1%
Frederick	7	2%
Giles	2	1%
Henry	1	0%
Montgomery	26	7%
Not in 511 Area	148	37%
Pulaski	8	2%
Radford	6	2%
Roanoke	62	16%
Rockbridge	9	2%
Rockingham	35	9%
Scott	1	0%
Shenandoah	19	5%
Smyth	1	0%
Staunton	1	0%
Tazewell	2	1%
Warren	2	1%
Washington	6	2%
Wise	1	0%
Wythe	2	1%
Total	**400**	**100%**

In versus Out-of-State	**Responses**	**Percentage of Total**
Out of state	84	21%
In State	316	79%
Total	**400**	**100%**

State Only	Responses	Percentage of Total
VA	316	79%
TN	12	3%
PA	9	2%
NC	9	2%
WV	7	2%
MD	7	2%
TX	6	2%
NY	5	1%
CT	5	1%
NJ	3	1%
LA	3	1%
OH	2	1%
KY	2	1%
GA	2	1%
FL	2	1%
AL	2	1%
SC	1	0%
OK	1	0%
MI	1	0%
ME	1	0%
MA	1	0%
DE	1	0%
DC	1	0%
CA	1	0%
Total	**400**	**100%**

In versus Out of 511 Area	Responses	Percentage of Total
In 511 Area	252	63%
From Out of 511 Area	148	37%
Total	**400**	**100%**

Screening Question 7: What is your typical reason for traveling in the I-81 Region?

Reason for I-81 Travel	Responses	Percentage of Total
Resident	227	57%
Tourist	154	39%
Commercial Driver	19	5%
Total	**400**	**100%**

RESIDENT QUESTIONS

Resident Question 1: On average, how many days a week do you drive a car or other vehicle?

Days of week	Respondents
1	1
2	4
3	5
4	5
5	11
6	15
7	186
Total	**227**

Resident Question 2: What days of the week do you drive on the interstates in the I-81 Region?

Days of the Week Driven	Respondents
Everyday	61
Monday - Friday	63
Weekends	37
Fri, Sat, Sun	11
Other	55
Total	**227**

Cumulative totals								
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	DK/R
	148	**141**	**140**	**141**	**164**	**142**	**121**	**8**

Resident Question 3: What is the primary reason you travel on the interstates?

Reason for Travel on Interstates	Responses	For graph
Medical Access	4	4
Travel to/from home (i.e. students)	15	21
Other	16	
Visit Family/Friends	34	34
Leisure (Shopping, to attend cultural events, etc.)	43	43
Work	115	119
All of the Above		6
Total	**227**	**227**

Resident Question 4: Do you drive to either work or school on a regular basis?

Agreement	Respondents
Yes	187
No	40
Total	**227**

Resident Question 5: What time of day do you commute?

Morning Commute	Respondents
1am	1
2am	1
3am	0
4am	2
5am	7
6am	27
7am	49
8am	58
9am	10
10am	4
11am	9
Total	**168**

Evening Commute	Respondents
Noon	3
1pm	4
2pm	12
3pm	15
4pm	20
5pm	73
6pm	30
7pm	9
8pm	2
9pm	5
10pm	7
11pm	3
Total	**183**

Resident Question 6: Which days do you typically commute?	
Days Commuted -By Category	**Responses**
Everyday	17
Weekends	13
Monday-Friday	137
Monday-Friday, Saturday	13
Total	**180**

Cumulative totals							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Total	**34**	**174**	**172**	**172**	**171**	**186**	**46**

Resident Question 7: Normally, how long does it take you to commute to/from work or school?	
Time for Commute	**Respondents**
0-5 minutes	16
6-15 minutes	43
15-30 minutes	47
30 minutes - 1 hour	59
Greater than 1 hour	13
Don't Know/Refused	5
Total	**183**

TOURIST QUESTIONS

Tourist Question 1: On average, how many days a week do you drive a car or other vehicle?

Days in a Week	Respondents
1	1
2	4
3	5
4	2
5	3
6	4
7 days a week	135
Total	**154**

Tourist Question 2: From where do your trips to the I-81 Region in Virginia normally originate?

All States	Respondents
CA	1
DE	1
LA	1
ME	1
MI	1
OK	1
SC	1
AL	2
DC	2
FL	2
GA	2
KY	2
NJ	2
OH	2
NY	3
CT	4
TX	4
WV	4
MD	6
TN	7
NC	8

Tourist Question 2: From where do your trips to the I-81 Region in Virginia normally originate?

All States	Respondents
PA	9
VA	88
Total	**154**

Top Virginia Cities	
Blacksburg	2
Loudon	2
Rockingham	2
Virginia Beach	2
Woodstock	2
Arlington	3
Alexandria	4
Harrisonburg	5
Winchester	6
Woodbridge	6
Fairfax	7
Richmond	8
Roanoke	8

Top North Carolina Cities	
Concord	1
Fayetteville	1
Gaston County	1
Lexington	1
Raleigh	1
Charlotte	3

Top Pennsylvania Cities	
Breezewood	1
Bux County	1
Dalton	1
DuBois	1
Johnstown	1
Lansdale	1
Pittsburgh	1
Sealands Grove	1
Stuartstown	1

Top Tennessee Cities	
Bristol	1
Nashville	1
Tullahoma	1
Chattanooga	2
Knoxville	2

Tourist Question 3: What is your typical final destination?	
All States	**Respondents**
GA	1
MS	1
NJ	1
OH	1
SC	1
WV	1
DC	2
MA	2
NY	3
FL	4
MD	5
PA	6
TN	6
NC	15
VA	103
Total	**152**

Top Virginia Cities	
Anandale	2
Bristol	2
Can't remember	2
Radford	2
Virginia Beach	2
Wytheville	2
Front Royal	3
Lexington	3
New Market	3
Richmond	3
Winchester	3
Staunton	5
Charlottesville	7
Blacksburg	10
Roanoke	14
Harrisonburg	15

Top Pennsylvania Cities	
Allentown	1
Carlisle	1
Easton	1
Scranton	1
Strausburg	1
Winchester	1

Top Tennessee Cities	
Chattanooga	1
Johnson City	1
Kingsport	1
Knoxville	1
Bristol	2

Top North Carolina Cities	
Ashville	1
Banner Elk	1
Boone	1
Chicory	1

Top North Carolina Cities	
Franklin	1
Greensboro	1
Hickory	1
Myrtle Beach	1
Outer Banks	1
Raleigh	1
Charlotte	4

Tourist Question 4: How often do you travel on I-81 enroute to (insert destination from Q3)?

Frequency	Respondents
Less than once a year	5
Once a year	9
Twice a year	18
3 to 5 times a year	15
> 5 times a year	105
Don't Know/Refused	2
Total	**154**

Tourist Question 5: How far in advance do you typically decide to make this trip?

Frequency	Respondents
Same Day	15
2-6 Days	42
1-3 weeks	51
1-3 months	28
4-6 months	7
More than 6 months	9
Don't Know/Refused	2
Total	**154**

Tourist Question 6: How many people are typically in your party for these trips?

# in Party	Respondents
1	47
2	66
3	22
4	11
5	6
More than 5	2
Total	**154**

CVO QUESTIONS

CVO Question 1: What type of Commercial Vehicle Operator are you?

CVO Type	Respondents
Both	1
OTR Dedicated route	1
Long Haul	7
Short Haul	10
Total	**19**

CVO Question 2: How often do you travel in the I-81 region for CVO operations?

Frequency	Respondents
More than once a week	11
Once every 2 weeks	3
Once a month	3
Once a week	1
Less than once a year	1
Total	**19**

CVO Question 3: On average, how many days a week do you drive a commercial vehicle?	
Days Driven	**Respondents**
1	1
2	0
3	0
4	3
5	4
6	4
7	7
Total	**19**

CVO Question 4: Which routes do you drive commercially in the I-81 Region on a regular basis?	
Roads	**Respondents**
I-81	17
I-64	14
I-66	11
US460	13
I-77	8
I-581	5
US220	10
US11	7
VA7	4
US250	4
US58	4
US221	4
VA8	2
US340	2

CVO Question 5: How accessible is truck parking in the I-81 Region?

Accessibility	Respondents	Applied Value	Totals
Very Accessible	2	2	4
Somewhat Accessible	5	1	5
Neither Accessible nor Inaccessible	0	0	0
Somewhat Inaccessible	3	-1	-3
Very Inaccessible	3	-2	-6
Don't Know/Refused	6		0
		Mean = (Neutral)	0

Scale Ranges	
-2 to -1	Very Inaccessible
-1 to 0	Somewhat Inaccessible
0	Neither Accessible nor Inaccessible
0 to 1	Somewhat Accessible
1 to 2	Very Accessible

CVO Question 6: If available, would you seek truck parking information in the I-81 Region?

Response	Respondents
Yes	11
No	2
Don't Know/Refused	6
Total	**19**

CVO Question 7: Are you able to find truck parking information for the I-81 Region?

Response	Respondents
Yes	5
No	4
Don't Know/Refused	10
Total	**19**

CVO Question 8: Where do you find it?

Response	Respondents
Interstate Signage	1
Maps/State Information	1
Rest Areas	1
Truck stops	1
Books/Truckers' Guides	2
Total	**6**

CVO Question 9: Do you operate as a single or team driver?

Type Driver	Respondents
Team Driver	2
Single Driver	17
Total	**19**

ACCESS AND AWARENESS

Access/Awareness Question 1: Do you currently have a cell phone?

Response	Respondents
Yes	383
No	17
Total	**400**

Access/Awareness Question 2: Do you typically use a phone to get information?

Response	Respondents
Yes	308
No	92
Total	**400**

Access/Awareness Question 3: Where did you first hear about 511 Virginia?		
Source for 511 Virginia	**Responses**	**%**
VDOT Website	2	0%
Don't Know/Refused	11	3%
Newspaper	13	3%
Radio	28	7%
Friends/Co-Workers	53	13%
Other	73	18%
Road Signs	233	56%
Total	**413**	**100%**

Source for 511 Virginia - Other	Respondents	Percentage
Advertisement at a rest area	1	1%
ASHTO	1	1%
Bus Tour (local tourist)	1	1%
State road map	1	1%
Tourist agency	1	1%
AAA magazine	2	3%
Brochure in cell phone mailing	3	4%
Brochure at hotel	3	4%
Gas Pump	4	5%
Information meeting	4	5%
VMS	6	8%
Internet	9	12%
Rack card	9	12%
Other	13	18%
TV	15	21%
Total	**73**	**100%**

Access/Awareness Question 4: Why did you first call 511 Virginia?	
For graph- Reason for 1st Call	**Respondents**
Directions (Maps/Routes)	8
Info on gas, food, lodging, rest stop	13
Construction	18
Road Conditions (fog,ice,flooding)	20
Accidents	45
Weather	54
Curiosity; boredom, general interest	87
Traffic (congestion/delays)	138
Total	**383**

Purpose - Other	**Respondents**	
Towing/Info for motorist assistance	2	2%
VMS sign directed to 511	4	4%
Can't remember	5	5%
Other	6	6%
Curiosity; boredom, general interest	87	84%
Total	**104**	**100%**

Access/Awareness Question 5: How did you first access 511 Virginia?	
Access Method	**Respondents**
Land Line (1-800 Number)	13
Land Line (511)	18
Cell Phone (1-800 Number)	9
Cell Phone (511)	352
Web	6
Don't Know/Refused	2
Total	**400**

NEEDS AND USAGE QUESTIONS

Needs & Usage Question 1: How safe do you feel on the roads in the I-81 Region?

Perception of Safety	Respondents	Scale	Results
Very Safe	107	2	214
Somewhat Safe	148	1	148
Neutral	50	0	0
Somewhat Not Safe	65	-1	-65
Not Safe at All	30	-2	-60
Total	400		
		Mean=Somewhat Safe	**0.6**

Scale Ranges	
-2 to -1	**Not Safe at All**
-1 to 0	**Somewhat Not Safe**
0	**Neutral**
0 to 1	**Somewhat Safe**
1 to 2	**Very Safe**

Needs & Usage Question 2: Has having access to 511 Virginia changed your perception of the safety of the roads in the I-81 Region?

Response	Respondents	%
Don't Know	14	4%
Yes	169	42%
No	217	54%
Total	**400**	**100%**

Needs & Usage Question 3: Was that change positive or negative?

	Respondents	%
Negative	2	1%
Positive	167	99%
Total	**169**	**100%**

Needs & Usage Question 4: Has 511 Virginia increased your awareness of traveler information in the I-81 Region?

	Respondents	%
Don't Know/Refused	7	2%
No	19	5%
Yes	374	94%
Total	**400**	**100%**

Needs & Usage Question 5: What information do you look for *before you leave* to travel in the I-81 Region?

Travel Info Source - Before Leaving	Respondents	Percentage
Travel Time/Distance	10	1%
Directions (maps, routes)	26	4%
None	32	4%
Road Conditions (fog, ice, flooding)	51	7%
Other	64	9%
Construction	109	15%
Accidents	117	16%
Traffic	124	17%
Weather	179	25%
Total	**712**	**100%**

Other - Broken Out	Respondents	%
Police	1	2%
Inconveniences	1	2%
Scheduling	1	2%
Good deals	1	2%
General info	1	2%
Size of road,	1	2%
Traveling situations	1	2%
GPS from laptop to check construction etc.	1	2%
Anything unexpected	1	2%
How may trucks will be on the road	1	2%
Road problems	1	2%
Gas level	2	3%
Time of day	2	3%
Road closures	3	5%
Events, holidays	3	5%
Detours	5	8%

Other - Broken Out	Respondents	%
Attractions, things to do	8	13%
Delays	9	14%
Info on gas, food, lodging, rest stop	21	33%
Total	**64**	**100%**

Needs & Usage Question 6: What sources do you use to *plan for* a trip to this region?		
	Respondents	**Percentage**
Exit Source Books	1	0%
Local/State Travel Guide	2	0%
Fleet Office/Dispatch	3	0%
Destination Company	3	0%
Own Experience	7	1%
Other Truckers/Travelers	7	1%
Friends/Relatives	12	2%
AAA/AARP	19	3%
Rand McNally/Atlas/Maps	22	4%
None	37	6%
Radio	56	9%
Other	61	10%
TV	68	11%
511 Virginia	144	23%
Internet	179	29%
Total	**621**	**100%**

Internet Sources Specified	Respondents	%
freetrip.com	1	2%
hotel web sites	1	2%
superpages.com	1	2%
switchboard.com	1	2%
Yahoo Travel	1	2%
expedia.com	2	4%
VDOT web site	6	13%
mapquest.com	10	22%
weather.com, weather channel	22	49%
Total	**45**	**100%**

Needs & Usage Question 7: What information do you look for *while traveling* in the I-81 Region?		
Data	**Respondents**	**%**
Don't Know/Refused	5	1%
Distances	8	1%
Info about Gas Stations	30	4%
Info about Gas Stations	30	4%
None	31	4%
Road Conditions (ice, flooding, fog)	48	6%
Info about Food (Where to Eat)	54	7%
Construction	91	12%
Accidents	143	18%
Other	161	21%
Traffic (Congestion, Delays)	184	23%
Total	**785**	**100%**

Other- Broken Out	**Respondents**	**%**
Attractions for kids	1	1%
Blacksburg Weather Station, portable CB	1	1%
Change in roads	1	1%
Emergency phone numbers	1	1%
HAR - 1610am	1	1%
Road hazards	1	1%
Info about gas Stations	1	1%
flashing lights	1	1%
emergency warning	1	1%
Automotive shops	1	1%
Police activity	1	1%
Terrorist Info	1	1%
Road/lane closures	2	1%
Exits/Mile markers	3	2%
Info about Food (Where to eat)	3	2%
News	3	2%
Shopping	4	2%
Directions	6	3%
Detours	8	4%
Rest Stops/Welcome Centers	8	4%
Informational Signage	9	5%

Other- Broken Out	Respondents	%
Lodging	11	6%
Traffic (Congestion, Delays)	15	8%
Info about Attractions	18	10%
Weather	78	43%
Total	**180**	**100%**

Needs & Usage Question 8: What information were you looking for when you called 511 and left your name for this survey?		
Categories	**Respondents**	**%**
None	5	1%
Don't Know/Refused	6	1%
Trip Routing	3	1%
Services	8	1%
Road Conditions	30	5%
Other	67	12%
Construction	75	13%
Weather	90	16%
Accidents	120	21%
Traffic	170	30%
Total	**574**	**100%**

Other - Broken Out	Respondents	%
Report speeding vehicles	1	1%
Road closures	1	1%
Traffic	1	1%
Truck activity	1	1%
Bridge Closing	2	3%
Motorist assistance	2	3%
Weather	2	3%
Tornado warnings	3	4%
General information	4	6%
Survey	5	7%
Trip routing	6	9%
Not specific - curiosity	12	17%
Services	14	20%
Delays/congestion/blockages	16	23%
Total	**70**	**100%**

Needs & Usage Question 9: What information are you typically seeking when you call 511 Virginia?		
Categories	**Respondents**	**%**
Don't Know/Refused	2	0%
Trip Routing	3	0%
None	5	1%
Services	11	2%
Other	46	6%
Road Conditions	50	7%
Weather	103	14%
Construction	114	16%
Accidents	166	23%
Traffic	222	31%
Total	**722**	**100%**

Other - Broken Out	Respondents	%
Report incident	1	2%
Traffic	1	2%
Blockages	2	4%
Boredom, curiosity	2	4%
Bridge Closing	2	4%
General Road Information	2	4%
Road Closures	2	4%
Backups	2	4%
Alternate Route	3	6%
Trip Routing	3	6%
First call	4	8%
Delays	12	24%
Services	14	28%
Total	**50**	**100%**

Needs & Usage Question 10: How useful is the information you find?			
Usefulness	**Respondents**	**Scale**	**Results**
Very Useful	263	2	526
Somewhat Useful	95	1	95
Neutral	15	0	0
Not Very Useful	10	-1	-10
Not Useful at All	12	-2	-24
Don't Know/Refused	5		
Total	**400**		
		Mean: Very Useful	**1.5**
Scale Ranges			
-2 to -1	**Not Useful at All**		
-1 to 0	**Not Very Useful**		
0	**Neutral**		
0 to 1	**Somewhat Useful**		
1 to 2	**Very Useful**		

Needs & Usage Question 11: What makes it useful?	
Category	**Respondents**
Helps make travel decisions	140
Useful information	50
Route information	49
Easy and convenient to use	44
Increase awareness	44
Other	44
Traffic and delay information	34
Weather information	33
Accident information	28
Location specific information	22
Voice response	22
Total	**510**

Other-broken out	Respondents
Saves time	20
Road condition information	16
Don't know/refused	12
Services information	11
Quality of information	10
Peace of mind	9
Connection function	6
Safe/hands free	6
Ability to alert others about being late	4
Miscellaneous	4
Coverage area	3
Tourism information	3
Free service & saves money	2
Time stamp	2
Travel advisory information	1
Total	**109**

Needs & Usage Question 12: What could be more useful for you?	
Category	**Respondents**
Nothing	97
Don't know/refused	75
Other	50
Make navigation easier	50
Provide more current information	39
Ensure voice recognition works	21
Improve construction information	21
Provide detour information	20
Expand coverage area	20
Improve services information	18
Improve information quality	16
Improve information by mile marker	14
Improve weather information	14
Improve availability	14
Improve accident information	13
Quality of traffic information	12
Delay information	11
Total	**505**

Other-broken out	Respondents
Group information differently	9
Provide backup length information	7
More awareness marketing	7
Miscellaneous/not related to 511	7
Provide directions	6
Provide for user input	4
Provide VSP information	3
Provide information on location of user	3
Provide road condition information	2
Provide road safety information	1
More cameras	1
Total	**51**

DECISION MAKING QUESTIONS

Decision Making Question 1: Have you ever heard anything on 511 Virginia that caused you to change your travel plans?		
Response	**Respondents**	**%**
Don't Know/Refused	4	1%
Yes	194	49%
No	202	51%
Total	**400**	**100%**

Decision Making Question 2: How did you change your plans?		
Category	**Respondents**	**%**
Slow Down/Change Speed	1	0%
Modified trip	3	1%
Stop Along the Way and Wait	5	2%
Don't Know/Refused	6	3%
Changed Time (arrive, depart)	13	6%
Cancel/Reschedule Trip	18	8%
Change Route	166	78%
Total	**212**	**100%**

Decision Making Question 3: Would you call 511 Virginia again?	
Responses	**Respondents**
Yes	397
No	2
Don't Know/Refused	1
Total	**400**

WHO SHOULD RUN 511?

Who Should Run 511 Question 1: As you probably know, there are any number of sources that can gather and offer to you information on Virginia roads. In your opinion, who should be responsible for providing this service?

Who should run 511?	Respondents	%
All	213	53%
Virginia Department of Transportation	76	19%
Government	57	14%
Virginia State Police	21	5%
Private Industry	14	4%
Don't Know/Refused	10	3%
PPT/VDOT	8	2%
PPT/VSP	1	0%
Total	**400**	**100%**

Who Should Run 511 Questions 2: And, in your opinion, which do you think would provide travel information that is more reliable?

Agency	Respondents	%
PPT/VDOT	2	1%
PPT/VSP	3	1%
Private Industry	11	3%
Don't Know/Refused	15	4%
Virginia Department of Transportation	63	16%
Government	84	21%
All	104	26%
Virginia State Police	118	30%
Total	**400**	**100%**

Who Should Run 511 Questions 3 & 4: Has access to 511 Virginia changed your perception of the services provided by the Virginia Department of Transportation? Has this change been positive or negative?		
Response and Positive/Negative	**Respondents**	**%**
Don't Know/Refused	17	4%
No	102	26%
Yes/Negative	1	0%
Yes/Positive	280	70%
Total	**400**	**100%**

511 Virginia Evaluation
January 2004

Awareness Survey Report
Chapter 5

CHAPTER 5: AWARENESS SURVEY REPORT

EXECUTIVE SUMMARY

An important component of this 511 Virginia evaluation is an assessment of how the Virginia Department of Transportation (VDOT) met the objective of increasing traveler awareness of the 511 Virginia service, under the overall goal of productivity, by measuring the awareness level of the general population within the 511 Virginia coverage area. An understanding of what percentage of people are aware of the service, what percentage have used the service, and what their perceptions of the service are was addressed with an awareness survey. Furthermore, an understanding of what types of information the respondents were likely to use the 511 Virginia service for was addressed. Appendix B, C, D, & E contain the raw results from the questions posed in the awareness survey.

The awareness survey was administered by the Center for Survey Research (CSR) at Virginia Tech. VTTI purchased the placement of four questions on the Quality of Life (QOL) in Virginia survey enabling the project team to reach a much larger audience than otherwise possible within the timeframe and budget of this evaluation. The four questions asked by the CSR for 511 Virginia are listed in appendix A. The CSR employed a stratified disproportionate sampling design for the 2003 QOL survey. The resulting completion of 1,099 interviews provides a representative sample of adult respondents in households across Virginia with a margin error of ±3.0 percent at the 95 percent level of confidence.

Statistically significant data was collected for all of Virginia. As a result, a baseline of data for the Commonwealth is established through this assessment and may be used in future evaluations for comparison purposes as more regions of Virginia are included in 511 Virginia's coverage area. For the purposes of this evaluation, the data that was collected across Virginia is broken into two sets. One set of data includes just the 511 Virginia coverage area (i.e., the I-81 Corridor). The second set of data includes the 511 Virginia coverage area as well as the rest of Virginia. The results from this data set are referred to as the "all-Virginia" results throughout this paper, as opposed to the "511 Virginia coverage area" results. The all-Virginia results are used when appropriate for comparison purposes.

The findings that emerged from the survey fell into two categories:
- Awareness and usage
- Categories of information users are most likely to use

Some of the major findings from respondents include:
- 19% of participants report having heard of 511 Virginia
- Of those who have heard of 511 Virginia, 8%, or 6 of 73, have used the service
- Of those who have heard of 511 Virginia, 32%, or 23 of 73 are familiar with the services 511 Virginia provides

- A majority of the respondents who have heard of 511 Virginia associate the following types of information with the service:

- o Road Conditions
- o Lodging
- o Traffic/Construction
- o Places to buy food
- A majority of all respondents are most likely to use 511 Virginia for:
  - o Emergency Services
  - o Accidents/Construction
  - o Road Conditions

Based on the findings there are several recommendations that can be made for 511 Virginia:
- Go beyond awareness marketing.
  - o There is gap between awareness and usage and between awareness and an understanding of services provided.
- Reevaluate marketing efforts.
  - o There are relatively similar usage/perception levels in 511 coverage area and all-Virginia.
- Explore further the users' perceptions of the meaning of terms "Road Conditions" and "Emergency Services."
- Consider enhancing Emergency Services to fit traveler's perceptions and expectations or differentiate 511 from #77 in Virginia.
- Consider eliminating categories that are not related to Travel Conditions.
- Differentiate 511 from other n11 services.

In terms of lessons learned, the project team found participation in an omnibus survey to be a good way to determine general awareness. The cost was low and the requirements of the team were minimal as well. In developing the awareness survey, one lesson learned was that consistency across other surveys being administered as part of the overall evaluation is important (e.g., the phone, web, and awareness survey).

Methods

(The following methods description is taken from the Quality of Life in Virginia: 2003 report)
The 511 Virginia Awareness Survey was administered as part of the 2003 QOL survey. The CSR administers the QOL survey annually and reserves a portion of the instrument for special items that may be requested by state policy-makers or faculty members at Virginia Tech. The 2003 QOL survey instrument is administered by telephone to Virginia citizens and is designed to encompass a wide variety of items assessing a broad domain of experiences and opinions.

After the initial draft of the 2003 QOL survey was developed, a multi-phase instrument pre-test was conducted by the CSR in order to test the position of each survey item within the instrument, the wording of each item, and the length of the interview. The survey pre-test was conducted with a small sample of randomly selected Virginia citizens. Following the pre-test, consequent non-substantive wording changes were made in order to improve the clarity of the instrument. It was established during the pre-test that the average interview length was 19 minutes. A copy of the 2003

QOL survey instrument (questions only relating to 511 Virginia), as well as demographic questions are provided in Appendix A.

A stratified disproportionate sampling design was employed for the 2003 QOL survey. The sample for this project was obtained by the CSR from the national sampling firm, Survey Sampling Inc., and it included the telephone number and numeric geographic identifier (Virginia city or county of residence) for each of the randomly selected 4,528 sample members. The sample used for this study included both listed and unlisted telephone numbers.

All telephone numbers in this sample were called between April 4 and June 11,2003. Only adults in households were interviewed. Excluding non-working and non-residential telephone numbers as well as numbers for which no eligible adult was available, the final "eligible" sample for this survey included 2,965 working household telephone numbers. With 1,099 interviews completed out of this sample of households, a completion rate of 37.1 percent was attained. The resulting completion of 1,099 interviews provides a representative sample of adult respondents in households across Virginia with a margin of error equaling ±3.0 percent at the 95 percent level of confidence. Thus, assuming there are no substantial differences between completed interviews and those that were not completed, results based on this sample size should vary no more than 3.0 percentage points above or below the obtained results. Given repeated administrations of the survey, results would vary beyond XX percent only five out of 100 administrations.[1]

Sample for the 511 Coverage Area

For the 511 Coverage area, a sample of 384 respondents was desired. This number is sufficient for a 5% acceptable error rate. This number (384) is obtained by using the formula in the box below.[2]

$$n=z^2(p \times q)/e^2$$
n=sample size
z=std error
p=established variability
q=(100-p)
e=acceptable error
$n=(1.96)^2(50 \times 50)/5^2$
n=384.16

Demographic Information

As stated previously, participants for the QOL survey were randomly selected. A portion of the survey was dedicated to obtaining demographic information about the participants. Figure 1 shows a chart of selected demographic information for both the 511 coverage area and for all of Virginia.

In analyzing the all-Virginia results, it is important to note that 35% of the participants are from the 511 coverage area and 65% are not from the 511 coverage area. Map1 shows the overlap in region of the two sets of results.

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[1] Bayer, Alan E., and Willis-Walton, Susan M. (2003). Quality of Life in Virginia. Pages 2-5
[2] Burns, Alvin C., Bush, Ronald F., Marketing Research 3rd Edition, Prentice Hall 2000. Page 439.

Map 1. Map of 511 Coverage Area vs. All of Virginia
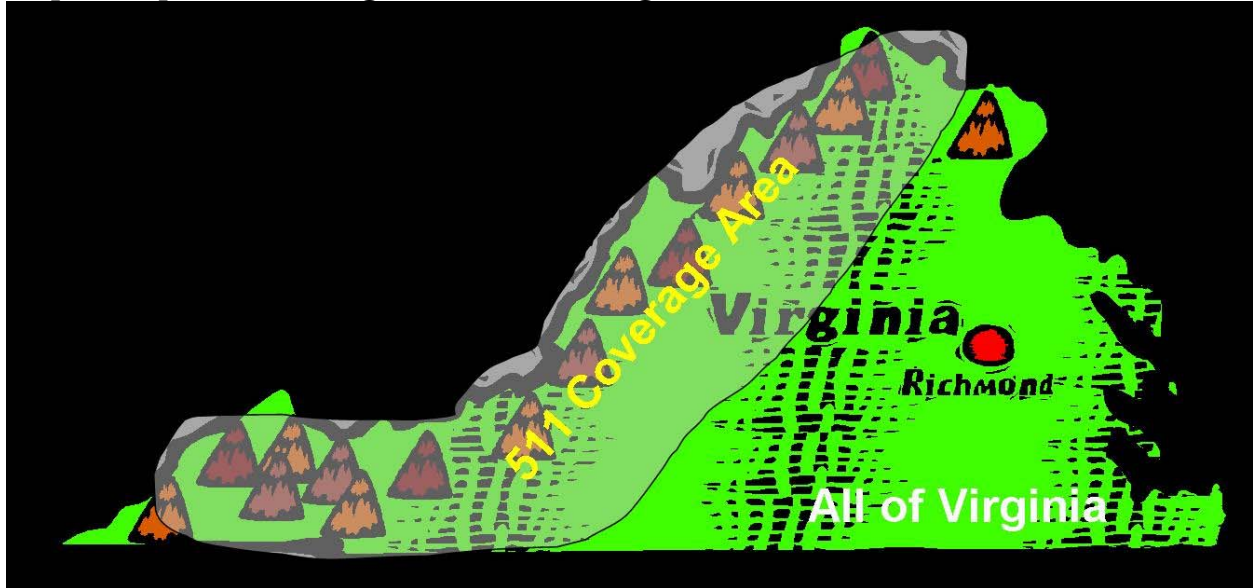
Figure 1. Selected Demographic Information (Survey Questions 23 – 38).

	511 Coverage Area	All Virginia
How old are you?	40-49 *Range: 18-96*	40-49 *Range: 18-96*
Does anyone in your household have a cell phone?	65% has cell phone	72% has cell phone
Is there a computer in your home?	63% with computer	78% with computer
Do you have access to the internet?	70% with access to internet	79% with access to internet
How many times per month do you use the internet?	Daily (21-31/month) *Range: 0/month to 300/month*	Daily (21-31/month) *Range: 0/month to 900/month*
Has anyone in your household ever purchased a product on the internet?	53% has purchased on the internet	63% has purchased on the internet
What was your household income before taxes last year?	Less than $20,000 *Range: less than $20,000 to over $120,000*	$30,000 to 40,000 (majority refused) *Range: less than $20,000 to over $120,000*
What is your gender?	66% female	65% female
	N=385	N=1099

Data from the 2000 Census shows that the information in Figure 1 is similar to, but not a complete reflection of, the general population of the Commonwealth of Virginia. Census data shows[3]:
- The average citizen in Virginia is female (51%)
- The average age is between 34-55
- The average income is between $50,000 and $74,999

MAJOR FINDINGS

The awareness survey yielded many interesting findings. For the purpose of this evaluation, findings are focused on results from the 511 Virginia coverage area; significant findings from the all Virginia results are noted when appropriate. In interpreting the analysis, it should be noted that, unless otherwise stated, the all Virginia category contains the responses from the 511 Virginia coverage area reflecting the entire Commonwealth, not just the area outside of the 511 region.

The findings from the survey fall into two categories:
- Awareness and usage
- Categories of information users are most likely to use

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[3]U.S. Bureau of the Census, Census 2000.

Below is a summary of these findings. The complete list of raw findings is located in Appendices B, C, D, & E. Appendix D and E present the complete, relevant demographic findings from the QOL survey. Although these findings are not part of this analysis, they may be of interest to VDOT.

Awareness and Usage

Awareness

One of VDOT's goals for the 511 Virginia service is to increase traveler awareness of the 511 Virginia service. In an effort to measure current awareness levels, participants of the QOL survey were asked if they had ever heard of 511 Virginia. Figure 2 represents the results of this question. 19% of all respondents report having heard of the service.

By comparison, the all-Virginia results showed that 13% of the respondents had heard of the service. When the data for the 511 Virginia coverage area was removed from the all-Virginia results, it was revealed that 9% of respondents outside of the 511 Virginia coverage area are aware of 511 Virginia. This finding is interesting to note because marketing and awareness efforts to date have occurred only in the 511 Virginia coverage area.

In comparing the results from the 511 Coverage area to the 511 Coalition Goals for national 511, it can be concluded that Virginia is not far from meeting the national goal of 25% of the nation's population being aware of 511 by 2005[4]. However, the all-Virginia results reveal that Virginia is far from that goal. At least one other state has published awareness results that can be compared to 511 Virginia. Statewide Minnesota had an awareness level of 13% prior to marketing. In comparing the states, Virginia has the least awareness, another indication of the need to step up awareness efforts.

Figure 2. Have you ever heard of 511 Virginia, the three-digit phone number service that provides information to citizens? (Survey Question 18).

N=385

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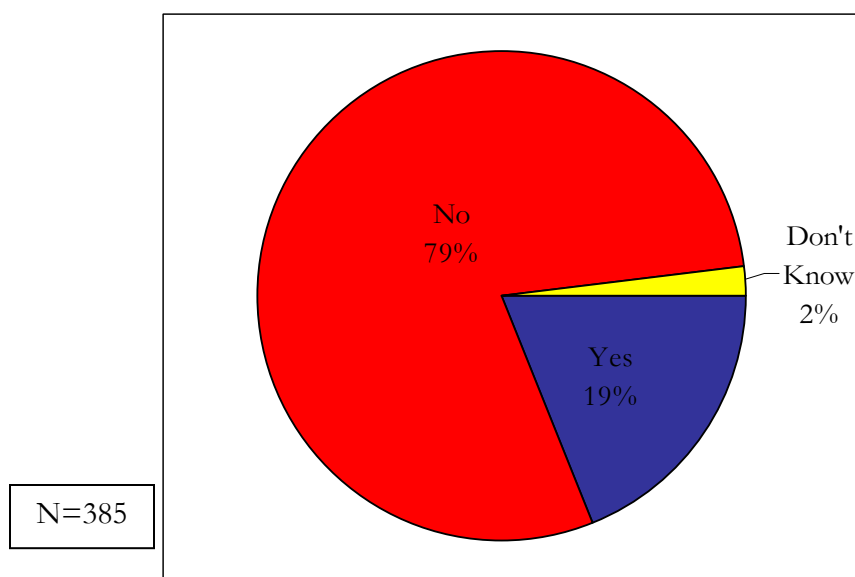
[4] 511 Deployment Coalition. 511 Implementation and Operational Guidelines (2003), Version 2.0, page ii

Figure 3. Comparison of state awareness levels.
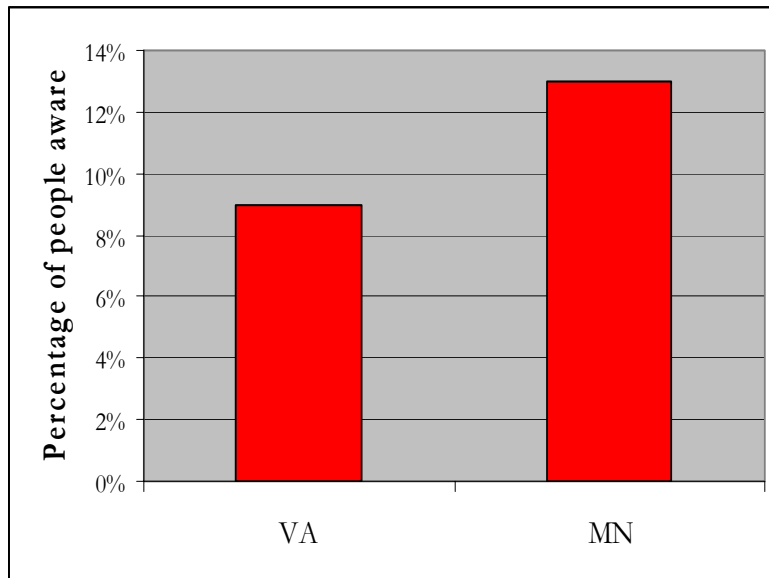
Usage

Going a step beyond awareness of the 511 Virginia service, the project team desired to measure the number of people who have heard of 511 and have used the service. Figure 3 shows the result that 6 participants (or 8%) of the 73 participants who reported having heard of 511 have ever called the service.

Similarly, the all Virginia results show that 7% (10 of 139) of the participants who reported having heard of 511 had ever called. As both sets of data indicate, there is a large gap between those who are aware of the 511 service and those who have used the service. This may be an indicator of a need for more effective awareness marketing of the 511 Virginia service.

Figure 4. Have you ever used the 511 Virginia phone service? (Survey Question 19).

N=73
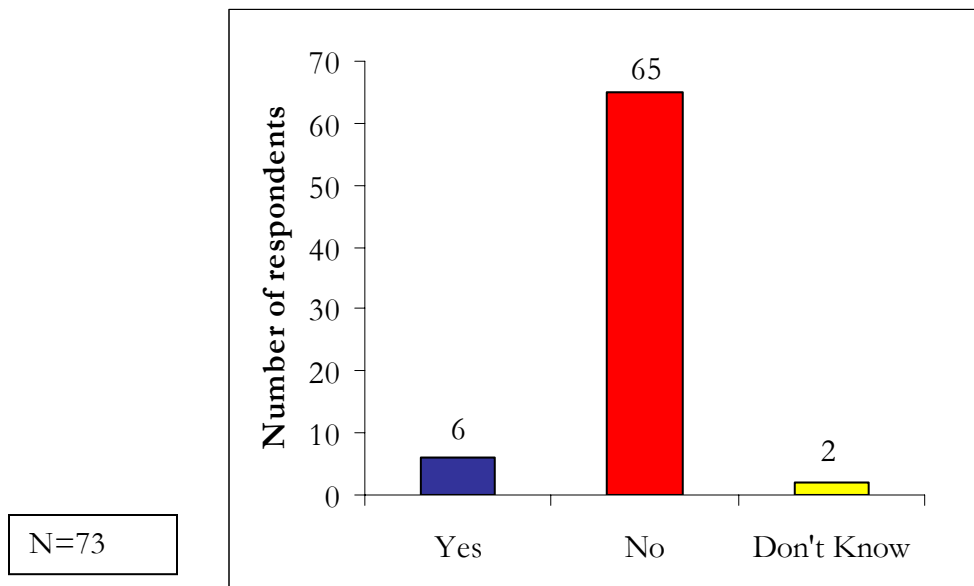
Perception of Services Offered

The 73 respondents who reported having heard of 511 were asked if they were aware of what types of information the 511 Virginia service provides. Figure 4 depicts the results that 23 (or 32%) of the 73 respondents were familiar with what the service provides.

The results for all Virginia indicate that 38 (or 27%) of the 139 who had heard of 511 were aware of the services it offers. Again, this is interesting to note given the focus of the marketing and awareness efforts only in the 511 Virginia coverage area.

This gap between awareness of 511 and understanding what it provides indicates an even greater need for an awareness campaign that includes education on what the service provides.

Figure 4. Are you familiar with the types of information that the 511 service provides? (Survey Question 20).

N=73
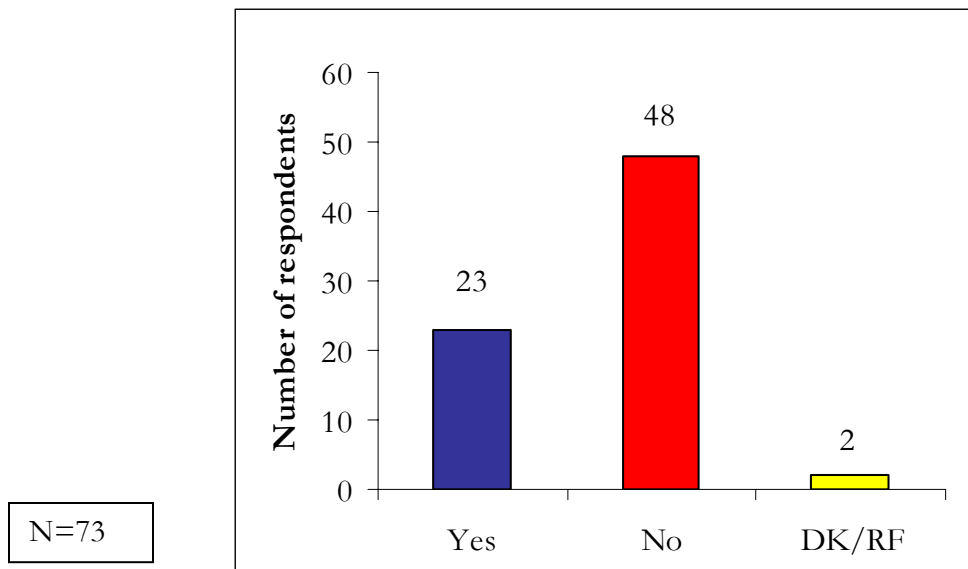
To gain an understanding of what respondent's perceptions of the services provided by 511 are, the 23 respondents who indicated they were aware of 511 Virginia were asked what the service provides to users. This was an open question, and no choices were presented to select from. Figure 5 represents the responses from the 23 respondents.

The data reveals that, of the 23 respondents, perceptions were almost equally split between travel condition information (road conditions, traffic/construction, and weather) and traveler services (lodging, places to buy food, tourism/attractions, gas stations, etc.).

Figure 5. What types of information are provided by the 511 service? (Survey Question 21).
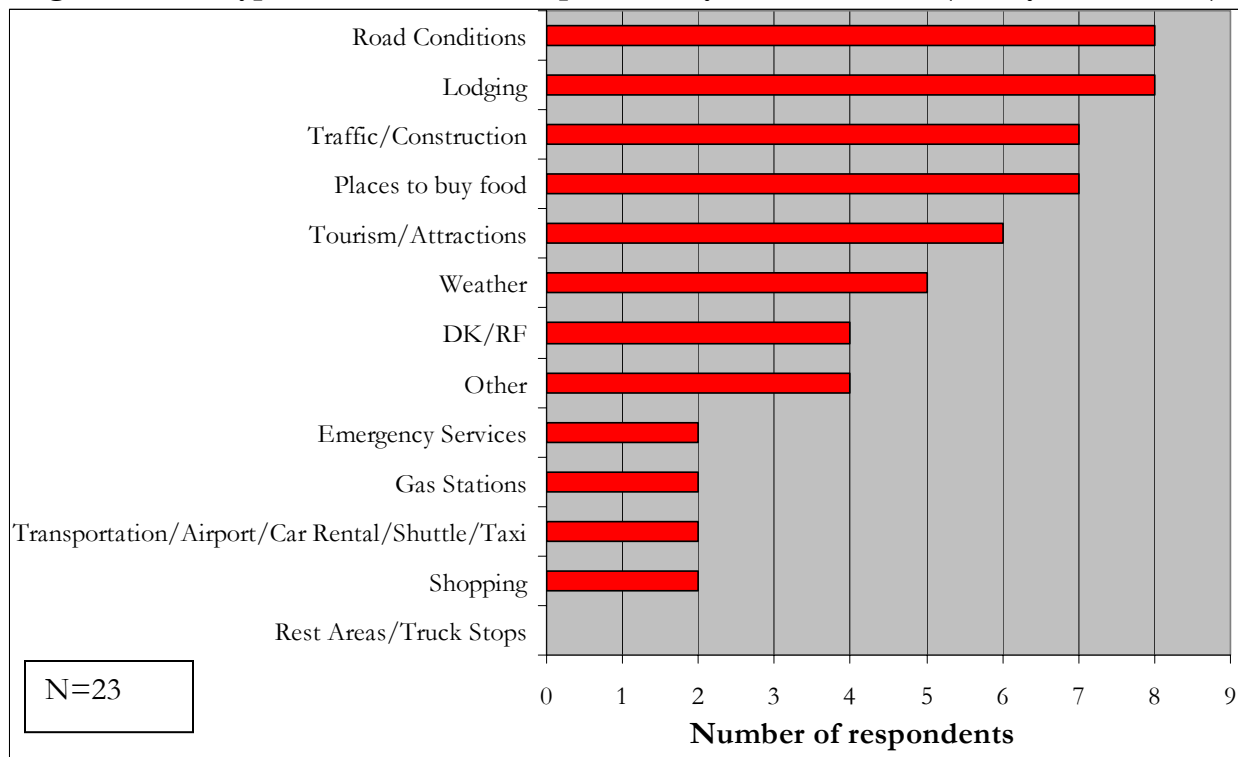
The "other" responses are broken down as follows:
- Health information and environmental issues
- Jobs, economic situations you can discuss with people
- Locating different types of places to go while traveling
- What is going on in a given community

The "other" responses may indicate some confusion with other N11 numbers such as 311 which has been designated to provide non-emergency governmental services. This is a further indication of the need for a marketing effort beyond general awareness.

Categories of Information Users are Most Likely to Use

VDOT was interested in gaining an understanding of what types of information the general population are interested in. All participants were asked how likely they were to use each of the various categories of information 511 Virginia provides:
- Restaurants or places to stop for food
- Lodging or places to stay while traveling
- Shopping
- Tourism sites and attractions
- The weather
- Transportation (e.g., airports, car rentals, shuttles, or taxi services)
- Places to stop for gasoline

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- Accidents, construction or traffic that might affect travel
- Rest areas or truck stops
- Road conditions
- Emergency services

Figure 6 depicts the findings from this question.

Figure 6. How likely are you to dial 511 to get each type of information below? (Survey Question 22).

	Very Likely	Somewhat Likely	Somewhat Unlikely	Not at all likely	DK/RF
Shopping	6%	19%	17%	58%	1%
Rest Areas	6%	21%	17%	56%	1%
Gas	8%	16%	17%	58%	1%
Restaurants	8%	24%	15%	54%	1%
Transportation	8%	26%	15%	51%	1%
Tourist Attractions	11%	33%	13%	43%	1%
Lodging	13%	31%	12%	44%	1%
Weather	14%	27%	10%	49%	1%
Road Conditions	17%	33%	9%	40%	1%
Emergency Services	19%	35%	10%	36%	1%
Accidents/Construction	21%	31%	10%	37%	1%
N=385					

Figure 7 shows the findings grouped into likely or not likely categories for a clearer picture of the respondent's opinions.

Responses indicate that only three categories are more likely than not to be used by participants:
- Emergency Services
- Accidents/Construction
- Road Conditions

All other categories the majority of participants stated they were less likely to use.

It is interesting to note that the categories that the majority of participants were likely to use were related to travel condition information. In contrast, the categories the majority of participants were not likely to use were related to traveler services, with the exception of weather.

The all-Virginia results revealed the same findings. The only three categories the participants stated they would be more likely than not to use are:
- Accidents/construction
- Road Conditions
- Emergency Services

All other categories the majority of participants stated they were less likely to use.

It is the opinion of the project team that the term "emergency services" was most likely interpreted by participants to mean access to emergency services at the time they need it, perhaps similar to dialing #77. However, without further exploration, this is difficult to conclude.

Figure 7. How likely are you to dial 511 to get each type of information below? (Combined answers). (Survey Question 22).
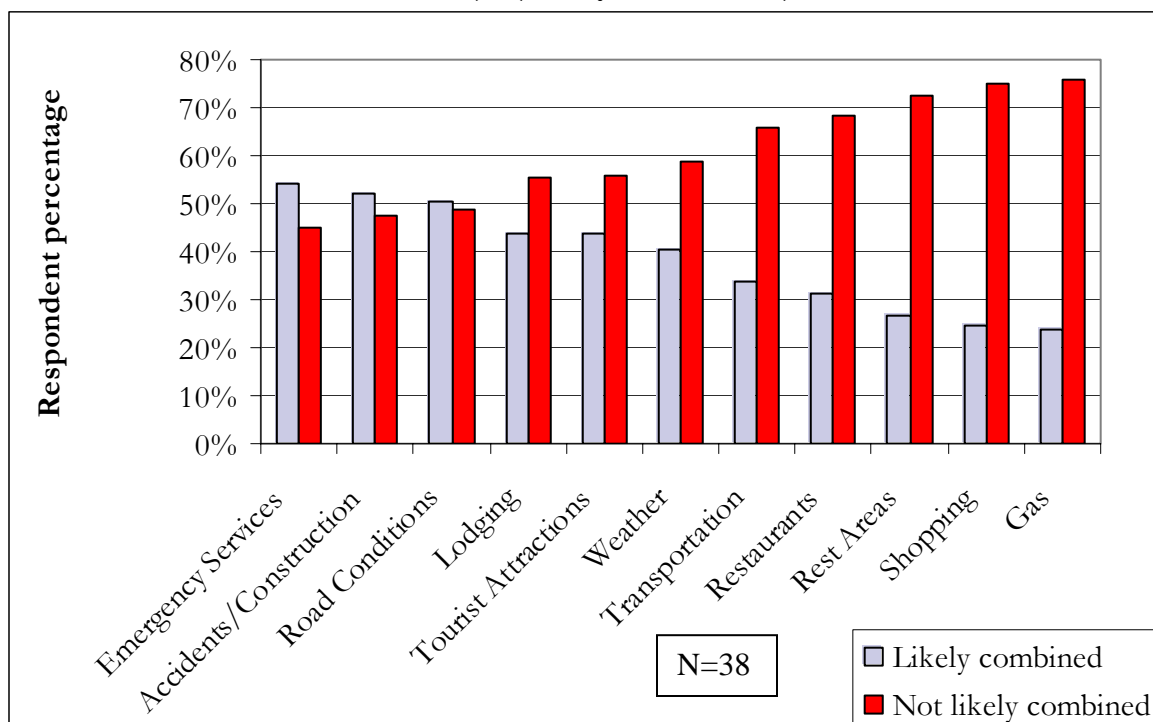
RECOMMENDATIONS

Based on the findings, there are several recommendations that can be made for 511 Virginia:
- Go beyond awareness marketing.
- There is gap between awareness and usage and between awareness and an understanding of services provided.
- Reevaluate marketing efforts.
- There are relatively similar usage/perception levels in 511 coverage area and all Virginia.
- Explore further the users' perceptions of the meaning of terms "Road Conditions" and "Emergency Services."

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- Consider enhancing Emergency Services to fit travelers' perceptions and expectations or differentiate 511 from #77 in Virginia.
- Consider eliminating categories that are not related to Travel Conditions.
- Differentiate 511 from other N11 services.

The awareness and usage section provided the insight that there is a large gap between the number of people who are aware of 511 and the number of people who are using 511. Further, another gap is evident between awareness of 511 and the understanding of what types of services 511 provides. These gaps indicate that the general population in the 511 coverage area is not being educated about what 511 Virginia can provide. It is the recommendation of the project team that further emphasis be placed on educating travelers within the 511 Virginia coverage area about what services 511 offers, as well as information that may make a user more likely to try the service. Such information could include:
- Ease of use. The user will be able to easily access information needed to make travel decisions.
- The cost to the user is no more than a local call.
- The service is safety conscious, using hands-free voice response technology.

This campaign should be fully implemented once a desirable awareness level is reached. Education without awareness may not lead to more users choosing to use 511, but education after an awareness of 511 will be meaningful and should optimize an increase in usage.

Similarly, the finding that the usage and perception of services offered were relatively consistent for both the 511 coverage area results and the all-Virginia results may indicate that the marketing efforts employed within the 511 Virginia coverage area prior to the evaluation period have not been as effective as anticipated. Therefore, the project team recommends that a marketing and awareness plan that emphasizes traveler awareness and understanding of the 511 Virginia service be created. This effort should stem from clear goals and targets established by VDOT for awareness and usage levels (e.g., VDOT could adopt the national goals). This effort should not be confused with an effort to create sales and revenue for the service.

Another recommendation is to create a better understanding of how the terms used in 511 Virginia are perceived, specifically the terms "Emergency Services" and "Road Conditions." These two terms are of particular importance to 511 Virginia as they are two of the three categories that the general population has an interest in throughout Virginia. The project team suspects that the term "Emergency Services" may be interpreted as roadside assistance or emergency assistance similar to the service #77 provides. "Road Conditions" may be interpreted by the general population as a broader category including traffic, construction, weather, or anything that is affecting the flow of traffic on the roads. It is the project team's recommendation that in-depth focus groups could be held to determine how a sample of the population interprets these terms. This information could provide the marketing/awareness campaign with useful information and be used to improve the 511 Virginia service.

For example, if it is found through further analysis that emergency services is interpreted by the majority of the population to be like #77, then it is to be assumed that the respondents who stated they were "very likely" or "somewhat likely" to call for this feature are really seeking a service similar

to #77. It is the project team's recommendation that either VDOT enhance this feature of 511 Virginia to provide more meaningful information (e.g., users may expect to be able to talk to a person for Emergency Services) or eliminate the category from 511 Virginia so users do not have a negative experience with 511 when their expectations are not met. Should the category be eliminated, VDOT should consider the need to differentiate 511 Virginia from #77 in public perception.

The project team recommends that VDOT consider eliminating the categories that the respondents indicated they were not likely to call 511 to get information for. The results show that these categories are almost exclusively traveler services categories, with the exception of weather information. If it is not VDOT's intention to completely eliminate the traveler services portion of the 511 Virginia service, then the project team recommends significantly reducing the categories that are offered under traveler services. Users from both the 511 coverage area as well as all of Virginia indicate that, although they are less likely to call for this type of information, the categories they would most likely be interested in are lodging and tourist attractions. The least likely categories are transportation, restaurants, rest areas, shopping, and gas in that order. Therefore, the project team would recommend maintaining only lodging and tourist attractions and eliminating the other categories if traveler services is to be maintained on 511 Virginia. Further, eliminating categories will help to simplify any sales efforts.

Finally, further evaluation may reveal an overall confusion with n11 numbers that exist in Virginia. 311 is available in some regions of Virginia and is designed for non-emergency governmental services, and 211 is coming to certain locations in Virginia. 211 is for social services (e.g., United Way, battered women shelters, etc.). More awareness and education marketing geared toward this possible problem may be beneficial.

METHODOLOGICAL LESSONS LEARNED

There is one primary lesson learned from the awareness survey. During the design phase of the survey, the evaluation team failed to coordinate the way questions were phrased in the awareness survey with the phone and web survey. For example, the breakdown of categories offered by 511 Virginia were identified differently in the phone and the web surveys (e.g., accidents/construction as one category or two separate categories). This resulted in findings that were difficult to compare across surveys within this 511 Virginia evaluation. Future evaluators should coordinate these questions so that comparisons of users can be made more easily.

Beyond this lesson learned, the project team found that participation in an omnibus survey such as the QOL survey was an efficient and effective method for determining awareness across a broad area. The cost of the survey was low compared to the cost it would have required to administer the survey in-house. Minimal staff resources needed to be allocated to the survey beyond development of the questions and analysis of the results. All other aspects were provided by the CSR.

In conclusion, the awareness survey was administered to determine whether or not VDOT met the goal of increasing traveler awareness of the 511 Virginia service by measuring the awareness level of the general population within the 511 Virginia coverage area. Significant findings include:

- 19% of participants report having heard of 511 Virginia.
- Of those who have heard of 511 Virginia, 6 of 73, or 8%, have used the service.
- Of those who have heard of 511 Virginia, 23 of 73, or 32%, are familiar with the services 511 Virginia provides.
- The majority of all respondents are most likely to use 511 Virginia for:
  - Emergency Services
  - Accidents/Construction
  - Road Conditions

APPENDIX A: 511 VIRGINIA AWARENESS SURVEY

VIRGINIA QUALITY OF LIFE SURVEY: 2003

SAMPLE RECORD

Telephone Number: Last Contact Date:
Record Number: Last Contact Time:
Respondent Number: Final Call Disposition:
Record Status: Callback Date:
Number of Attempts: Callback Time:
Number of Refusals: Definite/Indefinite Callback:
Record Priority (based on attempts):   Interviewer Message:
Interviewer ID Number:
Last Call Disposition:

CALL DISPOSITIONS

01 = No Answer   10 = Hard Refusal
02 = Busy Signal   11 = Automated Refusal/Screening Service
03 = Answering Machine   12 = Disconnected/Changed Number
04 = Callback   13 = Fax Tone
05 = Non Residential Number   14 = Temporarily Out of Service
06 = Language Difficulty   15 = No Resident Over 18 Years Old in Household
07 = Hearing Difficulty   16 = Partially Complete Interview
08 = Beeper Message   17 = Complete Interview
09 = Soft Refusal

CALLING INFORMATION: _____(RDD Phone Number)

**A. Hello, my name is _____ _____ and I'm calling from the Virginia Tech Center for Survey
Research. I would like to ask you some questions about life in Virginia that will only take a few
minutes. Our research requires that I talk to an adult [AGE 18 OR OLDER] in your household.
Would that be you?**

[GO TO Q1] YES 1
NO 2

B. May I speak with that person?

[REPEAT FIRST TWO SENTENCES OF A, GO TO Q1] YES 1
NO 2

C. When may I call back to speak with (him/her)?_____

D. So that I will know who to ask for, what is (his/her) name?_____
[REPEAT BACK FOR PRONUNCIATION IF NECESSARY, AND TERMINATE CALL]

<div style="border:1px solid black; background:#ffffcc; padding:4px;">

IF RESPONDENT OBJECTS: "We only need the person's first name, the last isn't necessary."

</div>

Q18.   Have you ever heard of five-one-one Virginia, the three-digit phone number service that provides information to citizens?

YES 1
NO [GO TO Q22] 2
DK/MAYBE/CAN'T REMEMBER [GO TO Q22] 3
RF [GO TO Q22] 4

Q19.   Have you ever used the five-one-one Virginia phone service?

YES 1
NO 2
DK/MAYBE/CAN'T REMEMBER 3
RF 4

Q20.   Are you familiar with the types of information that the five-one-one service provides?

YES 1
NO [GO TO Q22] 2
DK/RF [GO TO Q22] 3

<div style="border:1px solid black; background:#ffffcc; padding:4px;">

IF ASKED: "511 will be available throughout the Commonwealth by 2005 but is currently available only in some portions of Virginia."

</div>

Q21.   What types of information are provided by the five-one-one service?

CHOOSE ALL THAT APPLY
PLACES TO BUY FOOD 1
LODGING 2
SHOPPING 3
TOURISM/ATTRACTIONS 4
WEATHER 5
TRANSPORTATION/AIRPORT/CAR RENTAL/SHUTTLE/TAXI 6
GAS STATIONS 7
TRAFFIC/CONSTRUCTION 8
REST AREAS/TRUCKSTOPS 9
ROAD CONDITIONS 10
EMERGENCY SERVICES 11
OTHER (Please specify: _____) 12
DK/RF 13

Q22. The five-one-one service provides different types of traveler information and can provide callers with direct phone connections to businesses throughout Virginia. The service costs no more than the charge of a local call. Please tell me how likely you might be to dial five-one-one to get each type of information I mention.

		very likely	somewhat likely	somewhat unlikely	or not at all likely to call for this type of information?	DK/RF
a.	First, information about restaurants or places to stop for food. Would you say you would be...	very likely	somewhat likely	somewhat unlikely	or not at all likely to call for this type of information?	DK/RF
b.	how about information on lodging or places to stay while traveling?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF
c.	information on shopping?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF
d.	tourist sites and attractions?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF
e.	the weather?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF
f.	information on transportation like airports, car rentals, shuttles or taxi services?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF
g.	places to stop for gasoline?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF
h.	How about information on accidents, construction or traffic that might affect travel?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF
i.	information on rest areas or truck stops?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF
j.	road conditions?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF
k.	emergency services?	VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	NOT AT ALL LIKELY	DK/RF

Now, I have a few more general questions about you.

Q23.   What year were you born?

19
DK/RF 1999

Q24.   Counting yourself, how many people are currently living in your home?

DK/RF 99

> **IF ASKED: "Do not count college students living away at school."**

IF Q24=1, GO TO Q26

Q25. How many of these people are under the age of 18?

DK/RF 99

Q26. Do you own or do you rent your current home?

OWN OR BUYING 1
RENTING 2
OTHER 3
DK/RF 4

Q27. What is the highest level of formal education you have completed?

GRADE SCHOOL 1
SOME HIGH SCHOOL 2
HIGH SCHOOL GRAD [OR GED] 3
TRADE/VOC SCHOOL AFTER HS 4
SOME COLLEGE 5
COMPLETED COMMUNITY COLLEGE 6
FOUR YEAR COLLEGE/UNIVERSITY GRADUATE 7
GRADUATE SCHOOL/PROFESSIONAL SCHOOL 8
DK/RF 9

Q28. Are you currently married, single, divorced, separated, or widowed?

MARRIED 1
SINGLE 2
DIVORCED 3
SEPARATED 4
WIDOWED 5
LIVING WITH SOMEONE 6
DK/RF 7

Q29. Have you recycled paper, glass, metal, or other household trash in the past month?

YES 1
NO 2
DK/RF 3

Q30. How often do you make a special effort to buy fruits and vegetables grown without pesticides or chemicals? Would you say often, sometimes, rarely or never?

OFTEN 1
SOMETIMES 2
RARELY 3
NEVER 4
DK/RF 5

Q31.   Does anyone in your household have a cell phone?

YES 1
NO 2
DK/RF 3

Q32.   Is there a computer in your home?

YES 1
 NO 2
  DK/RF 3

Q33.   Do you have access to the Internet either at home or at work?

YES 1
NO [GO TO Q35] 2
 DK/RF [GO TO Q35] 3

Q34.   On average, how many times per month do you use the Internet?

DK/RF 999

Q35.   Has anyone in your household ever purchased a product on the Internet?

YES 1
NO 2
 DK/RF 3

Q36.   Do you consider yourself to be White, Black, Asian, Hispanic or a member of some other group?

WHITE 1
BLACK (AFRICAN AMERICAN, ETC.) 2
ASIAN (CHINESE, JAPANESE, KOREAN, ETC.) 3
HISPANIC (LATINO, ETC.) 4
 OTHER (Please specify: _____) 5
DK/RF 6

Q37.   Was your estimated total household income this past year less than $60,000 or was it $60,000 or more?

[GO TO Q37a] LESS THAN $60,000 1
[GO TO Q37b] $60,000 OR MORE 2
[GO TO Q38] DK/RF 3

INTERVIEWER: This refers to calendar year 2002.

Q37a. **Please stop me when I get to the bracket that includes your best estimate of your total household income before taxes last year...**

[GO TO Q38] less than $20,000?   1
[GO TO Q38] between $20,000 and less than $30,000?   2
[GO TO Q38] between $30,000 and less than $40,000?   3
[GO TO Q38] between $40,000 and less than $50,000?   4
[GO TO Q38] between $50,000 and less than $60,000?   5
[GO TO Q38] DK/RF   6

Q37b. **Please stop me when I get to the bracket that includes your best estimate of your total household income before taxes last year...**

between $60,000 and less than $70,000   1
between $70,000 and less than $80,000   2
between $80,000 and less than $90,000   3
between $90,000 and less than $100,000   4
between $100,000 and less than $120,000   5
over $120,000   6
 DK/RF 7

THE RESPONDENT, ASK: "Just one more question: our survey requires that I ask if you are male or female."

Q38.   **Gender**

MALE 1
FEMALE 2

IF YOU CAN'T TELL THE GENDER OF

That concludes our survey. We appreciate your help on our project. Thanks again and have a good evening/good afternoon!

INTERVIEWER IF ASKED: "This study is being conducted under the direction of Susan Willis-Walton and Alan Bayer. If you have any questions, you can call the Virginia Tech Center for Survey Research at 540-231-3695 any weekday. Results will be released to newspapers this Summer."

APPENDIX B: AWARENESS SURVEY FINDINGS – 511 COVERAGE AREA

Question 18: Have you ever heard of 511 Virginia, the three-digit phone number service that provides information to citizens?

	Respondents	Percentage of Total
Yes	73	19%
No	305	79%
DK/Maybe/Can't Remember	7	2%
Total	**385**	**100%**

Question 19: Have you ever used the 511 Virginia phone service?

	Respondents
Yes	6
No	65
DK/Maybe/Can't Remember	2
Total	**73**

Question 20: Are you familiar with the types of information that the 511 service provides?

	Respondents
Yes	23
No	48
DK/Maybe/Can't Remember	2
Total	**73**

Question 21: 511 services offered: places to buy food

	Respondents
Not chosen	16
Chosen	7
Total	**23**

Question 21: 511 services offered: lodging

	Respondents
Not chosen	15
Chosen	8
Total	**23**

Question 21: 511 services offered: shopping

	Respondents
Not chosen	21
Chosen	2
Total	**23**

Question 21: 511 services offered: tourism/attractions

	Respondents
Not chosen	17
Chosen	6
Total	**23**

Question 21: 511 services offered: weather

	Respondents
Not chosen	18
Chosen	5
Total	**23**

Question 21: 511 services offered: transportation/airport/car rental/shuttle/taxi

	Respondents
Not chosen	21
Chosen	2
Total	**23**

Question 21: 511 services offered: gas stations

	Respondents
Not chosen	21
Chosen	2
Total	**23**

Question 21: 511 services offered: traffic/construction

	Respondents
Not chosen	16
Chosen	7
Total	**23**

Question 21: 511 services offered: rest areas/truck stops

	Respondents
Not chosen	23
Chosen	0
Total	**23**

Question 21: 511 services offered: road conditions

	Respondents
Not chosen	15
Chosen	8
Total	**23**

Question 21: 511 services offered: emergency services

	Respondents
Not chosen	21
Chosen	2
Total	**23**

Question 21: 511 services offered: other

	Respondents
Not chosen	19
Chosen	4
Total	**23**

Question 21: 511 services offered: don't know/refused

	Respondents
Not chosen	19
Chosen	4
Total	**23**

Questions 21: 511 services offered: other response specified

	Respondents
Health information and environmental issues	1
Jobs, economic situations you can discuss with people	1
Locating different types of places to go while traveling	1
What is going on in a given community	1
Total	**4**

Question 22A: How likely to use 511 for: information about restaurants or places to stop for food

	Respondents	Percentage of total
Very likely	29	8%
Somewhat likely	91	24%
Somewhat unlikely	57	15%
Not at all likely	206	54%
DK/RF	2	1%
Total	**385**	**100%**

Question 22B: How likely to use 511 for: information on lodging or places to stay while traveling

	Respondents	Percentage of total
Very likely	48	13%
Somewhat likely	121	31%
Somewhat unlikely	46	12%
Not at all likely	168	44%
DK/RF	2	1%
Total	**385**	**100%**

Question 22C: How likely to use 511 for: information on shopping

	Respondents	Percentage of total
Very likely	23	6%
Somewhat likely	72	19%
Somewhat unlikely	66	17%
Not at all likely	222	58%
DK/RF	2	1%
Total	**385**	**100%**

Question 22D: How likely to use 511 for: tourist sites and attractions

	Respondents	Percentage of total
Very likely	42	11%
Somewhat likely	126	33%
Somewhat unlikely	48	13%
Not at all likely	167	43%
DK/RF	2	1%
Total	**385**	**100%**

Question 22E: How likely to use 511 for: the weather

	Respondents	Percentage of total
Very likely	53	14%
Somewhat likely	103	27%
Somewhat unlikely	39	10%
Not at all likely	188	49%
DK/RF	2	1%
Total	**385**	**100%**

Question 22F: How likely to use 511 for: information on transportation like airports, car rentals, shuttles, or taxi services

	Respondents	Percentage of total
Very likely	31	8%
Somewhat likely	98	26%
Somewhat unlikely	57	15%
Not at all likely	197	51%
DK/RF	2	1%
Total	**385**	**100%**

Question 22G: How likely to use 511 for: places to stop for gasoline

	Respondents	Percentage of total
Very likely	29	8%
Somewhat likely	62	16%
Somewhat unlikely	67	17%
Not at all likely	225	58%
DK/RF	2	1%
Total	**385**	**100%**

Question 22H: How likely to use 511 for: information on accidents, construction or traffic that might affect travel

	Respondents	Percentage of total
Very likely	82	21%
Somewhat likely	119	31%
Somewhat unlikely	38	10%
Not at all likely	144	37%
DK/RF	2	1%
Total	**385**	**100%**

Question 22I: How likely to use 511 for: information on rest areas or truck stops

	Respondents	Percentage of total
Very likely	24	6%
Somewhat likely	79	21%
Somewhat unlikely	65	17%
Not at all likely	215	56%
DK/RF	2	1%
Total	**385**	**100%**

Question 22J: How likely to use 511 for: road conditions

	Respondents	Percentage of total
Very likely	67	17%
Somewhat likely	128	33%
Somewhat unlikely	34	9%
Not at all likely	154	40%
DK/RF	2	1%
Total	**385**	**100%**

Question 22K: How likely to use 511 for: emergency services

	Respondents	Percentage of total
Very likely	74	19%
Somewhat likely	135	35%
Somewhat unlikely	37	10%
Not at all likely	137	36%
DK/RF	2	1%
Total	**385**	**100%**

APPENDIX C: AWARENESS SURVEY FINDINGS – ALL VIRGINIA

Question 18: Have you ever heard of 511 Virginia, the three-digit phone number service that provides information to citizens?

	Respondents	Percentage of Total
Yes	139	13%
No	946	86%
DK/Maybe/Can't Remember	14	1%
Total	**1099**	**100%**

Question 19: Have you ever used the 511 Virginia phone service?

	Respondents
Yes	10
No	127
DK/Maybe/Can't Remember	2
Total	**139**

Question 20: Are you familiar with the types of information that the 511 service provides?

	Respondents
Yes	38
No	96
DK/Maybe/Can't Remember	5
Total	**139**

Question 21: 511 services offered: places to buy food

	Respondents
Not chosen	25
Chosen	13
Total	**38**

Question 21: 511 services offered: lodging

	Respondents
Not chosen	26
Chosen	12
Total	**38**

Question 21: 511 services offered: shopping

	Respondents
Not chosen	33
Chosen	5
Total	**38**

Question 21: 511 services offered: tourism/attractions

	Respondents
Not chosen	28
Chosen	10
Total	**38**

Question 21: 511 services offered: weather

	Respondents
Not chosen	31
Chosen	7
Total	**38**

Question 21: 511 services offered: transportation/airport/car rental/shuttle/taxi

	Respondents
Not chosen	34
Chosen	4
Total	**38**

Question 21: 511 services offered: gas stations

	Respondents
Not chosen	34
Chosen	4
Total	**38**

Question 21: 511 services offered: traffic/construction

	Respondents
Not chosen	25
Chosen	13
Total	**38**

Question 21: 511 services offered: rest areas/truck stops

	Respondents
Not chosen	37
Chosen	1
Total	**38**

Question 21: 511 services offered: road conditions

	Respondents
Not chosen	26
Chosen	12
Total	**38**

Question 21: 511 services offered: emergency services

	Respondents
Not chosen	33
Chosen	5
Total	**38**

Question 21: 511 services offered: other

	Respondents
Not chosen	33
Chosen	5
Total	**38**

Question 21: 511 services offered: don't know/refused

	Respondents
Not chosen	31
Chosen	7
Total	**38**

Questions 21: 511 services offered: other response specified

	Respondents
Health information and environmental issues	1
Jobs, economic situations you can discuss with people	1
Locating different types of places to go while traveling	1
TDD, regional government information	1
What is going on in a given community	1
Total	**5**

Question 22A: How likely to use 511 for: information about restaurants or places to stop for food

	Respondents	Percentage of total
Very likely	111	10%
Somewhat likely	259	24%
Somewhat unlikely	170	16%
Not at all likely	554	50%
DK/RF	5	1%
Total	**1099**	**100%**

Question 22B: How likely to use 511 for: information on lodging or places to stay while traveling

	Respondents	Percentage of total
Very likely	147	13%
Somewhat likely	338	31%
Somewhat unlikely	135	12%
Not at all likely	473	43%
DK/RF	6	1%
Total	**1099**	**100%**

Question 22C: How likely to use 511 for: information on shopping

	Respondents	Percentage of total
Very likely	94	9%
Somewhat likely	196	18%
Somewhat unlikely	193	18%
Not at all likely	612	56%
DK/RF	4	0%
Total	**1099**	**100%**

Question 22D: How likely to use 511 for: tourist sites and attractions

	Respondents	Percentage of total
Very likely	138	13%
Somewhat likely	351	32%
Somewhat unlikely	129	12%
Not at all likely	477	43%
DK/RF	5	0%
Total	**1099**	**100%**

Question 22E: How likely to use 511 for: the weather

	Respondents	Percentage of total
Very likely	159	15%
Somewhat likely	268	24%
Somewhat unlikely	131	12%
Not at all likely	538	49%
DK/RF	3	0%
Total	**1099**	**100%**

Question 22F: How likely to use 511 for: information on transportation like airports, car rentals, shuttles or taxi services

	Respondents	Percentage of total
Very likely	117	11%
Somewhat likely	293	27%
Somewhat unlikely	157	14%
Not at all likely	528	48%
DK/RF	4	0%
Total	**1099**	**100%**

Question 22G: How likely to use 511 for: places to stop for gasoline

	Respondents	Percentage of total
Very likely	95	9%
Somewhat likely	176	16%
Somewhat unlikely	188	17%
Not at all likely	637	58%
DK/RF	3	0%
Total	**1099**	**100%**

Question 22H: How likely to use 511 for: information on accidents, construction or traffic that might affect travel

	Respondents	Percentage of total
Very likely	245	22%
Somewhat likely	348	32%
Somewhat unlikely	119	11%
Not at all likely	384	35%
DK/RF	3	0%
Total	**1099**	**100%**

Question 22I: How likely to use 511 for: information about restaurants or places to stop for food

	Respondents	Percentage of total
Very likely	105	10%
Somewhat likely	205	19%
Somewhat unlikely	180	16%
Not at all likely	606	55%
DK/RF	3	0%
Total	**1099**	**100%**

Question 22J: How likely to use 511 for: information about restaurants or places to stop for food

	Respondents	Percentage of total
Very likely	212	19%
Somewhat likely	341	31%
Somewhat unlikely	112	10%
Not at all likely	429	39%
DK/RF	5	1%
Total	**1099**	**100%**

Question 22K: How likely to use 511 for: emergency services

	Respondents	Percentage of total
Very likely	224	20%
Somewhat likely	329	30%
Somewhat unlikely	127	12%
Not at all likely	413	38%
DK/RF	6	1%
Total	**1099**	**100%**

APPENDIX D: AWARENESS SURVEY DEMOGRAPHIC FINDINGS – 511 COVERAGE AREA

Question 23: What year were you born?

	Respondent	Percentage of total
1910	1	.3%
1914	1	.3%
1915	1	.3%
1918	1	.3%
1919	1	.3%
1920	3	.8%
1921	2	.5%
1922	1	.3%
1923	3	.8%
1924	1	.3%
1925	2	.5%
1927	5	1.3%
1928	5	1.3%
1929	3	.8%
1930	4	1.0%
1931	2	.5%
1932	5	1.3%
1933	5	1.3%
1934	1	.3%
1935	5	1.3%
1936	10	2.6%
1937	4	1.0%
1938	5	1.3%
1939	6	1.6%
1940	8	2.1%
1941	9	2.3%
1942	8	2.1%
1943	3	.8%
1944	7	1.8%
1945	4	1.0%
1946	8	2.1%

	Respondent	Percentage of total
1947	**7**	1.8%
1948	6	1.6%
1949	9	2.3%
1950	9	2.3%
1951	10	2.6%
1952	11	2.9%
1953	7	1.8%
1954	3	.8%
1955	3	.8%
1956	9	2.3%
1957	12	3.1%
1958	10	2.6%
1959	9	2.3%
1960	6	1.6%
1961	13	3.4%
1962	13	3.4%
1963	5	1.3%
1964	8	2.1%
1965	8	2.1%
1966	3	.8%
1967	4	1.0%
1968	6	1.6%
1969	2	.5%
1970	5	1.3%
1971	7	1.8%
1972	8	2.1%
1973	8	2.1%
1974	2	.5%
1975	6	1.6%
1976	3	.8%
1977	8	2.1%
1978	9	2.3%
1979	4	1.0%
1980	7	1.8%
1981	4	1.0%

	Respondent	Percentage of total
1982	5	13.%
1983	3	.8%
1984	1	.3%
DK/RF	8	2.1%
Total	**385**	**100.0%**

Question 24: Counting yourself, how many people are currently living in your home?

	Respondent	**Percentage of total**
1	64	16.6%
2	162	42.1%
3	78	20.3%
4	54	14.0%
5	19	4.9%
6	1	.3%
7	1	.3%
10	1	.3%
DK/RF	5	1.3%
Total	**385**	**100.0%**

Question 25: How many of these people are under the age of 18?

	Respondent	**Percentage of total**
0	194	50.4%
1	62	16.1%
2	46	11.9%
3	11	2.9%
4	2	.5%
DK/RF	6	1.6%
Total	**321**	**83.4%**

Question 26: Do you own or do you rent your current home?

	Respondent	**Percentage of total**
Own or buying	310	80.5%
Renting	66	17.1%
Other	5	1.3%
DK/RF	4	1.0%
Total	**385**	**100.0%**

Question 27: What is the highest level of formal education you have completed?

	Respondent	Percentage of total
Grade school	14	3.6%
Some high school	27	7.0%
High school grad [or GED]	134	34.8%
Trade/voc school after high school	8	2.1%
Some college	70	18.2%
Completed community college	30	7.8%
Four year college/university graduate	62	16.1%
Graduate school/professional school	33	8.6%
DK/RF	7	1.8%
Total	**385**	**100.0%**

Question 28: Are you currently married, single, divorced, separated, or widowed?

	Respondent	Percentage of total
Married	252	65.5%
Single	53	13.8%
Divorced	33	8.6%
Separated	7	1.8%
Widowed	34	8.8%
Living with someone	2	.5%
DK/RF	4	1.0%
Total	**385**	**100.0%**

Question 31: Does anyone in your household have a cell phone?

	Respondent	Percentage of total
Yes	249	64.7%
No	136	35.3%
Total	**385**	**100.0%**

Q32 Is there a computer in your home?

	Respondent	Percentage of total
Yes	267	69.4%
No	118	30.6%
Total	**385**	**100.0%**

Question 33: Do you have access to the Internet either at home or at work?

	Respondent	Percentage of total
Yes	269	69.9%
No	116	30.1%
Total	**385**	**100.0%**

Question 34: On average, how many times per month do you use the Internet?

	Respondent	Percentage of total
0	18	4.7%
1	10	2.6%
2	4	1.0%
3	8	2.1%
4	6	1.6%
5	9	2.3%
6	3	.8%
7	1	.3%
8	3	.8%
9	2	.5%
10	13	3.4%
12	4	1.0%
15	8	2.1%
16	3	.8%
20	20	5.2%
21	1	.3%
25	1	.3%
28	1	.3%
30	134	34.8%
31	5	1.3%
40	1	.3%
45	1	.3%
48	1	.3%
50	2	.5%
60	4	1.0%
90	2	.5%
100	1	.3%
300	1	.3%

	Respondent	Percentage of total
DK/RF	2	.5%
Total	**269**	**69.9%**

Question 35: Has anyone in your household ever purchased a product on the Internet?

	Respondent	Percentage of total
Yes	207	53.8%
No	172	44.7%
DK/RF	6	1.6%
Total	**385**	**100.0%**

Question 36: Do you consider yourself to be White, Black, Asian, Hispanic or a member of some other group?

	Respondent	Percentage of total
White	355	92.2%
Black	13	3.4%
Asian (Chinese, Japanese, Korean, Etc.)	2	.5%
Hispanic (Latino, Etc.)	3	.8%
Other	6	1.6%
DK/RF	6	1.6%
Total	**385**	**100.0%**

Question 36: Race, other specified

	Respondent	Percentage of total
Mixed Race	2	.5%
Native American	4	1.0%
Total	**6**	**100.0%**

Question 37: Was your estimated total household income this past year less than $60,000 or was it $60,000 or more?

	Respondent	Percentage of total
Less than $60,000	245	63.6%
$60,000 or more	113	29.4%
DK/RF	27	7.0%
Total	**385**	**100.0%**

Question 37A: Please stop me when I get to the bracket that includes your best estimate of your total household income before taxes last year...

	Respondent	Percentage of total
Less than $20,000	65	16.9%
Between $20,000 and less than $30,000	46	11.9%
Between $30,000 and less than $40,000	52	13.5%
Between $40,000 and less than $50,000	38	9.9%
Between $50,000 and less than $60,000	25	6.5%
DK/RF	19	4.9%
Total	**245**	**63.6%**

Question 37B: Please stop me when I get to the bracket that includes your best estimate of your total household income before taxes last year...

	Respondent	Percentage of total
Between $60,000 and less than $70,000	32	8.3%
Between $70,000 and less than $80,000	28	7.3%
Between $80,000 and less than $90,000	17	4.4%
Between $90,000 and less than $100,000	10	2.6%
Between $100,000 and less than $120,000	9	2.3%
Over $120,000	9	2.3%
DK/RF	8	2.1%
Total	**113**	**29.4%**

Question 38: Gender

	Respondent	Percentage of total
Male	132	34.3%
Female	253	65.7%
Total	**385**	**100.0%**

APPENDIX E: AWARENESS SURVEY DEMOGRAPHIC FINDINGS – ALL-VIRGINIA

Question 23: What year were you born?

	Respondent	Percentage of total
1910	1	.1%
1912	1	.1%
1914	1	.1%
1915	1	.1%
1918	2	.2%
1919	3	.3%
1920	7	.6%
1921	7	.6%
1922	7	.6%
1923	5	.5%
1924	7	.6%
1925	4	.4%
1926	6	.5%
1927	7	.6%
1928	6	.5%
1929	6	.5%
1930	9	.8%
1931	6	.5%
1932	7	.6%
1933	16	1.5%
1934	7	.6%
1935	14	1.3%
1936	15	1.4%
1937	10	.9%
1938	12	1.1%
1939	18	1.6%
1940	18	1.6%
1941	21	1.9%
1942	15	1.4%
1943	10	.9%

	Respondent	Percentage of total
1944	22	2.0%
1945	15	1.4%
1946	24	2.2%
1947	23	2.1%
1948	19	1.7%
1949	29	2.6%
1950	22	2.0%
1951	25	2.3%
1952	30	2.7%
1953	32	2.9%
1954	30	2.7%
1955	19	1.7%
1956	30	2.7%
1957	21	1.9%
1958	24	2.2%
1959	23	2.1%
1960	22	2.0%
1961	25	2.3%
1962	28	2.5%
1963	29	2.6%
1964	25	2.3%
1965	27	2.5%
1966	15	1.4%
1967	14	1.3%
1968	23	2.1%
1969	9	.8%
1970	16	1.5%
1971	16	1.5%
1972	18	1.6%
1973	16	1.5%
1974	13	1.2%
1975	17	1.5%
1976	13	1.2%
1977	21	1.9%
1978	21	1.9%

	Respondent	Percentage of total
1979	18	1.6%
1980	14	1.3%
1981	9	.8%
1982	12	1.1%
1983	10	.9%
1984	4	.4%
1985	2	.2%
DK/RF	25	2.3%
Total	**1099**	**100.0%**

Question 24: Counting yourself, how many people are currently living in your home?

	Respondent	Percentage of total
1	181	16.5%
2	406	36.9%
3	219	19.9%
4	185	16.8%
5	69	6.3%
6	19	1.7%
7	6	.5%
8	1	.1%
9	1	.1%
10	1	.1%
DK/RF	11	1.0%
Total	**1099**	**100.0%**

Question 25: How many of these people are under the age of 18?

	Respondent	Percentage of total
0	499	45.4%
1	189	17.2%
2	155	14.1%
3	45	4.1%
4	16	1.5%
DK/RF	14	1.3%
Total	**918**	**83.5%**

Question 26: Do you own or do you rent your current home?

	Respondent	Percentage of total
Own or buying	854	77.7%
Renting	224	20.4%
Other	13	1.2%
DK/RF	8	.7%
Total	**1099**	**100.0%**

Question 27: What is the highest level of formal education you have completed?

	Respondent	Percentage of total
Grade school	19	1.7%
Some high school	54	4.9%
High school grad [or GED]	294	26.8%
Trade/voc school after high school	18	1.6%
Some college	195	17.7%
Completed community college	72	6.6%
Four year college/university graduate	262	23.8%
Graduate school/professional school	171	15.6%
DK/RF	14	1.3%
Total	**1099**	**100.0%**

Question 28: Are you currently married, single, divorced, separated, or widowed?

	Respondent	Percentage of total
Married	683	62.1%
Single	185	16.8%
Divorced	95	8.6%
Separated	33	3.0%
Widowed	85	7.7%
Living with someone	8	.7%
DK/RF	10	.9%
Total	**1099**	**100.0%**

Question 31: Does anyone in your household have a cell phone?

	Respondent	Percentage of total
Yes	793	72.2%
No	301	27.4%
DK/RF	5	.5%
Total	**1099**	**100.0%**

Question 32: Is there a computer in your home?

	Respondent	Percentage of total
Yes	850	77.3%
No	246	22.4%
DK/RF	3	.3%
Total	**1099**	**100.0%**

Question 33: Do you have access to the Internet either at home or at work?

	Respondent	Percentage of total
Yes	870	79.2%
No	227	20.7%
DK/RF	2	.2%
Total	**1099**	**100.0%**

Question 34: On average, how many times per month do you use the Internet?

	Respondent	Percentage of total
0	50	4.5%
1	21	1.9%
2	15	1.4%
3	18	1.6%
4	18	1.6%
5	30	2.7%
6	9	.8%
7	2	.2%
8	3	.3%
9	2	.2%
10	28	2.5%
11	1	.1%
12	9	.8%
13	1	.1%
15	19	1.7%

	Respondent	Percentage of total
16	6	.5%
18	1	.1%
20	43	3.9%
21	2	.2%
25	12	1.1%
28	3	.3%
30	472	42.9%
31	21	1.9%
35	2	.2%
40	8	.7%
45	1	.1%
48	1	.1%
50	10	.9%
60	21	1.9%
75	1	.1%
90	6	.5%
100	14	1.3%
120	2	.2%
150	3	.3%
180	1	.1%
200	2	.2%
300	4	.4%
900	1	.1%
DK/RF	7	.6%
Total	870	79.2%

Question 35: Has anyone in your household ever purchased a product on the Internet?

	Respondent	Percentage of total
Yes	688	62.6%
No	397	36.1%
DK/RF	14	1.3%
Total	**1099**	**100.0%**

Question 36: Do you consider yourself to be White, Black, Asian, Hispanic or a member of some other group?

	Respondent	Percentage of total
White	896	81.5%
Black	125	11.4%
Asian (Chinese, Japanese, Korean, Etc.)	19	1.7%
Hispanic (Latino, Etc.)	12	1.1%
Other	24	2.2%
DK/RF	23	2.1%
Total	**1099**	**100.0%**

Question 36: Race, other specified

	Respondent	Percentage of total
Arab	1	.1%
Mixed Race	9	.8%
Native American	8	.7%
Sudanese	1	.1%
Total	**19**	**100.0%**

Question 37: Was your estimated total household income this past year less than $60,000 or was it $60,000 or more?

	Respondent	Percentage of total
Less than $60,000	537	48.9%
$60,000 or more	471	42.9%
DK/RF	91	8.3%
Total	**1099**	**100.0%**

Question 37A: Please stop me when I get to the bracket that includes your best estimate of your total household income before taxes last year...

	Respondent	Percentage of total
Less than $20,000	112	10.2%
Between $20,000 and less than $30,000	107	9.7%
Between $30,000 and less than $40,000	125	11.4%
Between $40,000 and less than $50,000	83	7.6%
Between $50,000 and less than $60,000	71	6.5%
DK/RF	39	3.5%
Total	**537**	**48.9%**

Question 37B: Please stop me when I get to the bracket that includes your best estimate of your total household income before taxes last year...

	Respondent	Percentage of total
Between $60,000 and less than $70,000	103	9.4%
Between $70,000 and less than $80,000	86	7.8%
Between $80,000 and less than $90,000	71	6.5%
Between $90,000 and less than $100,000	41	3.7%
Between $100,000 and less than $120,000	58	5.3%
Over $120,000	73	6.6%
DK/RF	39	3.5%
Total	**471**	**42.9%**

Question 38: Gender

	Respondent	Percentage of total
Male	383	34.8%
Female	716	65.2&
Total	**1099**	**100.0%**

AREA511 CSR-assigned 511 geographic area designator

	Frequency	Percent
In 511 area	385	35.0%
Not in 511 area	714	65.0%
Total	**1099**	**100.0%**

References

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511 Deployment Coalition (2003). "511 Implementation and Operational Guidelines,"
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511 Virginia Evaluation

January 2004

Data Analysis Report
Chapter 6

CHAPTER 6: DATA ANALYSIS REPORT

EXECUTIVE SUMMARY

The primary purpose of the retroactive data analysis was to document user behavior patterns and compare these findings to those of the awareness and web surveys for evaluation. The secondary purpose was to provide enough background data on 511 Virginia to facilitate VDOT's (Virginia Department of Transportation) development of a Request for Proposal (RFP) for the state-wide 511 Virginia program. A tertiary purpose of the retroactive data analysis evolved over the course of the evaluation: determine how 511 Virginia can leverage other Intelligent Transportation Systems (ITS) applications.

The analysis of the retroactive data yielded the following information:
- Call and minute volumes are steadily increasing, lasting approximately 1 minute and 52 seconds.
- Peak simultaneous port use was 45 ports.
- The peak call date is Sunday between 2 and 3 pm. 511 Virginia calls peak at 2 pm and 4 pm. Winter months have the highest demand.
- Calls to the 511 number directly are 91% of total calls. Wireless calls have decreased but still remain the majority of calls to the service. Approximately 26% of calls have been from out-of-state registered phones.
- The system provides an average of 172 events per month.
- Sixty-nine percent of all callers are seeking traffic information, the remaining percentages are fairly evenly distributed amongst Construction, Weather, Road Conditions, and Services.
- 0.4% of all callers currently utilize the transfer function of the system.
- Traveler Services, predominantly lodging and food requests, has maintained 8% of all requests
- Bookmarks and repeat users are the significant users of the website.
- The website has shifted to being primarily traffic oriented year round.

The major recommendations stemming from the data analysis include the following:
- Implementing new changes during the winter should be avoided as that is the highest usage and demand for the phone system; better times are in April and September.
- A "Bookmark This Page" function should be built on the main page of the website.
- Trends in 511 call volumes and weather should be identified to help forecast peak usage day characteristics.
- A call data analysis function should be developed to automatically group calls using Nxx numbers.
- A provision for 511 data monitoring needs should be defined prior to awarding the state-wide RFP.
- In order to forecast minutes for the future state-wide 511 minute contract, a 1% adoption rate should be utilized for the first 18 months.
- The state-wide 511 system should be designed to coordinate with existing traveler data measures in order to better leverage 511 as an ITS investment.
- The availability of ANI_II (e.g., ii digits) should be ensured by the state-wide provider in order to monitor the wireless/land line ratio.
- Radio time should be bought at the peak usage hours, which are 2pm-3pm and 4pm to 5pm.

- Based on the web site pages visited and surveyed interest, traffic information should be moved to the homepage for 511 Virginia. (This change occurred in September 2003.)
- Efforts should be made to ensure that the telecommunications provider can accommodate at least 45 simultaneous calls.
- More geographic gradation should be added to weather in the top three requested areas: Roanoke, Winchester, and Staunton.
- All link referrals to the new website (i.e., from travelshenandoah.com to 511.va.org) should be updated.
- New link referrals to 511virginia.org should be actively pursued, especially with weather and tourism sites, in addition to pages and information within VDOT's own website.
- Data on 511 Virginia should be updated more frequently during winter storms.
- If possible, post as specific information as possible (multiple incidents on I-81 from mm1 to 35 does not necessarily help travelers make better travel decisions).
- If desired, a quarterly contract for minutes should be negotiated with the telecommunications provider, this would allow VDOT to purchase access to fewer ports for the majority of the year and to only purchase several dedicated ports during the peak months from December through March.
- While road signs have been successful with users as an initial source, marketing efforts should be focused on the land-line users, which, at current rates, will soon overtake the wireless users.
- Further research should be done into the best methods for using CMS and 511 in conjunction.
- Since Hitbox Central no longer offers a free tracking service, a new log analysis software should be researched and implemented as soon as possible to allow for continuous trending.
- A web page rank increase on the top search engines under Virginia Travel (e.g., Google) should be actively pursued.
- The webpage should be configured to be able to accommodate 1024 x 788 screen resolutions, as well as the top Internet browsers

The analysis concludes with data analysis lessons learned to assist future 511 deployers. Additionally, a large majority of the value of this Data Analysis report is the raw, historical data included in the appendices.

METHODS

Research Approach

The data analysis for 511 Virginia was developed to analyze the following points of query:

1. Discuss 511 Virginia performance with respect to the stated goals of the 511 Virginia evaluation:
   a. Meet traveler needs/improve the traveler experience, and
   b. Increase real-time data to travelers by measuring:
      i. Percentage of travelers using 511 (call volumes over I-81 forecasted traffic counts).
      ii. Document the number of messages posted to both the 511 phone and web system and on CMS signs bi-annually

2. Measure and trend a minimum of the nationally established usage monitoring statistics. The nationally-defined usage monitoring measures every month are:
   a. Calls per Month
   b. Peak Call Day
   c. Peak Call Day Count

    d. Peak Call Day Reason
    e. Peak Call Hour
    f. Peak Hour Call Count
    g. Peak Call Hour Date
    h. Peak Call Hour Reason
    i. Capacity Utilization
    j. # of dropped Calls
    k. Average Call Length (seconds)
    l. Total Minutes per Month
    m. % Wireless
    n. % Wireline
    o. % Category
        i. Traffic
        ii. Weather
        iii. Construction
        iv. Services
        v. Road Conditions
        vi. Transfers

3. Document ways VDOT utilized 511 Virginia to leverage other Intelligent Transportation Systems (ITS):
    a. Show how 511 Virginia call volumes were integrated to analyze traveler experience on I-81. (511 call volumes are the "pull," or user demand, for ITS information).

A brief discussion of these steps is described below and is followed by the outcome of this process (i.e., findings and recommendations).

Methodology: Collecting Data

511 Virginia had a unique advantage: the 511 call volume data collection was collected locally, in addition to the data collection completed by software communication partner, TellMe, Inc. The software for the phone system was also developed in-house by one of VTTI's programmers, Mr. Brian Daily.

After being developed, the software was run at VTTI, and TellMe's remote call center queried the server at VTTI. The call data was collected locally on the server in the form of log files, which are accessible through SQL Server. Call data was also available through the packaged performance measures available through TellMe, Inc.'s 511 Virginia account web site. This enabled the evaluation team to conduct data analysis that is not as readily available to other 511 deployers (e.g., repeat user analysis and wireless versus wireline analysis).

In general, there were three basic sources for the data collection for 511 Virginia:

1) HitboxCentral.com, which offered a free web site log analysis function for the web site statistics. Hitbox Central.com no longer offers a free service. See http://hitboxcentral.com for more details if interested in purchasing a remote access web site statistics tool.
2) TellMe, Inc. collected data for all calls to the 511 system routed through the indicated 1-800 numbers assigned to the three digit extension in Virginia. The CDRs (Call Detail Records) are also made available to users of TellMe, Inc. for more in-depth analysis.
3) Also, VTTI maintained and developed a separate administrative page for outputs from VTTI's specific data measurement needs. This site evolved from being the only source for data for 511 Virginia.

Other miscellaneous data reviewed in this report included: severe weather reports, which were obtained from Accuweather.com email updates for the three covered VDOT districts, and information for the case studies that were correlated with data available through VDOT's Interim Operations Center for the I-81 region, which temporarily resides at VTTI. Figure 1 shows the inputs and outputs of the Interim Operations Center as of August 2003:

Figure 1: Diagram of Inputs and Outputs of VDOT's Interim Operations Center located at VTTI.
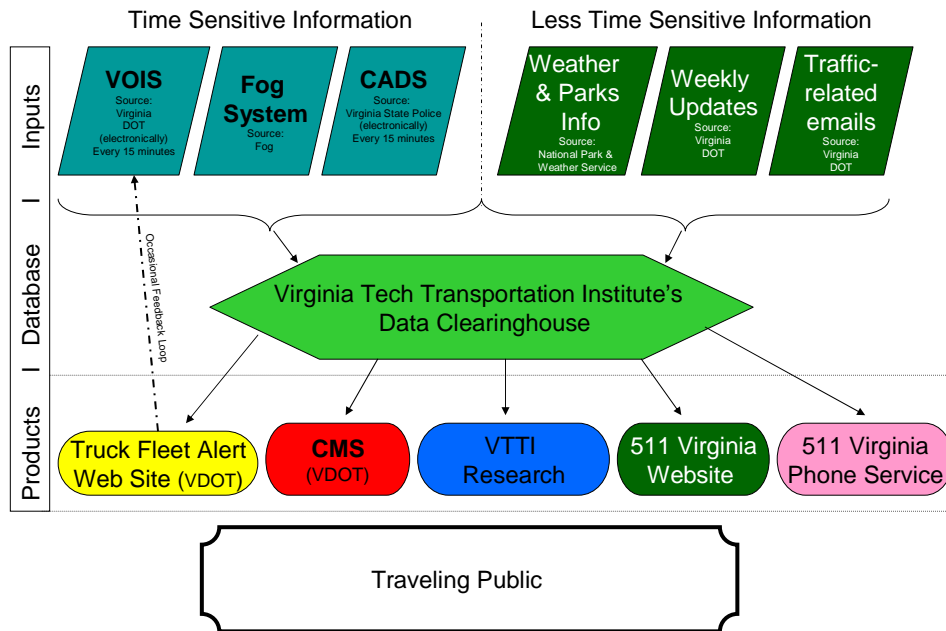
In general, data was collected from February 2002 through August 2003. However, in the case of analysis methods developed later in the process and for ease of comparison, the compilation data is presented in a single year increment (from August 2002 through August 2003).

Reporting Findings

The data analyzed for this section was presented to VDOT in the form of PowerPoint presentations that were delivered on a monthly basis. The data was collected and analyzed by VTTI from February 2002 to March 2003 and by Shentel, Inc. from March 2003 through August 2003. The repeat usage data was originally presented in various emails to the National 511 Evaluation Committee.

Subject Privacy

Participant's privacy was honored throughout the entire study and will continue to be honored. The data records retrieved from TellMe, Inc. and collected by the parallel system at VTTI did include discrete phone numbers. However, the numbers were always stored on secure, independent servers. In order to conduct repeat usage analysis, the discrete phone numbers were assigned generic codes that did not include the entire discrete phone number of the individual. This coded data was then shared with the analyst and stored on the analyst's computer for the repeat usage analysis. The findings from the repeat usage analysis were only presented in a conglomerate form, and no individuals were contacted using the phone numbers that the system provided. Only the software programmer on staff had access to the phone numbers in the raw form. The privacy of users has been a top concern of VTTI throughout the entire evaluation.

MAJOR FINDINGS

Six Month, One Year, and 18 Month Comparisons of Basic Performance Measures

Table X is a comprehensive table of six month, one year, and 18 month side by side comparisons. The following is a summary of those comparisons:

- Call and minute volumes are steadily increasing.
- The call volume, with respect to I-81 traffic counts, is exponentially increasing: 0.3% for the first year and 0.7% for the first 18 months, with a 1% increase forecasted for the two year measurement of call volume to traffic counts.
- Based upon a slight variation of the national measurement of coverage, which is call volume to population, the 511 call volumes were compared to the census populations of those people between the ages of 16 and 85 in the covered counties and cities. A better measurement would come from comparing call volume to licensed drivers in the region; this information can be obtained from the DMV. However, this measure ignores out of area traffic, which are included in the call volume totals. Perhaps a slightly better measure would be to adjust call volume totals by the percentage in-state callers, as shown below in Table 1, and divide that by an age-adjusted population data. This would still not account for those callers originating outside the 511 Virginia coverage area but that are still in Virginia, but it might give a better idea of effectiveness in the coverage area. For example:

Table 1: Calculating 511 Penetration Rates

% of callers with in-state area codes: 74%
*
Total Calls to 511 Virginia in one year: 112,331
83,124
divided by
Age-Adjusted Census Population Data: 1,136,067
7.3%

- This penetration rate (7.3%) is more likely than is the 9.9% penetration rate found using the method that does not account for tourists.
- Durations have held steady at approximately 1 minute and 52 seconds.
- The percentage of calls to the "new" three digit number, 511, has been a steady 91%.
- Wireless calls have decreased, but they still account for a majority of the calls to 511 Virginia.
- Approximately 26% of all calls have been from out-of-state registered phones.
- Peak port usage over 18 months was 45 ports.
- The system has progressed from reporting an average of 152 events per month to currently providing an average of 172 events per month.
- Correspondingly, VDOT's usage of CMS has also increased from an average of 34 CMS messages per month to 72 per month. However, VDOT has also added several new permanent CMS signs, which can account for some of this increase as well.
- Peak call day has fluctuated, but when all 18 months worth of call volumes are taken into account, the peak call day and time is Sunday between 2pm and 3pm.

- In contrast, the peak accident day and time is Friday between 5pm and 6pm.
- Sixty-nine percent of all callers are seeking traffic information, while the remaining percentages are fairly evenly distributed among Construction, Weather, Road Conditions, and Services.
- 0.4% of all callers currently utilize the transfer function of the system. This may simply be because callers do not follow the system deep enough to know the function exists.

Table 2: six month, one year, and 18 month side by side comparisons

Measure	1st Six Months (Feb-Aug '02)	1st Year (Feb '02 – Feb '03)	1st 18 Months (Feb '02 – Aug '03)
Call Volume	50,169	112,331	210,052
Minute Volume	94,399	212,378	396,222
Adoption Rate (call volume/I-81 traffic counts)	2.6%	2.9%	3.6%
% Increase from Previous Period	2.35 %	.3%	.7%
% Increase from Previous Equivalent Period	945% ↑ from Aug'01-Jan'02	1,045% ↑ from Feb'01-'02	1,800% from Aug'00–Jan'02
Penetration Rate (Population Covered >16<85)	4.4%	9.9%	18.5%
% Increase from Previous Period	↑ by 4.0%	↑ by 5.5%	↑ by 8.6%
Average Duration	1 minute 52 seconds	1 minute 50 seconds	1 minute 53 seconds
% Callers to the 3 Digit "511" Number	90%	90%	91%
% Wireless Calls	70%	62%	54%
% from Out of State Phones	33%	45.5%	26%
Peak Port Usage	20 of 25	54 of 25 (allowed overflow)	54 of 25 (allowed overflow)
Total Events Reported	1,024 (≈ 157 per month)	1,887 (≈ 157 per month)	3,098 (≈ 172 per month)
* Accident Events Reported	697 (≈ 107 per month)	1,276 (≈ 106 per month)	1,858 (≈ 103 per month)
* Construction Events Reported	308 (≈ 47 per month)	459 (≈ 38 per month)	942 (≈ 52 per month)
* Road Conditions Reported	N/A	152 (≈ 13 per month)	298 (≈ 16 per month)
* Weather Events Reported	19 (≈ 3 per month)	N/A	N/A
Total CMS Events Reported	203 (≈ 34 per month)	492 (≈ 41 per month)	1,303 (≈ 72 per month)
Peak Call Day of the Week	Friday btwn 3-4pm	Monday btwn 4pm-5pm	Sunday btwn 2pm–3pm
Peak Accident Day of the Week	Thursday btwn 4-5pm	Friday btwn 3pm-4pm	Friday btwn 5pm-6pm
Where Callers Are Going			
Traffic	70.6%	70.7%	68.6%
Construction	15%	8%	9%
Weather	7%	9%	8%
Services	7%	7%	8%
Road Conditions	N/A	5%	6%
Transfers	.4%	.3%	.4%

Please note the following information in interpreting Table 2
- Traffic Events cause spikes to the phone system. Weather, in general, causes an increase in call volumes but not spikes.
- Penetration Rate Population from Census est. from Jul '02 for >16 years old and < 85 years old in 511 covered counties.

Summary of Phone Usage

The following figures are the summary slides of 511 Virginia's performance over the past eighteen months.

In Figure 2, December 2002 and February 2003 stand out in terms of call volumes. While correlations to distinct time peaks in port usage tend not to correlate to weather events, overall call volumes are significantly affected by weather. In December and February, Southwest Virginia experienced a more snow intensive year than in the previous five years. During the winter, 511 Virginia began to offer VDOT's Road Conditions reports, as well as accident data.

Figure 2: 511 Phone System Total Calls 2001-2003.
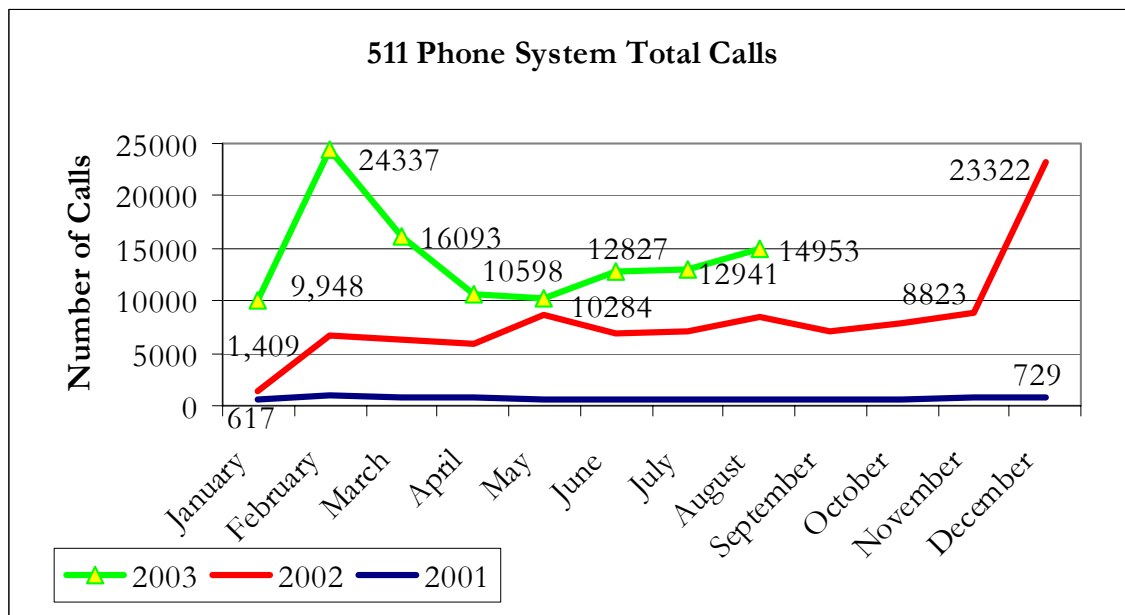
511 Virginia only purchased 25 ports for dedicated use. In Figure 3, the maximum port usage was 45 ports on December 1, 2002. The TellMe, Inc. contract allowed for the system to flex to almost unlimited simultaneous ports in use. Based upon the maximum ports in use, this was extremely important. However, purchasing fewer dedicated ports, with a guarantee that the system can flex to above 50 ports, would probably be economically sound. The mean port in use for the entire period is only one. For a complete table of all ports in use by hour, see Appendix C.

18 Month Summary

February 15, 2002 – August 31, 2003

- **Total Calls: 210,052**
- **Total Minutes: 396,222**
- **Average Duration: 1 minute 53 seconds**
- **% to 3 digit designation "511": 91%**
- **Max Port Usage: 45**
- **Mean Port Usage: 1**
- **Peak Hour: 2pm – 3pm**
- **Peak Day: Sunday**

Figure 4 shows the fact that 511 Virginia is developing into primarily a traffic information number. However, services, predominantly lodging and food requests, has maintained a healthy 8% of all requests.

Figure 4: Where Callers Went in the 1st 18 Months of 511 Virginia.
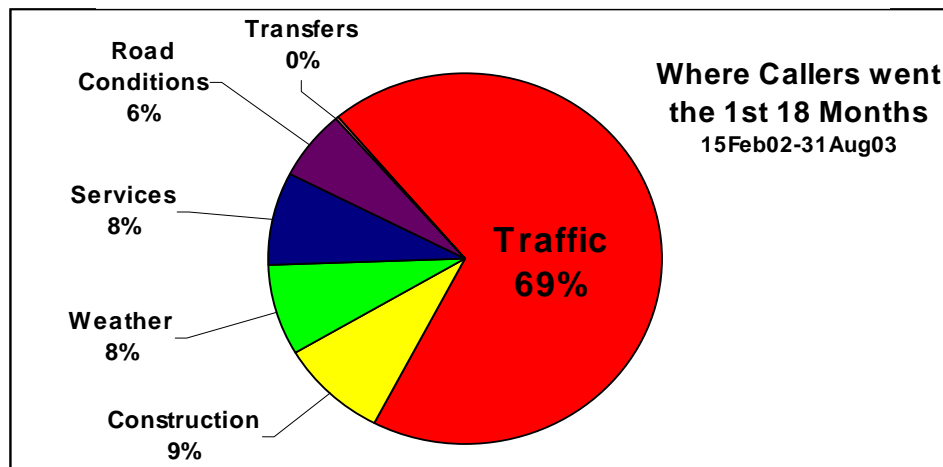
By taking into account all calls to 511 Virginia from the first eighteen months of operation, Figure 5 shows 511 Virginia calls peak at 2pm and 4pm more than any other hours.

511 Call Totals by Hour of the Day

Hour of Day
June 2002 - August 2003
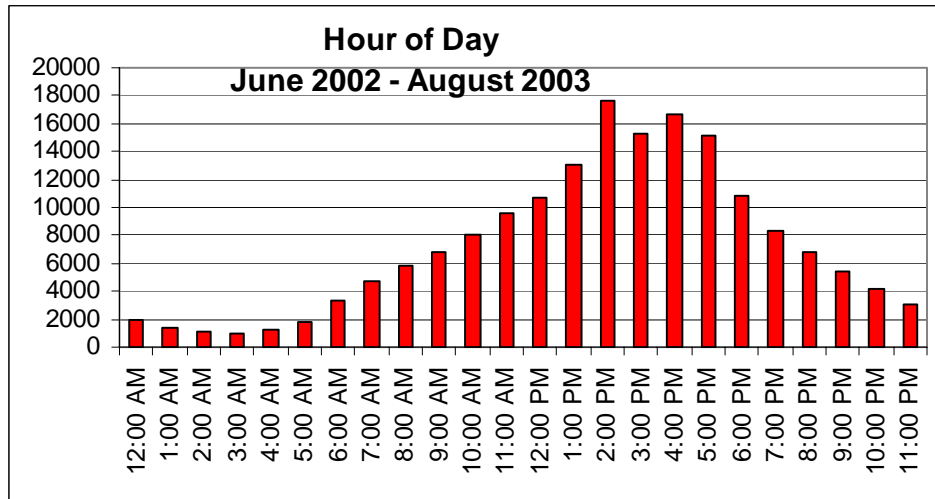
Figure 6 shows that calls to 511 peak on Sundays and Fridays.

Figure 6: 511 Virginia 18 Month Summary of Calls by Day of the Week.

511 Call Totals by Day of the Week

By Day of the Week June 2002 - August 2003

Day	Calls
Monday	20,115
Tuesday	16,826
Wednesday	26,122
Thursday	21,203
Friday	29,148
Saturday	19,472
Sunday	31,558
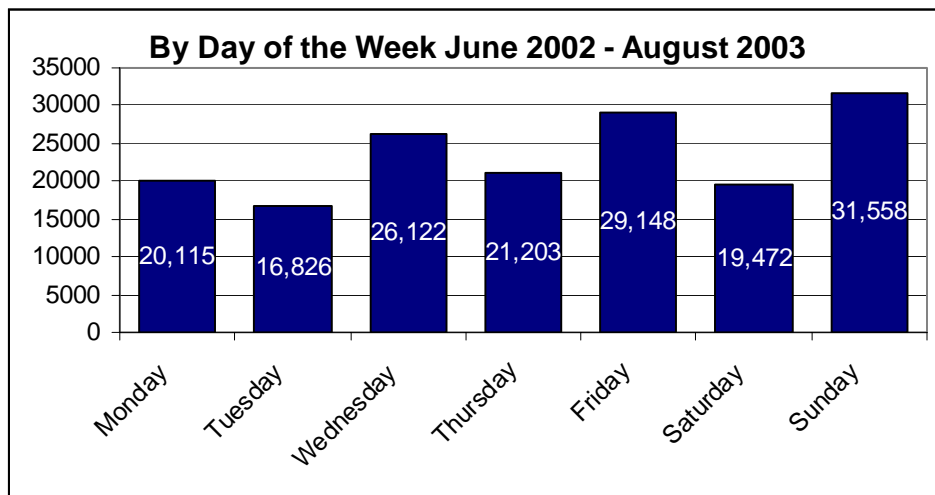
Figure 7 shows peak months for port usage, highlighting the winter months as having the highest demand. This would be important for any future contractor implementing new changes. VTTI would not recommend instituting new changes during the winter, because usage is highest then and the demand for reliable information in a familiar format is probably expected. The lowest call volume months are generally April and September.   Based upon both port usage trends and call

volume trends, the best months for implementing changes appear to be September/October and April.

Figure 7: 511 Virginia 18 Month Cumulative Port Usage.
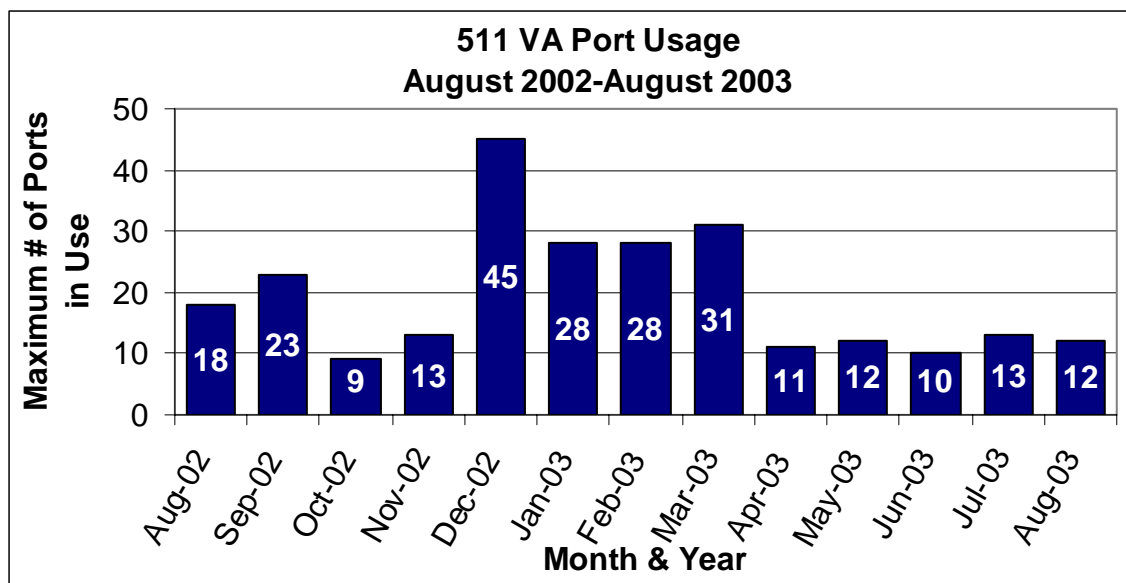
While the 511 System originally received more wireless calls in the beginning, the system has shifted to a more land line-called system. More research could probably be done into the exact causes for this.

Figure 8: Wireless vs. Land Line Usage.
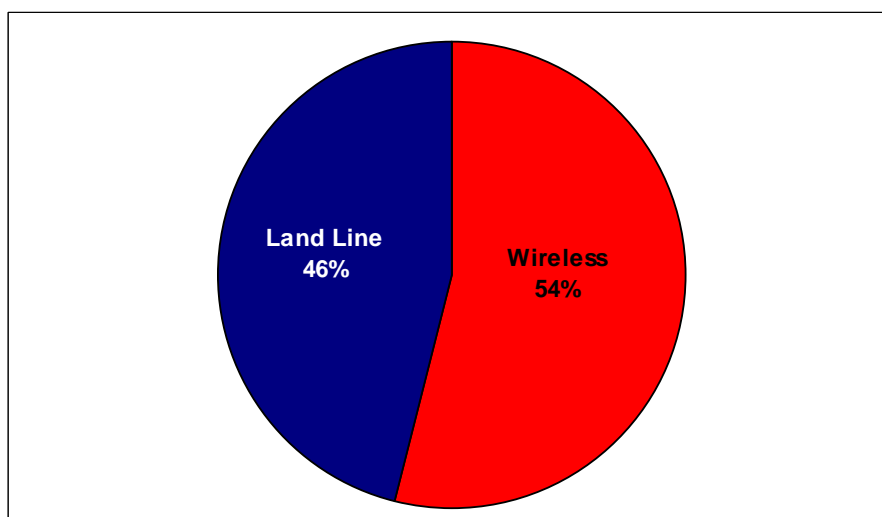
One reason for the increase of land line usage could be the increased percentage of in-state users. Figure 9 does not differentiate between in-area callers and out-of-area callers who are still in-state callers. However, the increase in in-state callers could also be due to caller education, with more marketing in the area and more local callers becoming aware of the system. VTTI suspects that this ratio will eventually match the area roads' composition of in-state versus out-of-state drivers.

Figure 9: Out-of-State versus In-State Caller Ratio.
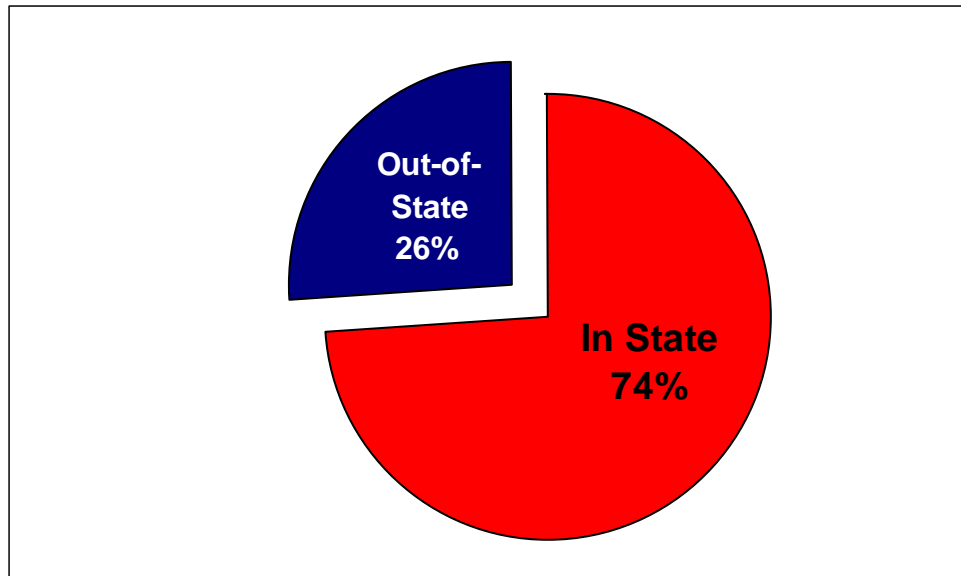
Figure 10 shows a possibility that the number of out-of-state callers to 511 Virginia is directly related to the interstates that pass through the region. The fact that I-81, I-77, and I-64 connect with the following interstates could explain the high caller volumes from the respective states: I-40 could explain the consistently high caller volumes from Tennessee, North Carolina, and Texas; I-75 could explain Georgia and Florida; I-95 could explain the northeast states; and I-65 could explain Arkansas. Also, the fact that the primary roads form the Dakotas, Nebraska, and Wyoming (I-94, I-90, and I-80) do not directly connect to the I-81 corridor could also explain the low caller volume from those states, as well.

Figure 10: VDOT's Public Relation's Representation of States Calling 511 VA.
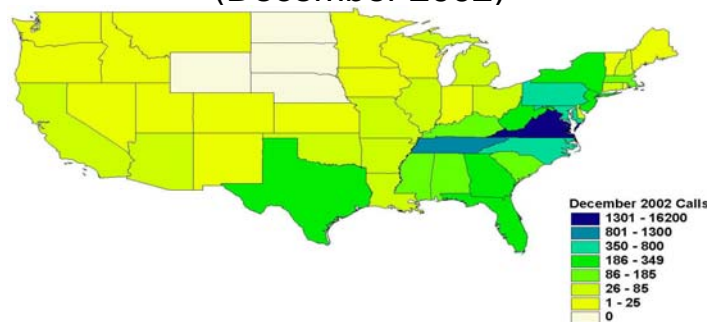
Figure 11 below shows only a single case study of the relationship between 511 call volume and displaying "Dial 511 for More Info" on a CMS sign. However, this potential relationship warrants additional research to determine how information posted to CMS affects 511 Virginia and vice versa. Some questions that might be asked are: What is the most effective means of using these two ITS tools in conjunction? Should 511 information be more detailed than CMS signs? Should the proposed exits on the 511 phone system be earlier on the road? Should CMS and 511 be used in

conjunction to reduce the traffic loads on exits? For example, 511 could detour traffic to an earlier exit than the CMS sign recommends, whereby all traffic will be able to exit at the CMS recommended sign. However, the 511 caller traffic would have the opportunity to exit earlier, and this could split the traffic onto two exits in the event of a road closure. However, is it fair to only give cell phone users timelier traveler information? How will travelers traveling without their cell phone feel if they see a CMS sign that instructs them to dial 511 for more information? While this research is outside the scope of this evaluation, the topic was highlighted throughout the data analysis process as being important for the future use of 511 and CMS together on a road system.

Figure 11:   A Relationship between CMS and 511 Call Volumes?

Is there a relationship between CMS and 511 Call Volumes?
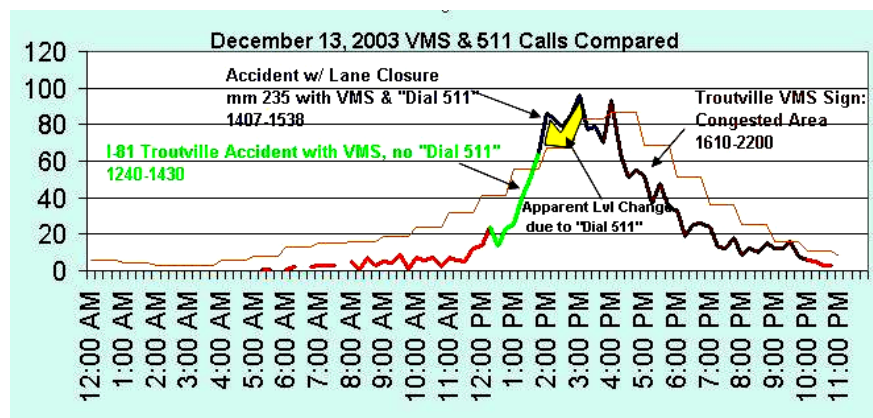
Summary of Web Usage

Figure 12 below provides an overview of the web site hits since the traveler information was provided.

Figure 12: Summary of Web Hits 2000-2003.

The Overall View…
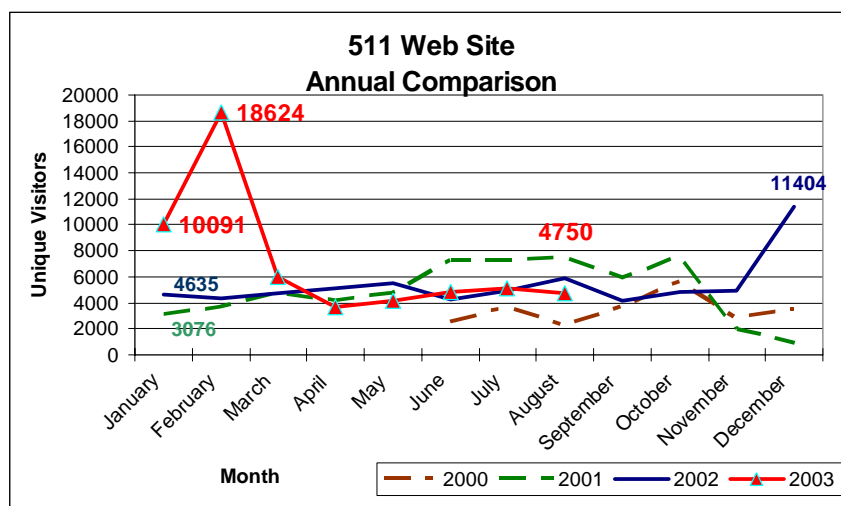
The website for 511 Virginia underwent a dramatic change in September 2003. However, the statistics captured for the purpose of this evaluation were limited to August 2003. Therefore, the change is not reflected in the statistics in Figure 13. Bookmarks and repeat users continue to be the significant users of the web site (Returning visitors make up 7.4% of all hits). However, the website has shifted to being primarily traffic-oriented year round, whereas in 2000 and 2001 the trends in the fall were tourism-oriented.

Figure 13: Summary of Web Site Statistics.

Summary Web Statistics

Top Referring Domain	Bookmarks 36%
Top 3 Referring URLs	
	• Bookmarks 45%
	• Shenandoah.com 10%
	• Virginia.org 6%
Top Major Domain	.com 46%
Top Search Engine	Google 38%
Ranking on Google under "Virginia Travel"	VDOT page w/ link to 511 Ranked 8th as of 12Dec03
Top Search Keyword	"Virginia Travel"
Browser War	Microsoft 92%
Operating System	Windows 2000 97%
Screen Resolution	800x600 24.8% / 1024x768 23.2%
Color Palettes	32 bit 45%
Highest Rated Month	February 2003 (92,067 visits)
Highest Rated Day	Thursday, December 4, 2003 (21,226)
Highest Rated Hour	10am Friday, December 5, 2003 (1,790)
New to Returning Visitors Ratio	92.6% New vs. 7.4% Returning

See Appendix C for all monthly summary reports and correlating severe weather events from February 2002 through August 2003.

RECOMMENDATIONS FOR THE 511 VIRGINIA SERVICE

Based on the research and findings from the data analysis of 511 Virginia, the following recommendations are provided for VDOT:
1. Build a "Bookmark This Page" function on the web site main page
2. Trend 511 call volumes and weather to help forecast peak usage day characteristics.
3. Develop a call data analysis function to automatically group calls using Nxx numbers.
4. Define a provision for 511 data monitoring needs prior to awarding the state-wide RFP.
5. In order to forecast minutes for the future state-wide 511 minute contract, utilize a 1% adoption rate for the first 18 months.
6. Design the state-wide 511 system to coordinate with existing traveler data measures to better leverage 511 as an ITS investment.
7. Ensure ANI_II (e.g., ii digits) will be available from the state-wide provider to monitor the wireless/land line ratio.
8. Buy radio time at the peak usage hours, which are 2pm-3pm and 4pm-5pm.
9. Based upon the web site pages visited and surveyed interest, move traffic information to the homepage for 511 Virginia (This change occurred in September 2003).
10. Ensure that the telecommunications provider can accommodate at least 45 simultaneous calls.
11. Add more geographic gradation to weather in the top three requested areas: Roanoke, Winchester, and Staunton.
12. Update all link referrals to the new website (i.e., from travelshenandoah.com to 511.va.org).
13. Actively pursue new link referrals to 511va.org, especially with weather and tourism sites, in addition to pages and information within VDOT's own website.
14. Update more frequently during winter storms.
15. If possible, post as specific information as possible (multiple incidents on I-81 from mm1 to 35 does not necessarily help travelers make better travel decisions).

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16. If desired, negotiate a quarterly contract for minutes from the telecommunications provider. This would allow VDOT to purchase access to fewer ports for the majority of the year and only purchase several dedicated ports during the peak months from December through March.
17. While road signs have been successful with users as an initial source, focus marketing efforts to the land-line users, which, at current rates, will soon overtake the wireless users.
18. Do further research into the best methods to use CMS and 511 in conjunction.
19. Since Hitbox Central no longer offers a free tracking service, research and implement a new log analysis software as soon as possible to allow for continuous trending.
20. Actively pursue a web page rank increase on the top search engines under Virginia Travel (e.g., Google).
21. Configure the webpage to be able to accommodate 1024 x 788 screen resolutions, as well as the top internet browsers.

Lessons Learned

There were several lessons learned throughout the design, implementation, and analysis stages of the data analysis that may be helpful to others conducting similar evaluations or new deployers. The lessons have been mentioned throughout the report, but Table 3 below provides a single table summary of these findings.

Table 3: Lessons Learned

Data Analysis Lessons Learned
1. Negotiate data analysis needs before signing a contract with a minutes provider. Ideally, include: periodic listings of top telecommunication providers for marketing purposes, "ii" digits for wireless and land line analysis, and discrete numbers and a corresponding usage/user privacy agreement for repeat user analysis or at least NXX analysis.
2. If forecasting 511 call volumes without historical data (i.e. a new 511 deployer) and if you choose to use a similar traffic volume-adoption curve method, utilize a 1% adoption rate (versus the 2% utilized for the 511 Virginia initial call volume forecast).
3. If implementing significant changes to the 511 Virginia system, recommend implementing in April or September/October to disrupt the fewest callers, and have the system changes in place prior to peak call periods.
4. Leverage the 511 investment: build in an ability to use 511 call volumes in correlation with traditional data measures to better describe the traveler experience. Review often.

511 Virginia Evaluation

January 2004

Cross Cutting Analysis Report
Chapter 7

CHAPTER 7: CROSS-CUTTING ANALYSIS

EXECUTIVE SUMMARY

This Cross-cutting Analysis is a brief look at the findings across all sections of the 511 Virginia Evaluation, including the Focus Group, the Web Survey, the Phone Survey, the Awareness Survey, and the Data Analysis. The findings and recommendations sections of each report were analyzed for similar results that could be compared for a more cross-cutting look at the findings from the evaluation.

Because these findings are limited to similar results, it is important to note that this Cross-cutting Analysis is in no way a complete reflection of the findings and recommendations found in the 511 Virginia Evaluation. The evaluation team recommends that each individual section be read thoroughly.

Similar findings across two or more sections of the 511 Virginia Evaluation were found in the areas of: pre-trip information, en-route information, cell phone usage, 511 Virginia awareness, 511 Virginia usage, demographics, user satisfaction, and user behavior. Similar recommendations found in two or more sections include: 511 Virginia usage and user needs.

FINDINGS

Pre-Trip Information

The focus group participants and the phone survey respondents offered differing opinions regarding the types of information they would want to obtain pre-trip, as shown in Table 1.

Table 1. Pre-Trip Information Desired

Type of Information	Focus Group Participants	Phone Survey Respondents
Weather	X	X
Directions	X	
Travel time	X	
Road conditions (traffic, accidents)	X	X
Construction		X

However, both groups of participants identified weather and road conditions as important pre-trip information. Additionally, focus group participants stated that pre-trip information on weather, construction, traffic, accidents, and road conditions would cause them to vary their routes or departure times.

En-Route Information

Focus group and phone survey participants again differed in what information they desire once en-route, as shown in Table 2.

Table 2. En-Route Information Desired

Type of Information	Focus Group Participants	Phone Survey Respondents
Gas and Rest stops	X	
Distances to destinations	X	
Road Conditions (Congestion, Traffic, Accidents)	X	X
Food locations	X	
Attractions	X	
Weather	X	
Construction		X

Both sets of participants identified Road Conditions (also identified as Congestion, Traffic, and Accidents) as important. Additionally, focus group participants identified congestion and weather as types of en-route information that would affect their travel.

Cell Phone Usage

The Focus Group and Phone Survey data revealed that the majority of travelers have a cell phone. In the focus group, 34 of 41 (83%) travel with cell phones, while 96% of the Phone Survey respondents (96%) use a cell phone and use it to get information. The Data Analysis revealed that cell phone users make up the majority of the calls to 511 Virginia (54%).

511 Virginia Awareness

The Focus Group and Phone data revealed that users are finding 511 Virginia through a variety of ways, but primarily through the road side signage.

The 511Virginia.org website was found by Web Survey participants through a search engine or link from another website, as well as through word of mouth or TV. However, the Data Analysis reveals that most web users are getting to the site through bookmarks and as returning visitors (7% of all hits).

General awareness of the service differed between Focus Group findings and Awareness Survey findings. The Focus Group found 14 of 41 (33%) participants had heard of 511 Virginia, (residents were most likely to have heard and tourists were least likely) and the Awareness Survey found 19% of respondents within the coverage area report had heard of the 511 Virginia service and 9% outside of the coverage area had heard of the service.

511 Virginia Usage

The Focus Group results show that of the 14 participants who had heard of 511 Virginia, only 4 had ever called the service (28%). Conversely, the Awareness Survey indicated that 6 of 73 (8%) participants in the coverage area who reported having heard of the service had used it.

Demographics

A comparison of the demographics of typical users indicates that users of the phone system may be different than a typical web user. The Web Survey reported 89 of 93 (95%) American respondents are from Virginia. The largest number of respondents was between the ages of 50 and 59 and has a household income before taxes of $36,000 to $50,000. Conversely, the Phone Survey reported the average caller was a male, in-state resident of the 511 region, between the ages of 18 and 29, with a household income between $51,000 and $65,000.

The Phone Survey revealed that 37% of the respondents were from out of state, while the Data Analysis showed that 26% of all calls were from out-of-state registered phones.

User Satisfaction

User responses from both the Phone Survey and the Web Survey indicate that users are more satisfied with the phone service overall.

The Web Survey reports over half of the participants said that they were satisfied with the 511Virginia.org home page and with the Travel Conditions page. Less than half respondents were satisfied with all other pages. Seventy-five of 108 (69%) said they would revisit the website and 64 (59%) said they would recommend it to others.

The Phone Survey found that 99% of respondents would call the service again. Sixty-six percent said the phone was very useful. When asked what was useful about it, 140 respondents of 400 (35%) stated that it helped them make informed travel decisions. Forty-nine percent have heard something on 511 Virginia that made them change their travel plans. The majority of these changed their route. Ninety-three indicated that 511 Virginia produced a positive change in their awareness of traveler information in the I-81 region.

User Behavior

In both the Phone Survey and the Web Survey, participants indicated that they are most interested in traffic information.

The Web Survey revealed that 77 of 108 (71%) respondents visited the website on the day they filled out the survey to find travel condition information; second to this was tourism and attractions.

The Phone Survey found that 36% of respondents called the service for the first time for traffic issues, such as congestion and delays, and that users are typically seeking information on traffic, accidents, construction, and weather.

The Data Analysis also found that users were traffic oriented. Sixty-nine percent of all callers are seeking traffic information; the remaining percentages were fairly evenly distributed among construction, weather, road conditions, and services. Services, especially lodging and food requests, were 8% of all requests, while .4% of users currently utilize the transfer function of the system.

RECOMMENDATIONS

511 Virginia Usage

In the analysis of the Focus Group results, the Web Survey, and the Awareness Survey, the need for additional or enhanced marketing efforts was identified. The large differentials between awareness and usage as well as between awareness and an understanding of what 511 Virginia offers indicates a lack of knowledge by users about what the service can do or how the service works. Because users to both systems are primarily seeking traffic information, marketing geared to those users who desire travel condition information is advised.

The Phone Survey also resulted in a recommendation that more awareness marketing be conducted. Many participants indicated that they called the service out of curiosity, rather than because of a specific desire for information they knew they could find from 511 Virginia.

User Needs

Participants of the Phone and Web Survey indicated the types of information they most likely would use, as detailed in Table 3.

Table 3. Types of Information Most Likely to be Used

Type of Information	Focus Group Participants	Awareness Survey Participants
Restaurants	X	
Road Conditions	X	
Weather Conditions	X	
Accident Information	X	X
Traffic Conditions	X	
Alternate Routes and Detours	X	
Construction		X
Emergency Services		X

Based on the feedback from both surveys, it is recommended that VDOT consider eliminating categories that are not related to travel conditions. However, Focus Group participants indicated that they desire information be added to the system concerning detours and alternate routes, if possible.

For the website specifically, it is recommended that the site be redesigned to cater to those looking for travel condition information. The home page should be focused on travel conditions, and the information should be enhanced or expanded. There were also requests from Web Survey participants to add more cameras. The Data Analysis resulted in the suggestion that, based on the site's web pages visited and surveyed interest, traffic information should be moved to the homepage for 511 Virginia. (This change occurred in September 2003.)

The Phone and Web Survey resulted in data regarding what improvements can be made to the phone and web systems. The suggestions were somewhat similar. For example, Web Survey respondents pointed out the lack of information available on the site, especially the Travel Conditions page, either due to technical problems or lack of data. They desired more coverage area, and more information on travel conditions that is timelier. The Phone Survey respondents' top three suggested improvements for the 511 service were: improved navigation, timeliness of information, and voice recognition system.

Based on phone survey responses, it is recommended that more detailed traffic information, specifically the exact location and duration of road incidents, be included. One way it is recommended to achieve the goal of timely and specific information provided on 511 Virginia is to monitor and improve timeliness of travel information available on 511 Virginia, as suggested in the Phone Survey report.

To address the issue of how difficult the system was perceived to navigate, it is suggested, based on the Phone Survey, that more usability research is done regarding how to make the phone system easier to navigate. Moreover, the phone tree structure and information format could be tailored to better facilitate caller decision making, especially more in-depth alternate route information that can be accessed more easily from the traffic menu.

The phone survey also resulted in a recommendation that evaluators investigate why some callers perceive that the voice recognition is not working. Respondents identified this as an area to improve, but specific information was not gathered.

Both the Focus Group and Phone Survey results identified a need for information on 511 Virginia specifically tailored to truckers. Several Focus Group participants mentioned that they look for information such as low-underpass bridges and hazmat routes, and it is recommended that more research should be done into the CVO community's needs and usage of the 511 phone service.

511 Virginia Evaluation

January 2004

511 Virginia Phone Survey
Appendix 1-A

Introduction

Instructions for the survey administrator are in *italics*.

_____ *Ask for the caller by name.*

_____ *Introduce yourself and describe who you are with.*

_____ *Indicate where you got their contact information.*

_____ *Mention the promised payment/rules for participation.*

_____ *Tell them how long it will take.*

_____ *Ask if this is a good time, and if it is not a good time, ask when would be a good time to call back.*

For example:

- May I speak with John? (use first name for a better reception, and be careful to pronounce correctly)
- Good Evening, my name is Sally Plant and I'm with 511 Virginia, and you called and left your name indicating you might be willing to complete a survey about our service for $10. It takes about 10 minutes. Are you still interested? Is now a good time?

If they are not willing to participate, thank them and terminate.

If they are willing to participate, mention:

_____ *Participation is completely voluntary.*

_____ *You are free to stop the survey at any point and you can refuse to answer any particular question at any time during the survey.*

Personal Information Permission

_____   *Ask if they would be interested in having their contact information remain on a list for VDOT to periodically contact about issues of interest in the I-81 region.*

- Would you be interested in allowing VDOT to maintain your name to contact you in the future for your opinion about transportation issues in the I-81 Region?

Other items, if they ask:

- Your information will be maintained in a secure database, and it will only be available to VDOT personnel for the use of research.

- Your name and personal information will not be sold or shared with any third party without your explicit permission.

Screening Questions

(There were seven screening questions)

We'd like to start with some questions that are for classification purposes only.

(*If necessary, explain*: We use this information to make sure that we are collecting the opinions from a variety of adults. This information will only be used to help analyze the results of this survey. During this survey, we only collect personally identifiable information, such as your name and address, to send you your payment after the survey is complete).

Screening Question 1: Are you at least 18 years old?

Yes *(Continue)*

 No *(Thank them and terminate)*

If they are under 18, thank them for their willingness to participate and explain that for research purposes we can only legally survey persons 18 years old or older.

Response	Responses	Percentage of Total
Yes	400	100%
No	0	0%
Total	**400**	**100%**

Screening Question 2: Do you travel on I-81, I-77, I-66, I-64, or in the areas around these interstates?

Yes *(Continue)*

 No *(Thank them and terminate)*

If not, thank them for their willingness to participate and explain that for research purposes we are focusing on drivers in our area of interest.

Response	Responses	Percentage of Total
Yes	400	100%
No	0	0%
Total	**400**	**100%**

Screening Question 3: Recorded Gender

DO NOT READ

(Circle/Check gender)

Gender	Responses	Percentage of Total
Female	176	44%
Male	224	56%
Total	**400**	**100%**
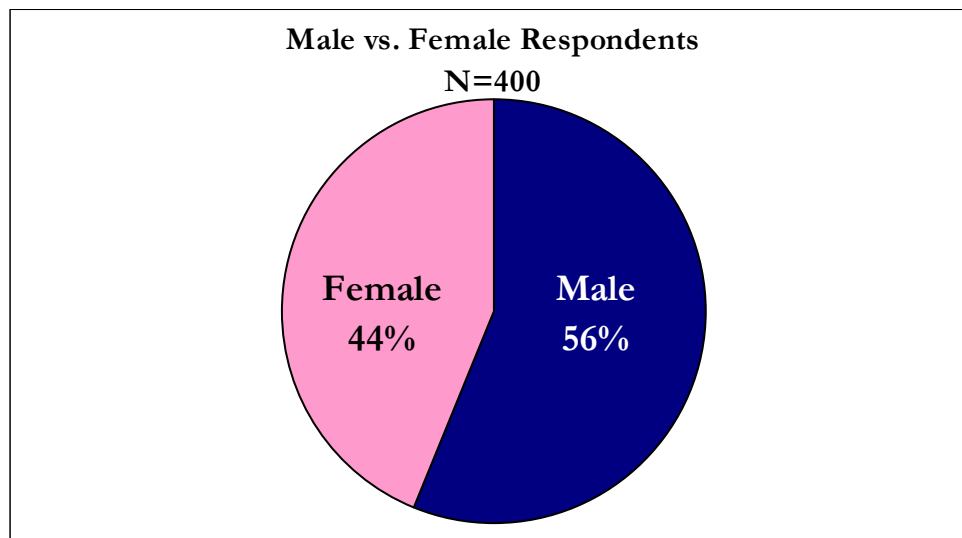
Screening Question 4: What was your age on your last birthday?

DO NOT READ - for reporting purposes only, circle the appropriate range for the age listed below:

Age Bracket	Responses	Percentage of Total
18-29	110	28%
30-39	77	19%
40-49	99	25%
50-59	83	21%

Age Bracket	Responses	Percentage of Total
60-69	25	6%
70+	6	2%
Total	**400**	**100%**
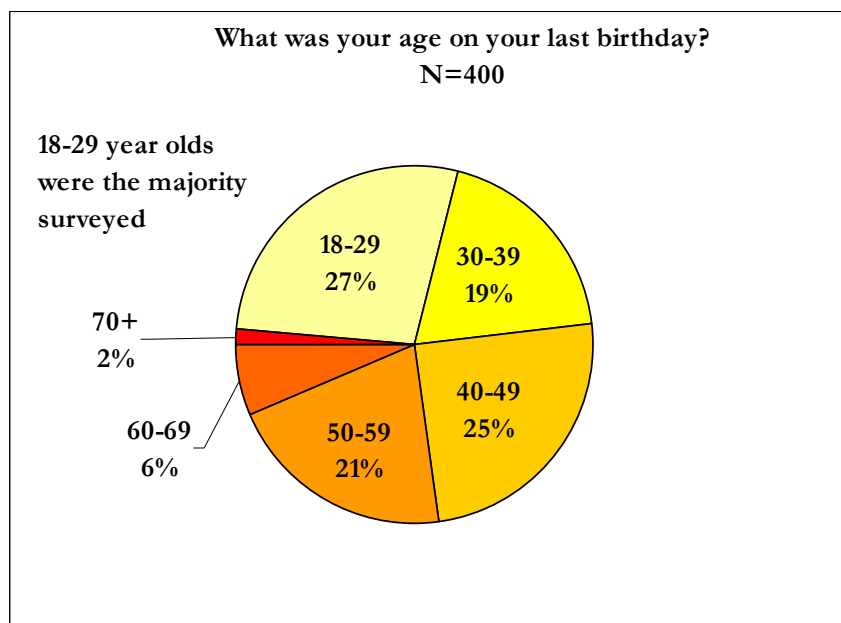
What was your age on your last birthday?
N=400

18-29 year olds were the majority surveyed

18-29 27%
30-39 19%
40-49 25%
50-59 21%
60-69 6%
70+ 2%

Screening Question 5: Since tourism is so important to the economic livelihood of the I-81 region, we would like to collect a general idea about the incomes of those who drive on I-81. Would you be willing to share the range of your 2002 household income before taxes? Please stop me when I get to the right range:

Income Bracket	Responses	Percentage of Total
Under 20K	35	9%
21-35K	58	15%
36-50K	60	15%
51-65K	67	17%
66-80K	43	11%
81-100K	40	10%
100K +	57	14%
Don't Know/Refused	40	10%
Total	**400**	**100%**

Would you be willing to share the range of your 2002 household income before taxes?

N=400

- Don't Know/Refused 10%
- Under 20K 9%
- 21-35K 15%
- 36-50K 15%
- 51-65K 16%
- 66-80K 11%
- 81-100K 10%
- 100K + 14%
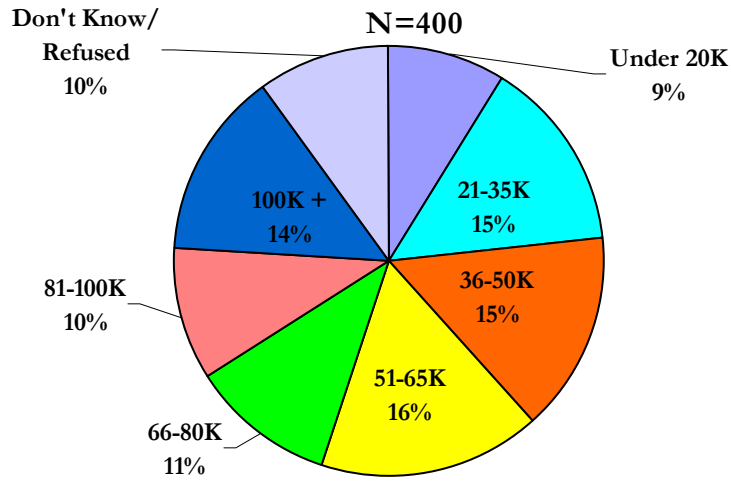
Respondents Income Level without Don't Knows/Refusals
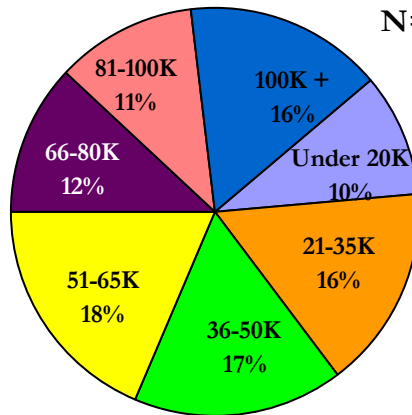
N=360

- 81-100K 11%
- 100K + 16%
- Under 20K 10%
- 21-35K 16%
- 36-50K 17%
- 51-65K 18%
- 66-80K 12%

Screening Question 6: To make sure we talk with a variety of people, in which county and state do you live?

(If unlisted county select "Not in 511 Area". If the state is not Virginia, record only the state and select "Not in 511 Area").

County	Responses	Percentage of Total
Augusta	32	8%
Bath	1	0%
Bedford	3	1%
Botetourt	11	3%
Carroll	2	1%
Clarke	2	1%
Floyd	5	1%
Franklin	5	1%
Frederick	7	2%
Giles	2	1%
Henry	1	0%
Montgomery	26	7%
Not in 511 Area	148	37%
Pulaski	8	2%
Radford	6	2%
Roanoke	62	16%
Rockbridge	9	2%
Rockingham	35	9%
Scott	1	0%
Shenandoah	19	5%
Smyth	1	0%
Staunton	1	0%
Tazewell	2	1%
Warren	2	1%
Washington	6	2%
Wise	1	0%
Wythe	2	1%
Total	**400**	**100%**

In which county...do you live?
511 Area Only
N=252

Warren 1%
Washington 2%
Wythe 1%
Bedford 1%
Botetourt 4%
Carroll 1%
Clarke 1%
Floyd 2%
Franklin 2%
Frederick 3%
Giles 1%
Montgomery 10%
Pulaski 3%
Radford 2%
Roanoke 25%
Rockbridge 4%
Rockingham 14%
Shenandoah 8%
Tazewell 1%
Augusta 13%

In- versus Out-of-State	Responses	Percentage of Total
Out-of-State	84	21%
In-State	316	79%
Total	**400**	**100%**

In which...state do you live?
In vs. Out-of-State
N=400

In-State 79%
Out-of-state 21%

State Only	Responses	Percentage of Total
VA	316	79%
TN	12	3%
PA	9	2%
NC	9	2%
WV	7	2%
MD	7	2%
TX	6	2%
NY	5	1%
CT	5	1%
NJ	3	1%
LA	3	1%
OH	2	1%
KY	2	1%
GA	2	1%
FL	2	1%
AL	2	1%
SC	1	0%
OK	1	0%
MI	1	0%
ME	1	0%
MA	1	0%
DE	1	0%
DC	1	0%
CA	1	0%
Total	**400**	**100%**

In which county and state do you live?
Out of State Responses (N=84)

In- versus Out-of-511 Area	Responses	Percentage of Total
In 511 Area	252	63%
From Out of 511 Area	148	37%
Total	**400**	**100%**

In Area vs. Out of Area
N=400

226

Screening Question 7: What is your typical reason for traveling in the I-81 Region?

(Read three choices and circle category of response)

Resident (Commute, errands, students, etc.)

Tourist (Vacation, business trip away from home area, etc.)

Commercial Driver (CDL license, profession is as a driver, cab, bus, etc.)

Reason for I-81 Travel	Responses	Percentage of Total
Resident	227	57%
Tourist	154	39%
Commercial Driver	19	5%
Total	**400**	**100%**

Screening Question 7: What is your typical reason for traveling in the I-81 region?
N=400

Commercial Driver (CVO) 5%

Resident 56%

Tourist 39%
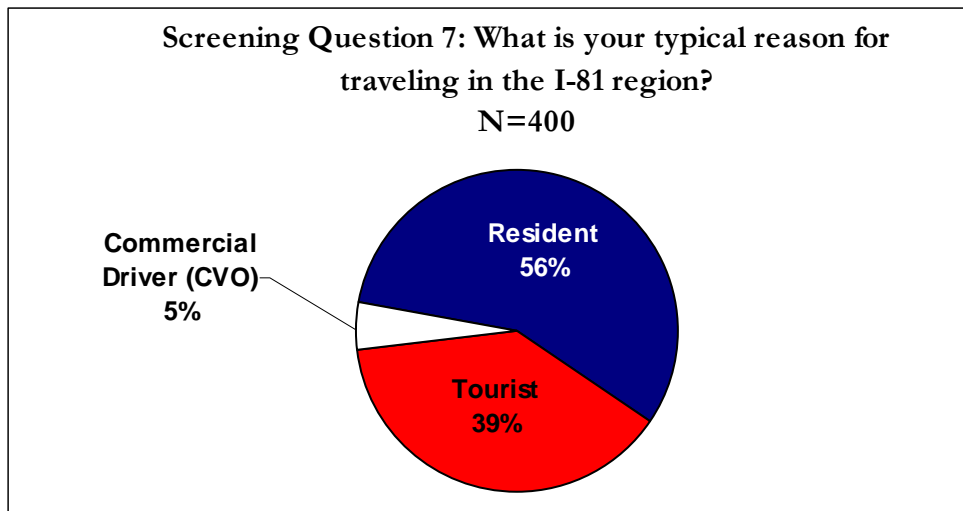
Path #1: Resident Questions

(There were seven resident questions.)

Resident Question 1: On average, how many days a week do you drive a car or other vehicle?

# of Days of the Week Driven	Responses
1	1
2	4
3	5
4	5
5	11
6	15
7	186
Total	**227**

On averge, how many days a week do you drive a car or other vehicle? (N=227)
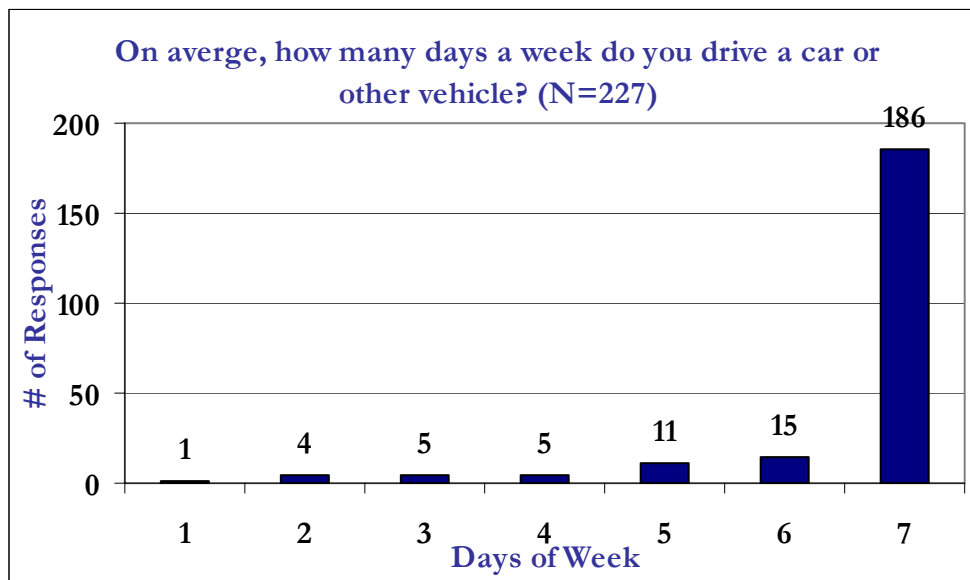
Resident Question 2: What days do you drive on the interstates in the I-81 Region?

Days of the Week Driven	Responses
Everyday	61
Monday - Friday	63
Weekends	37
Fri, Sat, Sun	11
Other	55
Total	**227**

What days do you drive on the interstates in the I-81 Region? (N=227)

What days do you drive on the interstates in the I-81 Region? (Cumulative) (N=219)
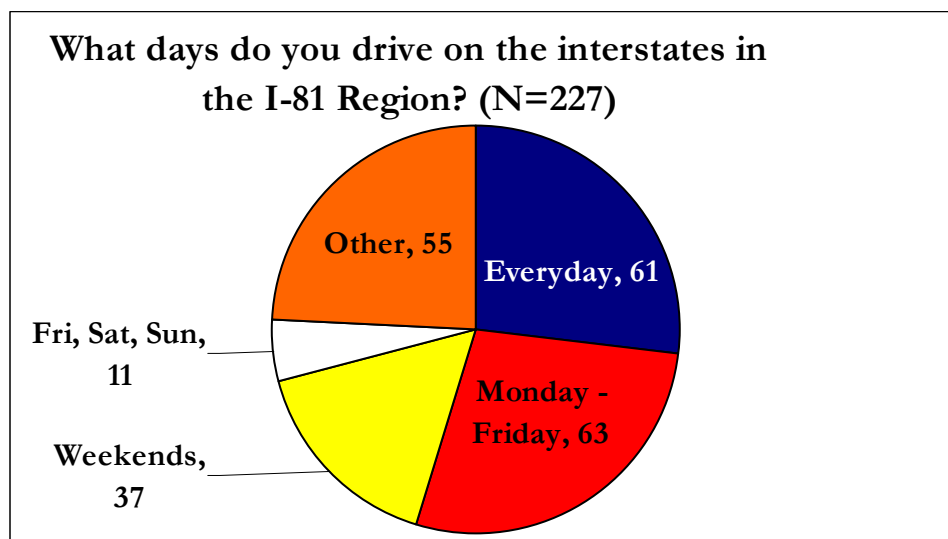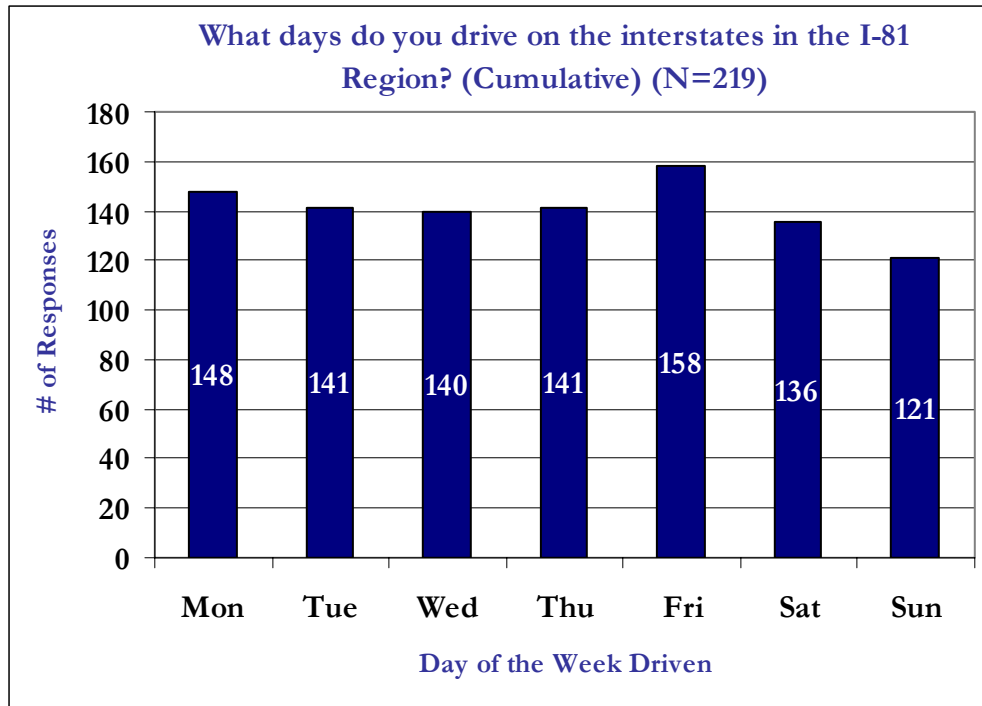
Other - Days of the Week Driven	Responses
Monday-Friday, Saturday	9
Don't Know/Refused	8
Friday, Saturday	8
Saturday	4
Friday, Sunday	4
Tues, Thurs	3
Monday, Friday	2
Mon, Fri, Sat, Sun	2
Mon, Fri, Sun	1
Mon, Sat	1
Mon, Thurs, Fri, Sat	1
Mon, Tues	1
Mon, Tues, Thurs	1
Mon, Tues, Wed, Thurs	1
Mon, Wed, Thurs, Fri, Sat	1
Thurs, Fri, Sat, Sun	1
Thurs, Fri, Sun	1

Other - Days of the Week Driven	Responses
Tues, Sat	1
Tues, Sat, Sun	1
Wed, Sun	1
Wed, Thurs, Fri, Sat	1
Mon, Tues, Sat, Sun	1
Mon, Wed, Sat, Sun	1
Total	**55**

Resident Question 3: What is the primary reason you travel on the interstates?

Reason for Travel	Responses	For the Graph
Medical Access	4	4
Travel to/from home (e.g., students)	15	21
Other	16	
Visit Family/Friends	34	34
Leisure (Shopping, to attend cultural events, etc.)	43	43
Work	115	119
All of the Above		6
Total	**227**	227

What is the primary reason you travel on the interstates? (N=223)

Work, 115

All of the Above, 6

Medical Access, 4

Travel to/from home (i.e. students), 21

Visit Family/ Friends, 34

Leisure (Shopping, to attend cultural events, etc.) 43
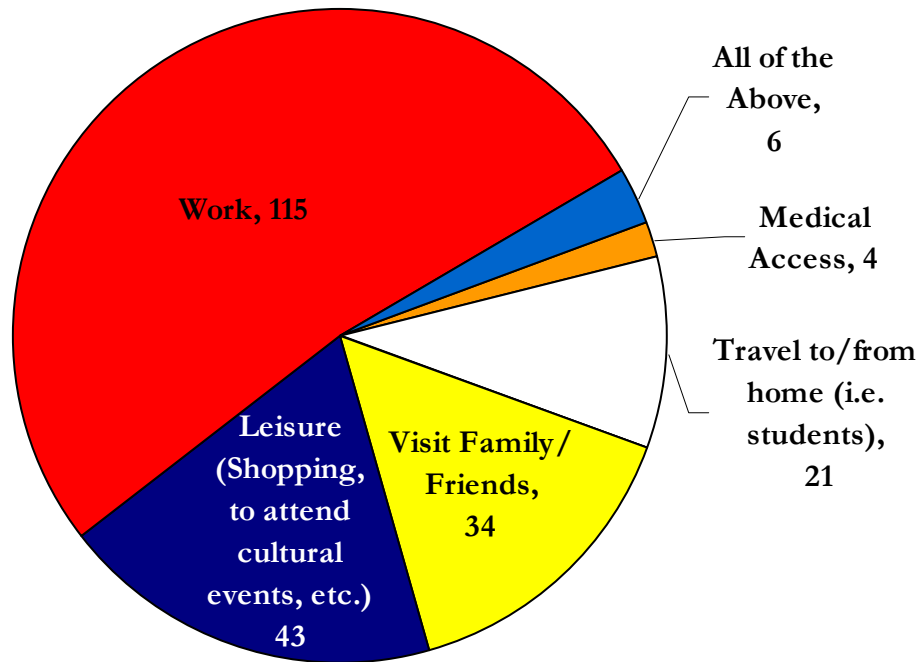
Reason for Travel - Other	Responses
Travel to/from Home (e.g., students)	6
All of the Above	6
Leisure (Shopping, to attend cultural events, etc.)	4
Total	**16**

Resident Question 4: Do you drive to either work or school on a regular basis?

Yes *(Continue)*

 No *(Skip to end and press NEXT)*

 Don't Know/Refused *(Skip to end and press NEXT)*

Response	Responses
Yes	187
No	40
Don't Know/Refused	173
Total	**400**

Do you drive to either work or school on a regular basis?

N=227

No 18%

Yes 82%
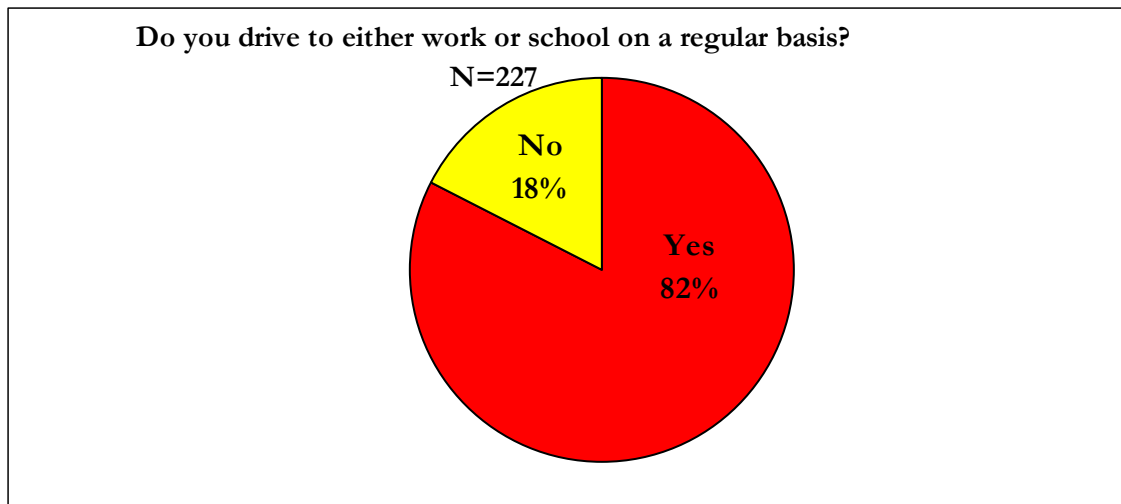
Resident Question 5: What time of day do you commute?

If needed, prompt for both morning and afternoon times.

Morning Commute	Responses
1am	1
2am	1
3am	0
4am	2
5am	7
6am	27
7am	49
8am	58

Morning Commute	Responses
9am	10
10am	4
11am	9
Don't Know/Refused	59
Total	**227**

What time of day do you commute? (N=168)
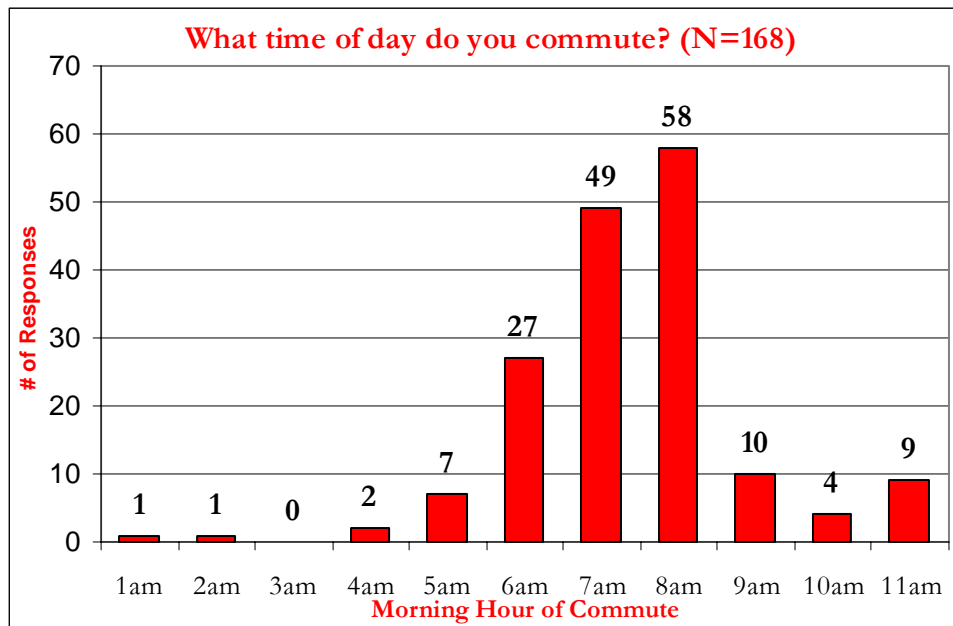
Evening Commute	Responses
Noon	3
1pm	4
2pm	12
3pm	15
4pm	20
5pm	73
6pm	30
7pm	9
8pm	2
9pm	5
10pm	7
11pm	3
Don't Know/Refused	44
Total	**227**

What time of day do you commute? (N=183)
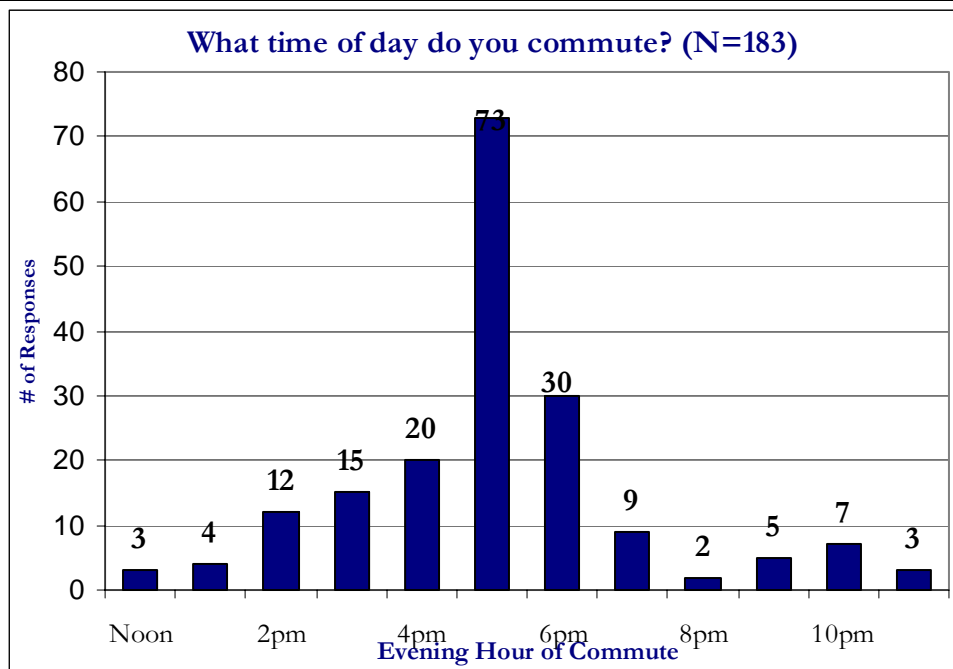
Resident Question 6: Which days do you typically commute?

(Multiple Answers Allowed)

Days of the Week	Responses
Monday-Friday	137
Don't Know/Refused	33
Everyday	17
Weekends	13
Monday-Friday, Saturday	13
MWF	1
Fri/Sat/Sun	1
Fri/Sun	1
Monday	1
Monday, Friday	1
Monday, Friday, Saturday, Sunday	1
Monday, Thursday	1
Monday, Tuesday, Thursday	1
Monday, Tuesday, Wednesday, Sunday	1
Monday, Tuesday, Wednesday, Thursday	1
Tuesday	1
Tuesday, Wednesday, Thursday, Friday, Saturday	1
Wednesday	1
Wednesday, Friday	1
Total	**227**

Which days do you typically commute? Cumulative (N=194)

Day	# of Responses
Sun	34
Mon	174
Tue	172
Wed	172
Thu	171
Fri	186
Sat	46

Cumulative Day Commuted

Which days do you typically commute? By Category N=194

- Monday-Friday, 137
- Other, 14
- Everyday, 17
- Weekends, 13
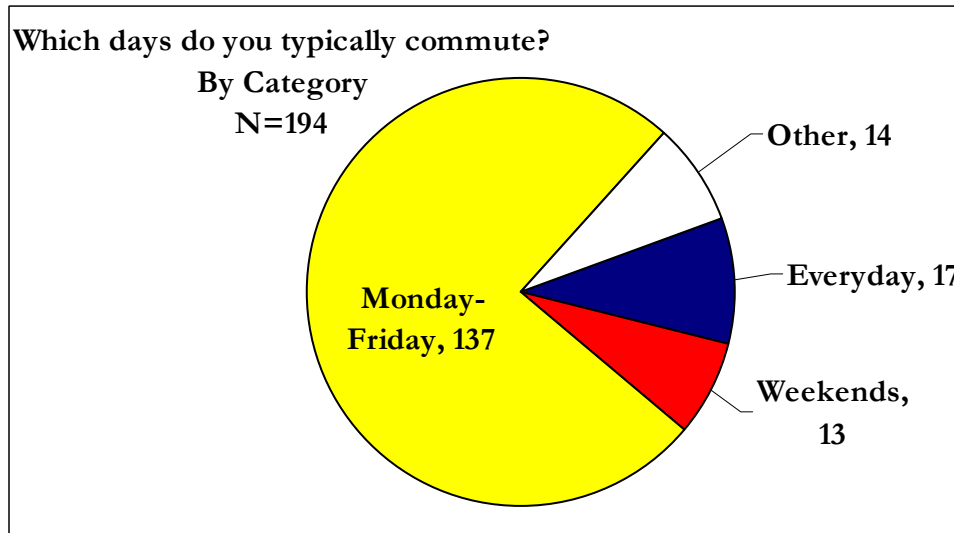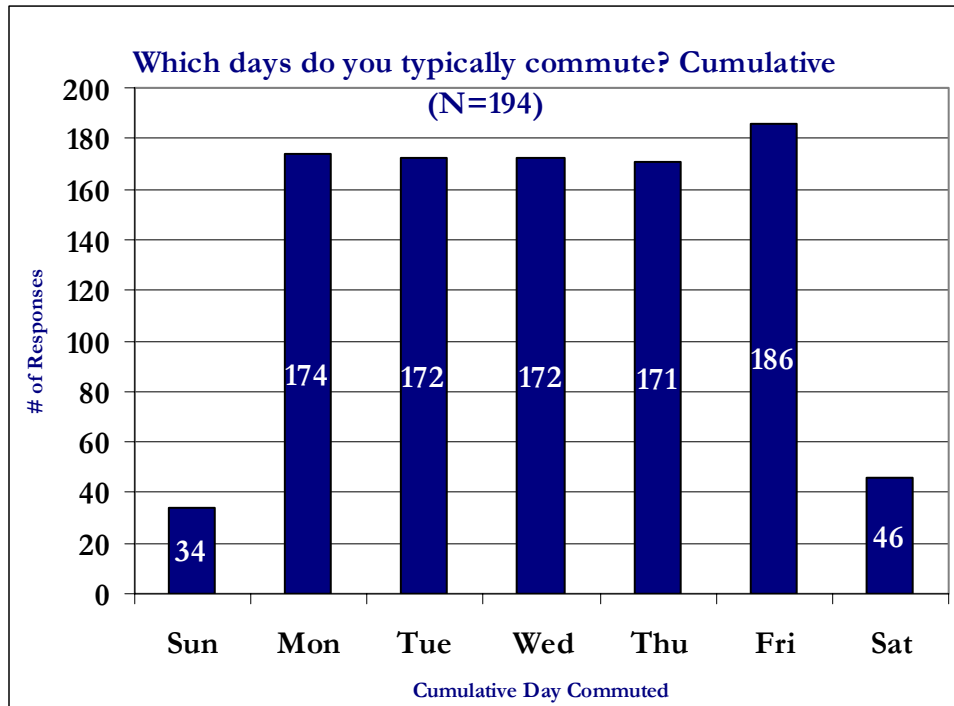
Resident Question 7: Normally, how long does it take you to commute to/from work or school?

If needed, prompt for both morning and afternoon times.

Time for Commute	Responses
0-5 minutes	16
6-15 minutes	43
15-30 minutes	47

Time for Commute	Responses
30 minutes - 1 hour	59
Greater than 1 hour	13
No Answer	44
Don't Know/Refused	5
Total	**227**

Normally, how long does it take you to commute to work or school? (N=178)
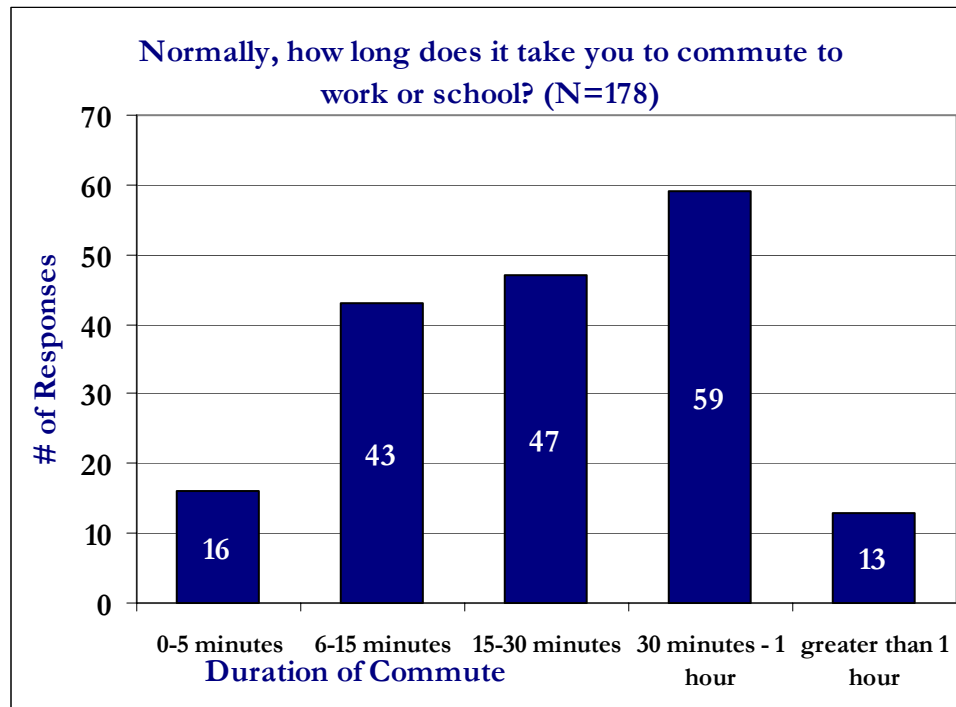
Path #2: Tourist Questions

(There were six tourist questions)

Tourist Question 1: On average, how many days a week do you drive a car or other vehicle?

Days in a Week	Responses
1	1
2	4
3	5
4	2
5	3
6	4

Days in a Week	Responses
7	135
Total	**154**
Other (Days 1-6 summarized)	19
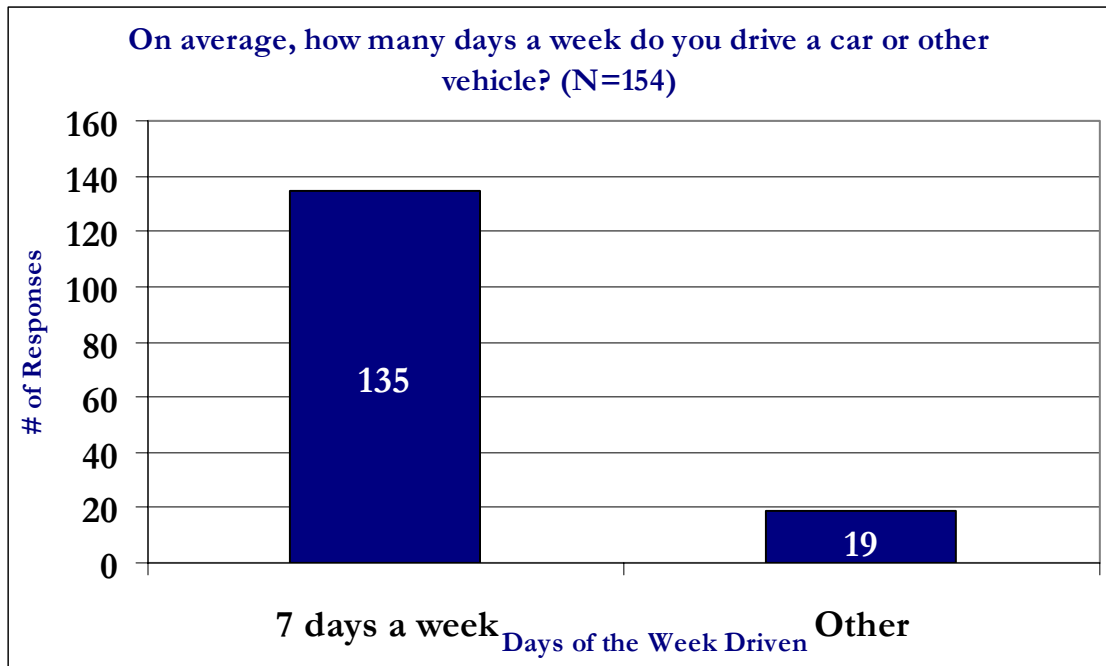
Tourist Question 2: From where do your trips to the I-81 Region in Virginia normally originate?

City

State *(Use 2 letter codes)*

Don't Know/Refused *(Skip to Q5)*

All States *(2 letter code)*	**Responses**
CA	1
DE	1
LA	1
ME	1
MI	1
OK	1
SC	1

All States (2 letter code)	Responses
AL	2
DC	2
FL	2
GA	2
KY	2
NJ	2
OH	2
NY	3
CT	4
TX	4
WV	4
MD	6
TN	7
NC	8
PA	9
VA	88
Total	**154**

From where do your trips to the I-81 Region in Virignia normally originate?
N=154

240
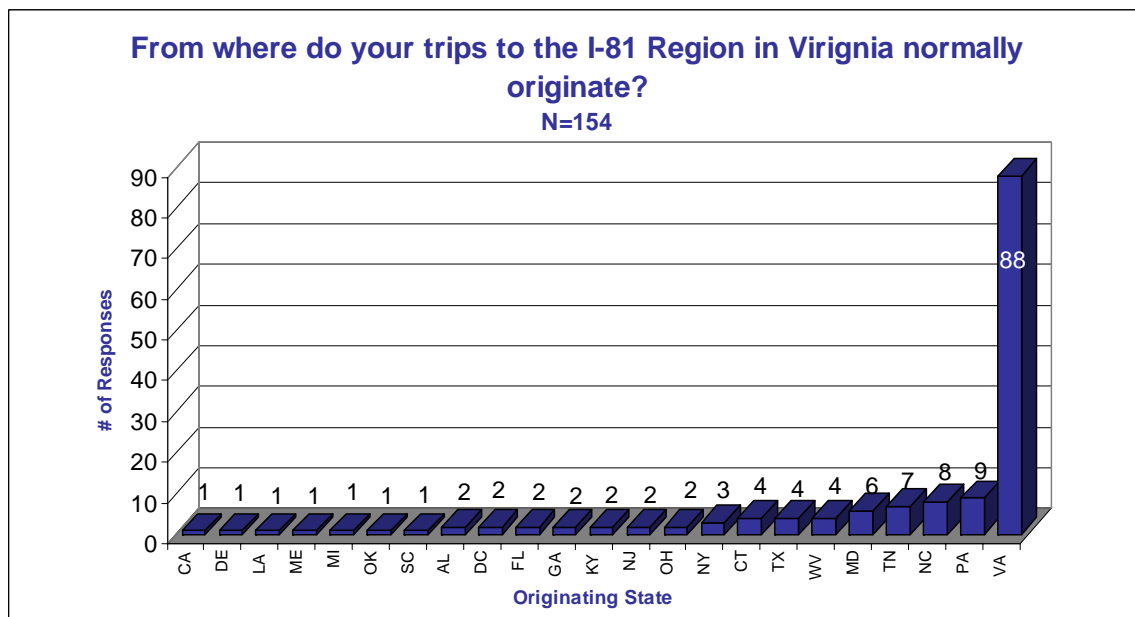
Cities in Virginia	Responses
Blacksburg	2
Loudon	2
Rockingham	2
Virginia Beach	2
Woodstock	2
Arlington	3
Alexandria	4
Harrisonburg	5
Winchester	6
Woodbridge	6
Fairfax	7
Richmond	8
Roanoke	8
Total	**57**

From where do your trips to the I-81 Region in Virginia normally originate?
Cities in VA
N=57
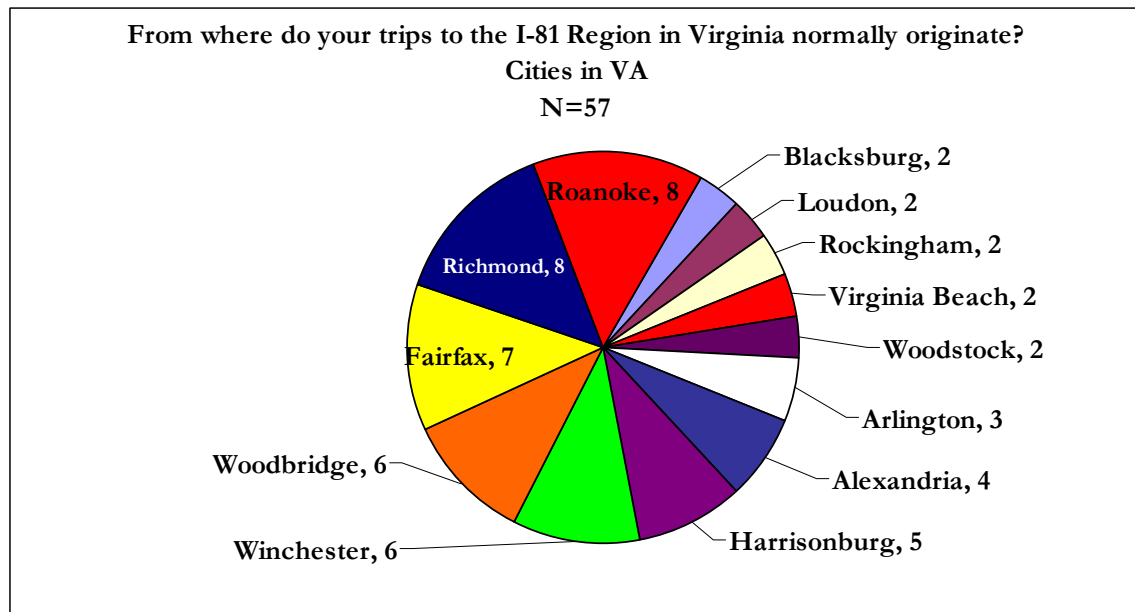
Cities in North Carolina	Responses
Concord	1
Fayetteville	1
Gaston County	1

Cities in North Carolina	Responses
Lexington	1
Raleigh	1
Charlotte	3
Total	**8**

Cities in Pennsylvania	Responses
Breezewood	1
Bux County	1
Dalton	1
DuBois	1
Johnstown	1
Lansdale	1
Pittsburgh	1
Sealands Grove	1
Stuartstown	1
Total	**9**

Cities in Tennessee	Responses
Bristol	1
Nashville	1
Tullahoma	1
Chattanooga	2
Knoxville	2
Total	**7**

Tourist Question 3: What is your typical final destination?

(If necessary, explain: In the I-81 Region of Virginia*)*

City

State *(Use 2 letter codes)*

Don't Know/Refused *(Continue)*

All States	Responses
GA	1
MS	1

All States	Responses
NJ	1
OH	1
SC	1
WV	1
DC	2
MA	2
NY	3
FL	4
MD	5
PA	6
TN	6
NC	15
VA	103
Total	**152**

243
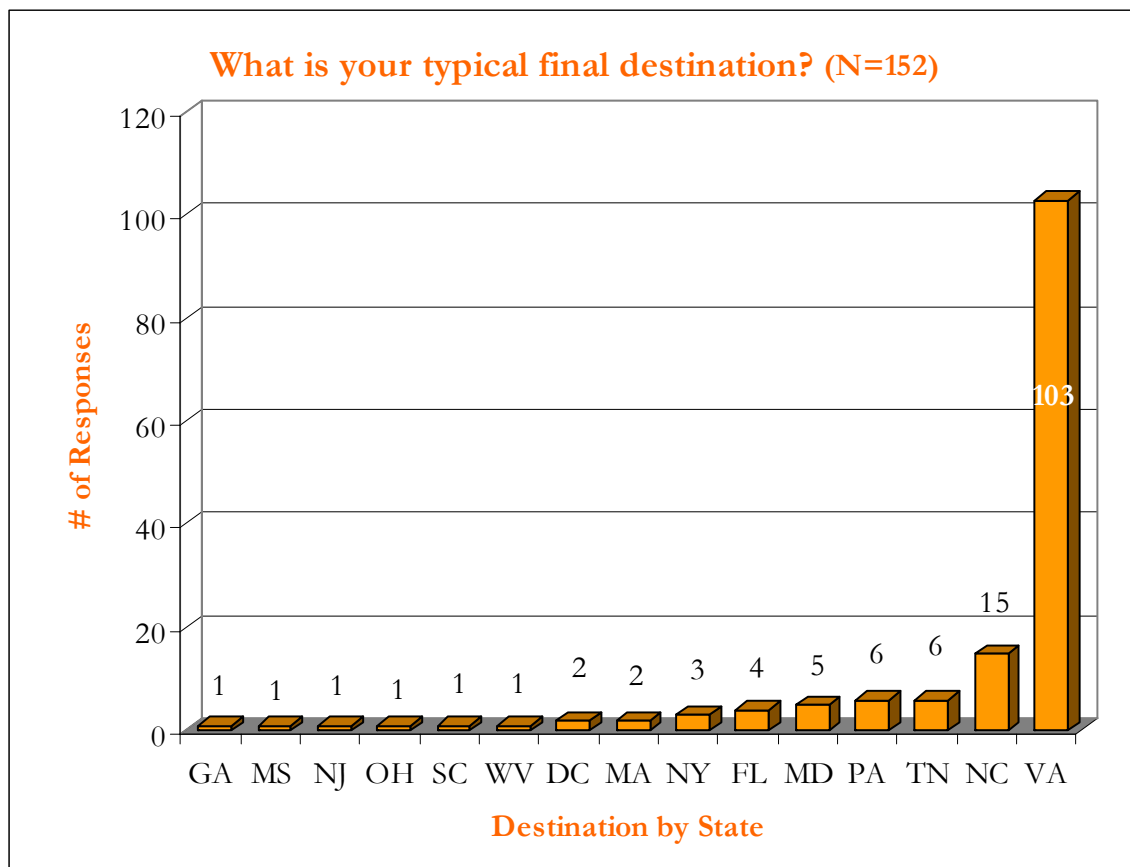
Cities in Virginia	Responses
Annandale	2
Bristol	2
Can't remember	2
Radford	2
Virginia Beach	2
Wytheville	2
Front Royal	3
Lexington	3
New Market	3
Richmond	3
Winchester	3
Staunton	5
Charlottesville	7
Blacksburg	10
Roanoke	14
Harrisonburg	15
Total	**103**

What is your typical final destination? Cities in VA (N=103)
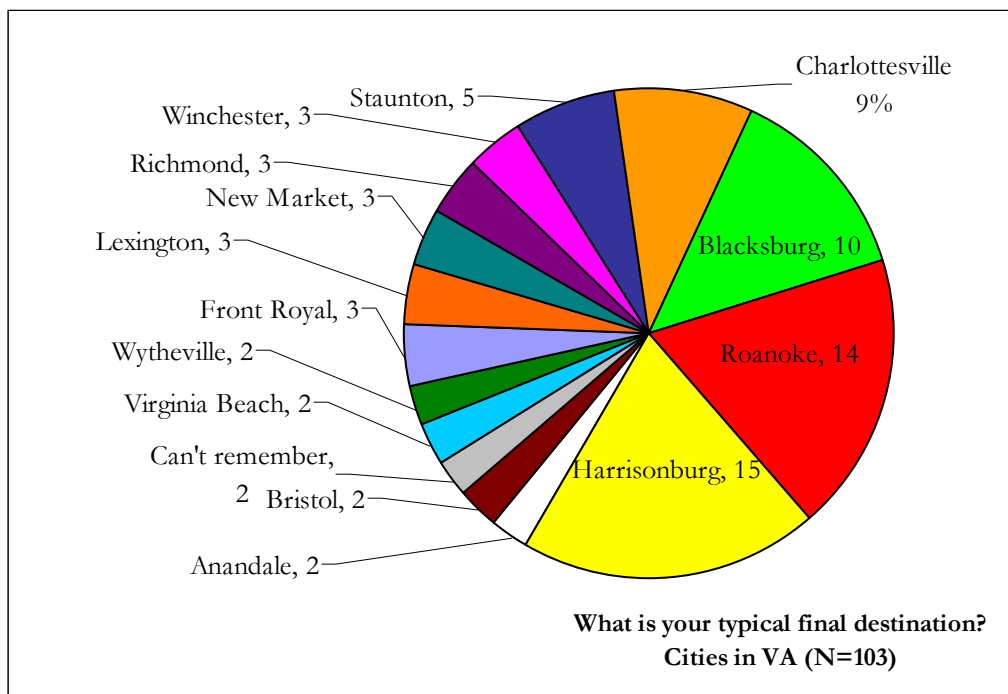
Cities in North Carolina	Responses
Ashville	1
Banner Elk	1
Boone	1
Chicory	1
Franklin	1
Greensboro	1
Hickory	1
Myrtle Beach	1
Outer Banks	1
Raleigh	1
Charlotte	4
Total	**15**

Cities in Tennessee	Responses
Chattanooga	1
Johnson City	1
Kingsport	1
Knoxville	1
Bristol	2
Total	**6**

Cities in Pennsylvania	Responses
Allentown	1
Carlisle	1
Easton	1
Scranton	1
Strausburg	1
Winchester	1
Total	**6**

Tourist Question 4: How often do you travel on I-81 enroute to (insert destination from Q3)? Stop me when I get to the right frequency: *(Read list)*

I-81 Travel Frequency	Responses
Less than once a year	5
Once a year	9
Twice a year	18
3 to 5 times a year	15
> 5 times a year	105
Don't Know/Refused	2
Total	**154**

How often do you travel on I-81 enroute to (insert destination from Q3)? (N=152)
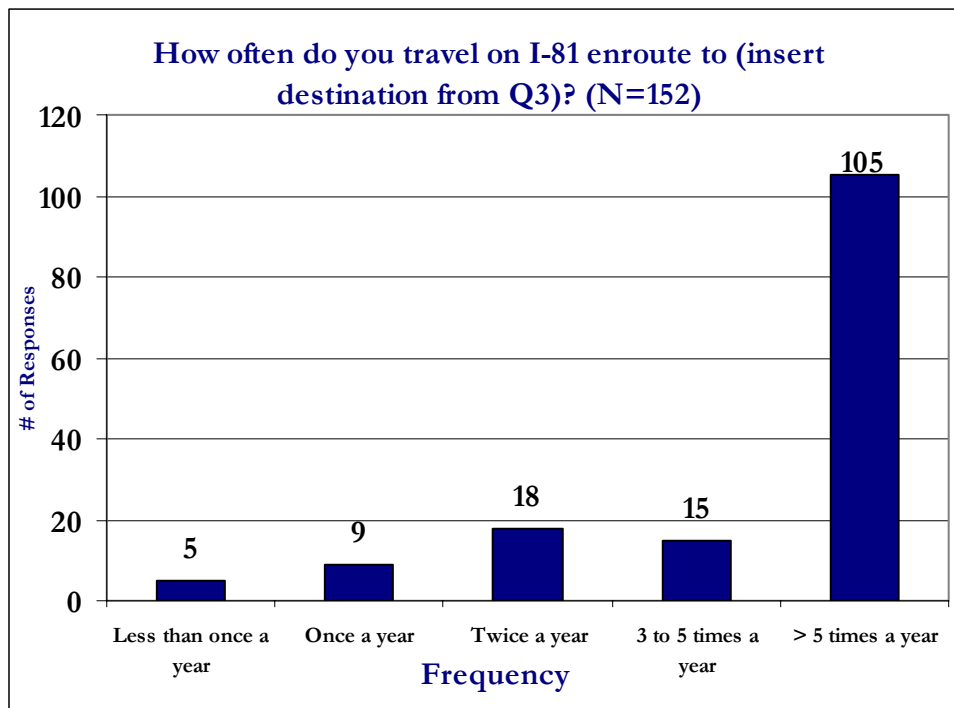
Tourist Question 5: How far in advance do you typically decide to make this trip? Please stop me when I get to the right time frame: *(Read List)*

Planning Time	Responses
Same Day	15
2-6 Days	42
1-3 weeks	51

Planning Time	Responses
1-3 months	28
4-6 months	7
More than 6 months	9
Don't Know/Refused	2
Total	**154**
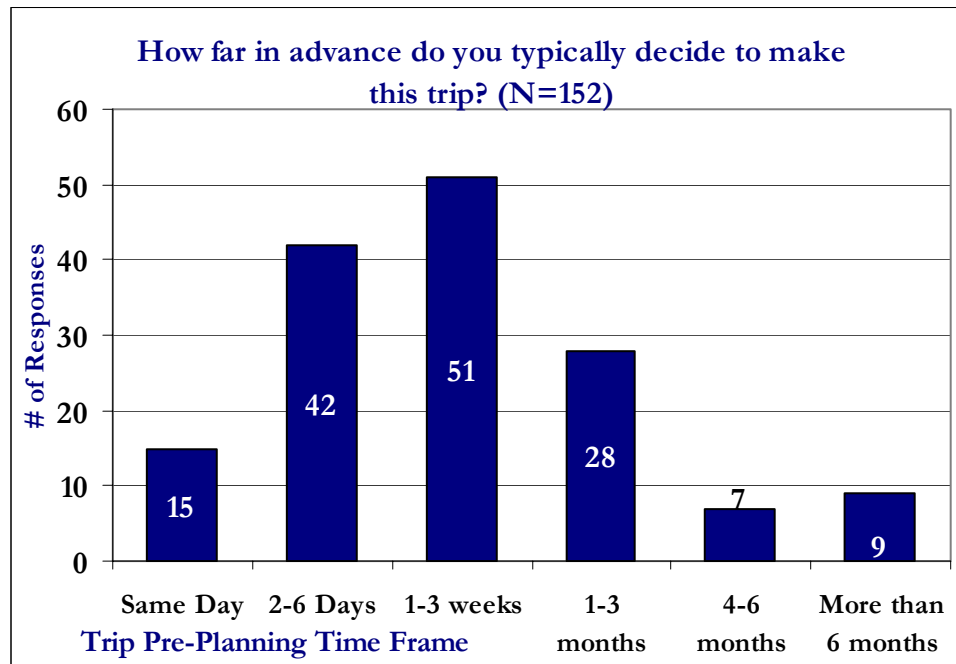
How far in advance do you typically decide to make this trip? (N=152)

Trip Pre-Planning Time Frame	# of Responses
Same Day	15
2-6 Days	42
1-3 weeks	51
1-3 months	28
4-6 months	7
More than 6 months	9

Tourist Question 6: How many people are typically in your party for these trips?

# in Party	Responses
1	47
2	66
3	22
4	11
5	6
More than 5	2
Total	**154**

How many people are typically in your party for these trips? (N=154)
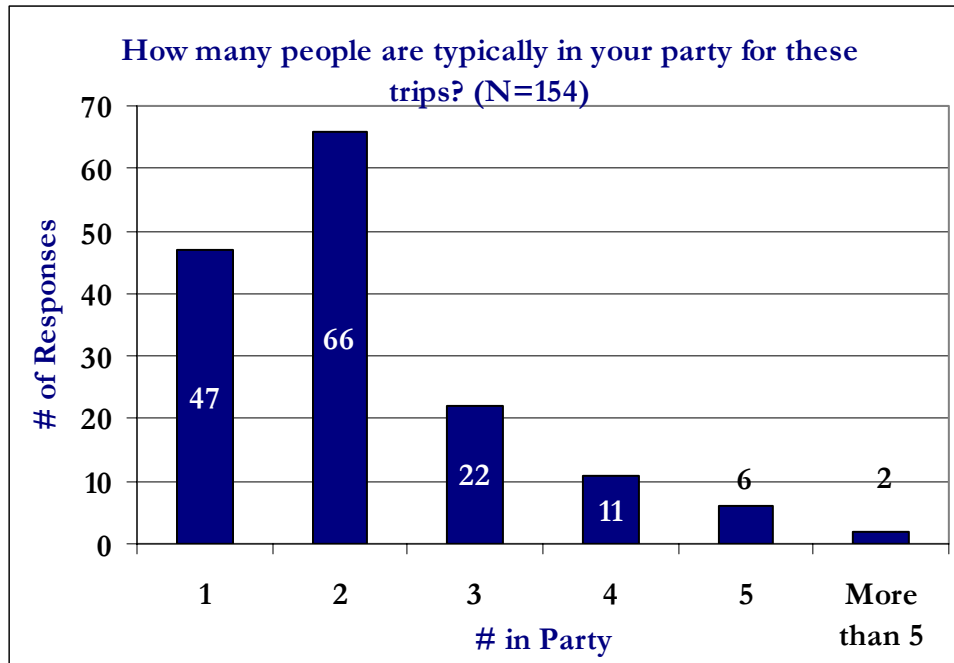
Path #3: CVO Questions

(There were nine CVO questions)

CVO Question 1: What type of Commercial Vehicle Operator are you?

CVO Type	Responses
Both	1
Other: Dedicated Route	1
Long Haul (i.e. overnight)	7
Short Haul (i.e. not overnight)	10
Total	**19**
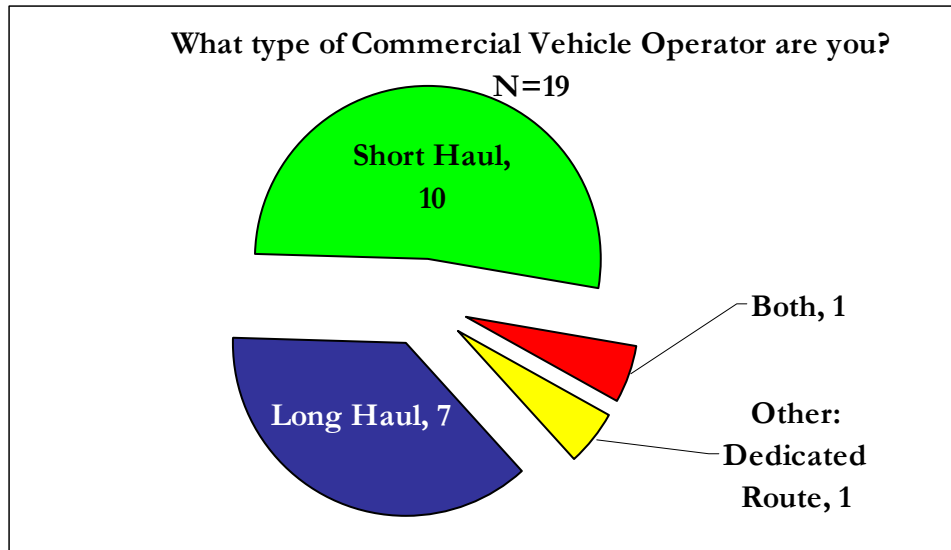
What type of Commercial Vehicle Operator are you?
N=19

Short Haul, 10

Both, 1

Long Haul, 7

Other: Dedicated Route, 1

CVO Question 2: How often do you travel in the I-81 region for CVO operations? Stop me when I get to the right frequency: *(Read list)*

Frequency	Responses
More than once a week	11
Once every 2 weeks	3
Once a month	3
Once a week	1
Less than once a year	1
Total	**19**

How often do you travel in the I-81 Region for CVO Operations? (N=19)
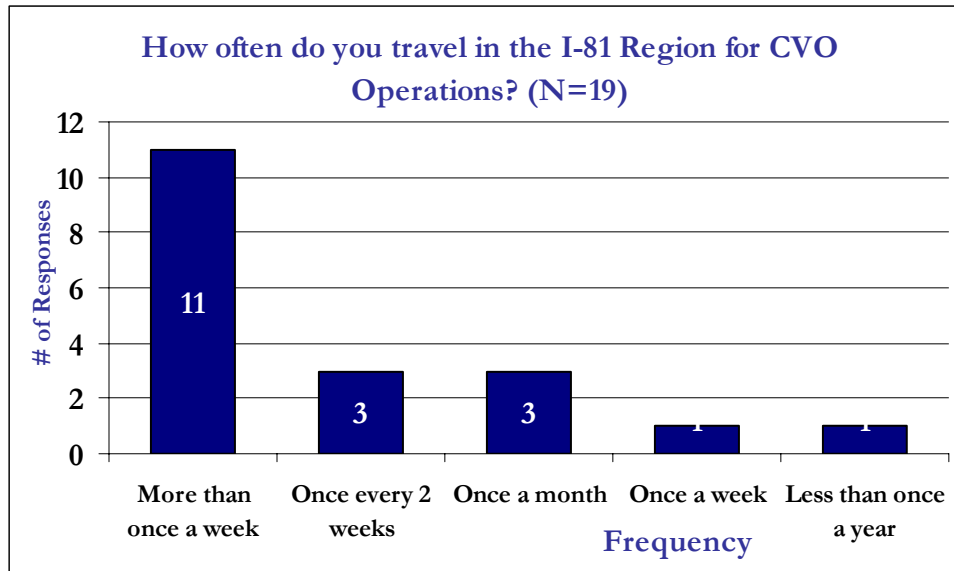
CVO Question 3: On average, how many days a week do you drive a commercial vehicle?

Days Driven	Responses
1	1
2	0
3	0
4	3
5	4
6	4
7	7
Total	19

On average, how many days a week do you drive a commercial vehicle? (N=19)
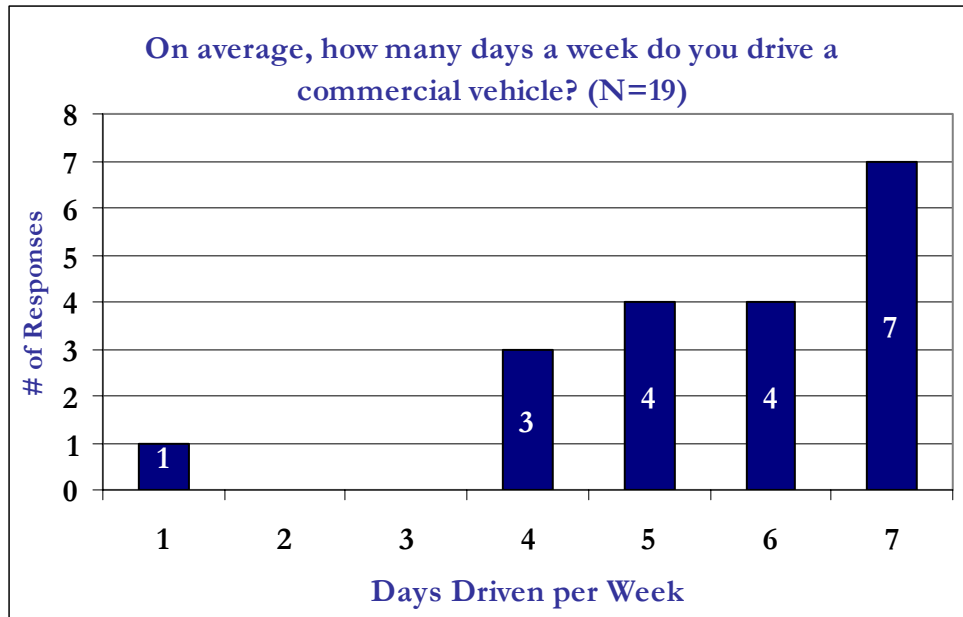
CVO Question 4: Which routes do you drive commercially in the I-81 Region on a regular basis? (*Check all that apply*)

Primary	Responses
I-581	1
I-77	1
I-81	17
Total	**19**

Single Answer only, CVO Primary Routes N=19
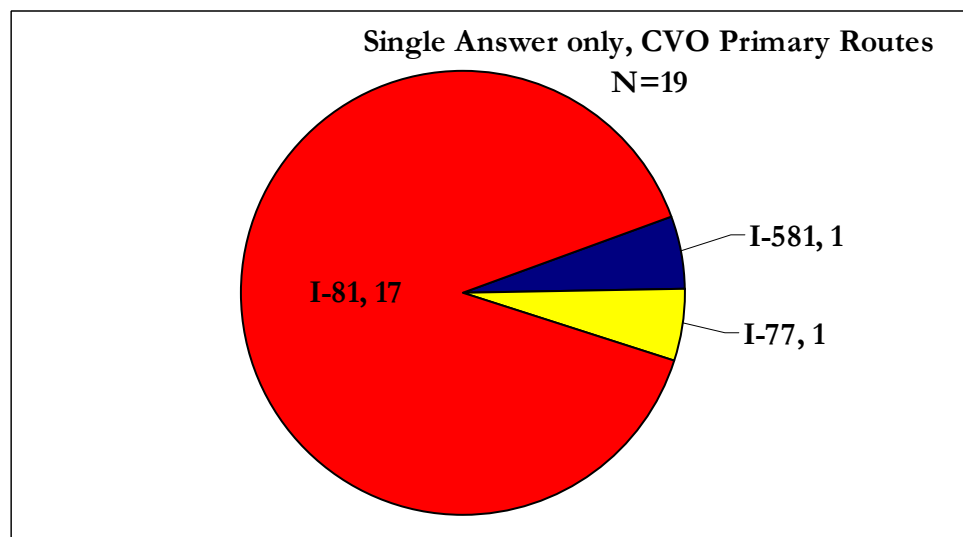
Cumulative CVO Routes	Responses
I-81	17
I-64	14
I-66	11
US460	13
I-77	8
I-581	5
US220	10
US11	7
VA7	4
US250	4
US58	4
US221	4
VA8	2
US340	2
Total	**95**

Which routes do you drive commercially in the I-81 Region on a regular basis? Cumulative (N=19)
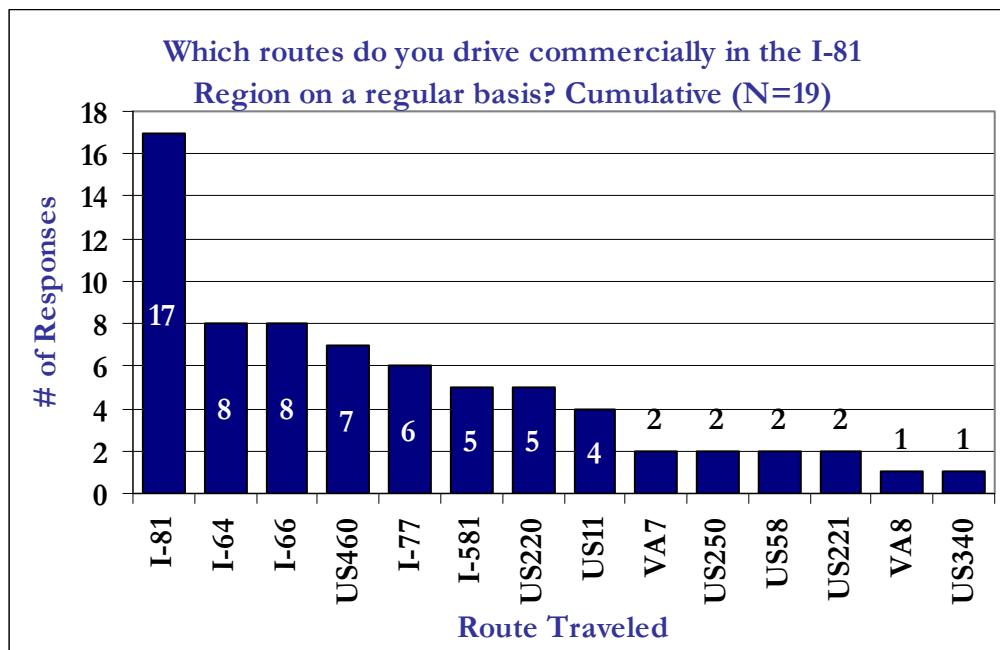
CVO Question 5: How accessible is truck parking in the I-81 Region?

Accessibility	Responses	Applied Value	Totals
Very Accessible	2	2	4
Somewhat Accessible	5	1	5
Neither Accessible nor Inaccessible	0	0	0
Somewhat Inaccessible	3	-1	-3
Very Inaccessible	3	-2	-6
Don't Know/Refused	6		0
Total	**19**		**0**
		Mean = (Neutral)	**0**

Scale Ranges

-2 to -1	Very Inaccessible
-1 to 0	Somewhat Inaccessible
0	Neither Accessible nor Inaccessible
0 to 1	Somewhat Accessible
1 to 2	Very Accessible

How accessible is truck parking in the I-81 Region?
Mean = Neutral (0)
N=13

253
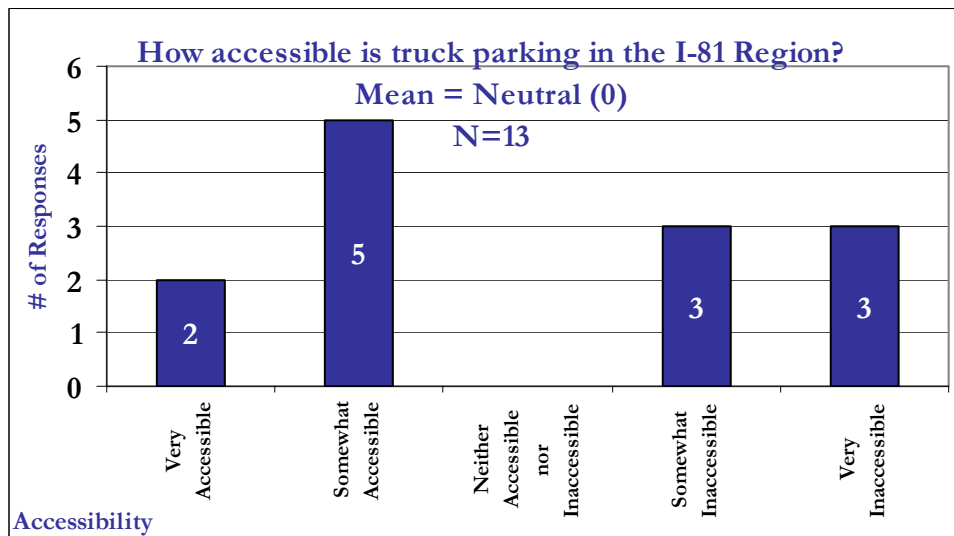
CVO Question 6: If available, would you seek truck parking information in the I-81 Region?

Response	Responses
Yes	11
No	2
Don't Know/Refused	6
Total	**19**

CVO Question 7: Are you able to find truck parking information for the I-81 Region?

Yes *(Continue)*

 No *(Skip to Q9)*

 Don't Know/Refused *(Skip to Q9)*

Response	Responses
Yes	5
No	4
Don't Know/Refused	10
Total	**19**

Are you able to find truck parking information for the I-81 Region? (N=19)

Agreement	# of Responses
Yes	5
No	4
Don't Know/Refused	10
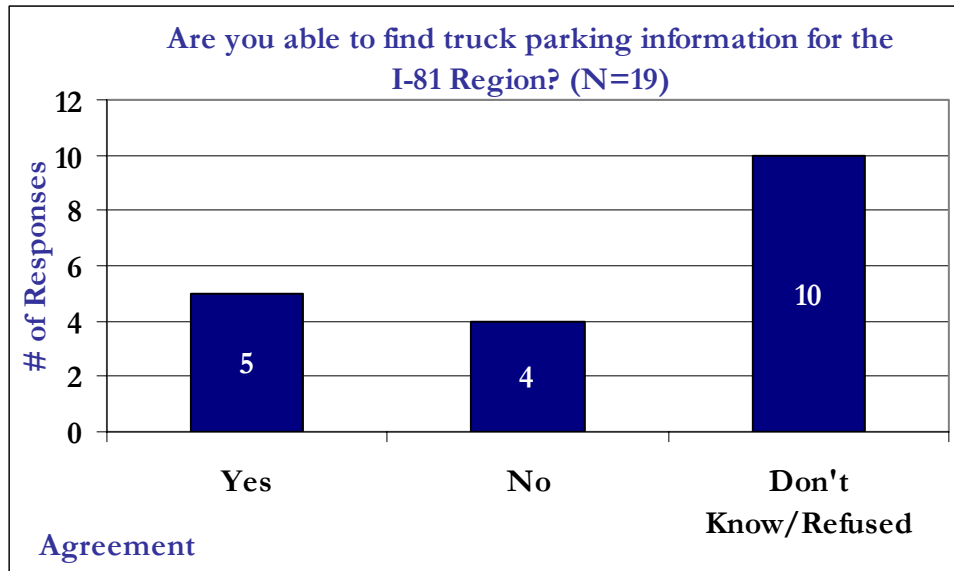
CVO Question 8: Where do you find it (truck parking information)?

(Write in Response)

Response	Responses
Interstate Signage	1
Maps/State Information	1
Rest Areas	1
Truck stops	1
Books/Truckers' Guides	2
Total	**6**

Where do you find it? (Truck Parking Information) N=6

A horizontal bar chart showing Sources of Truck Parking Info (y-axis) versus # of Responses (x-axis):

Sources of Truck Parking Info	# of Responses
Books/Truckers' Guides	2
Truck stops	1
Rest Areas	1
Maps/State Information	1
Interstate Signage	1
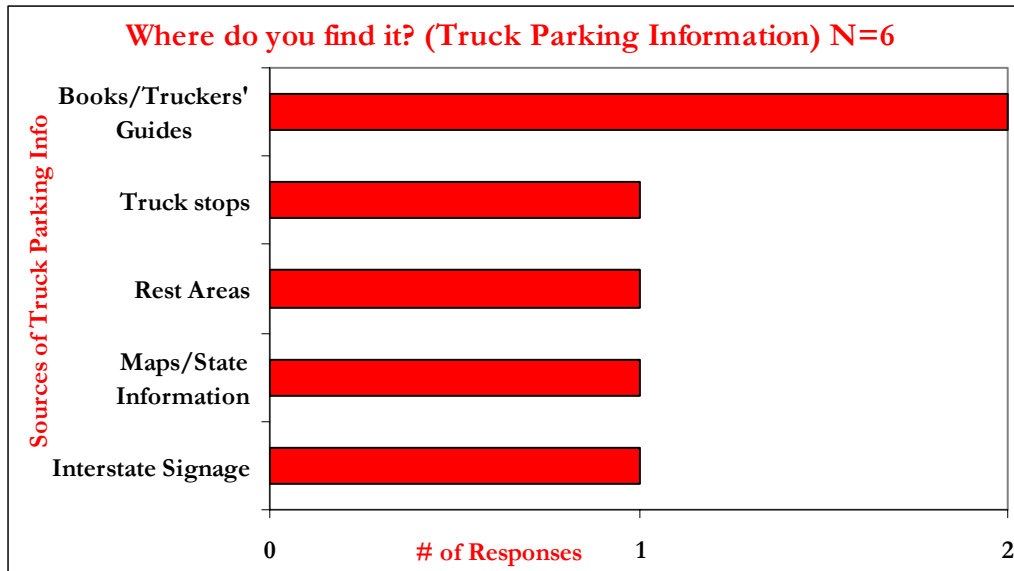
CVO Question 9: Do you operate as a single or team driver?

Type Driver	Responses
Team Driver	2
Single Driver	17
Total	**19**

Do you operate as a single driver or a team driver? N=19

Pie chart:
- Single Driver, 17
- Team Driver, 2
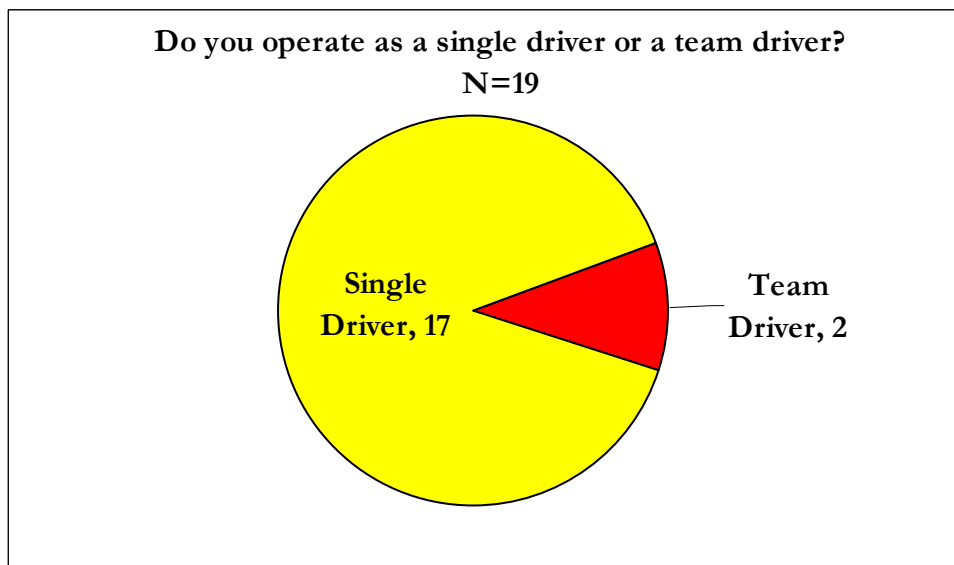
Access/Awareness Questions

(There were five Access/Awareness questions)

Access/Awareness Question 1: Do you currently have a cell phone?

Yes *(Continue)*

No *(Continue)*

Don't Know/Refused *(Continue)*

Response	Responses	Percentage of Total
Yes	383	96%
No	17	4%
Total	**400**	**100%**

Do you currently have a cell phone?

N=400

Yes 96%

No 4%
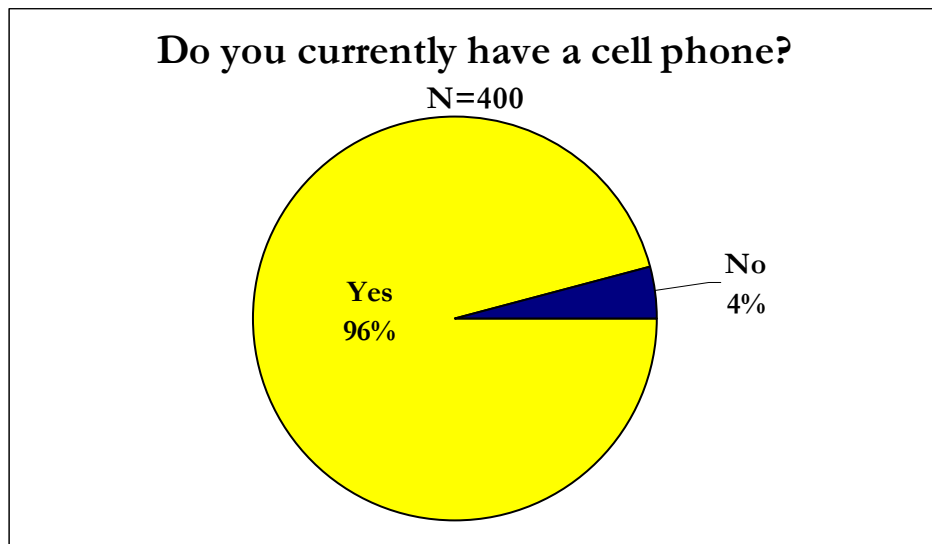
Access/Awareness Question 2: Do you typically use a phone to get information?

(*If they need clarification, examples are*: movie schedules, directory assistance, etc.)

Response	Responses	Percentage of Total
Yes	308	77%
No	92	23%
Total	**400**	**100%**
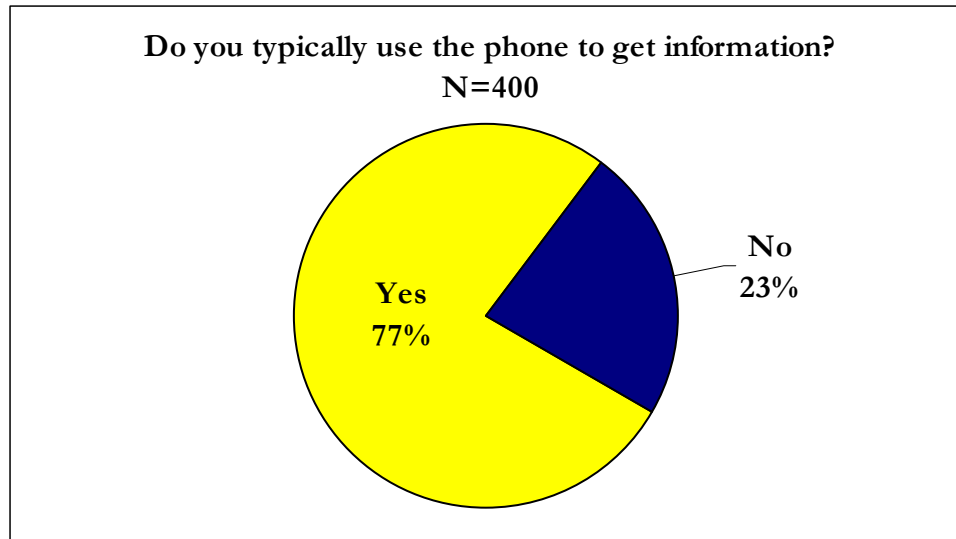
Do you typically use the phone to get information?
N=400

Yes
77%

No
23%

Access/Awareness Question 3: Where did you hear about 511 Virginia?

Source for 511 Virginia	Responses	Percentage of Total
VDOT Website	2	0%
Don't Know/Refused	11	3%
Newspaper	13	3%
Radio	28	7%
Friends/Co-Workers	53	13%
Other	73	18%
Road Signs	233	56%
Total	**413**	**100%**

Source for 511 Virginia -Other	Responses
Advertisement at a rest area	1
ASHTO	1
Bus Tour (local tourist)	1
State road map	1
Tourist agency	1
AAA magazine	2
Brochure in cell phone mailing	3
Brochure at hotel	3

Source for 511 Virginia -Other	Responses
Gas Pump	4
Information meeting	4
VMS	6
Internet	9
Rack card	9
Other	13
TV	15
Total	**73**

For graph- Source for 511 Virginia	Responses
VMS	6
Internet	9
Rack Card	9
Don't Know/Refused	11
Newspaper	13
TV	15
Radio	28
Friends/Co-Workers	53
Road Signs	233
Total	**377**

Where did you first hear about 511 Virginia? (N=377)

Y-axis: # of Responses

X-axis (1st Source): VMS = 6, Internet = 9, Rack Card = 9, Don't Know/Refused = 11, Newspaper = 13, TV = 15, Radio = 28, Friends/Co-Workers = 53, Road Signs = 233
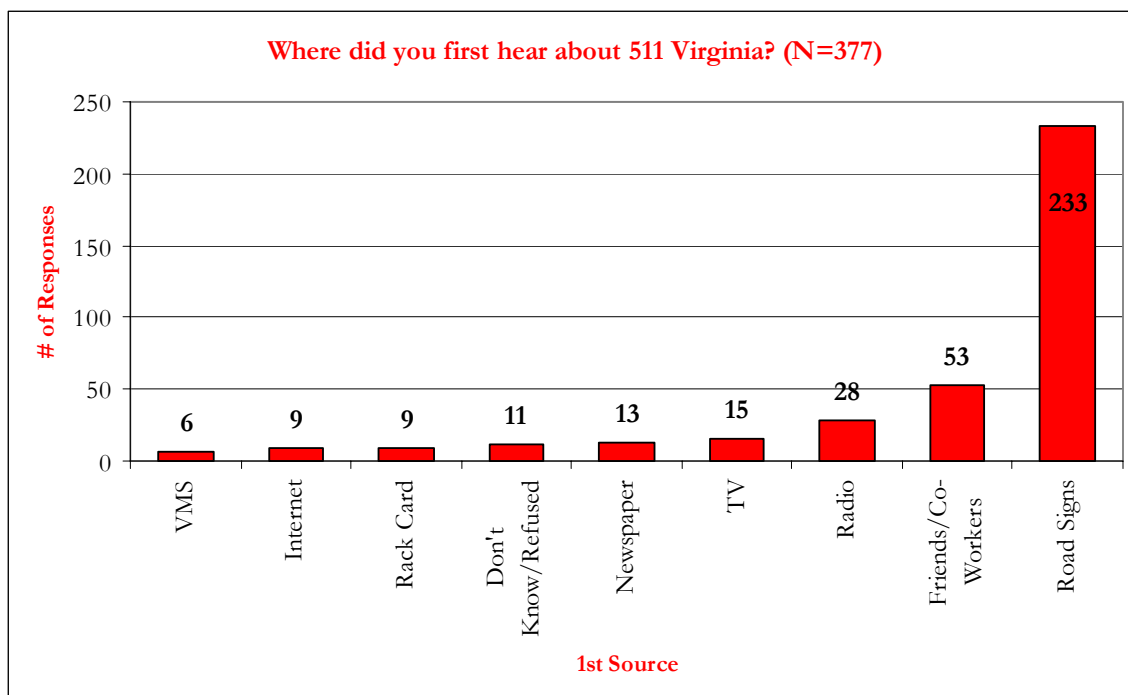
Access/Awareness Question 4: Why did you first call 511 Virginia?

Reason for 1st Call	Responses	Percentage of Total
Directions (Maps/Routes)	8	1%
Other	104	26%
Info on gas, food, lodging, rest stop	13	3%
Construction	18	5%
Road Conditions (fog, ice, flooding)	20	5%
Accidents	45	11%
Weather	54	14%
Traffic (congestion/delays)	138	35%
Total	**400**	**100%**

Reason for 1st Call- Other Category	Responses
Towing/Info for motorist assistance	2
VMS sign directed to 511	4
Can't remember	5

Reason for 1st Call- Other Category	Responses
Other	6
Curiosity; boredom, general interest	87
Total	**104**

For graph- Reason for 1st Call	Responses
Directions (Maps/Routes)	8
Info on gas, food, lodging, rest stop	13
Construction	18
Road Conditions (fog, ice, flooding)	20
Accidents	45
Weather	54
Curiosity; boredom, general interest	87
Traffic (congestion/delays)	138
Total	**383**

Why did you first call 511 Virginia? (N=383)
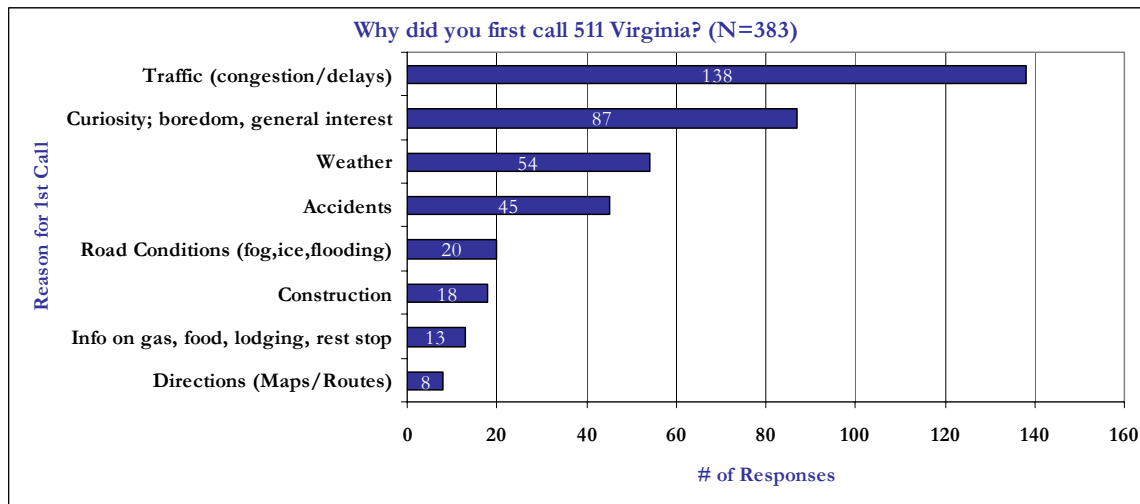
Access/Awareness Question 5: How did you first access 511 Virginia?

Access Method	Responses
Land Line (1-800 Number)	13
Land Line (511)	18
Cell Phone (1-800 Number)	9
Cell Phone (511)	352

Access Method	Responses
Web	6
Don't Know/Refused	2
Total	**400**

How did you first access 511 Virginia?
N=398
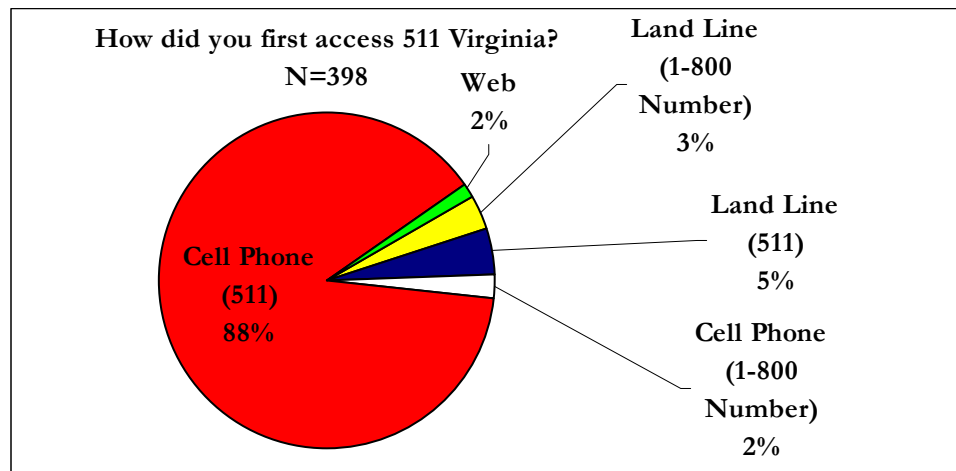
Needs/Usage Questions

(There were twelve Needs/Usage questions)

Needs & Usage Question 1: How safe do you feel on the roads in the I-81 Region?

Perception of Safety	Responses/ Percentage of Total	Applied Value	Results
Very Safe	107/ 26%	2	214
Somewhat Safe	148/ 36%	1	148
Neutral	50/ 13%	0	0
Somewhat Not Safe	65/ 16%	-1	-65
Not Safe at All	30/ 8%	-2	-60
Total	**400**		

Scale Ranges		**Mean = Somewhat Safe**	**0.6**
-2 to -1	Not Safe at All		
-1 to 0	Somewhat Not Safe		
0	Neutral		
0 to 1	Somewhat Safe		
1 to 2	Very Safe		
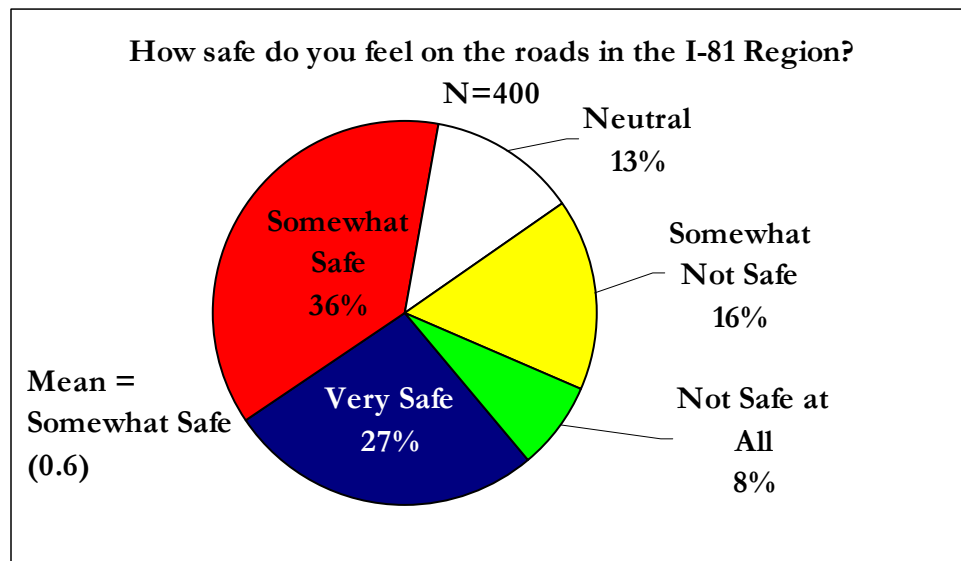
How safe do you feel on the roads in the I-81 Region?
N=400

Neutral 13%
Somewhat Safe 36%
Somewhat Not Safe 16%
Very Safe 27%
Not Safe at All 8%
Mean = Somewhat Safe (0.6)

Needs/Usage Question 2: Has having access to 511 Virginia changed your perception of the safety of the roads in the I-81 region?

Yes

 No *(Skip to Q4)*

 Don't Know/Refused *(Skip to Q4)*

Response	Responses	Percentage of Total
Don't Know/Refused	14	4%
Yes	169	42%
No	217	54%
Total	**400**	**100%**

Needs/Usage Question 3: Was that change positive or negative?

Change in VDOT Perception	Responses	Percentage of Total
Negative	2	0%
Positive	167	42%
Don't Know/Refused	231	58%
Total	**400**	**100%**

For graph - Change & Type	Responses	Percentage of Total
Yes, Negative change	2	1%
Don't Know	14	4%
Yes, Positive change	167	42%
No	217	54%
Total	**400**	**100%**
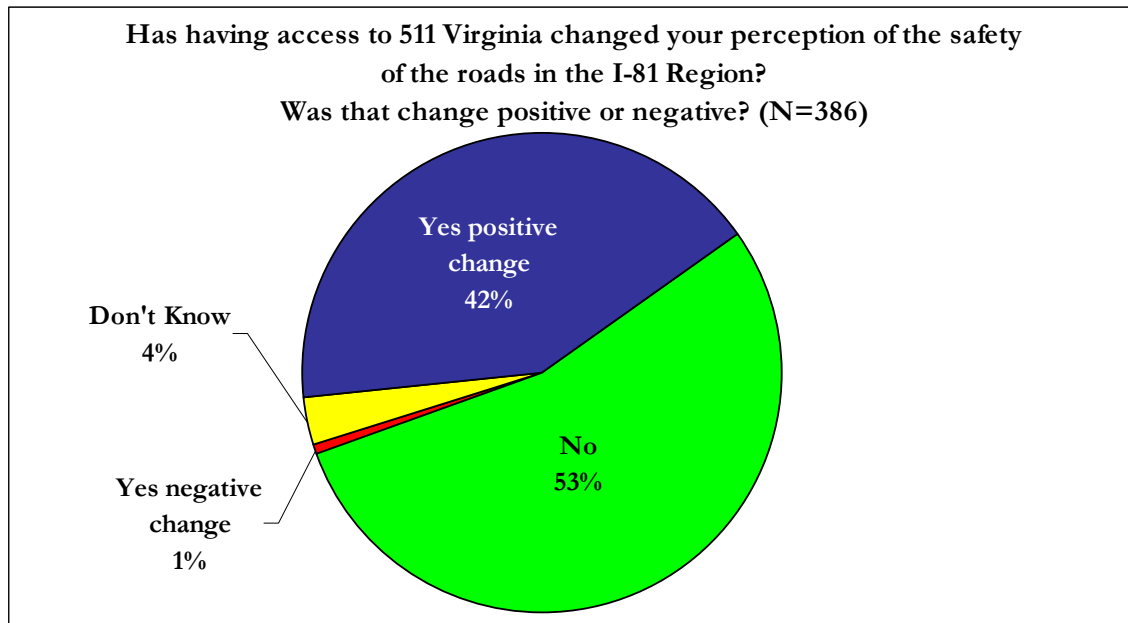
Has having access to 511 Virginia changed your perception of the safety of the roads in the I-81 Region?

Was that change positive or negative? (N=386)

Needs/Usage Question 4: Has 511 Virginia increased your awareness of traveler information in the I-81 Region?

Awareness Change	Responses	Percentage of Total
Don't Know/Refused	7	1%
No	19	5%
Yes	374	94%
Total	**400**	**100%**
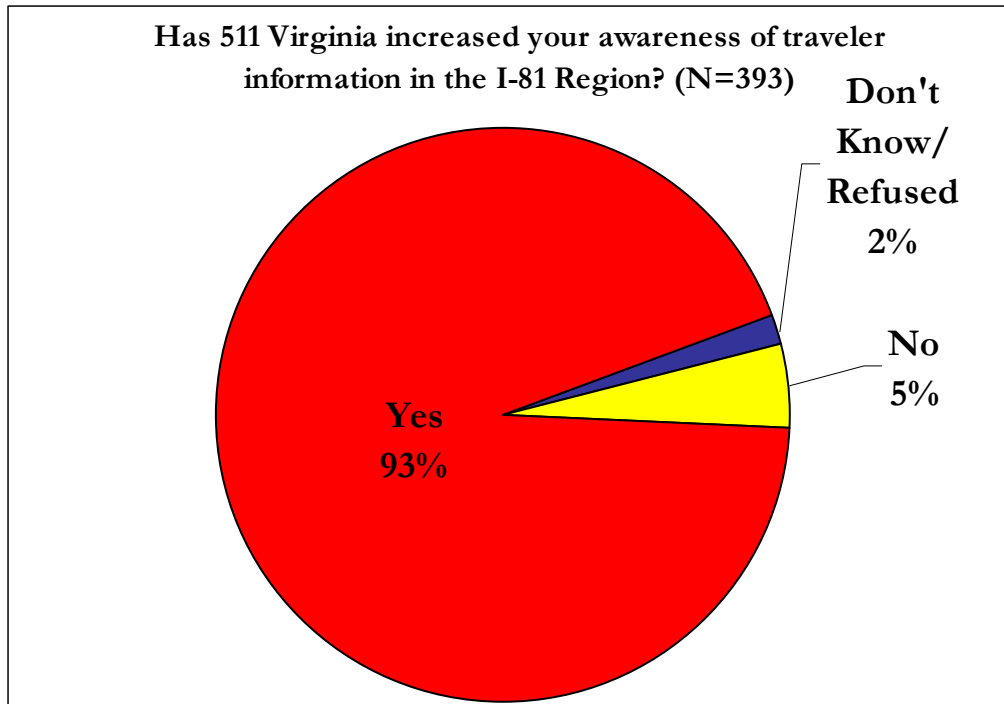
Has 511 Virginia increased your awareness of traveler information in the I-81 Region? (N=393)

Yes 93%

Don't Know/ Refused 2%

No 5%

Needs/Usage Question 5: What information do you look for *before* you leave to travel in the I-81 region? (*Multiple Answers Allowed*)

Travel Info Source - Before Leaving	Responses	Percentage of Total
Travel Time/Distance	10	1%
Directions (maps, routes)	26	4%
None	32	4%
Road Conditions (fog, ice, flooding)	51	7%
Other	64	9%
Construction	109	15%
Accidents	117	16%
Traffic	124	17%
Weather	179	25%
Total	**712**	**100%**

Travel Info – Before: Other Category	Responses
Police	1
Inconveniences	1
Scheduling	1

Good deals	1
General info	1
Size of road,	1
Traveling situations	1
GPS from laptop to check construction etc.	1
Anything unexpected	1
How may trucks will be on the road	1
Road problems	1
Gas level	2
Time of day	2
Road closures	3
Events, holidays	3
Detours	5
Attractions, Things to do	8
Delays	9
Info on gas, food, lodging, rest stop	21
Total	**64**

For Graph: Info Sought - Before	Responses	Percentage of Total
Attractions, Things to do	8	1%
Delays	9	1%
Travel Time/Distance	10	1%
Info on gas, food, lodging, rest stop	21	3%
Directions (maps, routes)	26	4%
Other	26	4%
None	32	4%
Road Conditions (fog, ice, flooding)	51	7%
Construction	109	15%
Accidents	117	16%
Traffic	124	17%
Weather	179	25%
Total	**712**	**100%**

What information do you look for *before* you leave to travel in the I-81 Region? (N=400)

Type of Information Sought Before Leaving	# of Responses
Attractions, things to do	8
Delays	9
Travel Time/Distance	10
Info on gas, food, lodging, rest stop	21
Directions (maps, routes)	26
Other	26
None	32
Road Conditions (fog, ice,	51
Construction	109
Accidents	117
Traffic	124
Weather	179

Needs/Usage Question 6: What sources do you use to plan for a trip to this region?

(Multiple Answers Allowed)

Trip Planning Sources	Responses	Percentage of Total
Exit Source Books	1	0%
Local/State Travel Guide	2	0%
Fleet Office/Dispatch	3	0%
Destination Company	3	1%
Own Experience	7	1%
Other Truckers/Travelers	7	1%
Friends/Relatives	12	2%
AAA/AARP	19	3%
Rand McNally/Atlas/Maps	22	4%
None	37	6%
Radio	56	9%
Other	61	10%
TV	68	11%

Trip Planning Sources	Responses	Percentage of Total
511 Virginia	144	23%
Internet	179	29%
Total	**621**	**100%**

Travel Planning Sources – Other Category	Responses
Blue Ridge Community College email	1
Cell phone info MSN gets delivered to phone	1
GPS from laptop to check construction etc.	1
Leaflet from company he works for, weather bands	1
Look to see	1
Member services through hotel chains	1
Navigation Unit in Car	1
Park Rangers	1
Shopping offered	1
Highway Patrol	2
Chamber of commerce	3
VDOT	3
Travel Info Number	5
Newspaper	8
Total	**30**

Internet Planning Source - Specified	Responses
freetrip.com	1
hotel web sites	1
superpages.com	1
switchboard.com	1
Yahoo Travel	1
expedia.com	2
VDOT web site	6
mapquest.com	10
weather.com/weather channel	22
Total	**45**

For Graph- Travel Planning Sources	Responses	Percentage of Total
Exit Source Books	1	0%
Local/State Travel Guide	2	0%
Fleet Office/Dispatch	3	0%
Destination Company	3	0%
Own Experience	7	1%
Other Truckers/Travelers	7	1%
Friends/Relatives	12	2%
AAA/AARP	19	3%
Rand McNally/Atlas/Maps	22	4%
None	37	6%
Radio	56	9%
Other	61	10%
TV	68	11%
511 Virginia	144	23%
Internet	179	29%
Total	**621**	**100%**

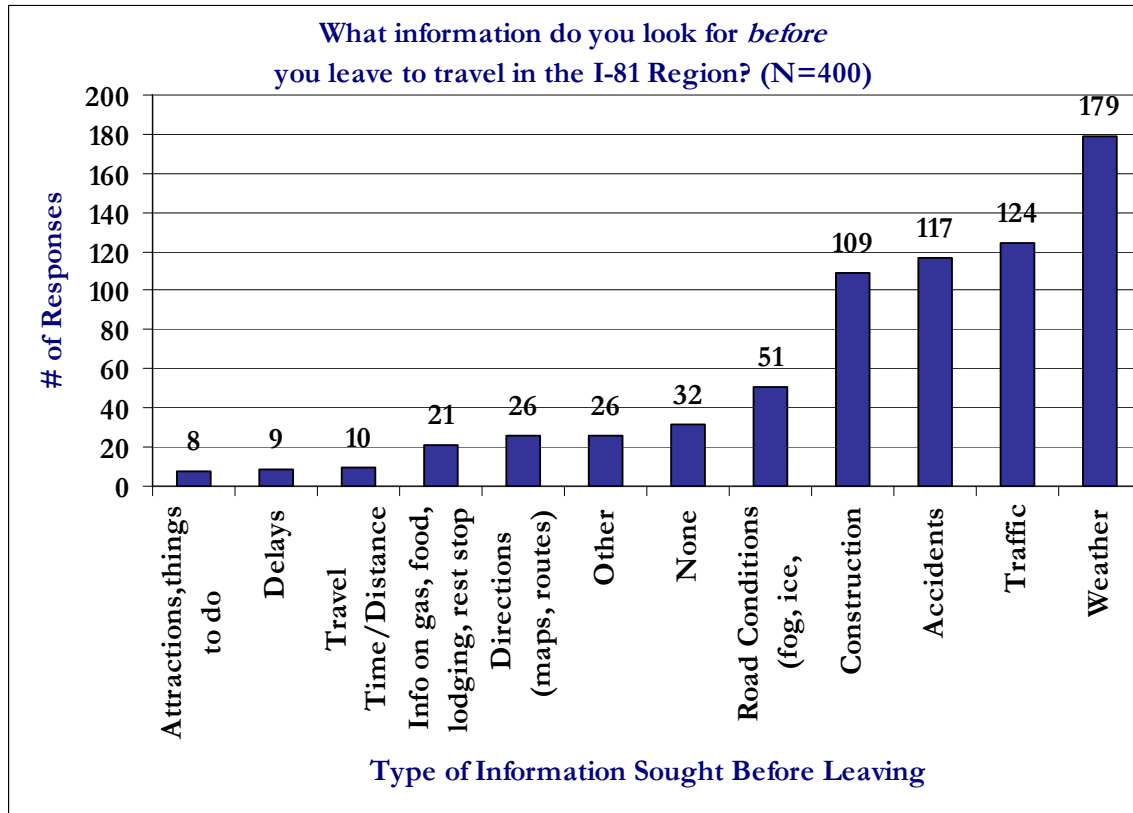What sources do you use *to plan* for a trip to this region? (N=400)

Needs/Usage Question 7: What information do you look for while traveling in the I-81 region? (*Multiple Answers Allowed*)

Travel Info- While Traveling	Responses	Percentage of Total
Don't Know/Refused	5	1%
Distances	8	1%
Info about Gas Stations	30	4%
Info about Gas Stations	30	4%
None	31	4%
Road Conditions (ice, flooding, fog)	48	6%
Info about Food (Where to Eat)	54	7%
Construction	91	12%
Accidents	143	18%
Other	161	21%
Traffic (Congestion, Delays)	184	23%
Total	**574**	**100%**

Travel Info-While Traveling: Other Category	Responses
Attractions for kids	1
Blacksburg Weather Station, portable CB	1
Change in roads	1
Emergency phone numbers	1
HAR - 1610am	1
Road hazards	1
Info about gas Stations	1
flashing lights	1
emergency warning	1
Automotive shops	1
Police activity	1
Terrorist Info	1
Road/lane closures	2
Exits/Mile Markers	3
Info about Food (Where to eat)	3
News	3

Travel Info-While Traveling: Other Category	Responses
Shopping	4
Directions	6
Detours	8
Rest Stops/Welcome Centers	8
Informational Signage	9
Lodging	11
Traffic (Congestion, Delays)	15
Info about Attractions	18
Weather	78
Total	**180**

For Graph: Travel Info While Traveling	Responses	Percentage of Total
Info about Gas Stations	31	4%
None	31	4%
Road Conditions (ice, flooding, fog)	52	6%
Info about Food (Where to Eat)	57	7%
Weather	78	9%
Construction	91	11%
Accidents	143	17%
Other	161	19%
Traffic (Congestion, Delays)	199	24%
Total	**843**	**100%**
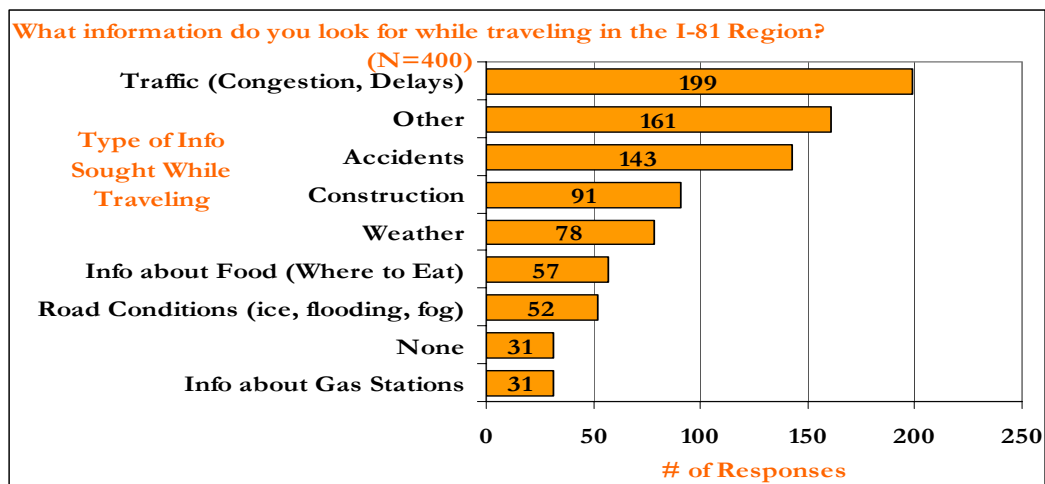
What information do you look for while traveling in the I-81 Region? (N=400)

Needs/Usage Question 8: What information were you looking for when you called 511 and left your name for this survey? (*Do not read. Circle responses on the list below; write in unlisted responses.*)

Travel Info- Survey Call	Responses	Percentage of Total
None	5	0%
Don't Know/Refused	6	1%
Trip Routing	3	1%
Services	8	1%
Road Conditions	30	5%
Other	67	12%
Construction	75	13%
Weather	90	16%
Accidents	120	21%
Traffic	170	30%
Total	**574**	**100%**

Travel Info- Survey Call: Other Category	Responses
Report speeding vehicles	1
Road closures	1
Traffic	1
Truck activity	1
Bridge Closing	2
Motorist assistance	2
Weather	2
Tornado warnings	3
General information	4
Survey	5
Trip routing	6
Not specific - curiosity	12
Services	14
Delays/congestion/blockages	16
Total	**70**

For Graph: Travel Info- Survey Call	Responses	Percentage of Total
Not specific - curiosity	12	3%
Delays/congestion/blockages	16	3%
Services	22	4%
Other	22	4%
Road Conditions	30	6%
Construction	75	13%
Weather	92	16%
Accidents	120	21%
Traffic	171	30%
Total	**560**	**100%**
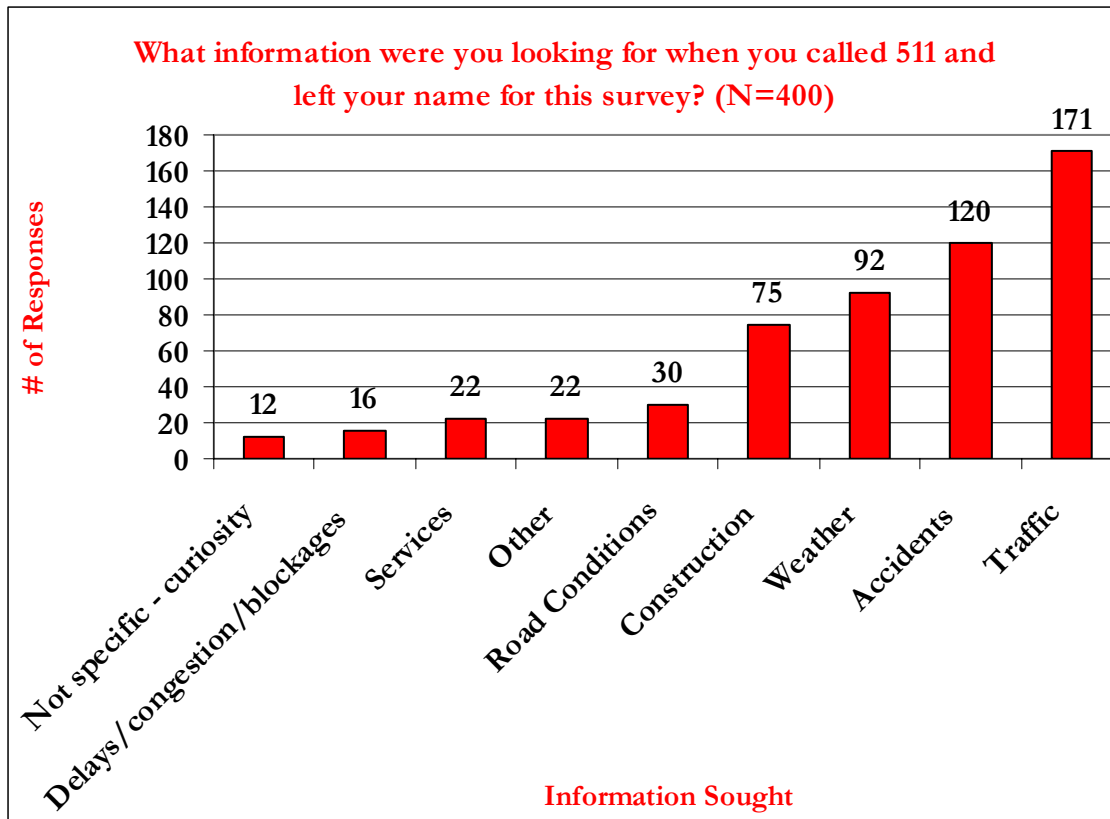
What information were you looking for when you called 511 and left your name for this survey? (N=400)

Needs/Usage Question 9: What information are you typically seeking when you call 511 Virginia? (*Do not read. Circle responses on the list below; write in unlisted responses*).

Travel Info- Typically Sought	Responses	Percentage of Total
Don't Know/Refused	2	0%

Travel Info- Typically Sought	Responses	Percentage of Total
Trip Routing	3	0%
None	5	1%
Services	11	2%
Other	46	6%
Road Conditions	50	7%
Weather	103	14%
Construction	114	16%
Accidents	166	23%
Traffic	222	31%
Total	**722**	**100%**

Travel Info- Typically Sought: Other Category	Responses
Report Incident	1
Traffic	1
Blockages	2
Boredom, Curiosity	2
Bridge Closing	2
General Road Information	2
Road Closures	2
Backups	2
Alternate Route	3
Trip Routing	3
First Call	4
Delays	12
Services	14
Total	**50**

Needs & Usage Question 10: How useful is the information you find?

If a variation of useful, continue.

If any other response, skip to Q12.

Usefulness	Responses	Applied Value	Results
Very Useful	263	2	526
Somewhat Useful	95	1	95

Usefulness	Responses	Applied Value	Results
Neutral	15	0	0
Not Very Useful	10	-1	-10
Not Useful at All	12	-2	-24
Don't Know/Refused	5		
Total	400		587
		Mean: Very Useful	1.5

Scale Ranges

-2 to -1	**Not Useful at All**
-1 to 0	**Not Very Useful**
0	**Neutral**
0 to 1	**Somewhat Useful**
1 to 2	**Very Useful**

How useful is the information you find?
N=395

Somewhat Useful 24%
Very Useful 66%
Neutral 4%
Not Very Useful 3%
Not Useful at All 3%

Mean:
Very Useful
(1.5 on a scale from -2 to 2)
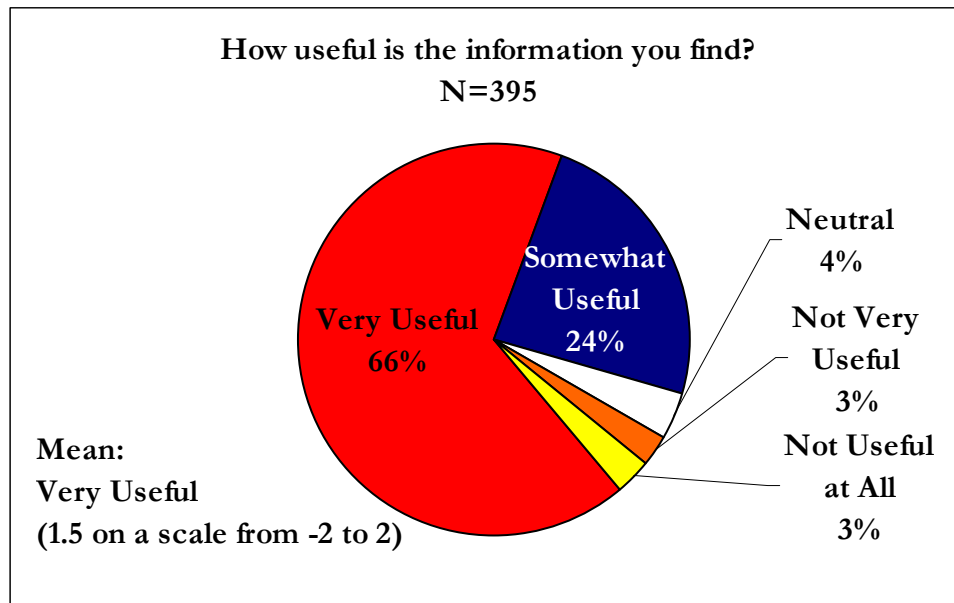
Needs/Usage Question 11: What makes it useful? (*Write in the response, no limit*).

(*Don't Read*) Don't Know/Refused

(Responses consolidated into categories by authors).

Usefulness Category	Responses
Helps make informed travel decisions	140
Useful Information	50
Info on Construction, Alt. Routes, Road Closures	49

276

Usefulness Category	Responses
Easy and Convenient to Use	44
Increases Awareness	44
Other	44
Info on Traffic and Delays	34
Info on Weather	33
Info on Accidents	28
Location Specific Info	22
Voice Response	22
Total	**510**
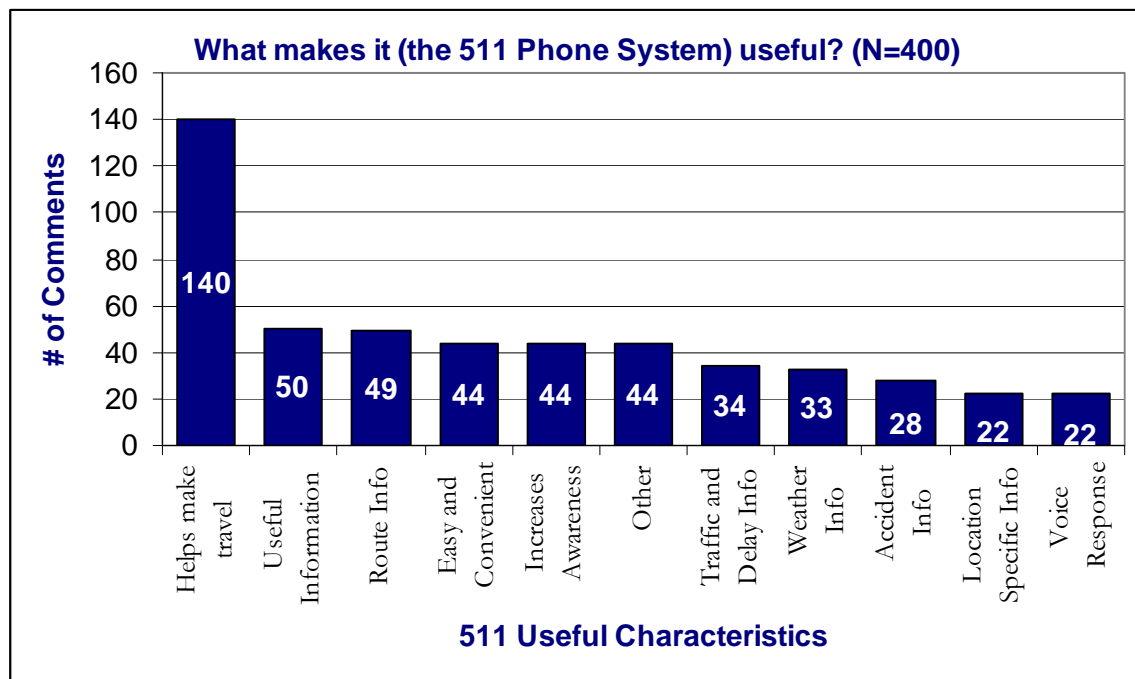
Usefulness Category: Other	Responses
Saves Time	20
Information on Road Conditions	16
Don't Know/Refused	12
Information on Services (e.g., Gas, Hotels, Restaurant)	11
Quality Information (Breadth, Concise, etc.)	10
Peace of Mind	9
Connecting to Businesses and Services	6
Safe (hands-free)	6

Usefulness Category: Other	Responses
Ability to alert others about being late	4
Miscellaneous	4
Coverage Area	3
Information on Tourism and Attractions	3
Free Service and Saves money	2
Time Stamp	2
Information on Travel Advisories	1
Total	**109**
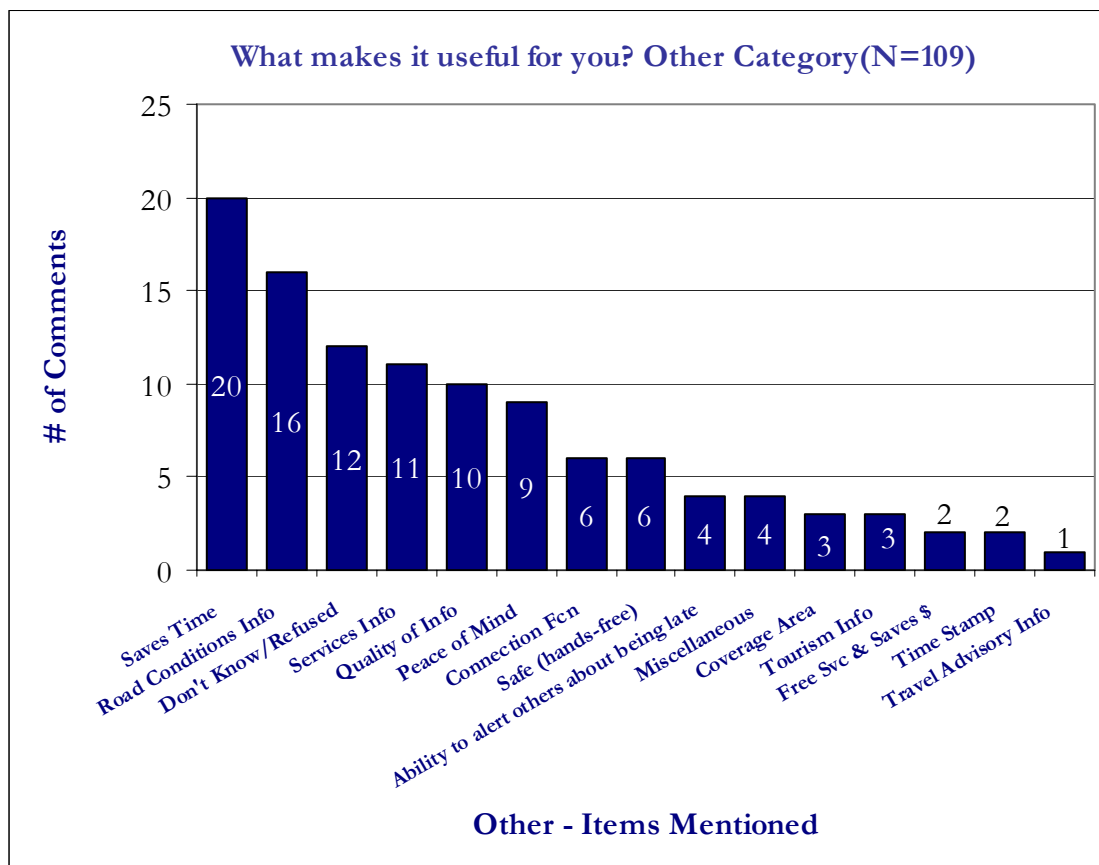
Needs/Usage Question 12: What could be more useful? (*Write in the response, no limit*).

(*Don't Read*) Don't Know/Refused

(Responses consolidated into categories by authors).

Suggestions - For graph	Responses	Percentage of Total
Provide more information about delays	11	2%

Suggestions - For graph	Responses	Percentage of Total
Improve quality of traffic information	12	2%
Improve accident information	13	3%
Improve availability	14	3%
Improve weather information	14	3%
Provide information by mile marker	14	3%
Improve information quality	16	3%
Improve services information	18	4%
Expand coverage area	20	4%
Provide detour information	20	4%
Provide better construction information	21	4%
Voice recognition not working	21	4%
Information not current	39	8%
Difficult to navigate system	50	10%
Other	50	10%
Don't Know/Refused	75	15%
Nothing	97	19%
Total	**505**	**100%**
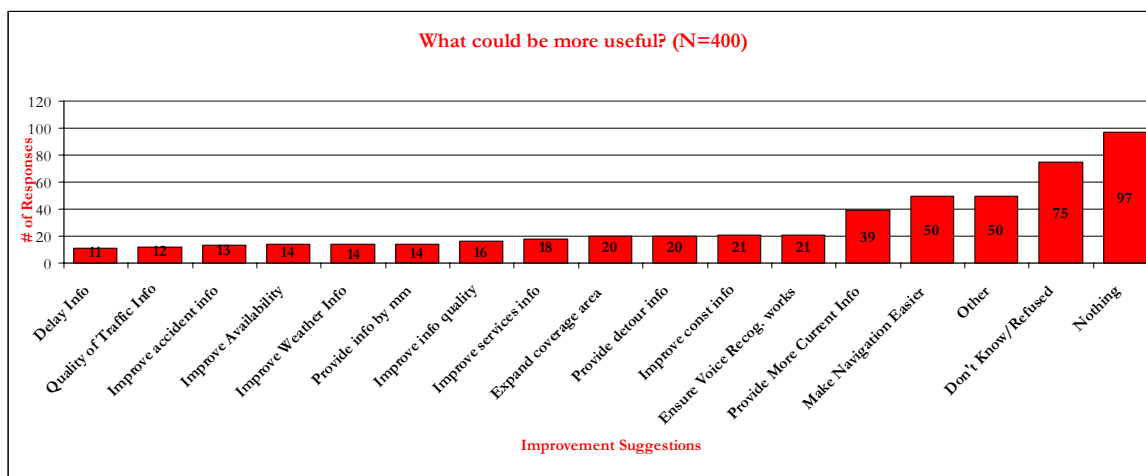
Suggestions -Other	Responses
More cameras	1
Provide information on road safety	1
Improve road condition information	2
Provide information on location of user	3

Suggestions -Other	Responses
Provide State Police information	3
Provide way for user to report	4
Provide directions	6
Misc./Not related to 511	7
More awareness marketing	7
Provide information on start and length of backup	7
Group information differently	9
Total	**50**
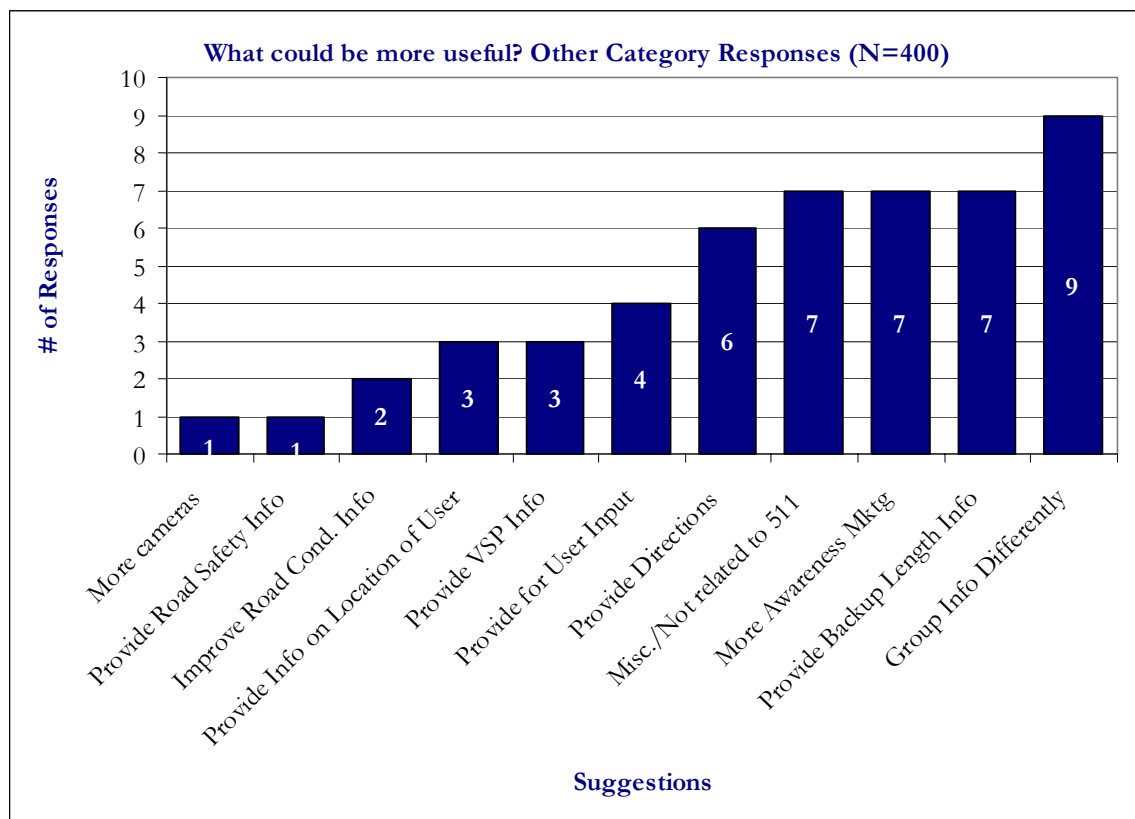
Decision Making Questions

(There were three decision making questions).

Decision Making Question 1: Have you ever heard anything on 511 that caused you to change your travel plans?

Yes *(Continue)*

No *(Skip to Q3)*

Don't Know/Refused *(Skip to Q3)*

Changed Travel Plans	Responses	Percentage of Total
Don't know/Refused	4	0%
Yes	194	49%
No	202	51%
Total	**400**	**100%**

Have you ever heard anything on 511 Virginia that caused you to change your travel plans? (N=400)
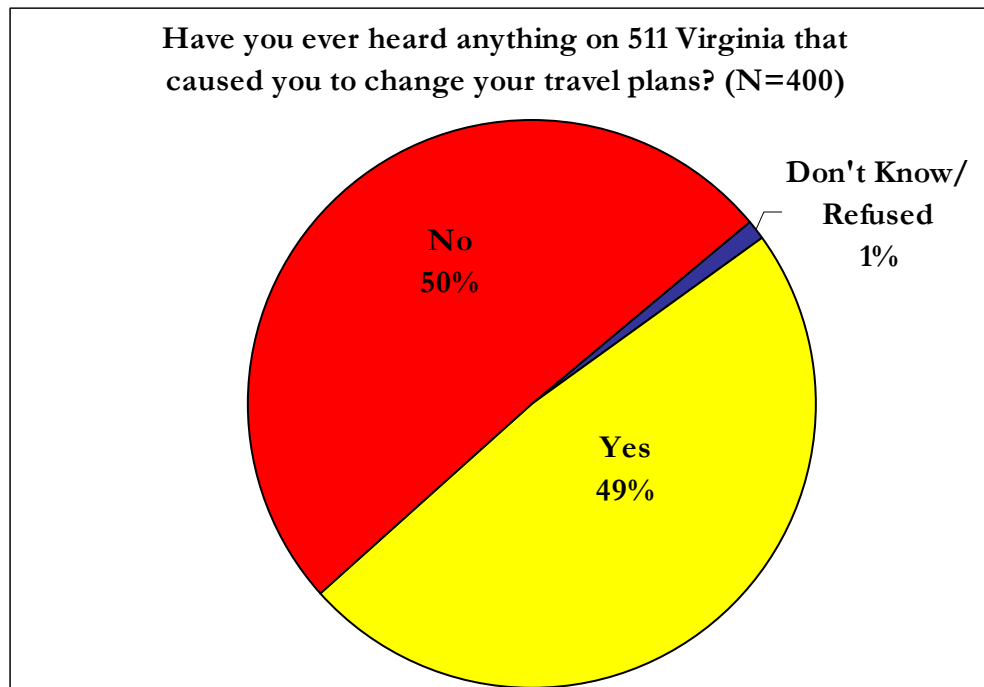
Decision Making Question 2: How did you change your plans?

Changed Plans	Responses	Percentage of Total
Slow Down/Change Speed	1	0%
Other	3	1%
Stop Along the Way and Wait	5	2%
Don't Know/Refused	6	3%
Changed Time (arrive, depart)	13	6%
Cancel/Reschedule Trip	18	8%
Change Route	166	78%
Total	**212**	**100%**

Changed Plans: Other Category	Responses
Modified Trip	3
Total	**3**

Changed Plans: For graph	Responses	Percentage of Total
Slow Down/Change Speed	1	0%
Modified Trip	3	1%
Stop Along the Way and Wait	5	2%
Don't Know/Refused	6	3%
Changed Time (arrive, depart)	13	6%
Cancel/Reschedule Trip	18	8%
Change Route	166	78%
Total	**212**	**100%**

How did you change your plans?
N=212

Change in Plans	# of Responses
Slow Down/Change Speed	1
Modified Trip	3
Stop Along the Way and Wait	5
Don't Know/Refused	6
Changed Time (arrive, depart)	13
Cancel/Reschedule Trip	18
Change Route	166

Decision Making Question 3: Would you call 511 Virginia again?

Responses	Responses	Percentage of Total
Yes	397	99%
No	2	1%
Don't Know/Refused	1	0%
Total	**400**	**100%**

Would you call 511 Virginia again?
N=399

Yes
99%

No
1%
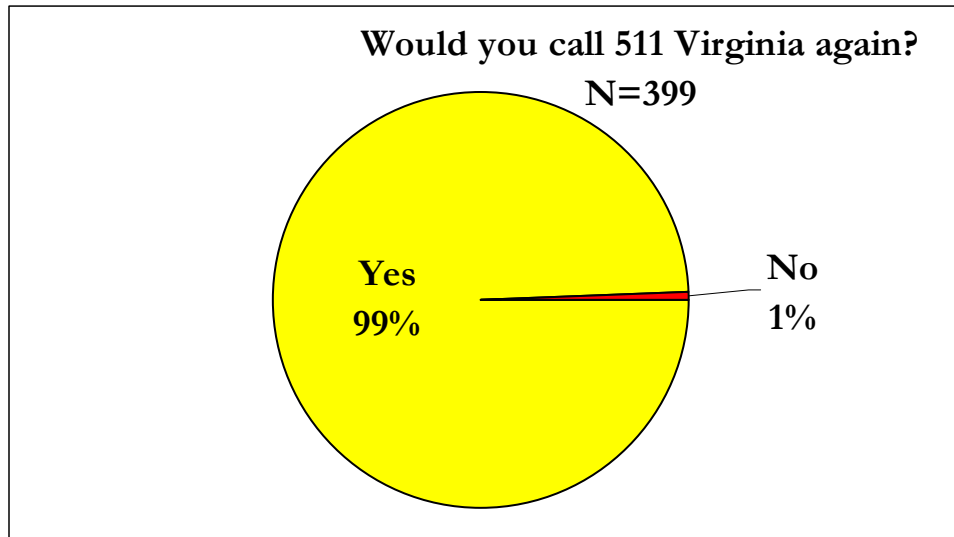
Who Should Run 511 Questions

(There were four "Who Should Run 511 Virginia?" questions)

Read the following statements about the 511 system.

Next we'd like to ask about who you think should be responsible for 511. Here's a full description of the service:

511 Virginia is a traveler information system for the I-81 region. It is available on the web at 511Virginia.org and via the phone at 511 or a 1-800 number. The system obtains up-to-date traffic incidents and construction information directly from the Virginia State Police and Virginia Department of Transportation. It is available 24 hours a day, 365 days a year. There is also a private partner, Shentel, Inc., which provides trip routing and various tourist services for in the I-81 Region.

Who Should Run 511? Question 1: As you probably know, there are any number of sources that can gather and offer to you information on Virginia roads. In your opinion, who should be responsible for providing this service? *(Multiple Answers Allowed)*

Virginia State Police

Virginia Department of Transportation

 Private Industry

 All

 Don't Know/Refused

Agency Which Should Run 511	Responses	Percentage of Total
All of the Above	213	53%
Virginia Department of Transportation (VDOT)	76	19%
Government (VDOT & VSP)	57	14%
Virginia State Police (VSP)	21	5%
Private Industry	14	4%
Don't Know/Refused	10	3%
Private Industry & VDOT	8	2%
Private Industry & VSP	1	0%
Total	**400**	**100%**

Raw Data Code Key

All of the Above	5
Government (VDOT & VSP)	4.5
VDOT Only	4
VSP Only	3.5
Private Only	3
VDOT & Private	2
VSP & Private	1
Don't Know/Refused	0

As you probably know, there are any number of sources that can gather and offer to you infomration on Virginia roads. In your opinion, who shuld be responsible for providing this service? (N=390)
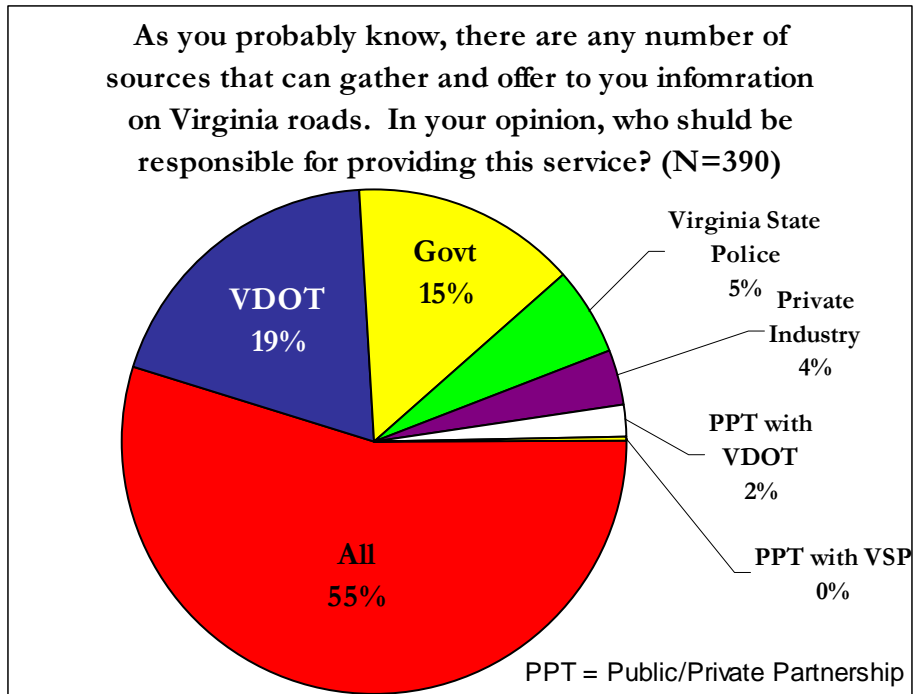
Who Should Run 511? Question 2: And, in your opinion, which do you think would provide travel information that is more reliable? *(Multiple Answers Allowed)*

Virginia State Police

Virginia Department of Transportation

Private Industry

They are all reliable; no one is more reliable than the other

Don't Know/Refused

Most Reliable Travel Information	Responses	Percentage of Total
Private & VDOT	2	1%
Private & VSP	3	1%
Private Industry Only	11	3%
Don't Know/Refused	15	4%
VDOT Only	63	16%
Government (VDOT & VSP)	84	21%
All of the Above	104	26%
VSP Only	118	30%
Total	**400**	**100%**
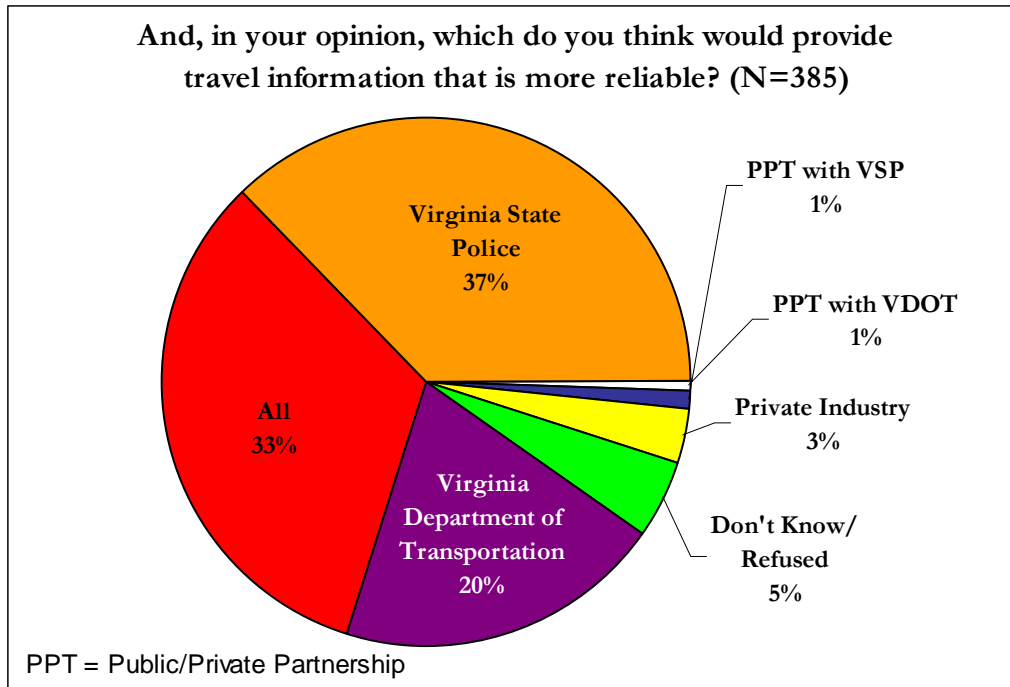
And, in your opinion, which do you think would provide travel information that is more reliable? (N=385)

Virginia State Police 37%

PPT with VSP 1%

PPT with VDOT 1%

Private Industry 3%

Don't Know/ Refused 5%

All 33%

Virginia Department of Transportation 20%

PPT = Public/Private Partnership

Who Should Run 511 Questions 3 & 4: Has access to 511 Virginia changed your perception of the services provided by the Virginia Department of Transportation? Has this change been positive or negative?

Reponses and Positive/Negative	Responses	Percentage of Total
Don't Know/Refused	17	4%
No	102	26%
Yes/Negative	1	0%
Yes/Positive	280	70%
Total	**400**	**100%**

Has access to 511 Virginia changed your perception of the services provided by VDOT? Has this change been positive or negative? (N=383)

No
27%

Yes/
Negative
0%

Yes/Postive
73%
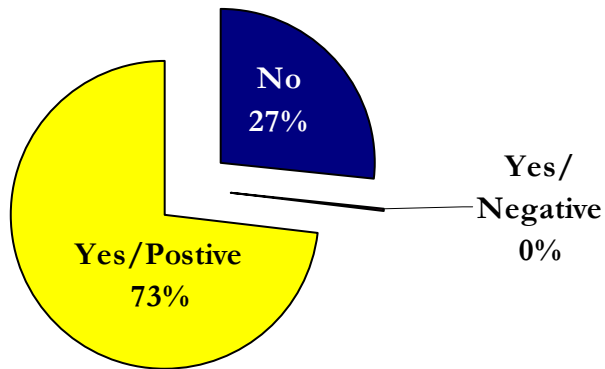
Payment Information

(Read the following statements, and enter appropriate information).

Thankyou for your participation. As promised, we will send you a $10.00 check in the next month for participating in this survey. In order to do this, we will need to collect some information that will be destroyed once we have evidence that you have cashed the voucher.

First Name: _____

Middle Initial (if applicable): _____

Last Name: _____

Street
Address:_____

City:_____

State: _____ (two letter abbreviation)

Zipcode:_____

Thank-you again for participating! VDOT values your opinion.

(Print two copies).

511 Virginia Evaluation

January 2004

511 Virginia Cumulative Trend Statistics

Appendix 1-B

Figure 1: Travel Shenandoah/511 Virginia Call Volume Historical Trends 2001-2003

511 Phone System Total Calls

Stat	November	December	January	February	March	April	May	June	July	August	September	October
Monthly Calls (2003)	8863	23345	10082	24339	16025	10599	10284	12827	12941	14953		
Monthly Minutes	15744	43331	19649	56520	21195	25470	16878	21789	24511	19050		
Monthly Duration	1:49	1:43	1:47	2:15	1:18	2:24	1:38	1:42	1:54	1:12		
2002 Month Total	-	-	1409	6779	6337	5867	8577	6928	6998	8552	7075	7783
2001 Month Total	791	729	617	1006	859	825	547	604	557	673	592	606
2000 Month Total	507	708	-	-	-	-	-	-	-	-	-	25
Cumulative Calls	73828	97173	107255	131594	147619	158218	168502	181329	194270	209223	209223	209223
Cumulative Minutes	135993	179324	198973	255493	276688	302158	319036	340825	365336	384386	384386	384386
Cumulative Duration	1:52	1:50	1:50	1:55	1:55	1:50	1:54	1:53	1:55	1:32		
Cumulative % calls to 511	91%	90%	90%	89%	89%	92%	91%	91%	92%	88%		

*Started using Year To Date for Cumulative Duration & % Calls to 511

*Used Admin Data because Tellme N/A

Figure 2: 511 VA Port Usage by Month

**511 VA Port Usage
August 2002-August 2003**

Month & Year	Aug-02	Sep-02	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03
Maximum # of Ports in Use	18	23	9	13	45	28	28	31	11	12	10	13	12
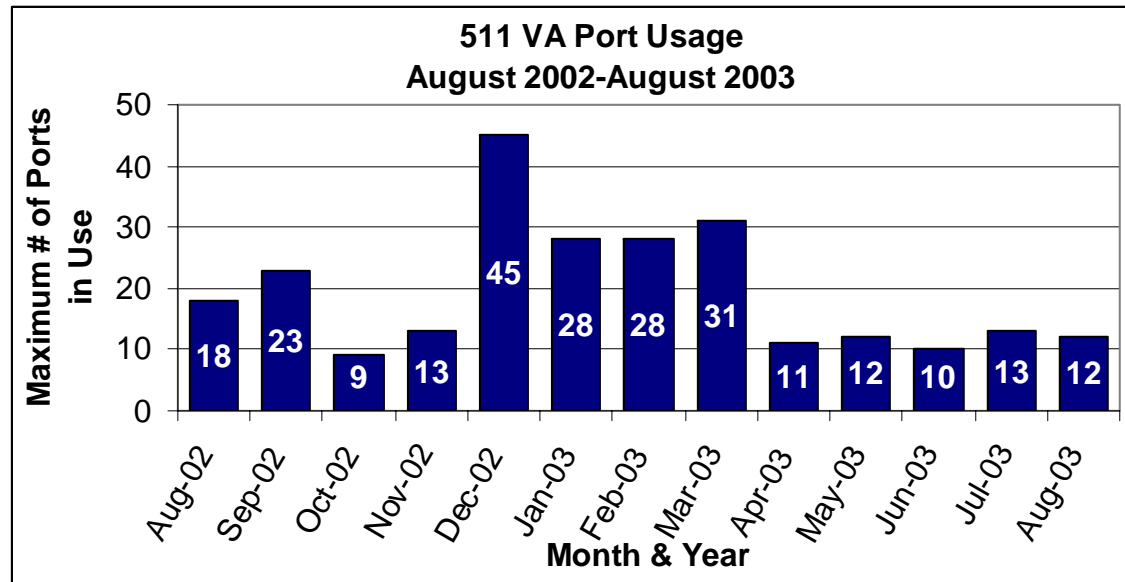
Table 2: Port Usage Statistics 511 Virginia

Port Usage	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-03	Average
1	3	10	5	3	45	3	3	4	5	9	4	4	6	8.0
2	7	23	3	4	5	6	3	4	4	4	4	6	5	6.0
3	4	3	3	5	5	7	4	4	3	4	4	4	11	4.7
4	5	3	4	3	28	4	3	4	4	3	4	5	8	6.0
5	3	4	3	4	19	28	3	4	3	4	7	5	4	7.0
6	5	3	4	4	7	8	8	6	8	5	4	8	4	5.7
7	4	3	4	4	3	3	7	6	5	5	5	4	5	4.5
8	5	4	3	5	5	4	4	4	3	4	4	4	6	4.2
9	18	3	5	2	8	3	3	7	5	12	6	6	7	6.5
10	4	3	4	6	3	3	5	4	5	8	5	5	4	4.5
11	5	3	7	4	12	4	3	5	5	5	6	4	5	5.2
12	3	5	4	5	3	3	4	3	5	4	7	6	4	4.3
13	5	4	7	3	17	3	4	5	6	5	6	6	6	5.9
14	4	4	5	3	4	5	8	4	4	4	4	6	5	4.6
15	3	5	5	3	3	4	21	3	4	10	5	5	7	6.0
16	4	4	6	5	3	8	19	13	11	5	5	4	7	7.2
17	4	10	4	4	4	4	28	3	7	4	4	3	6	6.5
18	5	3	8	4	6	4	13	3	11	10	4	4	3	6.0
19	3	2	4	3	5	7	6	4	4	3	5	6	6	4.5
20	3	3	5	6	3	4	5	7	5	6	9	13	6	5.8
21	3	5	9	7	7	4	6	4	5	4	4	5	9	5.5
22	3	5	3	4	3	4	7	4	4	5	5	4	6	4.4
23	3	3	7	4	3	7	6	4	5	6	7	4	4	4.8
24	13	3	7	3	8	4	4	4	5	4	10	6	12	6.4

Port Usage	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-03	Average
25	6	3	6	3	13	4	8	4	7	4	8	5	4	5.8
26	3	3	3	6	4	4	14	31	4	5	8	3	5	7.2
27	4	5	3	10	6	4	13	5	6	5	5	11	4	6.2
28	3	4	4	5	3	3	26	4	4	4	7	5	4	5.8
29	5	4	5	5	7	4		5	7	3	4	5	12	5.5
30	8	3	6	13	4	6		17	7	5	5	4	5	6.9
31	5	23	3		3	6		4		4	10	9	3	7.0
													Average	5.8
													Maximim	45

Figure 3: 511 Call Volumes Cumulative by Hour of the Day

Call Volumes by Hour of the Day
August 2002 - August 2003
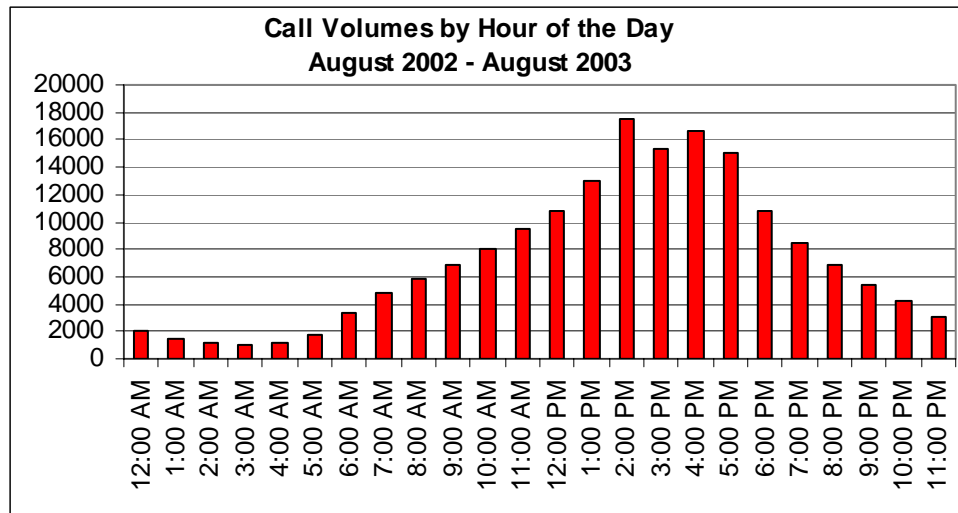
Table 3: 511 Call Volumes by Hour of Day August 2002 – August 2003

Start Time (EDT)	August 2002	September 2002	October 2002	November 2002	December 2002	January 2003	February 2003	March 2003	April 2003	May 2003	June 2003	July 2003	August 2003	4,633 Average
12:00 AM	68	63	39	79	187	105	252	145	145	209	244	180	209	**142**
1:00 AM	53	35	44	57	123	95	160	100	96	163	169	109	174	**102**
2:00 AM	40	22	34	48	108	56	174	94	41	131	120	103	123	**81**
3:00 AM	35	24	19	31	87	40	182	68	50	87	78	84	145	**70**
4:00 AM	29	20	34	15	185	77	262	68	60	115	79	91	172	**88**
5:00 AM	23	37	91	37	261	146	360	78	104	174	129	106	182	**126**
6:00 AM	90	67	219	113	402	237	672	127	153	483	241	175	315	**242**
7:00 AM	142	142	257	191	464	324	810	233	255	716	368	279	469	**341**
8:00 AM	196	197	389	270	500	315	982	364	305	726	411	404	555	**414**
9:00 AM	288	200	361	319	601	383	1063	493	332	843	426	546	723	**487**
10:00 AM	363	292	340	416	732	460	1115	667	414	991	566	567	819	**576**
11:00 AM	537	347	436	456	998	648	1290	710	477	1120	665	641	831	**681**
12:00 PM	554	624	570	626	1260	677	1516	623	515	1032	717	699	849	**764**
1:00 PM	593	600	592	798	1746	703	1746	1291	618	1249	954	759	902	**933**
2:00 PM	780	521	631	776	2078	727	1688	4633	800	1570	937	837	1037	**1256**
3:00 PM	827	602	683	714	2558	704	1805	784	863	1838	926	988	1365	**1091**
4:00 PM	776	640	707	694	2689	754	1764	1076	978	2015	1128	947	1747	**1182**
5:00	807	648	477	646	2143	696	1459	1071	1010	1699	1171	1031	1564	**1073**

Start Time (EDT)	August 2002	September 2002	October 2002	November 2002	December 2002	January 2003	February 2003	March 2003	April 2003	May 2003	June 2003	July 2003	August 2003	4,633 Average
PM														
6:00 PM	482	510	291	501	1585	498	1090	750	753	1138	865	889	1063	**775**
7:00 PM	388	317	283	378	1111	379	909	509	590	1017	706	760	859	**604**
8:00 PM	291	274	288	302	775	311	864	391	486	814	600	545	696	**489**
9:00 PM	252	188	178	254	493	257	666	321	401	685	520	424	610	**387**
10:00 PM	197	109	104	181	348	209	546	284	257	572	427	456	412	**301**
11:00 PM	134	97	64	148	241	115	375	195	183	412	380	270	305	**216**
Entire Period	7,945	6,576	9,133	10,052	23,677	10,919	23,753	15,075	9,886	21,802	14,830	13,893	16,126	**13,565**

	12 mo. Avg
	162,785

Figure 4: 511 Call Volumes Cumulative by Day of the Week

By Day of the Week August 2002 - August 2003

Day	Value
Monday	20,115
Tuesday	16,826
Wednesday	26,122
Thursday	21,203
Friday	29,148
Saturday	19,472
Sunday	31,558
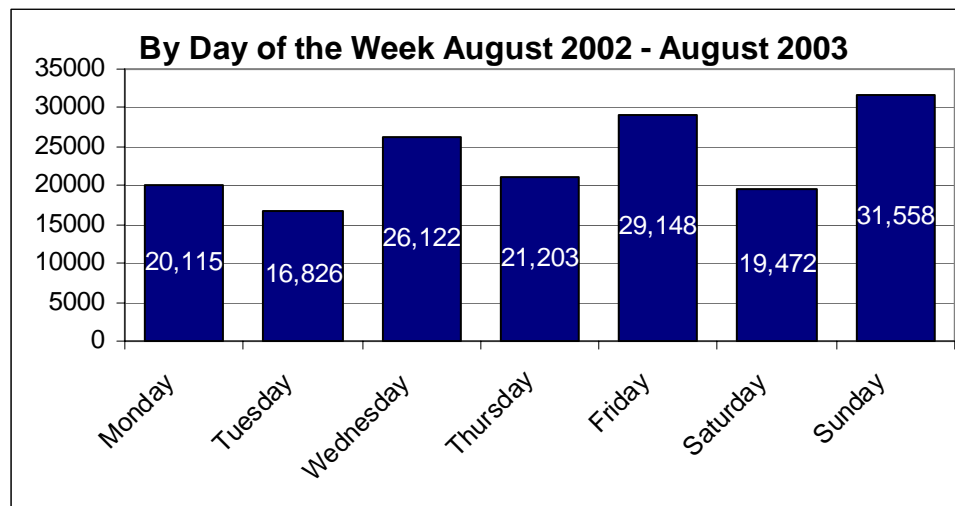
Table 4: 511 Cumulative Call Volumes by Day of the Week August 2002 – August 2003

Calls by Day of the Week	Aug-02	Sep-02	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Average
Monday	525	1968	970	534	977	895	4434	1151	1240	1114	1778	1778	1854	**1,417**
Tuesday	567	1004	864	968	1368	842	2038	934	1342	1170	2183	2475	1590	**1,282**
Wednesday	688	502	998	1990	4855	748	1993	5700	1477	1000	1977	1977	1708	**1,888**
Thursday	1134	659	844	923	1817	1880	2739	1729	1367	1727	1262	1656	2318	**1,507**
Friday	2326	694	1829	989	2937	1807	4643	1292	1922	2336	2106	2106	2989	**2,063**
Saturday	1661	545	736	1770	1038	520	2522	1311	1036	1700	1938	1514	2377	**1,396**
Sunday	1062	1204	890	876	8683	2224	3381	2958	1508	1237	1613	1613	3290	**2,280**

**Top 10 Roads Asked for In Construction
December 2002 - August 2003
I-81 = 7,316**

# of Visits

Road	# of Visits
I-77	548
I-64	383
I-581	310
VA8	268
US221	232
I-66	156
US460	86
US11	83
US19	27
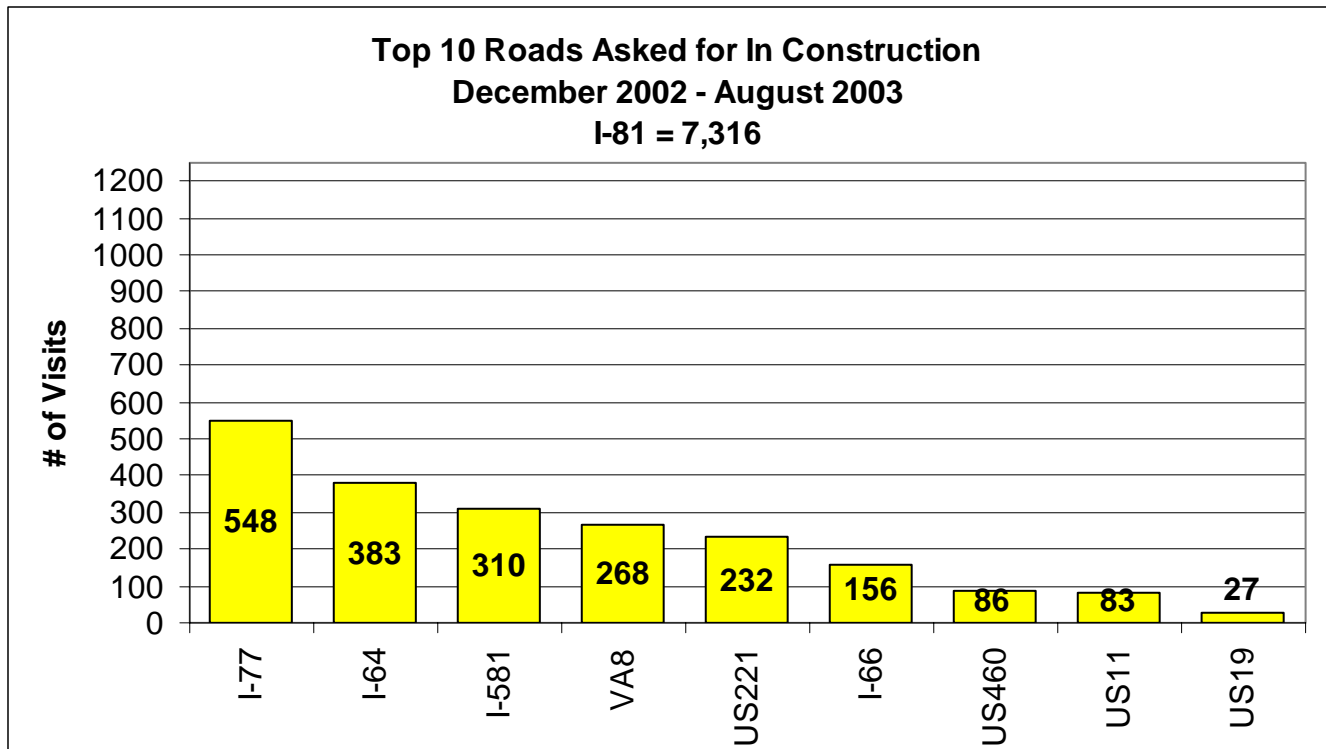
Table 5: Top Roads asked for in Construction

	Aug-03	Jul-03	Jun-03	May-03	Apr-03	Mar-03	Feb-03	Jan-03	Dec-02
I-81	1234	926	1401	812	1314	485	196	289	659
I-77	100	90	97	80	70	28	12	15	56
I-581	71	62	92	28	32	6	9	3	7
I-64	68	73	72	39	42	32	8	19	30
US221	59	52	68	21	12		7	5	8
I-66	31	35	27	12	19	5	5	5	17
US11	23	22		19	10		3	2	4
VA8	22	18	20	37	63	54	13	23	18
US460	12		20	10	22	13	1	4	4
US19	12			4	3	4	1	1	2

Figure 6: Top 10 Locations Requested under Weather December 2002 – August 2003

Top 10 Locations Requested for Weather
December 2002 - August 2003

Location	Value
I-81	2337
Roanoke	1536
Winchester	1444
Staunton	967
Harrisonburg	691
Bristol	236
I-77	215
Lexington	145
Richlands	58
I-581	48
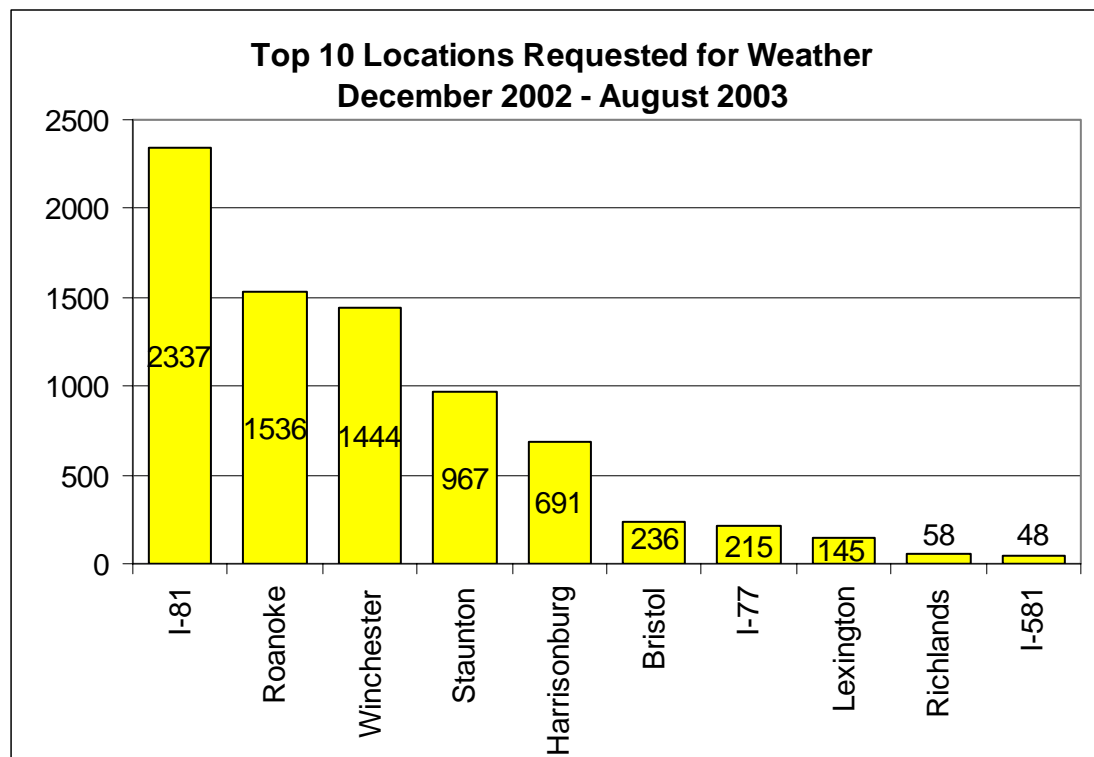
Table 6: Top Locations Asked for in Weather

	Aug-03	Jul-03	Jun-03	May-03	Apr-03	Mar-03	Feb-03	Jan-03	Dec-02
I-81	217	214	106	168	97	136	563	347	489
Roanoke	104	104	103	103	66	86	384	254	332
Winchester	82	128	132	135	83	107	325	277	175
Staunton	59	64	79	103	75	79	222	146	140
Harrisonburg	54	26	33	40	28	29	191	143	147
Bristol	44	27	9	22	16	27	38	28	25
I-581	23	25							
Richlands	20	22	16						
Lexington	18	21		12	8	17	24	27	18
I-77	18				7		83	48	59

Figure 7: Travel Shenandoah/511 VA Web Site Trends 2000-2003

302
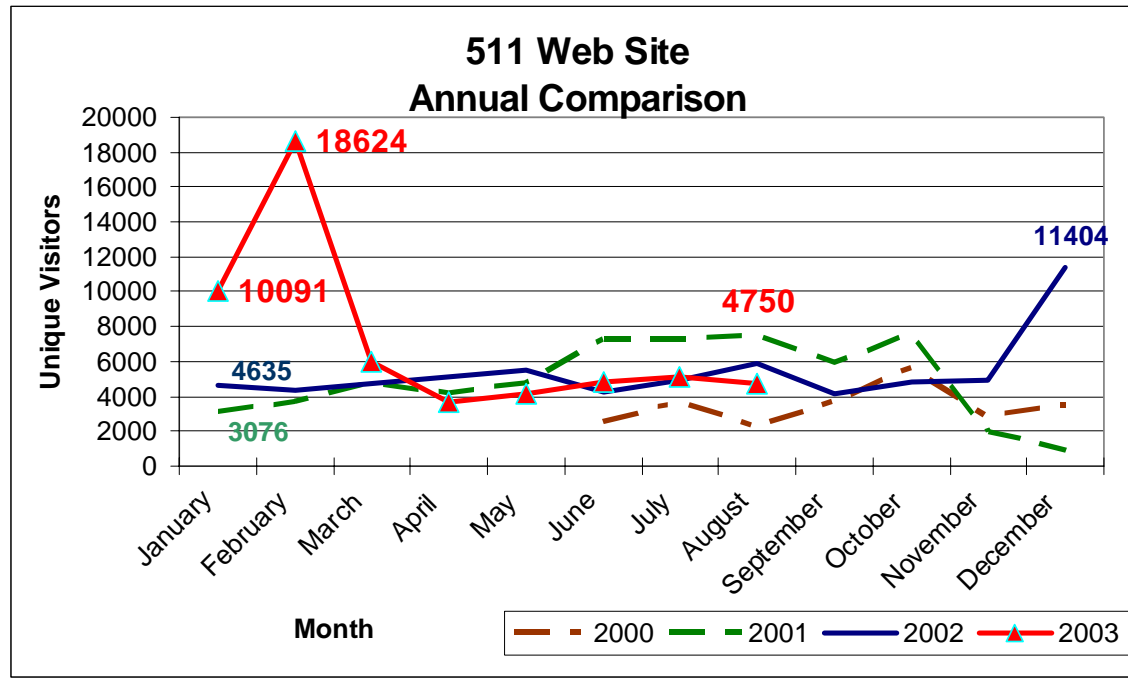
Table 7: Travel Shenandoah/ 511VA.org Web Unique Visitors 2000-2003

	January	February	March	April	May	June	July	August	September	October	November	December
2003	10,091	18,624	5,989	3,691	4,168	4,812	5,144	4,750	*	*	*	*
2002	4,635	4,306	4,782	5,081	5,536	4,251	4,927	5,907	4,186	4,850	4,921	11,404
2001	3,076	3,702	4,740	4,144	4,697	7,263	7,281	7,445	5,879	7,493	1,895	873
2000	*	*	*	*	*	2,477	3,662	2,242	3,656	5,609	2,801	3,451
2003 Total since Feb02	70,242	88,866	94,855	98,546	102,714	107,526	112,670	117,420	*	*	*	*
2003 Total since Jun00	157,263	175,887	181,876	185,567	189,735	194,547	199,691	204,441	*	*	*	*

Sites Linking to 511 VA	Links Referrer's Pages	Specifically links to:
Harrisonburg & Rockingham Outdoor Recreation	http://www.hrcvb.org/backroads.html	www.travelshenandoah.com
Winchester Star Links	http://www.winchesterstar.com/Links_new.asp	www.travelshenandoah.com
Yahoo Travel Destinations - Virginia	http://dir.yahoo.com/recreation/travel/destination_guides/by_region/u_s__states/virginia/complete_list/	www.travelshenandoah.com
Shenandoah Regional Airport	http://www.flyshd.com/area_links.html	www.travelshenandoah.com
Silver Lake Mill Information	http://www.silverlakemill.com/info.htm	www.travelshenandoah.com
Congressman Frank Wolf (10th district)	http://www.house.gov/wolf/news/2000/06-08-VDOT_Grant.html	www.travelshenandoah.com
Old Spring Farm B&B	http://www.oldspringfarm.com/directions.htm	www.travelshenandoah.com
Roanokegov.com	http://www.roanokegov.com/WebMgmt/ywbase61b.nsf/vwContentFrame/N24YAM7W525ASTNEN	www.travelshenandoah.com
VDOT I-81 Projects	http://www.virginiadot.org/projects/constSTAN-I81proj-brochures.asp	www.travelshenandoah.com
JMU Resources	http://www.jmu.edu/research/resources.shtml	www.travelshenandoah.com
www.TravelWV.com	http://www.travelwv.com/html/shenandoah.htm	www.travelshenandoah.com

511 Virginia Evaluation

January 2004

Phone & Web Summary Statistics
Appendix 1-C

Figure 1: 511 Call Volume Trends 2001 - 2003

511 Phone System Total Calls
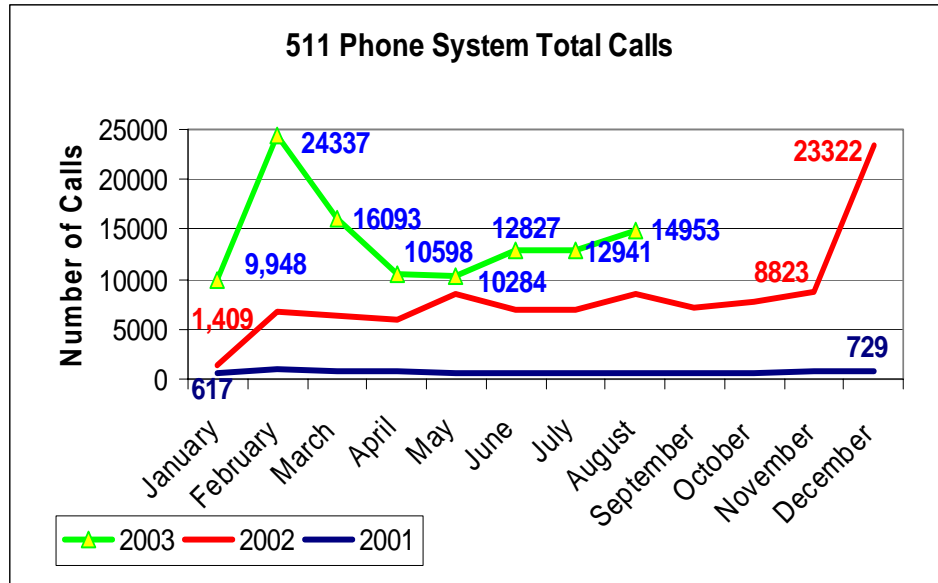
Figure 2: Highest Call Volume Statistics

Highest Call Volume Statistics

- Highest Call Volume Month
  - December 2002 (23,322)
- Highest Call Volume Day
  - December 1, 2002 (7,523)
- Highest Call Volume Hour
  - March 26, 2003 1pm (947)

Top Ten Call Volume Days

1. December 1, 2002   7,523
2. March 26, 2003   4,967
3. February 17, 2003   3,755
4. February 28, 2003   3,101
5. February 16, 2003   2,505
6. December 4, 2002   2,452
7. January 5, 2003   1,715
8. December 13, 2002   1,669
9. February 27, 2003   1,641
10. September 2, 2003   1,531

Figure 4: First Six Month Summary for 511 Virginia

Six Month Summary

February 15, 2002 – August 31, 2002

- **Total Calls: 50,169**
- **Total Minutes: 94,399**
- **Average Duration: 1 minute 52 seconds**
- **% to 3 digit designation "511": 90%**
- **Max Port Usage: 20**
- **Mean Port Usage: 1**
- **Peak Hour: 3pm - 4pm**
- **Peak Day: Friday**

Figure 5: Where Callers Went: First Six months of 511 Virginia
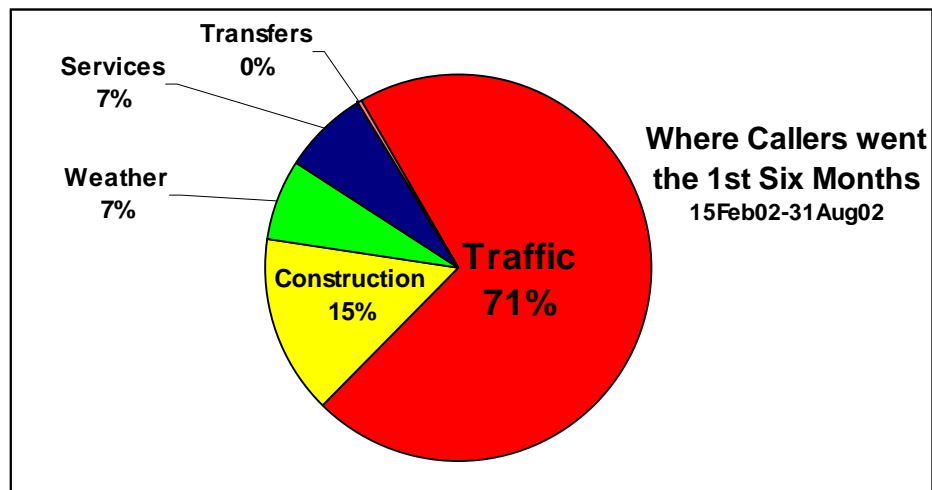
Figure 6: First Year Summary for 511 Virginia

One Year Summary

February 15, 2002 – February 15, 2003

- **Total Calls: 112,331**
- **Total Minutes: 212,378**
- **Average Duration: 1 minute 53 seconds**
- **% to 3 digit designation "511": 89%**
- **Max Port Usage: 45**
- **Mean Port Usage: 1**
- **Peak Hour: 4pm - 5pm**
- **Peak Day: Monday**

Figure 7: Where Callers Went: First Year of 511 Virginia
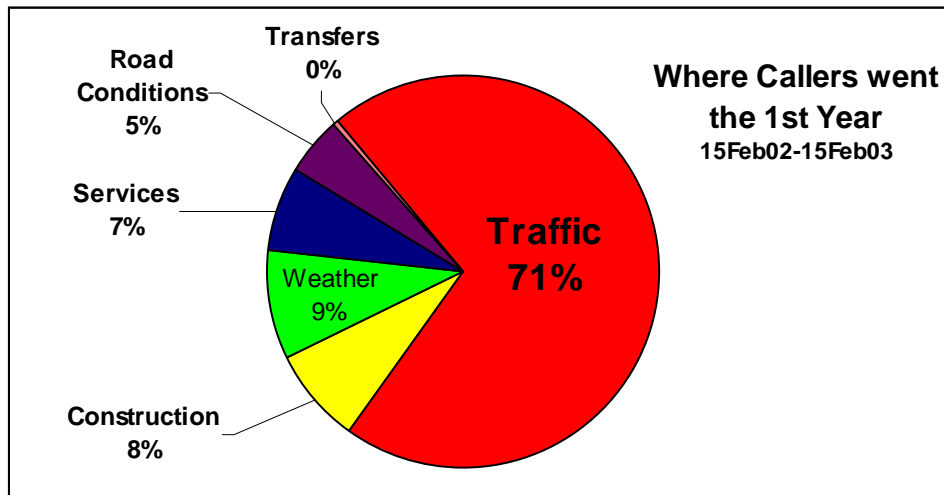
Figure 8: First 18 Months Summary of 511 Virginia

18 Month Summary

February 15, 2002 – August 31, 2003

- **Total Calls: 210,052**
- **Total Minutes: 396,222**
- **Average Duration: 1 minute 53 seconds**
- **% to 3 digit designation "511": 91%**
- **Max Port Usage: 45**
- **Mean Port Usage: 1**
- **Peak Hour: 2pm – 3pm**
- **Peak Day: Sunday**

Figure 9: Where Callers Went: First 18 Months of 511 Virginia
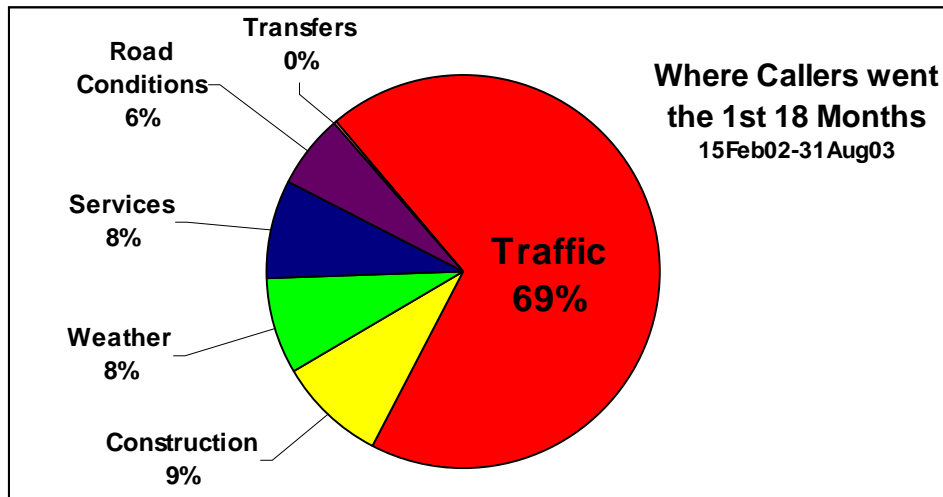
Figure 10: 511 Total Calls by Hour of the Day
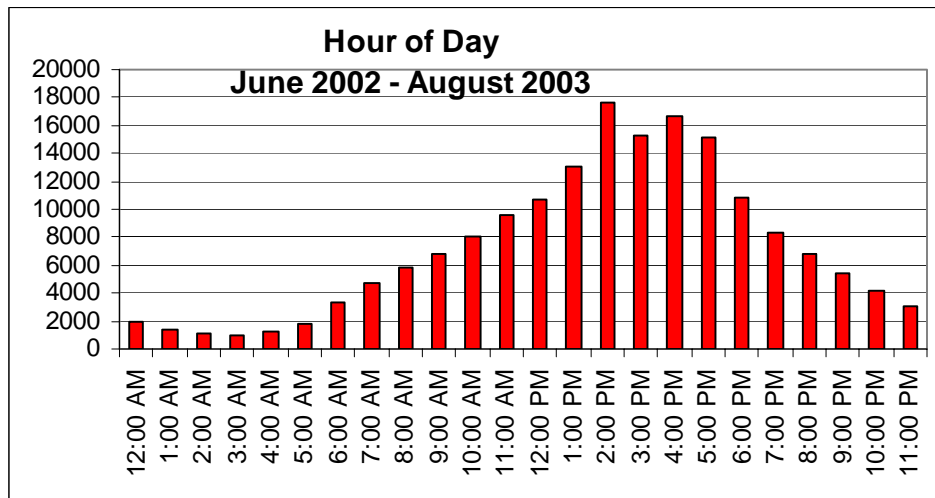
511 Call Totals by Hour of the Day

511 Call Totals by Day of the Week

By Day of the Week June 2002 - August 2003

Monday: 20,115
Tuesday: 16,826
Wednesday: 26,122
Thursday: 21,203
Friday: 29,148
Saturday: 19,472
Sunday: 31,558
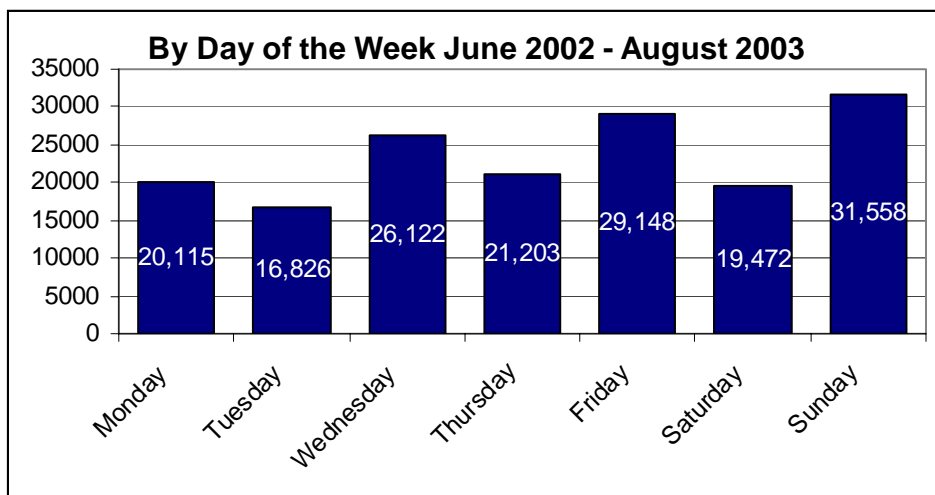
Figure 12: 511 Virginia Port Usage August 2002 – August 2003

511 VA Port Usage
August 2002-August 2003

Maximum # of Ports in Use

Aug-02: 18
Sep-02: 23
Oct-02: 9
Nov-02: 13
Dec-02: 45
Jan-03: 28
Feb-03: 28
Mar-03: 31
Apr-03: 11
May-03: 12
Jun-03: 10
Jul-03: 13
Aug-03: 12

Month & Year
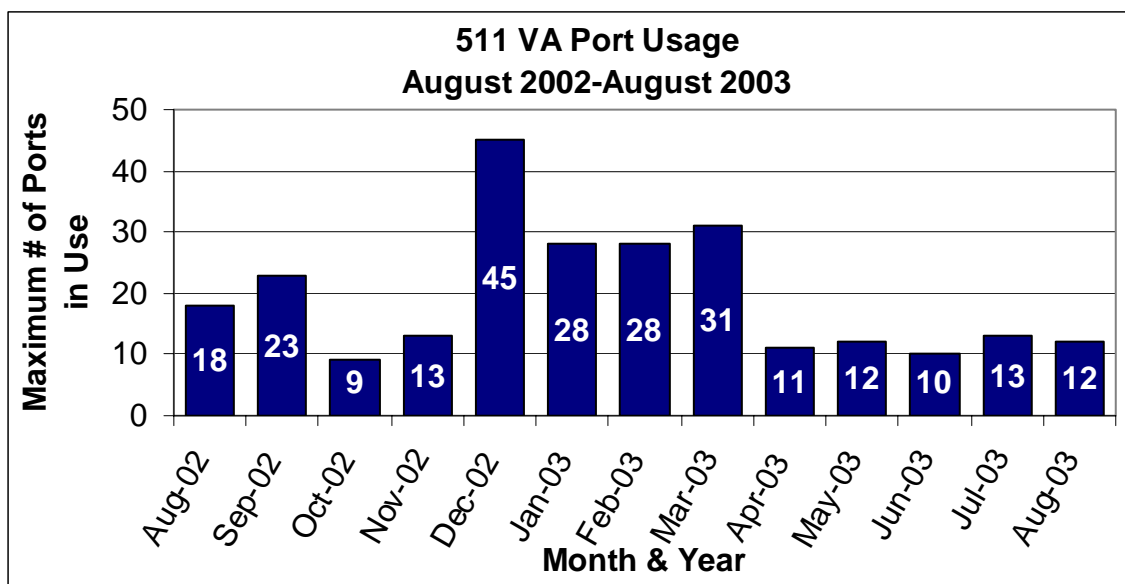
Figure 13: Wireless vs. Landline November 2002 – August 2003
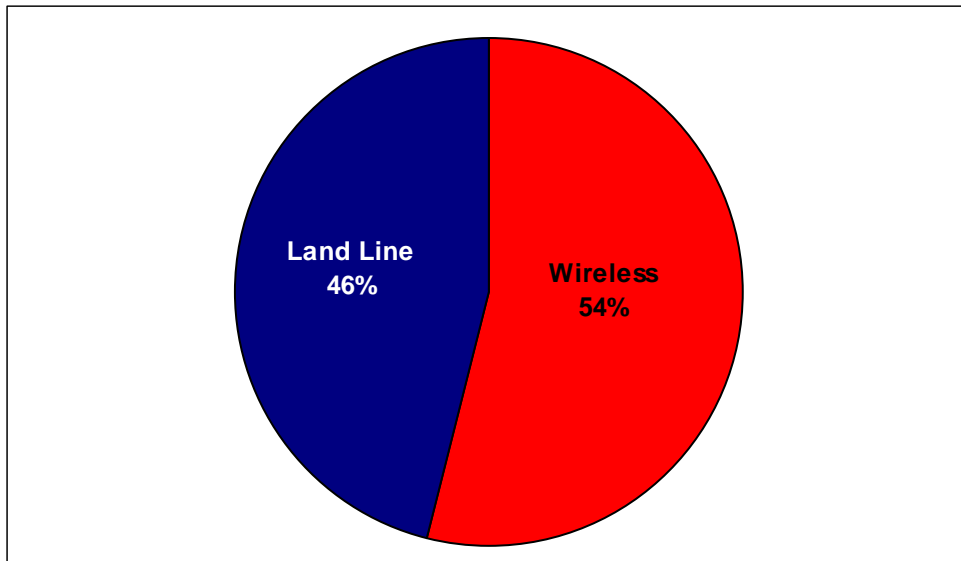
Figure 14: In-State vs. Out-of-State Callers June 2002 – August 2003
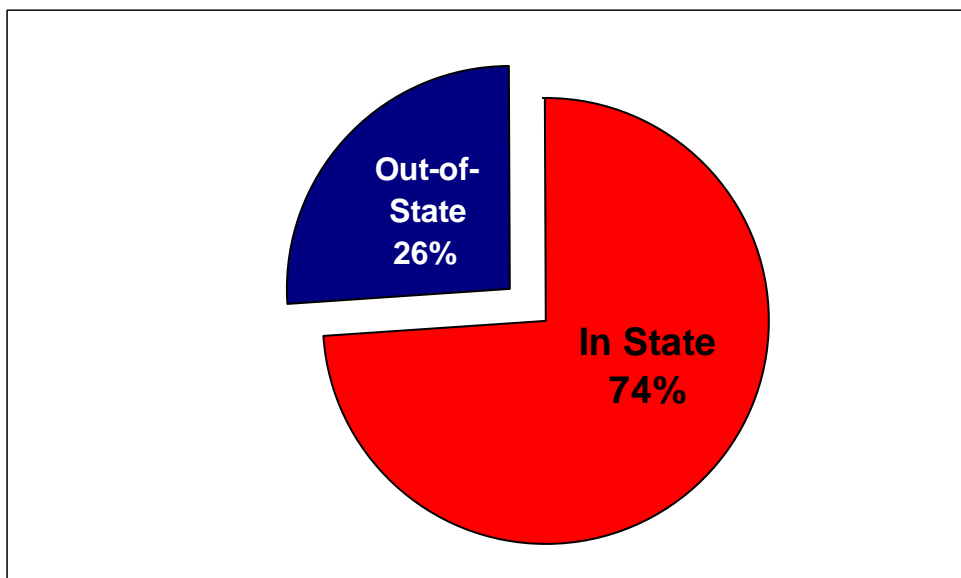
Figure 15: Top States Calling 511 Virginia (February 2002 – August 2003)

Top States Calling Into 511

State	511 Virginia Calls
1. VA	136,657
2. TN	11,057
3. MD	5,148
4. PA	3,271
5. NC	3,232
6. NY	2,092
7. GA	1,815
8. WV	1,734
9. TX	1,719
10. FL	1,549

Figure 16: VDOT's Public Relations' Presentation of December 2002 State Distribution

State Distribution of Calls to 511 Virginia
(December 2002)
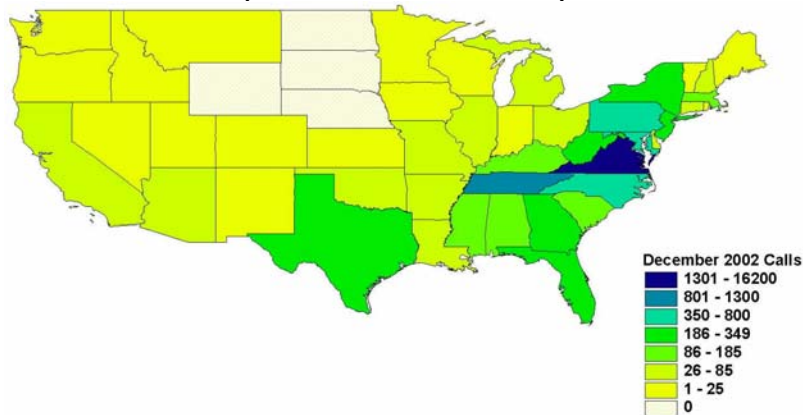
December 2002 Calls
- 1301 - 16200
- 801 - 1300
- 350 - 800
- 186 - 349
- 86 - 185
- 26 - 85
- 1 - 25
- 0

Is there a relationship between CMS and 511 Call Volumes?
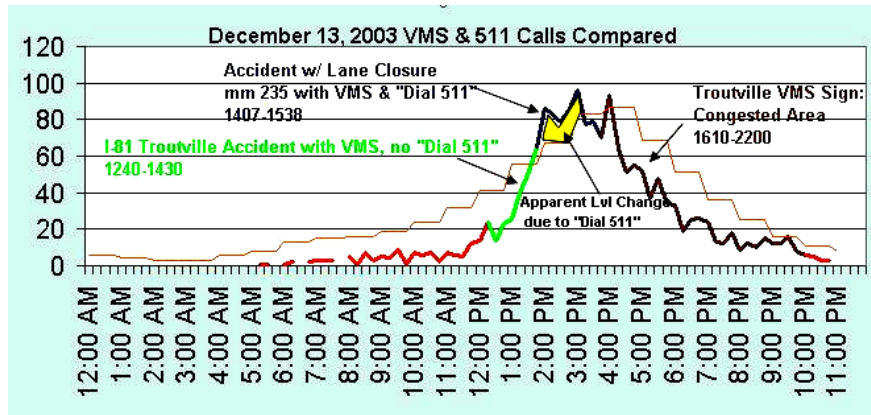
18 Monthly Statistics and Weather Summaries

Figure 18: February 2002 Monthly Summary

February 2002 Overview
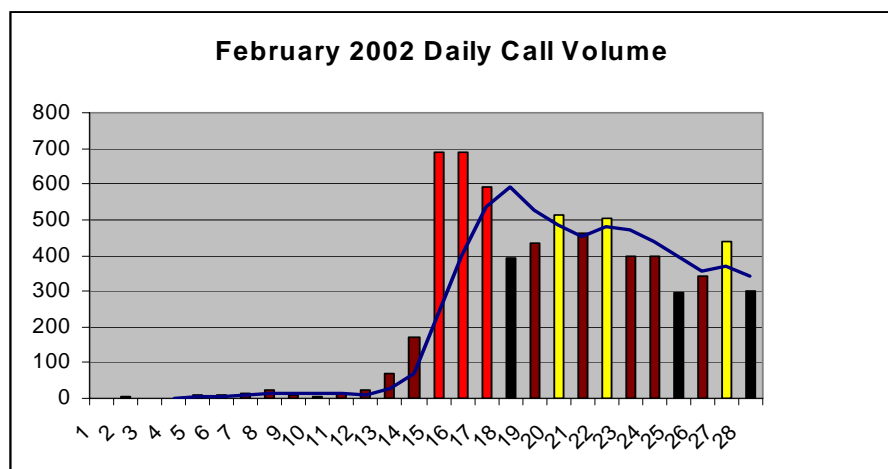
March 2002 Overview

March Daily 511 Call Volume
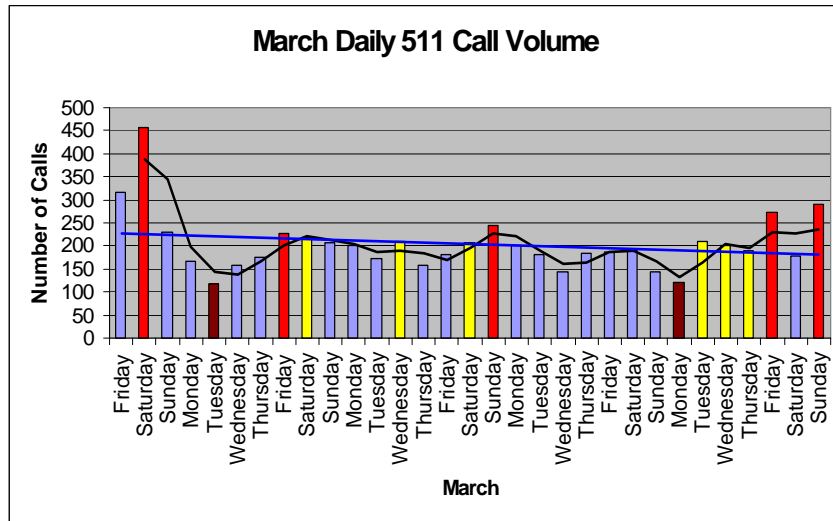
March Events

- **Saturday, March 2nd**
  – Virginia Tech and JMU Spring Breaks Begin
- **Friday, March 8th**
  – CMS ran 511 Message from 10am -2pm
- **Friday/Saturday, March 8th & 9th**
  – Virginia Tech and JMU Spring Breaks End
- **Saturday, March 17th**
  – St. Patrick's Day Events
  – Hollins University Spring Break Begins
  – NASCAR – Darlington Raceway
- **Sunday, March 24th**
  – NASCAR- Bristol Speedway
- **Friday & Sunday March 29th & 31st**
  – Easter Weekend

Figure 21: April 2002 Monthly Summary

April 2002 Overview
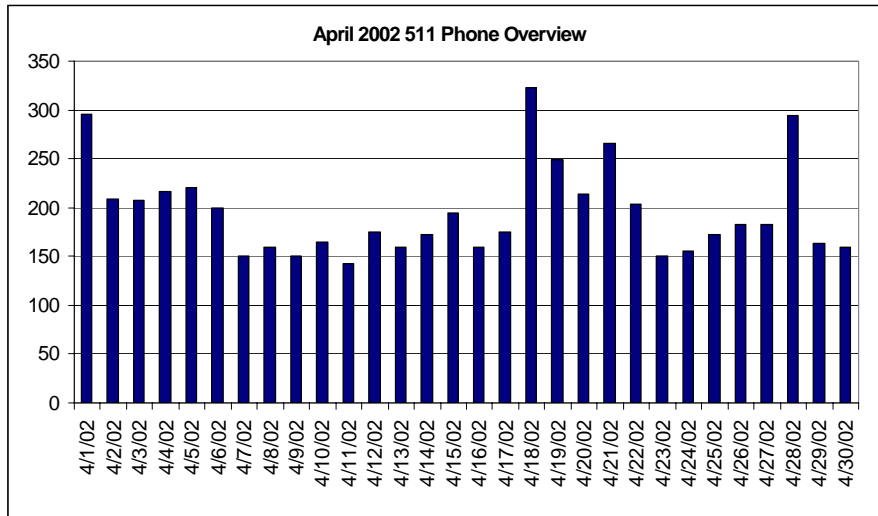
Figure 22: May 2002 Monthly Summary

May 2002 Overview
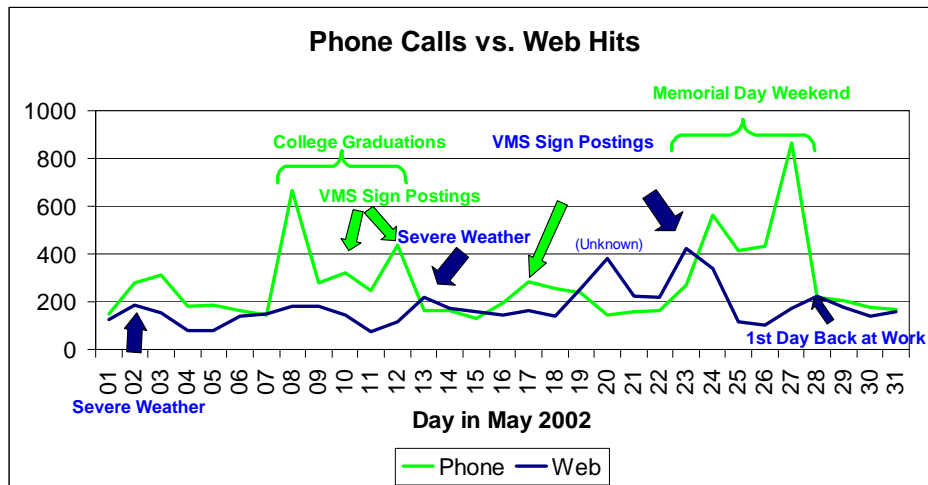
May 2002 Weather Summary

– Multiple Tornado and Severe Thunderstorm Warnings were reported on **May 2nd** and **13th** throughout the I-81 Corridor

– A single Severe Thunderstorm Warning was issued on May **26th** and **27th.**

– **By itself, weather did not correlate to increases in 511 call volume or website hits.**

Figure 24: June 2002 Monthly Summary

June 2002 Overview

Phone Calls vs. Web Hits
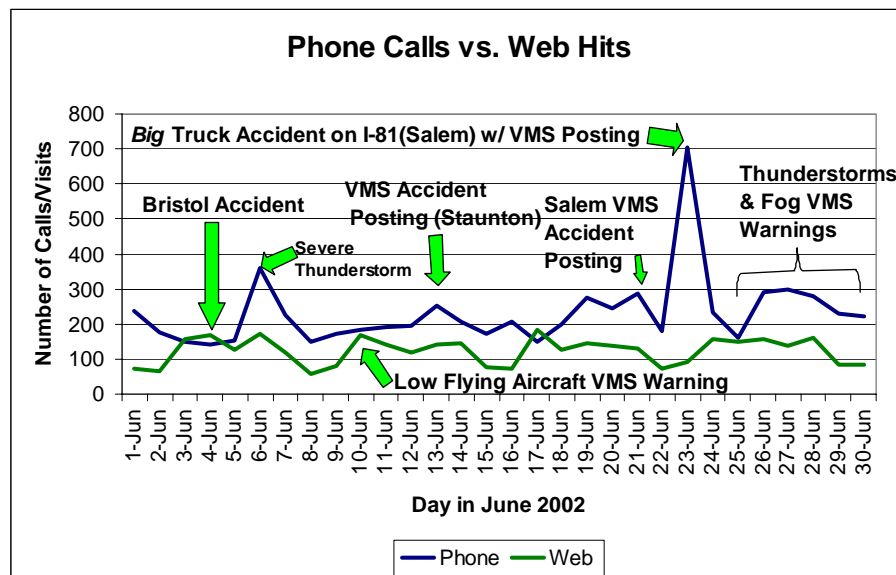
June 2002 Weather Summary

- June 3-6 – several severe thunderstorms up and down the corridor
- Most of the month saw extremely high temperatures in all three districts, including heat advisories in Staunton.
- June 25 – severe thunderstorm on 460 near Blacksburg.

Figure 26: July 2002 Monthly Summary

July 2002 Overview
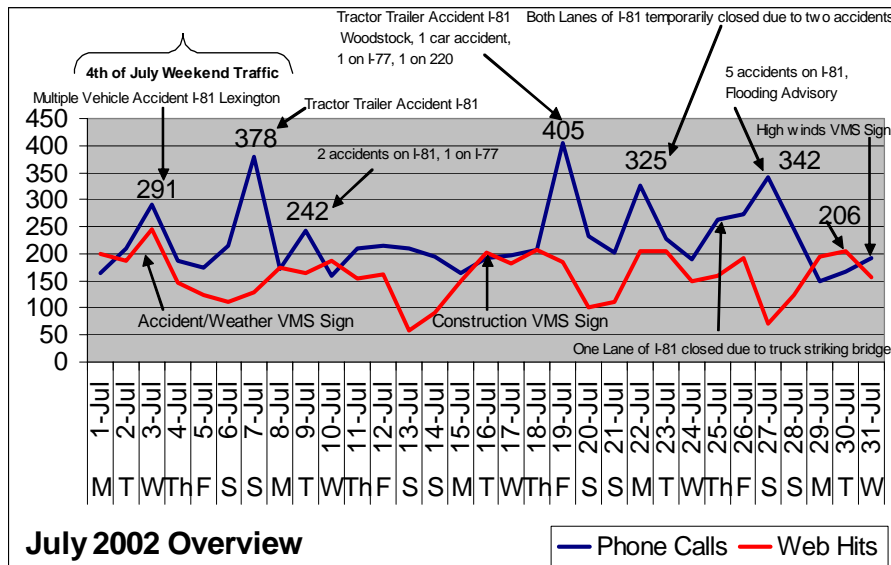
July 2002 Weather Summary

- High Heat indices predominated the month throughout the corridor
- July 27th – Flooding Advisory
- July 31st – High Wind Advisory

August 2002 Overview

August 2002 511 Web vs. Phone
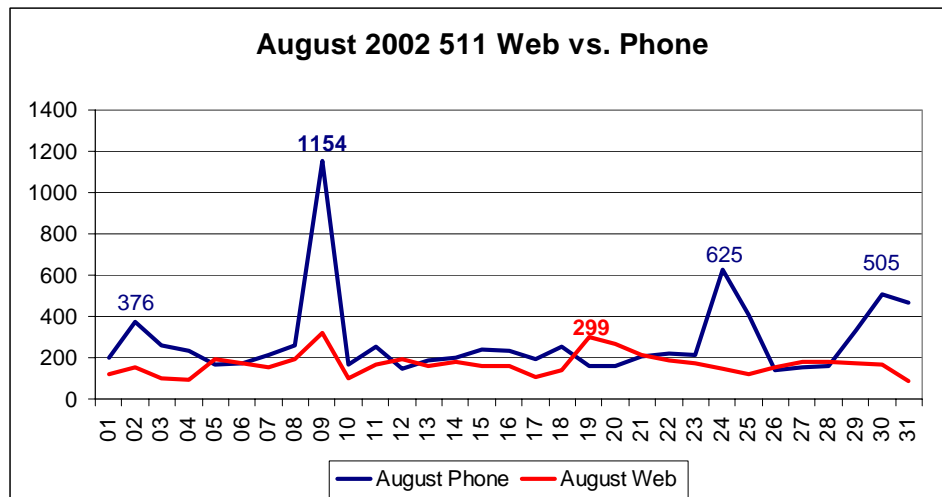
August 2002 Weather Summary

- Heat Advisories
  - Staunton 2nd, 5th, 22nd, 23rd
- Excessive Heat Warnings
  - Staunton 3rd, 4th, 22nd, 23rd
- Severe Thunderstorm Warning
  - Staunton 5th
  - Abingdon 1st, 2nd
- **In general, the weather alone did not directly correlate to increases in calls to 511.**

Figure 30: September 2002 Monthly Summary

September Overview

11,261 Total Queries to the 511 System

1,561 ◀ Accident on I-81 in Staunton District

I-81 Accidents in Salem & Staunton

Accident/HazMat Spill on I-81 in Bristol District

649

247

Phone — Web — **Date**
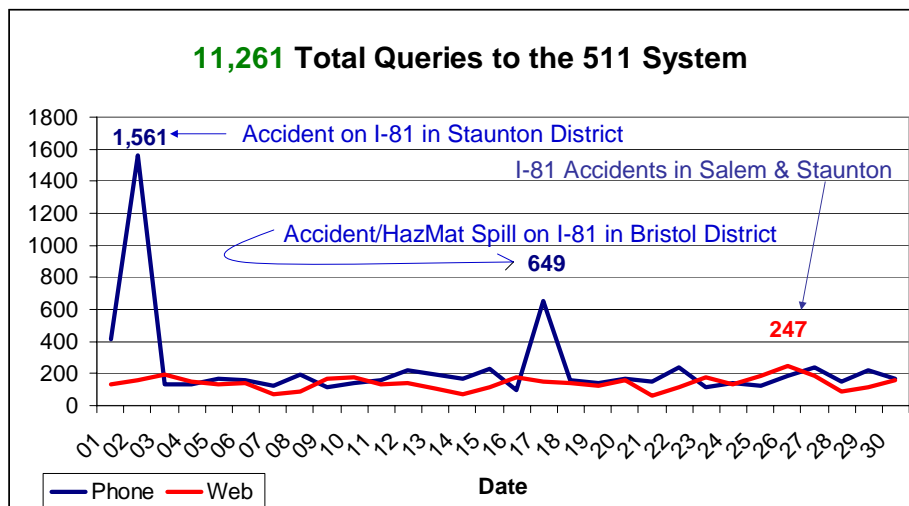
September 2002 Weather Summary

- Strong Wind Advisory
  - Salem Friday, September 27th
  - Bristol Friday, September 27th

- **In general, the weather alone did not directly correlate to increases in calls to 511**.

* Our weather data comes from the AccuForecast.com email service.

Figure 32: October 2002 Monthly Summary

October Overview

October 2002 Daily Overview

811 432 382 467 392 369

Number of Calls

Phone — Web
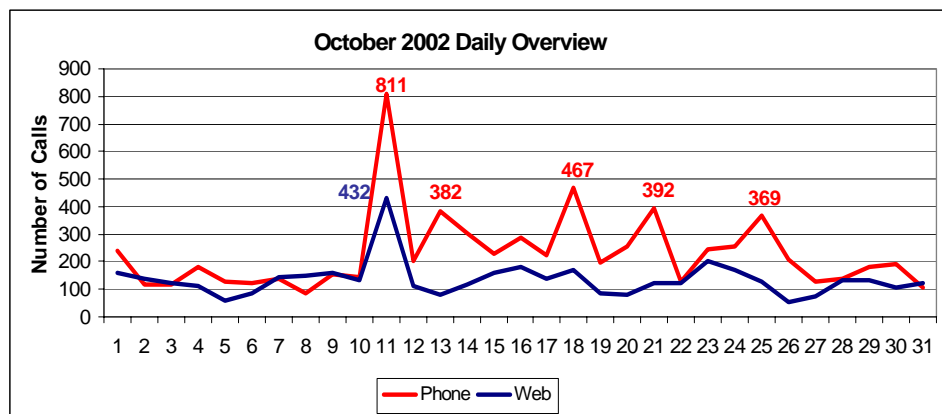
October Weather Summary

- Freeze/Frost Advisories
  - October 14th – Staunton
  - October 17th – Staunton, Salem
  - October 18th – Salem
  - October 31st – Salem,
- Dense Fog Advisories
  - October 12th - Abingdon
- In general, the weather alone did not directly correlate to increases in calls to 511.

> Our weather data comes from the AccuForecast.com email service. If a better source is available, please let us know.

Figure 34: November 2002 Monthly Summary

November Overview

November 2002 Daily Overview
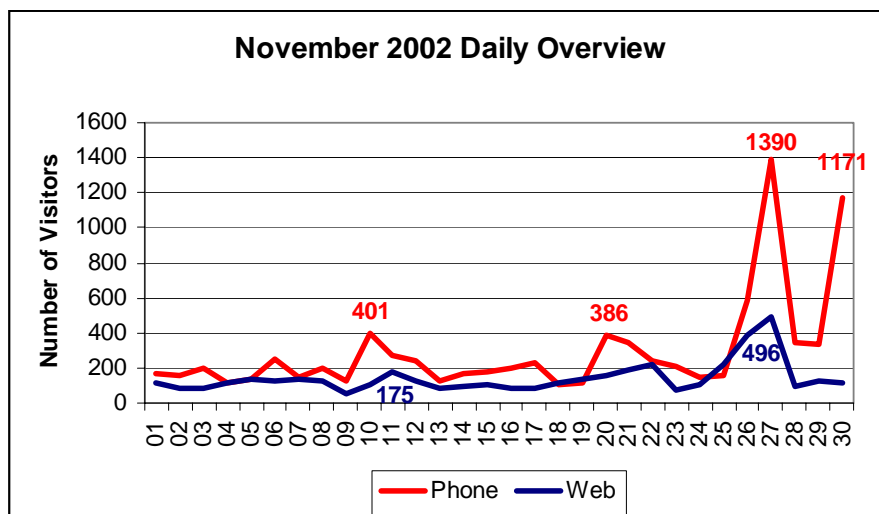
November Weather Summary

- 01 NOV: Freeze Warning (Bristol)
- 06 NOV: High Winds (Salem)
- 10 NOV: Tornado Watch/Severe Thunderstorm (Bristol)
- 11 NOV: Tornado Watch/Severe Thunderstorm (Salem & Bristol)
- 17 NOV: High Winds (Salem)
- 19/20 NOV: Dense Fog (Bristol)
- 22 NOV: High Winds (Salem); Dense Fog (Staunton)
- 30 NOV: Strong Wind Advisory (All Districts)

Our weather data comes from the AccuForecast.com email service. If a better source is available, please let us know.

Figure 36: December 2002 Monthly Summary

December Overview

December 2002 Daily Overview
Month Total Phone: 23,322
Web: 9,905
Cummulative Total: 33,227
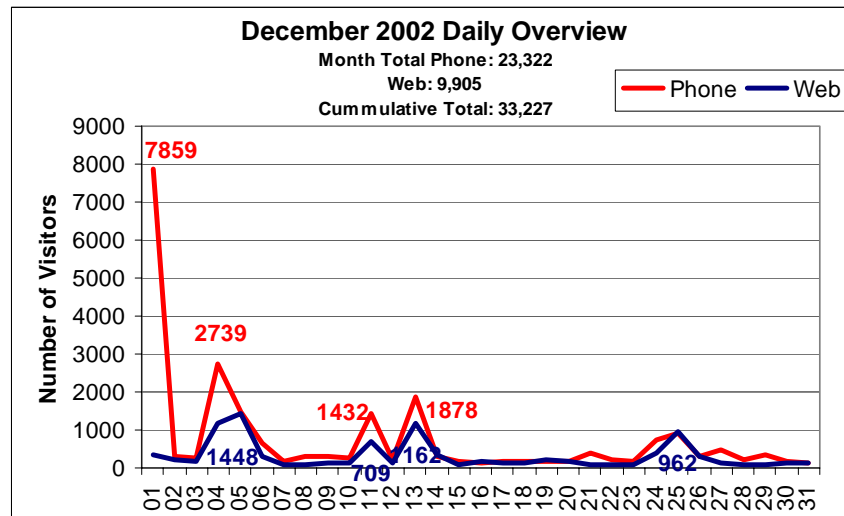
Figure 37: December 2002 Monthly Summary (without December 1st)

December 2002 Daily Overview
(w/o December 1st)
Month Total Phone: 23,322
Web: 9,905
Cummulative Total: 33,227

— Phone — Web

Hi
2739

Hi
1448

Lo
142

Lo
70

Number of Visitors

02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
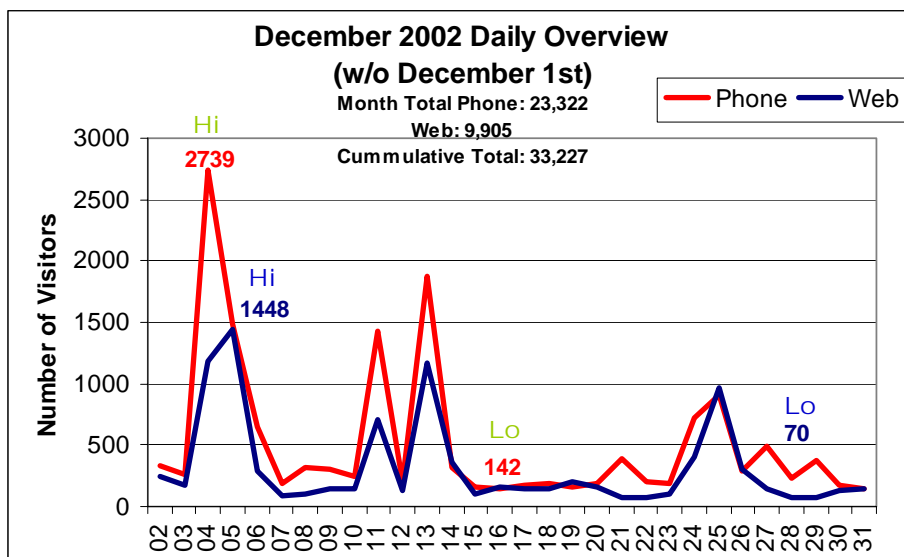
Figure 38: December 2002 Monthly Summary with "Dial 511" on CMS Signs

December 2002 Daily Overview
(w/o December 1st)
Month Total Phone: 23,322
Web: 9,905
Cummulative Total: 33,227

— Phone — Web

Dial 511 Posted on VMS Signs

2739

1448

142

70

Number of Visitors

02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
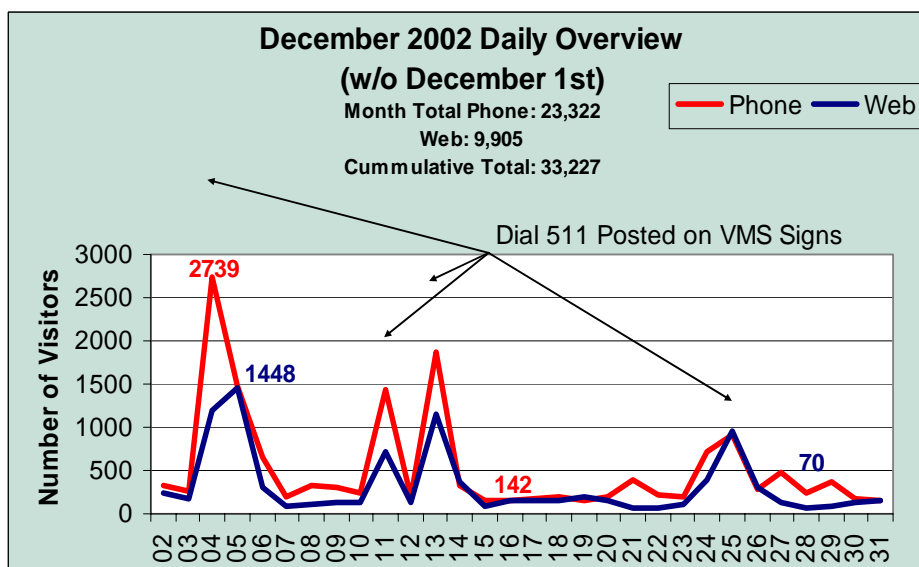
Weather Forecast Summary

- Bristol
  - Winter Weather Advisory
    - 3rd, 4th, 14th, 24th, 25th
  - Strong Wind Advisory (19th)
- Salem
  - Winter Weather/Freezing Rain
    - 3rd, 4th, 5th, 11th, 10th, 25th
  - Strong Winds
    - 12th, 13th, 14th, 25th
- Staunton
  - Winter Weather/Freezing Rain
    - 3rd, 4th, 10th, 11th, 13th, 17th, 24th, 25th
  - Strong Winds (14th)

Our weather data comes from the AccuForecast.com email service. If a better source is available, please let us know.

Figure 40: January 2003 Monthly Summary

January Overview

January 2003 Daily Overview
Month Total Phone: 9,928
Web: 10,091 dailies
Cummulative Total: 20,019

— Phone — Web

Dial 511 VMS

Accident mm 128 Snow & Ice VMS in Staunton

Adverse Road Conditions VMS in Bristol

High Winds/ Wind Chill

Icy Roads Staunton VMS

Number of Visitors
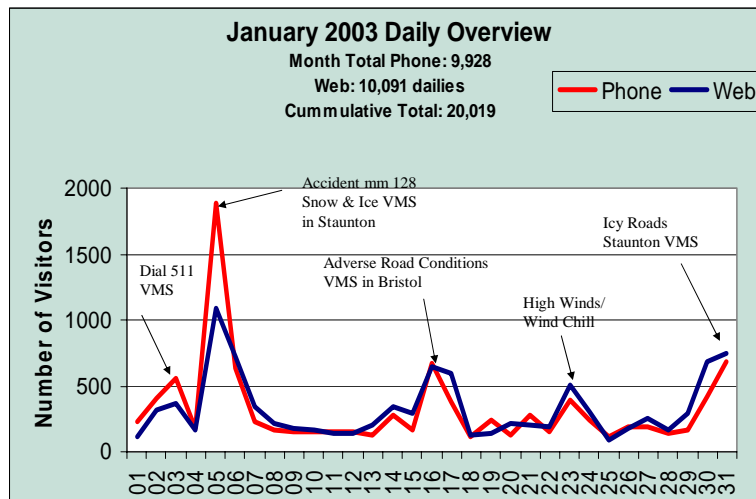
January Weather Summary

- Bristol
  - Winter Weather Advisory
    - 20th, 21st
  - Winter Storm Warning
    - 2nd ,3rd ,6th ,15th ,16th
  - Wind Chill (23rd)
- Salem
  - Winter Storm Warning
    - 15th,16th,23rd
  - High Winds
    - 6th,7th,8th,9th,23rd
- Staunton
  - Winter Weather Advisory
    - 5th,6th
  - Winter Storm Warning
    - 15th,16th
  - Wind Chill
    - 22nd,23rd,26th,27th
  - High Winds
    - 8th, 9th

Figure 42: February 2003 Monthly Summary

February Overview

February 2003 Overview
Month Total Phone: *24,337* Web Monthly Uniques: *16,093*
Cummulative Total: *40,430*

Legend: Phone — Web — Feb Average — Jan Average

Winter Storm in all districts

4 Multiple Tractor Trailers,
3 Tractor Trailers,
1 Multiple Accidents,
4 Accidents,
1 Severe Congestion,
1 Road Closure

- # Bristol
  - **Winter Weather Advisories** (6th, 7th, 9th,10th, 16th, 17th,18th,25th)
  - **Flood Warning/Watch** (14th, 21st, 22nd)
  - **Severe Thunderstorm Warning** (22nd)
- # Salem
  - **Winter Storm Warning/Watch** (6th,9th,10th,13th,14th,15th, 17th,26th,27th,28th)
  - **Flood Warning/Watch** (21st,22nd,23rd)
  - **High Wind Advisory** (4th, 12th,22nd)

- # Staunton
  - **Winter Storm Warning/Watch** (6th,7th,13th,15th,16th, 17th,25th,28th)
  - **High Wind Advisory** (4th,11th,12th,22nd,23rd)
  - **Flood Warning/Watch** (22nd)
  - **Dense Fog Advisory** (21st,22nd,23rd)

Weather Forecast Summary

Figure 44: March 2003 Monthly Summary

March Overview

March 2003 Daily Overview — Phone

I-81 Southbound Accident at mm174.

Unknown 5003

Flooding

Winter Storms

662

917

1658

511 Survey Intercept was active.

# of calls — 5000, 4000, 3000, 2000, 1000, 0

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
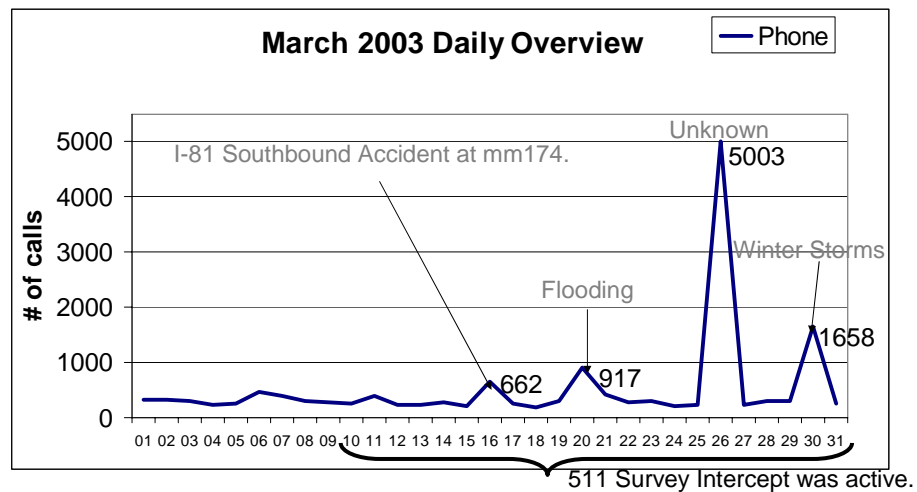
Figure 45: March 2003 Weather Summary

Weather in March

- Staunton:
  - Wind Advisory (8-9 March)
  - Severe Thunderstorm Watch (13 March)
  - Flood Warning (19-20 March)
  - Winter Storm Warning (30 March)
- Salem:
  - Wind Advisory (9 March)
  - Winter Weather Advisory (29 March)
  - Winter Storm Warning (30 March)
- Bristol:
  - Dense Fog Advisory (1 March)
  - Winter Weather Advisory (29 March)
  - Winter Storm Warning (30 March)

Figure 46: April 2003 Monthly Summary

April 2003 Overview

Fri: Fog; Accidents: Rte 340, I-81 mm271

Tues: High Winds; I-81 Tractor Trailer mm270, Vehicle mm133

April 2003 Daily Overview

Wed: Fog; Minor Road Conditions; I-81 mm323, TT mm103 w/ lane closure, TT Route 460

869

763

489

749

914

731

689

Mon: I-81 Tractor Trailer mm126 (7:26 hours)

# of calls

Phone — Website

Wed: High Winds; I-81 mm50
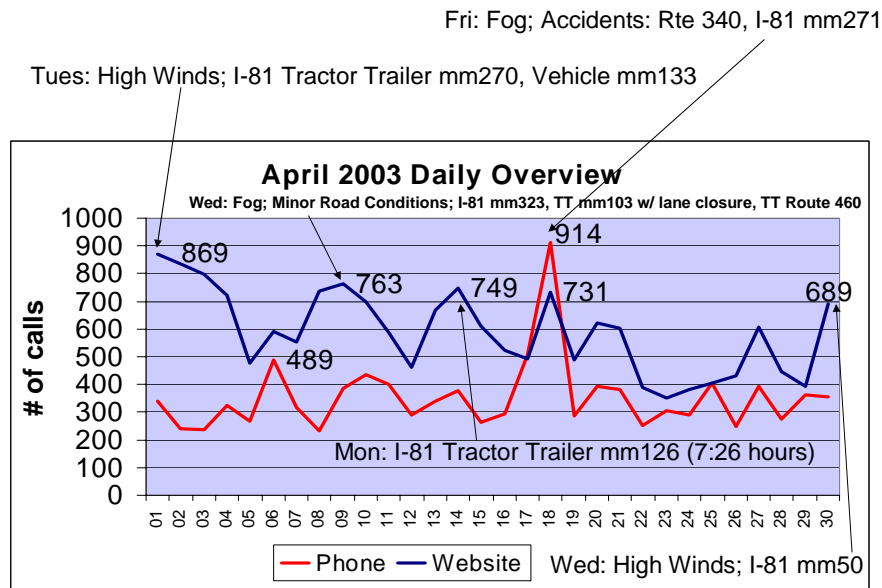
Weather in April

- **Staunton:**
  - Winter Storm Warning (6 April)
  - Flood Watch (10-11 April)
- **Salem:**
  - Wind Advisory (1 April)
  - Flood Watch (9 April)
  - Flood Warning/Minor Flooding (10-11 April)
- **Bristol:**
  - Wind Advisory (1 April)
  - Flood Watch/Warning (9-10 April)
  - Dense Fog Advisory (18 April)

Figure 48: May 2003 Monthly Summary

May Overview

June 2003 Daily Overview

Total Calls to Phone System - 12,827

Total Hits to Website - 4,812

Phone — Web
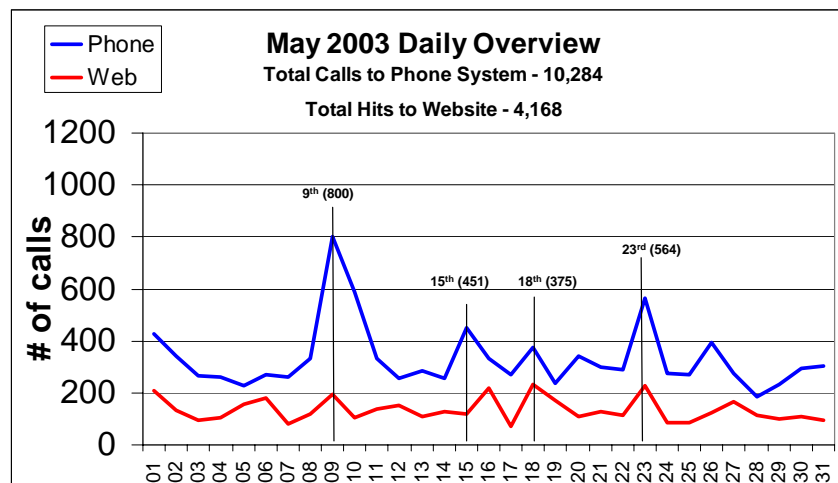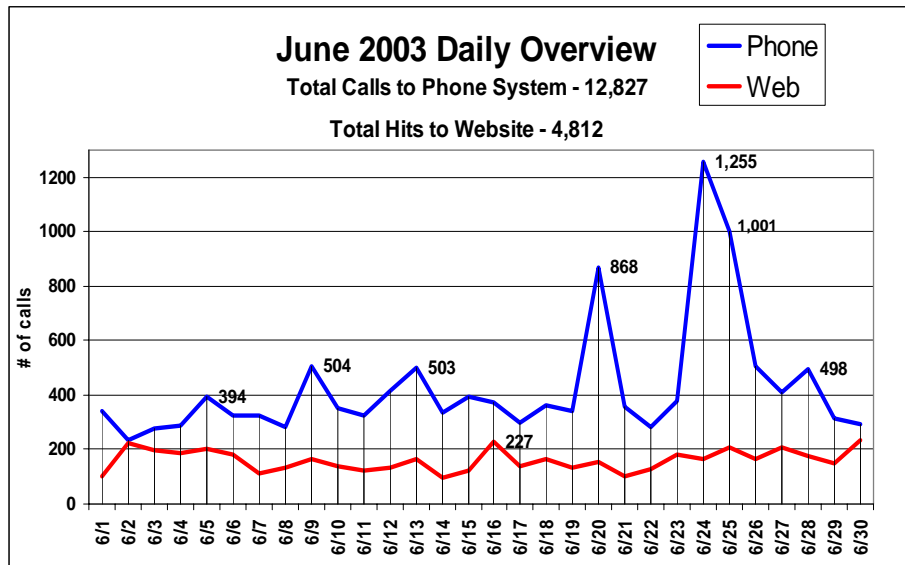
Figure 50: June 2003 Weather Summary

Weather in June 2003

- Staunton
  - Flood Watch 6th, 7th,14th,15th,21st
  - Severe Thunderstorm Watch 11th,12th,14th
  - Flash Flood Warning 11th
- Salem
  - Severe Thunderstorm Watch 11th,12th
  - Flood Watch 11th, 14th, 17th
- Bristol
  - Severe Thunderstorm Warning 11th
  - Flash Flood Warning 11th
  - Flood Watch 15th,16th,17th,18th

Figure 51: July 2003 Monthly Summary

511 Volumes - July 2003
Phone Total: 12,941
Web Total: 5,144

Phone —— Web ——

• We're seeing a trend for a peak on Sunday on the phone, to be followed on Monday by a peak on the web. We're not sure why this is occurring.

4th of July Holiday

Flood Warning

Tractor Trailer, NB I-81 mm212
Elapsed time: 1 hour, 56 minutes
No 511-VMS Sign

766

Tractor Trailer, NB I-81 mm228
Elapsed time: 3 hours, 17 min.
"Dial 511 for more info"
VMS Used

891

434

Severe Thunderstorm Warning/Watch

Figure 52: July 2003 Weather Summary

Weather in July 2003

- Staunton
  - Flood Watch 1st
  - Severe Thunderstorm Warning/Watch 7th,8th,9th,10th,12th
- Salem
  - Flood Watch 1st
  - Flood Warning 6th
  - Flash Flood Warning 13th
  - Severe Thunderstorm Warning/Watch 5th,6th,7th,9th,10th,12th, 13th
- Bristol
  - Severe Thunderstorm Warning/Watch 9th,10th,12th
  - Flood Watch 1st
  - Patchy Dense Fog 3rd, 17th

Figure 53: July 2003 Monthly Summary (More Comprehensive)

A More Comprehensive Look at July 2003

511 Volumes - July 2003
Phone Total: 12,941
Web Total: 5,144

Legend: Phone (red), Web (blue)

- We're seeing a trend for a peak on Sunday on the phone, to be followed on Monday by a peak on the web. We're not sure why this is occurring.

4th of July Holiday

Flood Warning

434

891

766
Tractor Trailer, NB I-81 mm228
Elapsed time: 3 hours, 17 min.
"Dial 511 for more info"
VMS Used

Tractor Trailer, NB I-81 mm212
Elapsed time: 1 hour, 56 minutes
No 511-VMS Sign

Severe Thunderstorm Warning/Watch

Figure 54: August 2003 Monthly Summary

August 2003 Daily Overview
Total Calls to Phone System - 14,953
Total Hits to Website - 5,490

Legend: Phone (red), Web (blue)

# of calls

I-81 NB:
mm299 Tractor Trailer Accident
I-81 SB:
mm302 Multi-Vehicle Accident.
Right Lane Closed.
mm108 Multi-Vehicle Accident

I-81 NB:
mm49- Both Lanes blocked by Multi-Vehicle accident
mm131- Single Accident -vehicle flipped in center of road
No permanent VMS sign used for 511

999

824

914

I-81 NB:
mm125 Heavy Congestion
mm230 Accident

Flood Warnings

Severe Thunderstorm Warnings

331

Weather in August 2003

- Bristol
  - Dense Fog (18th)
  - Flood Warning (3rd, 4th, 7th)
  - Flash Flood Warning (31st)
  - Severe Thunderstorm Warning (4th, 17th, 28th)
- Salem
  - Flash Flood Watch (8th, 9th)
  - Severe Thunderstorm Warning (5th, 17th)
- Staunton
  - Flood Warning (8th)
  - Flash Flood Watch (10th, 11th)
  - Severe Thunderstorm Warning (5th, 17th, 27th)

511VA.org Web Statistics Summary

Figure 56: Web Site Summary for www.TravelShenandoah/www.511VA.org

The Overall View…

Summary Web Statistics

Top Referring Domain	Bookmarks 36%
Top 3 Referring URLs	
	• Bookmarks 45%
	• Shenandoah.com 10%
	• Virginia.org 6%
Top Major Domain	.com 46%
Top Search Engine	Google 38%
Ranking on Google under "Virginia Travel"	VDOT page w/ link to 511 Ranked 8th as of 12Dec03
Top Search Keyword	"Virginia Travel"
Browser War	Microsoft 92%
Operating System	Windows 2000 97%
Screen Resolution	800x600 24.8% / 1024x768 23.2%
Color Palettes	32 bit 45%
Highest Rated Month	February 2003 (92,067 visits)
Highest Rated Day	Thursday, December 4, 2003 (21,226)
Highest Rated Hour	10am Friday, December 5, 2003 (1,790)
New to Returning Visitors Ratio	92.6% New vs. 7.4% Returning

Case Study Examples for 511 Virginia

Figure 58: Case Study: July 22, 2002

July 22, 2002: A Busy Day in the Life of 511 Virginia

- "Isolated thunderstorms brought heavy rain to Roanoke County this afternoon…and problems started when a car overturned in the northbound lanes near Dixie Caverns. As traffic backed up, a garbage truck tried to stop, hydroplaned and crashed into three more vehicles. Two people were taken to Roanoke Memorial Hospital for what are described as non-life-threatening injuries." –Jean, anchor for July 22, 2002 WDBJ 7 11 o'clock news broadcast.

- Reported to and posted on 511: Accident, Salem, I-81, Northbound, mile marker 134: "Tractor Trailer Accident: I-81 northbound, at mile marker 134 by Salem. Expect Major Delays."

- Unfortunately, no permanent VMS sign was posted because the nearest sign was at mile marker 136, after the accident, and the nearest before the accident was in Bristol, at mile marker 70.

- 511 itself had only 325 calls for the entire 24 hour period. This is relatively low compared to the call volume for the last major tractor trailer incident on June 23, 2002, which peaked at 704 for the 24-hour period. The June 23rd accident included a VMS sign posting, and the back up area covered several 511 road signs. 511 can make a difference in getting the word out about accidents, but we still need to work on getting better information in and out to help reduce secondary accidents, like the one that occurred on Monday.

- *If back up information could be included in reports from contractors in work zones, VDOT personnel on construction sites, and Virginia State Police at accidents, 511 could possibly influence a viable reduction in secondary accidents.*
- To report back-up information, please call: 231-xxxx. If no answer, please leave a message where you can be reached and a dispatcher will get back in touch with you as soon as possible. This could save lives. Thank-you for being the eyes and ears of this service!

July 19th vs. July 22nd 2002: Comparing Two Incidents on I-81

- On Friday, July 19th there was on tractor trailer and one car accident on I-81, 1 car accident on I-77 and 1 car on US220. There were 405 calls on 511.
- On Monday, July 22nd there were two accidents on I-81 which temporarily blocked all lanes on I-81. There were 325 calls on 511.
- Why was call volume on Monday almost 20% less than on Friday? Monday blocked all lanes, while traffic was only slowed on Friday. There could be three reasons:
  - Traffic volume is less on Mondays than on Fridays, in general
  - Weekend drivers are more likely to call than work week drivers about incidents.
  - Weekend drivers may have less of a familiarity with the area.

Figure 60: Case Study: August 9, 2002

August 9th 2002

- Multi-Tractor Trailer Accident I-81 Southbound, mile marker 220.
- The phone provider a more timely detour exit, but the recommendation to call "511" on VMS, was after the recommended exit (mile marker 224).
- However, a large increase in calls was directly attributable to the VMS sign posting the 511 message.

August 24th 2002

- At 11:10am a tractor trailer accident was reported on I-81 Southbound at mile marker 271, 2 miles south of Mt Jackson. There were 99 calls in the 11am hour, alone.
- A VMS sign was posted at 2:20pm on I-81 Southbound, at mile marker 88.
- The accident cleared at 2:35pm.
- There were a total of 451 calls made from 11am to 3pm.
- "Traffic" received 89% of all calls that day (much higher than normal).
- Sources: Todd Kell, Tell Me, Inc., and the VMS Log.

August 30th 2002

- Labor Day Weekend
- Hillsville Flea Market
- Accidents
    - Tractor Trailer Accident on I-77 mm 1 at 5:46pm
    - US 11, 2 accidents 12:27pm and 12:39pm
    - Tractor Trailer Accident VA 8 12:14pm
    - I-64 WB Accident 11:44am
    - I-81 NB mm 49 Accident 10:11am

Inbound Calls Detail Report :   (877) 327-4734
Activity Period: 08/30/2002 12:00 am to 08/30/2002 11:59 pm EDT

Number of Calls: (877) 327-4734
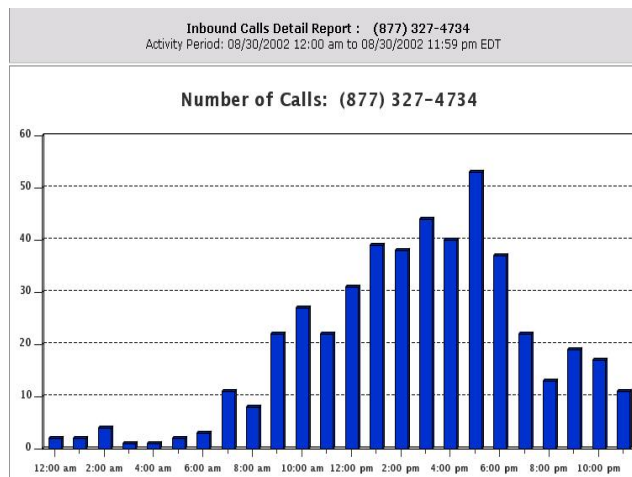
September 2nd 2002

- In the Staunton District (I-81 mm 245), Monday, Labor Day, at noon, a southbound 1998 Honda flipped three times and landed upside down in front of oncoming northbound traffic. Two passengers were evacuated by helicopter.
- **1,561** total calls to 511
  - Average on Mondays: **131**
- **373** total calls from 12pm to 1pm
  - Average calls from 12pm to 1pm: **18**
- Peaked from 12:30 to 12:45pm: **111** calls.
- There was only 1 VMS posting: Fog, SB I-77 mm 11

September 17th 2002

Inbound Calls Detail Report :   (877) 327-4734
Activity Period: 09/17/2002 12:00 am to 09/17/2002 11:59 pm EDT

Number of Calls: (877) 327-4734
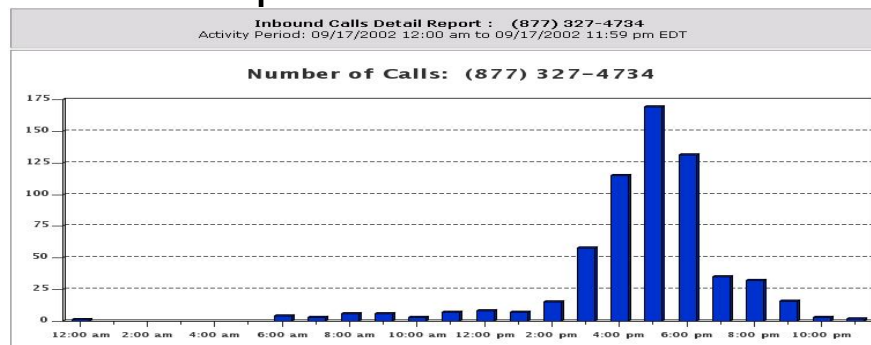
- An incident with an HCL spill on I-81, Exit 7 in the Bristol District around 2:15pm, the clean up continued until the next day, but the peak was during rush hours (3pm – 6pm).
- There were 649 total calls (non-Verizon area – vs. 1,561 in a Verizon area on 02SEP02).
- There were VMS signs in all 3 districts, Salem & Staunton also displayed: "Dial 511 for more info", beginning at 3pm, and seemed to have a direct affect on call volumes.
- All Accident VMS signs were blanked at 8:40pm. The accident clean up VMS signs remained through the 18th.

336

Web Peak: September 26th 2002
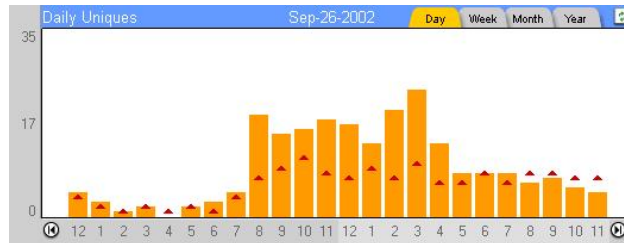
- Two Accidents on I-81
- 1:41pm SB I-81 mm 168 in Salem
- 3:36pm NB I-81 mm 291 in Staunton
- The ▲ indicates the average expected that day.
- Only 1 VMS posting: Heavy Fog SB I-77 mm 11.

Figure 66: Case Study: October 11, 2002

October 11th 2002

881 callers, peaking from 4pm to 5pm with 129 callers.

Two theories:

Event Related: Columbus Day Three Day Weekend

 Possibly slightly elevated due to Parents' Weekend at Virginia Tech

Or:

Traffic Related: Multiple Accidents on I-81

Two accidents at the exact same mile marker on I-81 (mile marker 240 at 12:26pm and 7:27pm).

Neither correlate exactly to the 4pm peak hour.

June 5th 2003

- **June Peak 511 Call Days Rank : *7th of 7***
- **511 Call Volume: *394***
- **Max. 511 Ports Used: *7***
- **Day of the Week: *Thursday***

- **VMS Posted: *3***
  - *1-77 SB mm 11.3, I-81 SB mm 152, I-81 NB mm179*
  - *Paving-caused traffic back ups (4 hours, 3 minutes)*

- **511 Postings: *4***   **(elapsed time)**
  - *High Winds/Fancy Gap (16 hours, 21 minutes)*
  - *581 Debris Clean-up (2 hours, 19 minutes)*
  - *Accident Route 340 (40 minutes)*
  - *Tractor Trailer I-81 mm 64 (7 minutes)*
  - *Tractor Trailer I-81 mm 205 (1 hour, 36 minutes)*

- **No major weather warnings**

June 9th 2003

- **June Peak 511 Call Days Rank : *4th of 7***
- **511 Call Volume: *504***
- **Max. 511 Ports Used: *6***
- **Day of the Week: *Monday***

- **VMS Posted: 0**

- **511 Postings: 6**   **(elapsed time on the 511 phone system)**
  - *Accident I-81 SB mm 316 (12 minutes)*
  - *Multi-Tractor Trailer I-81 NB mm 127 (4 hours, 33 minutes)*
  - *Congestion I-81 NB mm 130 (1 hour, 37 minutes)*
  - *Accident I-81 NB mm 14 (36 minutes)*
  - *Accident I-66 E&W mm 24 (5 hours, 56 minutes)*
  - *Accident I-81 N&S mm 321 (3 hours, 15 minutes)*

- **No major weather warnings**

June 13th 2003

- **June Peak 511 Call Days Rank : 5*th of 7***
- **511 Call Volume: *503***
- **Max. 511 Ports Used: *6***
- **Day of the Week: *Friday***

- **VMS Posted: 2**
  – *Accident, posted on 1-77 NB mm 20.6,*
  – *Fog, posted on I-77 SB mm 11.3, I-77 SB mm 16.9*

- **511 Postings: 8**   **(elapsed time)**
  – *Congestion I-81 SB mm114 (4 hours, 20 minutes)*
  – *Fog Advisory/Fancy Gap (17 hours, 35 minutes)*
  – *Accident I-81 mm103 (3 hours, 27 minutes)*
  – *Accident Route 7 EB (51 minutes)*
  – *Tractor Trailer I-77 NB mm21 (2 hours, 47 minutes)*
  – *Tractor Trailer I-81SB mm168 (2 hours, 3 minutes)*
  – *Multi-Vehicle Accident Route 220 (1 hour, 16 minutes)*
  – *Accident I-81 SB mm 125 (45 minutes)*

- **No major weather warnings**
  – **(Severe Thunderstorm Warnings on the 12th and 14th, though)**

June 16th 2003

- **June Peak 511 *Web* Days Rank : *1 of 1***
- **511 Website Hits: *227***
- **Day of the Week: *Monday***

- **VMS Posted: 2**
  – *Fog, posted on I-77 SB mm 11.3, I-77 SB mm 16.9*

- **511 Postings: 6**   **(elapsed time)**
  – *Fog Advisory/Fancy Gap (7 hours, 50 minutes)*
  – *Fog Advisory/Fancy Gap (9 hours, 10 minutes)*
  – *Tractor Trailer I-64 WB mm 9 (7 hours, 19 minutes)*
  – *Accident I-81 SB mm 167 (35 minutes)*
  – *Accident I-77 NB mm 24 (12 minutes)*
  – *Multi-Vehicle Accident I-81 SB mm 92 (1 hour, 4 minutes)*

- **Weather**
  – **Flood Watch in Bristol**

June 20th 2003

- **June Peak 511 Call Days Rank :** *3rd of 7*
- **511 Call Volume: 868**
- **Max. 511 Ports Used:** *9*
- **Day of the Week:** *Wednesday*

- **VMS Posted: 1 Public Service Message, All Signs**

- **511 Postings:** *9*   **(elapsed time)**
  - *Tractor Trailer I-81 NB mm 149 (2 hours)*
  - *Accident I-81 NB mm128 (2 hours, 18 minutes)*
  - *Accident Route 220 NB (2 hours, 23 minutes)*
  - *Accident Route 220 (19 minutes)*
  - *Accident I-77 NB mm 4 (20 minutes)*
  - *Accident I-81 SB mm 299 (1 hour, 35 minutes)*
  - *Accident I-81 SB mm 196 (3 hours, 19 minutes)*
  - *Child Abduction Alert (Amber Alert) (14 hours, 27 minutes)*
  - *High Wind Advisory I-77 N/S (8 hours, 52 minutes)*

- **No Major Weather Warnings**

June 24th 2003

- **June Peak 511 Call Days Rank :** **1st** *of 7*
- **511 Call Volume: 1,255**
- **Max. 511 Ports Used:** *10*
- **Day of the Week:** *Tuesday*

- **VMS Posted: 4 (all Staunton District)**
  - *1 Accident posted on I-81 NB mm 230.0, mm 259.0*
  - *3 Construction posted on I-81 SB mm267.0, NB mm 179.0*
    (Included Dial 511 for more info)

- **511 Postings:** *1*   **(elapsed time)**
  - *Tractor Trailer Fire/Explosion I-81 NB mm 262 (7 hours, 58 minutes)*
    (Detour Required off of I-81, overlaps with the 25th)

- **No Major Weather Warnings**

June 25th 2003

- **June Peak 511 Call Days Rank : 2nd *of 7***
- **511 Call Volume: 1,001**
- **Max. 511 Ports Used: *8***
- **Day of the Week: *Wednesday***

- **VMS Posted: 3**
  - *3 Construction posted on I-81 NB mm 216.8 & mm230.0*
  (Included dial 511 for more info)
  Mowing with left and right lane closures caused delays, including stopped traffic.

- **511 Postings: *2***   **(elapsed time)**
  - **Tractor Trailer I-81 NB mm 262 (detoured req'd)**
  (6 hours, 44 minutes) – continued from June 24th
  - **Accident I-81 SB mm 280 (59 minutes)**

- **No Major Weather Warnings**

June 28th 2003

- **June Peak 511 Call Days Rank : *6th of 7***
- **511 Call Volume: *498***
- **Max. 511 Ports Used: *7***
- **Day of the Week: *Saturday***

- **VMS Posted: 2**
  - *Congestion General posted on I-77 NB mm 20.6, I-81 NB mm 287.0*
  - *Construction posted on I-81 NB mm 216.8 & mm230.0*
  (Lane Closures due to Tractor Trailer Accident with a fire)

- **511 Postings: *3***   **(elapsed time)**
  - **Tractor Trailer I-81 NB mm 292 (1 hours, 1 minute)**
  - **Accident I-81 SB mm 280 (1 hour, 5 minutes)**
  - **Congestion I-77 NB Exit 32 (3 hours, 39 minutes)**

- **No Major Weather Warnings**

Figure 75: Case Study: July 7, 2003

July 7th 2003

- **July Peak Web Day**
- **Web Hits:** 434
- **Day of the Week:** *Monday*
- **Peaks Higher than Average:** *8am – 3pm*

- **Peak Hours - Dispatcher Log**
  - 8:49am US 58 Disabled Vehicle – Hazard
  - 8:53am I-81 NB mm43 Vehicle Crash – Property Damage
  - 9:27am I-81 NB mm19 Vehicle Crash – Unknown injuries
  - 10:45am Fog on I-77

- **Relevant 511 Postings:** (Elapsed Time)
  - 4th of July Holiday Construction Notice
    (4 days)
  - 10:49am Fog Advisory I-77 NB & SB Fancy Gap to NC State Line. Use Caution.
    (2 hours, 25 minutes)

- **VMS Posted:**
  - *10:45am 1 frame:*
  Frame 1: HEAVY FOG AHEAD USE CAUTION

  - *12:38pm 2 frames:*
  Frame 1: MOWING 40 MILES AHEAD USE CAUTION
  Frame 2: MOWING RT SHOULDER CLOSED USE CAUTION

- **Weather Warnings**
  - *Severe Thunderstorm Warning Staunton & Salem Districts*

- **Special Events**
  - 4th of July Holiday (Day Off This Year)
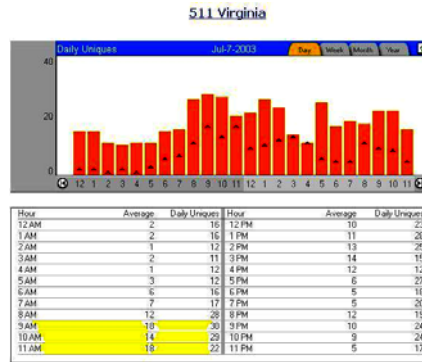
Ten Code- Dispatcher Log Daily Summary	Incidents
Vehicle Crash – Property Damage	13
Vehicle Crash – Unknown Injuries	4
Vehicle Crash- Injuries	2
None	2
Disabled Vehicle – Hazard	2
Vehicle Fire	1

Figure 76: Case Study: July 20, 2003

July 20th 2003

- **July Peak 511 Call Days Rank :** *2 of 2 peaks*
- **511 Call Volume for the day:** *766*
- **Max. 511 Ports Used:** *13 (Rank: 1 of 2 peaks)*
- **Day of the Week:** *Sunday*
- **Peak Hours:** *6pm -8pm*

Order posted: CADS, VMS, 511

- **Peak Hours – Dispatcher Log**
  - 5:45pm I-81 NB mm212 Tractor Trailer Accident
  - 8:01pm I-81 NB mm222 Accident

- **Relevant 511 Postings:** (Elapsed Time)
  - 5:56pm Tractor Trailer Accident: I-81 NB, at mm 212, about 8 miles south of Staunton. Expect Delays. *(1 hour, 56 minutes)*
  - 8:28pm Accident: I-81 NB, at mm 222, in Staunton. Expect Delays. *(1 hour, 21 minutes)*

- **VMS Posted:**
  - I-81 NB mm179.0
    5:55pm-7:51pm 2 frames:
    Frame 1: ACCIDENT 33 MILES AHEAD EXPECT DELAYS
    Frame 2: ACCIDENT 33 MILES AHEAD USE CAUTION

- **No Major Weather Warnings**

Ten Code- Dispatcher Log Daily Summary	Incidents
Vehicle Crash – Property Damage	10
Vehicle Crash – Unknown Injuries	10
Vehicle Crash- Injuries	2
Vehicle Fire	1
Traffic - Other	1
Disabled Vehicle – Other	1
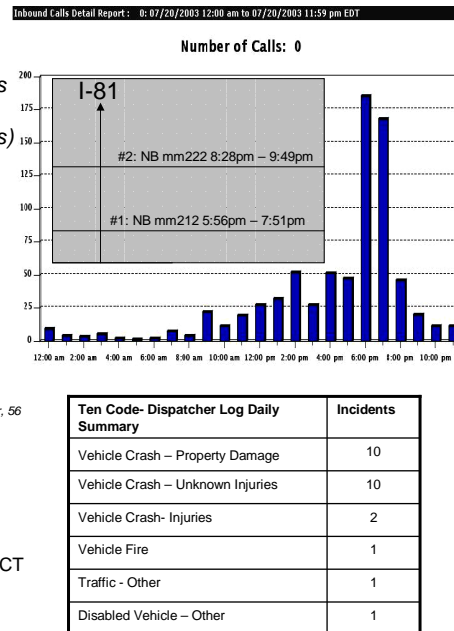
Figure 77: Case Study: July 31, 2003

July 31st 2003

- **July Peak 511 Call Days Rank :** *1 of 2 peaks*
- **511 Call Volume for the day:** *891*
- **Max. 511 Ports Used:** *9 (Rank: 2 of 2 peaks)*
- **Day of the Week:** *Thursday*
- **Peak Hours:** *3pm – 6pm*

- **Peak Hours – Dispatcher Log**
    - **5:25am** I-81 NB mm228 Accident with Injuries
    - **1:55pm** I-81 NB mm228 Accident with Injuries
    - **2:32pm** I-81 SB mm32 Accident with Property Damage
    - **3:39pm** US340 Accident with Unknown Injuries
    - **3:41pm** US340 Accident with Unknown injuries
    - **4:01pm** I-81 mm 138 Accident with Property Damage
    - **4:58pm** US220 Accident with Property Damage
    - **5:15pm** US220 South Accident with Unknown Injuries
    - **5:40pm** VA7 Accident with Property Damage

- **Relevant 511 Postings: (Elapsed Time)**
    - **7:10am – 6:19pm** Fog Advisory: I-77 in Fancy Gap area, near the NC state line. Use Caution. *(35 hours, 9 minutes)*
    - **2:04pm-5:22pm** Tractor Trailer Accident: I-81 NB at mm 228, about 3 miles north of Staunton. VDOT is reporting severe delays on I-81 and Route 11, North in Staunton. Expect severe delays. *(3 hours, 17 minutes)*
    - **3:10pm** Accident I-81 SB mm32, about 3 miles north of Glade Spring. Expect delays. *(32 minutes)*

- **VMS Posted:**
    - I-81 NB mm 216.8
    - **2:05pm – 3:55pm** 2 frames:
    Frame 1: ACCIDENT 12 MILES AHEAD LEFT LANE CLOSED
    Frame 2: ACCIDENT 12 MILES AHEAD EXPECT DELAYS
    3:55pm-5:21pm updated to read:
    Frame 1 : ACCIDENT 12 MILES AHEAD LEFT LANE CLOSED
    * Frame 2: SEVERE DELAYS ON I-81 AND RTE 11 DIAL 511 FOR INFO
    * Appears to have caused an increase in calls to 511

- **No Major Weather Warnings**

Ten Code- Dispatcher Log Daily Summary	Incidents
Vehicle Crash – Unknown Injuries	16
Vehicle Crash – Property Damage	15
Vehicle Crash- Injuries	7
None	2
Disabled Vehicle - Hazard	2
Traffic Control	1
Vehicle Fire	1
Traffic - Other	1
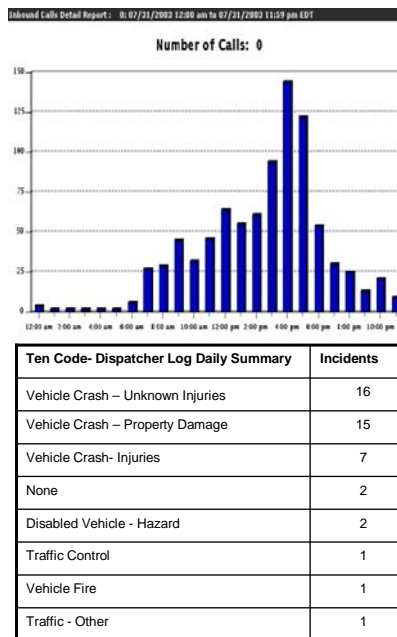
Figure 78: Case Study: August 3, 2003

August 3rd 2003

- **August Peak 511 Call Days Rank :** 1st
- **511 Call Volume for the day:** 999
- **Max. 511 Ports Used:** *11 (peaked at 4pm)*
- **Day of the Week:** *Sunday*
- **Peak Hours:** *4pm-5pm*

Order posted: CADS, VMS, 511

- **Peak Hours – Dispatcher Log**
    - **3:44pm** I-81 NB mm 49 Accident – multi-vehicle, with debris, both NB lanes of I-81 blocked – cars passing in the shoulder.
    - **3:52pm** I-81 NB mm 131 Accident- single vehicle flipped in center of road.

- **Relevant 511 Postings: (Elapsed Time)**
    - **3:53pm** Accident I-81 NB, at mm 131, about 9 miles south of Salem. Expect delays. *(48 minutes)*
    - **4:00pm** Accident: I-81 NB, at mm 49, about 2 miles north of Marion. Expect delays. *(2 hours)*

- **VMS Posted:**
    - I-81 NB mm179.0
    7:15pm-8:00pm 2 frames:
    Frame 1: HEAVY TRAFFIC REDUCE SPEED USE CAUTION

- **Weather:**
    - **Fog – Fancy Gap/I-77** (12:08pm – 5:25pm)
    - **Flood Watch (Bristol)**

Figure: August 3, 2003 511 Call Volumes by Hour

Ten Code- Dispatcher Log Daily Summary	Incidents
Vehicle Crash – Property Damage	10
Vehicle Crash – Unknown Injuries	21
Vehicle Crash- Injuries	4
None	2
Disabled Vehicle – Other	1
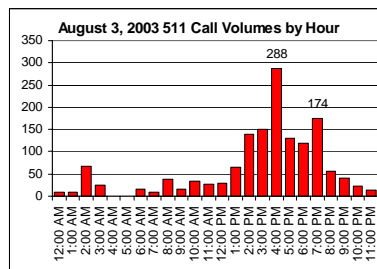
511 Virginia Evaluation

January 2004

Forecasting 511 Call Volumes

Appendix 1-D

Forecasting 511 Call Volumes without Historical Data

Table 1: Forecasting Call Volumes without Historical Data based on Traffic Volumes

	Total Daily Cars & Trucks Total	Total Transfers	Average Truck and Car Volumes Based on 2000 Traffic Counts			
Low Sum	417	8	**Trucks**		**Cars**	
High Sum	1670	33	*Low*	*High*	*Low*	*High*
Transfer Through	0.02		124	496	293	1173
Low Forecast	**% Transfers**	Daily Charges	Monthly Charges	Quarterly Charges	Annual	Two Years
Transfer	0.20	$ 1.67	$ 50.09	$ 150.27	$ 601.08	
Initial Call	0.25	$ 104.35	$ 3,130.61	$ 9,391.84	$ 37,567.36	
Low Totals		$ 106.02	$ 3,180.70	$ 9,542.11	$ 38,168.44	$ 76,336.87
High Forecast	**% Transfers**					
Transfer	0.20	$ 6.68	$ 200.36	$ 601.08	$ 2,404.31	
Initial Call	0.25	$ 417.42	$ 12,522.45	$ 37,567.36	$ 150,269.44	
High Totals		$ 424.09	$ 12,722.81	$ 38,168.44	$ 152,673.75	$ 305,347.49

Forecasted 2002 Annual Call Volume		**Actual**	Difference	
High	609,550	**112,331**	497,219	Over
Low	152,205		39,874	Over

Forecasting 511 Call Volumes with Historical Data Available

Formal Forecasting Method	Mean Average Deviation (MAD)
3 period Moving Average	4007.2
3 period Weighted Moving Average	3917.6
4 period Weighted Moving Average	9109.5
5 period Weighted Moving Average	9920.9
Exponential Smoothing	31878.1
Regression	1667.2

Also included are two regression types and a % change and percentage growth method.

Table 2: 3-period Moving Average Table

Forecast using Moving Averages								
OBJECTIVE:								
This is used to make forecasts based on a 3-period Moving Average technique.								
The 3-period moving average calculation is for a time series of 22 periods.								
By entering data in column B, error measurements, Tracking Signal, as well as the								
charts, are automatically generated.								
INPUT:								
				$(A_t - F_t)^2$	$|A_t - F_t|$			
	A_t	Ft	$A_t - F_t$	Error	Absolute			
Period	Actual	Forecast	Error	Squared	Deviation	RSFE	MAD(t)	TS(t)
1	1409							
2	6779							
3	6337							
4	5867	4094	2243	5031049	2243	2243	2243	1
5	8577	6328	2249	5059500	2249	4492	2246	2
6	6928	6102	826	682276	826	5318	1773	3
7	6998	5867	1131	1279161	1131	6449	1612	4
8	8552	7501	1051	1104601	1051	7500	1500	5
9	7052	7493	-441	194187	441	7060	1324	5
10	7883	7534	349	121801	349	7409	1184	6
11	8823	7829	994	988036	994	8403	1161	7
12	23322	7919	15403	237242140	15403	23805	2743	9
13	9948	13343	-3395	11523762	3395	20411	2808	7
14	24337	14031	10306	106213636	10306	30717	3490	9
15	16093	19202	-3109	9667954	3109	27607	3458	8
16	10598	16793	-6195	38373895	6195	21413	3669	6
17	10284	17009	-6725	45230108	6725	14687	3887	4
18	12827	12325	502	252004	502	15189	3661	4
19	12941	11236	1705	2905888	1705	16894	3539	5
20	14953	12017	2936	8618139	2936	19830	3503	6
21	12626	13574	-948	898072	948	18882	3361	6
22	12760	13507	-747	557511	747	18135	3224	6
23		13446	-13446	180803880	13446	4689	3735	1
24		12693	-12693	161112249	12693	-8004	4162	-2
25		12760	-12760	162817600	12760	-20764	4552	-5
			-20764	980677451	100153			
OUTPUT:								
a	Bias			-20764.0				
b	Mean Square Error			980677450.7				
c	Standard Error			31315.8				
d	Mean Absolute Deviation			4007.2				

3-period Moving Average

Figure 1: 3-period Moving Average Graph
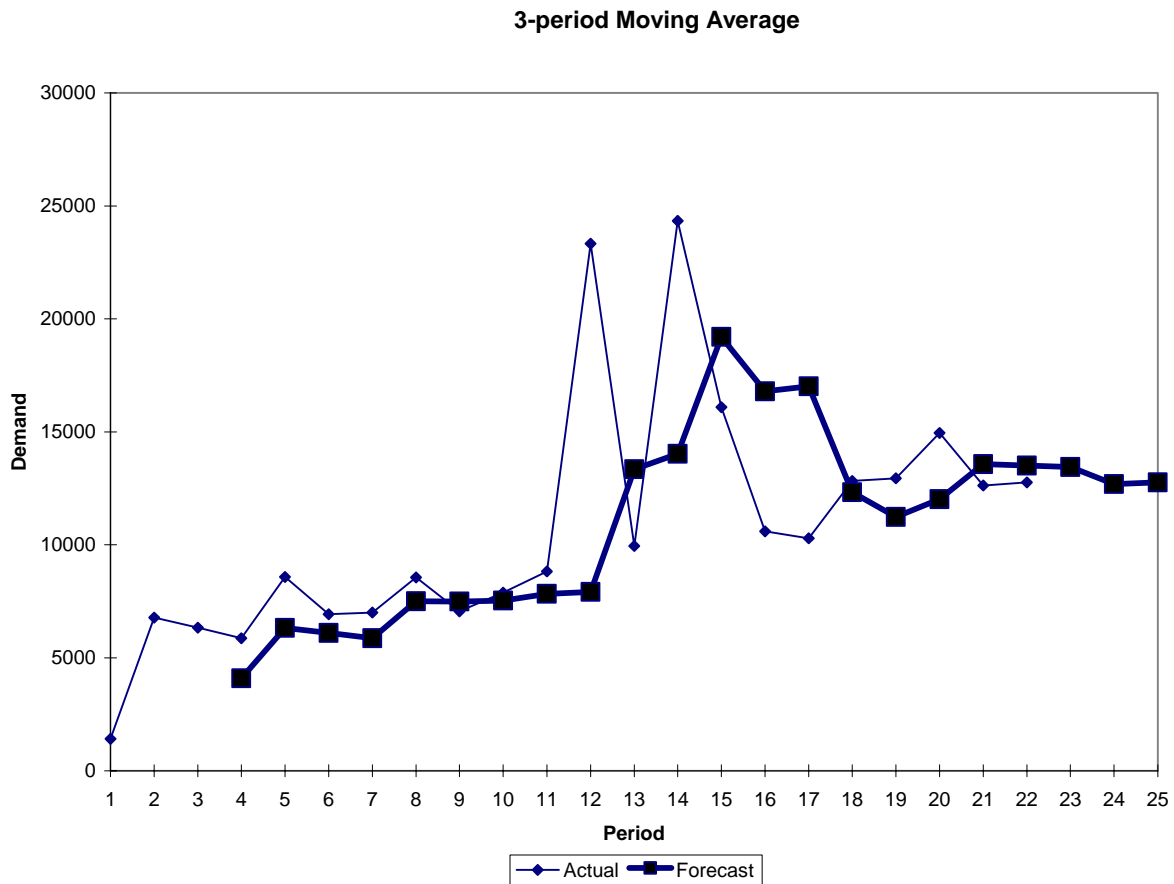
Table 3: 3 Period Weighted Average Table

Forecasting using Weighted Moving Averages

OBJECTIVE:
This template is used to make forecasts based on a 3-period Weighted Moving Average technique.
The 3-period Weighted Moving Average calculation is for a time series of 22 periods.

The weights: a_1, a_2, and a_3 are entered as required.
By entering data in column B, error measurements, Tracking Signal, as well as the
charts, are automatically generated. Using Excel's Solver, can help help to find the most perfect a
values to achieve the lowest MAD.

INPUT:

$a_1 =$ 0.00

$a_2 =$ 0.46

$a_3 =$ 0.48

$$(A_t - F_t)^2 \qquad |A_t - F_t|$$

Period	A_t Actual	Ft Forecast	A_t - F_t Error	Error Squared	Absolute Deviation	RSFE	MAD(t)	TS(t)
1	1409							
2	6779							
3	6337							
4	5867	6102	-235	55200	235	-235	235	-1
5	8577	5674	2903	8425106	2903	2668	1569	2
6	6928	6749	179	32136	179	2847	1106	3
7	6998	7200	-202	40918	202	2645	880	3
8	8552	6481	2071	4290751	2071	4716	1118	4
9	7075	7252	-177	31360	177	4539	961	5
10	7883	7258	625	390356	625	5164	913	6
11	8823	6968	1855	3439763	1855	7018	1031	7
12	23322	7784	15538	241421735	15538	22556	2643	9
13	9948	15105	-5157	26597227	5157	17399	2894	6
14	24337	15356	8981	80665960	8981	26380	3448	8
15	16093	16093	0	0	0	26380	3160	8
16	10598	18739	-8141	66276802	8141	18239	3543	5
17	10284	12362	-2078	4317567	2078	16161	3439	5
18	12827	9712	3115	9703644	3115	19276	3417	6
19	12941	10780	2161	4667911	2161	21437	3339	6
20	14953	11994	2959	8755932	2959	24396	3316	7
21	12626	13001	-375	140769	375	24021	3153	8
22	12760	12812	-52	2700	52	23969	2990	8
23		11814	-11814	139570531	11814	12155	3431	4
24		5810	-5810	33756352	5810	6345	3544	2
25		-6	6	39	6	6351	3383	2
			23968.89	459255836	74434			

OUTPUT:

a	Bias	5992.2
b	Mean Square Error	114813959.0
c	Standard Error	10715.1
d	Mean Absolute Deviation	3917.6

3-period Weighted Moving Average
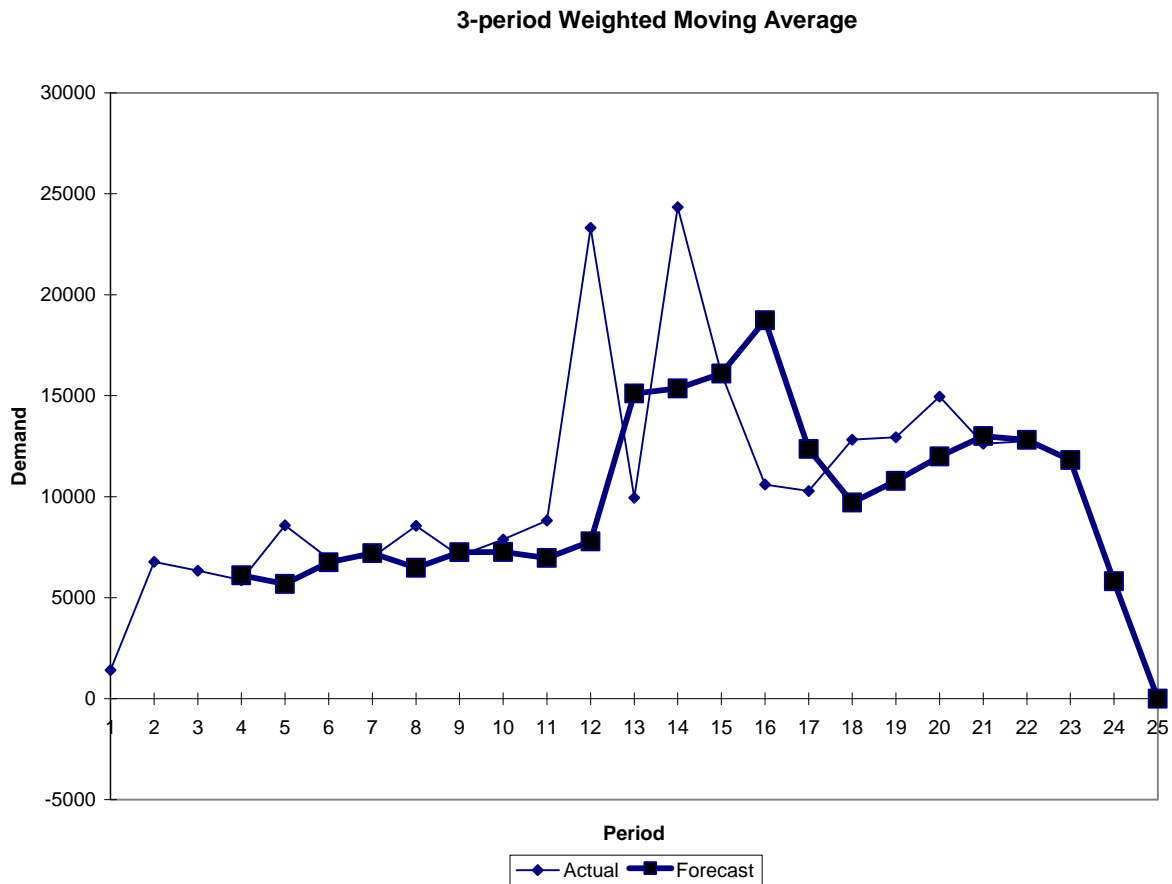
Table 4: 4-period Weighted Moving Average

Forecasting using Weighted Moving Averages							
OBJECTIVE:							
This template is used to make forecasts based on a 4-period Weighted Moving Average technique.							
The 4-period Weighted Moving Average calculation is for a time series of 22 periods.							
The weights: b_1, b_2, b_3 and b_4 are entered as required.							
By entering data in column B, error measurements, Tracking Signal, as well as the							
charts, are automatically generated. Using Excel's Solver, can help find the optimal b values to achieve the lowest value of MAD.							
INPUT:							
$b_1 =$	-0.08						
$b_2 =$	0.26						
$b_3 =$	0.76						
$b_4 =$	0.11						

| | A_t | F_t | $A_t - F_t$ | $(A_t - F_t)^2$ Error | $\lvert A_t - F_t \rvert$ | | | |
| | | | | | Absolute | | | |
Period	Actual	Forecast	Error	Squared	Deviation	RSFE	MAD(t)	TS(t)
1	1426							
2	7088							
3	6993							
4	6001							
5	7690	7690	0	0	0	0	0	-1
6	6496	6667	-171	29347	171	-171	86	-2
7	7818	7567	251	62980	251	80	141	1
8	8070	7319	750	563169	750	830	293	3
9	8149	7913	236	55523	236	1066	282	4
10	7888	8545	-658	432330	658	408	344	1
11	8306	8540	-234	54650	234	174	329	1
12	22917	8389	14528	211058066	14528	14702	2103	7
13	10222	10266	-43	1864	43	14659	1875	8
14	22752	20058	2694	7259312	2694	17353	1956	9
15	15489	15557	-68	4621	68	17285	1785	10
16	11788	19861	-8073	65178664	8073	9212	2309	4
17	11892	18138	-6246	39011934	6246	2966	2612	1
18	12903	12511	392	153976	392	3359	2453	1
19	11437	12307	-871	758359	871	2488	2348	1
20	13552	13222	330	108992	330	2818	2222	1
21	13370	12598	772	596574	772	3590	2136	2
22	13607	13727	-120	14374	120	3470	2024	2
23		14272	-14272	203697656	14272	-10802	2669	-4
24		12723	-12723	161862724	12723	-23524	3172	-7
25		2476	-2476	6132701	2476	-26001	3139	-8
26		-1044	1044	1089921	1044	-24957	3043	-8
			3470	325344738	36438			
OUTPUT:								
a	Bias			867.6				
b	Mean Square Error			81336184.5				
c	Standard Error			9018.7				
d	Mean Absolute Deviation			9109.5				

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4-per.Weighted Moving Average

Table 5: 5-period Weighted Moving Average

Forecasting using Weighted Moving Averages							
OBJECTIVE:							
This template is used to make forecasts based on a 5-period Weighted Moving Average technique.							
The 5-period Weighted Moving Average calculation is for a time series of 22 periods.							
The weights: c_1, c_2, c_3 c_4 and c_5 are entered as required.							
By entering data in column B, error measurements, Tracking Signal, as well as the							
charts, are automatically generated. Using Excel's solver can help determine the optimal values of c,							
to achieve the lowest value of MAD							
INPUT:							
$c_1 =$	0.08						
$c_2 =$	0.06						
$c_3 =$	0.25						
$c_4 =$	0.50						
$c_5 =$	0.13						
				$(A_t - F_t)^2$	$\lvert A_t - F_t \rvert$		

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Period	A$_t$ Actual	Ft Forecast	A$_t$ - F$_t$ Error	Error Squared	Absolute Deviation	RSFE	MAD(t)	TS(t)
1	1409							
2	6779							
3	6337							
4	5867							
5	8577							
6	6928	6098	830	688718	830	830	830	1
7	6998	7519	-521	271625	521	309	676	0
8	8552	7318	1234	1521523	1234	1542	862	2
9	7075	7266	-191	36369	191	1352	694	2
10	7883	7985	-102	10310	102	1250	575	2
11	8823	7612	1211	1466075	1211	2461	681	4
12	23322	7865	15457	238927371	15457	17918	2792	6
13	9948	10400	-452	204176	452	17466	2500	7
14	24337	16086	8251	68072828	8251	25717	3139	8
15	16093	14980	1113	1239695	1113	26830	2936	9
16	10598	18716	-8118	65905710	8118	18712	3407	5
17	10284	17842	-7558	57120998	7558	11154	3753	3
18	12827	12827	0	0	0	11154	3464	3
19	12941	12268	673	452731	673	11827	3265	4
20	14953	12486	2467	6088173	2467	14294	3212	4
21	12626	12975	-349	121849	349	13945	3033	5
22	12760	13838	-1078	1162864	1078	12867	2918	4
23		13406	-13406	179733333	13406	-539	3501	0
24		11412	-11412	130230007	11412	-11951	3917	-3
25		5118	-5118	26191481	5118	-17069	3977	-4
26		1768	-1768	3126946	1768	-18837	3872	-5
27		1010	-1010	1020443	1010	-19848	3742	-5
			12867	443291015	49605			
OUTPUT:								
a	Bias			2573.4				
b	Mean Square Error			88658203.0				
c	Standard Error			9415.8				
d	Mean Absolute Deviation			9920.9				

Figure 4: 5-period Moving Average Graph
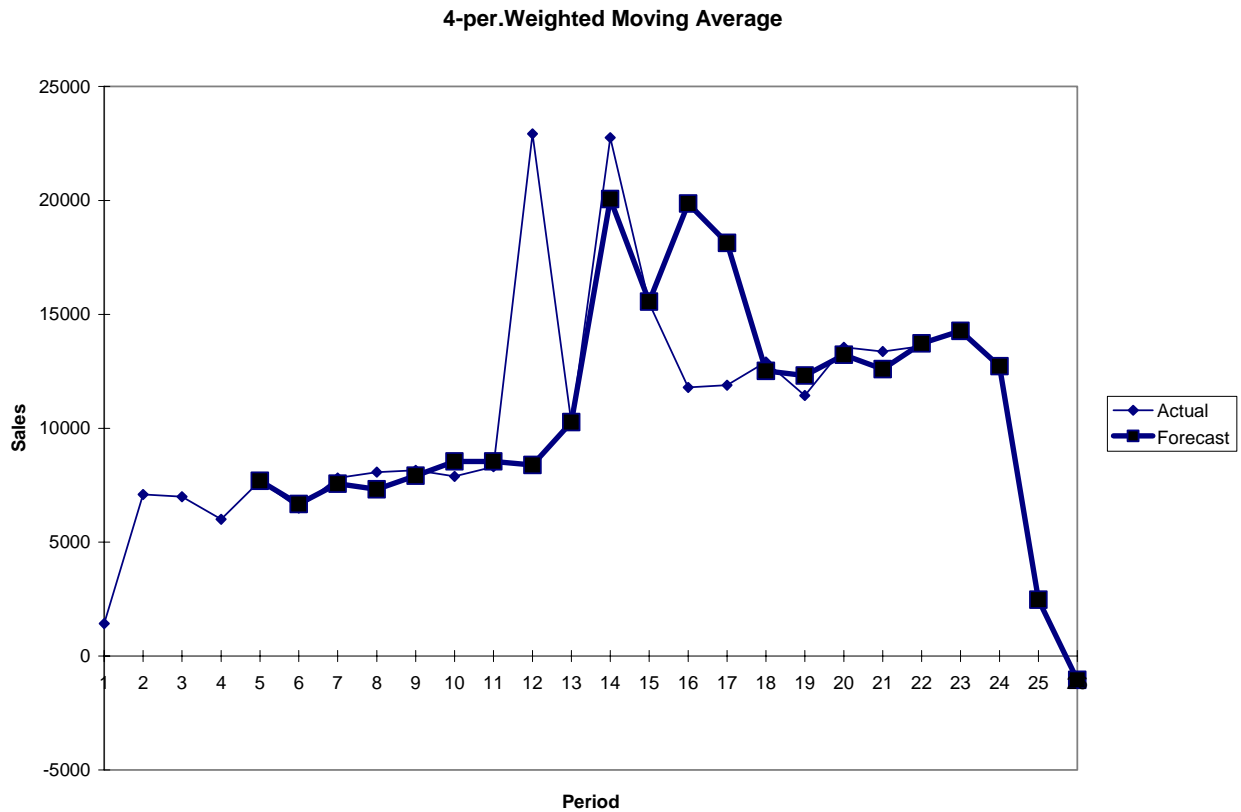
5-per. Weighted Moving Average
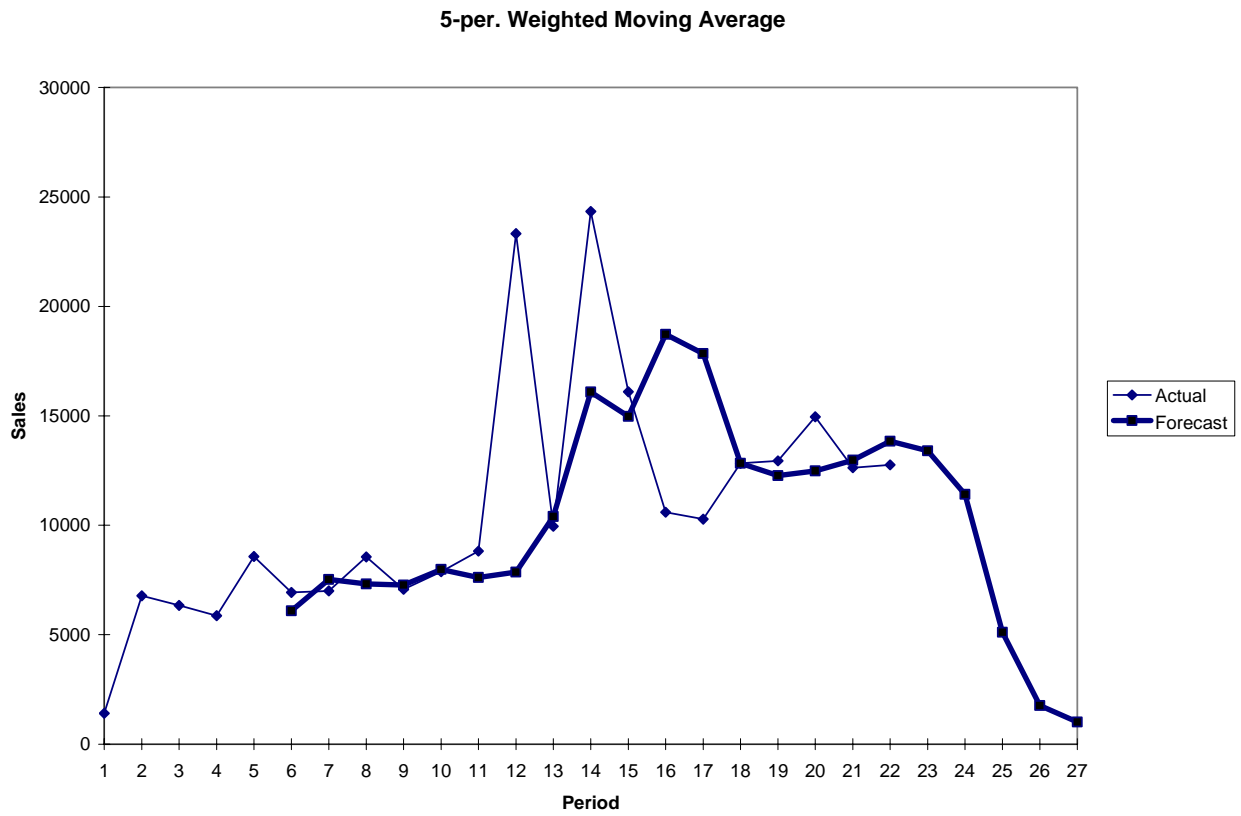
Table 6: Exponential Smoothing Table

Forecast using Exponential smoothing

OBJECTIVE:
This template is used to make forecasts based on the Exponential smoothing technique
for a time series of 22 periods. The value of the smoothing constant in entered in cell B15.
By entering data in column B, error measurements, Tracking Signal, as well as the
charts, are automatically generated.Use solver to obtain an optimum alpha.

INPUT:

alpha = 0.3

Period	A_t Actual	F_t Forecast	$A_t - F_t$ Error	$(A_t - F_t)^2$ Error Squared	$\|A_t - F_t\|$ Absolute Deviation	RSFE	MAD(t)	TS(t)
1	1409	1409	N/A	N/A	N/A	N/A	N/A	N/A
2	6779	1409	5370	28836900	5370	5370	5370	1
3	6337	3193	3144	9884820	3144	8514	4257	2
4	5867	4237	1630	2655367	1630	10144	3381	3
5	8577	4779	3798	14426155	3798	13942	3485	4
6	6928	6041	887	787429	887	14829	2966	5
7	6998	6335	663	439006	663	15492	2582	6
8	8552	6556	1996	3985847	1996	17488	2498	7
9	7075	7219	-144	20676	144	17344	2204	8
10	7883	7171	712	506912	712	18056	2038	9
11	8823	7408	1415	2003496	1415	19472	1976	10
12	23322	7878	15444	238523862	15444	34916	3200	11
13	9948	13009	-3061	9367028	3061	31855	3189	10
14	24337	11992	12345	152403946	12345	44201	3893	11
15	16093	16093	0	0	0	44201	3615	12
16	10598	16093	-5495	30195339	5495	38706	3740	10
17	10284	14268	-3984	15868318	3984	34722	3755	9
18	12827	12944	-117	13720	117	34605	3541	10
19	12941	12905	36	1280	36	34641	3347	10
20	14953	12917	2036	4144865	2036	36677	3278	11
21	12626	13593	-967	935974	967	35709	3162	11
22	12760	13272	-512	262200	512	35197	3036	12
23		13102	-13102	171660920	13102	22095	3494	6
24		8749	-8749	76550263	8749	13346	3722	4
25		5843	-5843	34136732	5843	7503	3810	2
			35197	515263142	63756			

OUTPUT:

a	Bias	17598.5
b	Mean Square Error	257631570.9
c	Standard Error	16050.9
d	Mean Absolute Deviation	31878.1

Exponential Smoothing
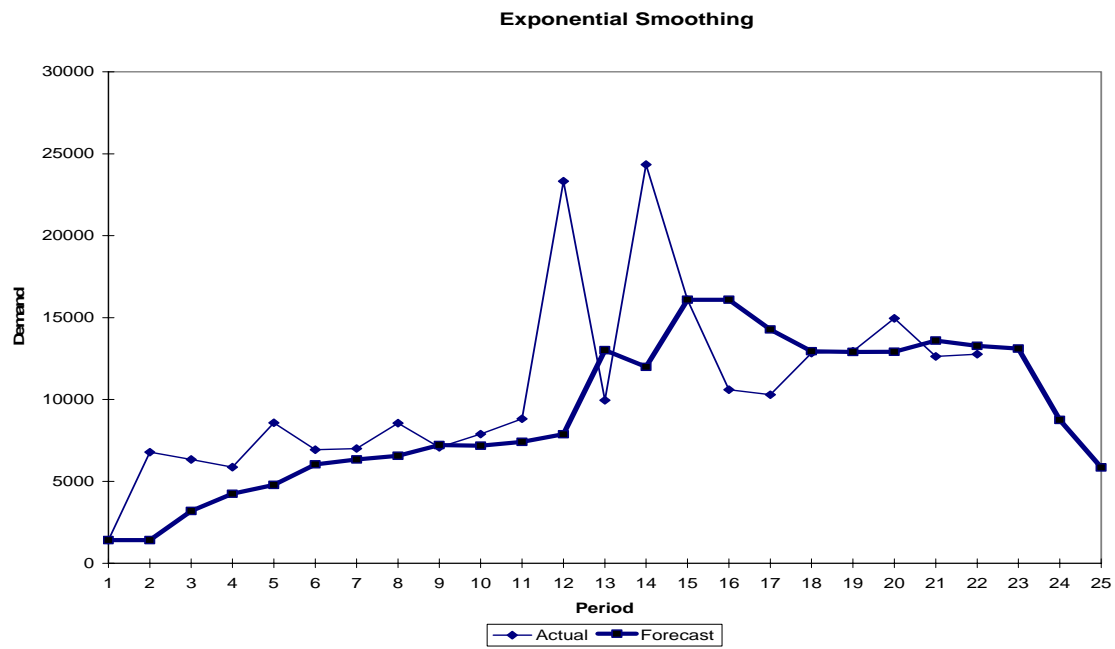
Table 7: Period-to-Period Regression Analysis Table (2002)

2002 Month	Formula		Forecast		Actual		Error	SQDEV	ABS	RSFE	MAD(t)	TS(t)
January	y=700+(1+-.1285)(708)		1317		1409		-92	8460	92	-92	92	-1
February	y=5627+(1+.6305)(617)		7267		6779		488	238420	488	396	290	1
March	y=5627+(1+-.11)(1006)		6527		6337		190	35988	190	586	257	2
April	y=5627+(1+.02)(859)		6501		5867		634	401772	634	1220	351	3
May	y=5627+(1+-.34)(825)		6174		8577		-2403	5774409	2403	-1183	761	-2
June	y=5627+(1+.10)(547)		6231		6928		-697	485809	697	-1880	751	-3
July	y=5627+(1+-.08)(604)		6184		6998		-814	662596	814	-2694	760	-4
August	y=5627+(1+.21)(557)		6300		8552		-2252	5071504	2252	-4946	946	-5
September	y=5627+(1+-.12)(673)		6219		7075		-856	732736	856	-5802	936	-6
October	y=5627+(1+.02)(592)		6233		7883		-1650	2722500	1650	-7452	1008	-7
November	y=5627+(1+.31)(606)		6418		8823		-2405	5784025	2405	-9857	1135	-9
December	y=5627+(1+-.08)(791)		6356		23322		-16966	287845156	16966	-26823	2454	-11
			12,774		98,550.00		(sum of past months)					
	(sum of future month forecasts)											
							Total Calls:	**98,550**				
							Average Duration:	1.88				
							Total Annual Minutes	**185,274**				

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Table 8: Period-to-Period Regression Analysis (2003)

2003 Month	Forecast	Actual	Error	SQDEV	ABS	RSFE	MAD(t)	TS(t)
January	6299	9948	-3649	13316225	3649.14	-3649	3649	-1
February	12406	24337	-11931	142348761	11931	-15580	7790	-2
March	11964	16093	-4129	17048641	4129	-19709	6570	-3
April	11494	10598	896	802816	896	-18813	5151	-4
May	14204	10284	3920	15366400	3920	-14893	4905	-3
June	12555	12827	-272	73984	272	-15165	4133	-4
July	12625	12941	-316	99856	316	-15481	3588	-4
August	14179	14953	-774	599076	774	-16255	3236	-5
September	12702	12626	76	5776	76	-16179	2885	-6
October	13510	12760	750	562500	750	-15429	2671	-6
November	14450		14450	208802500	14450	-979	3742	0
December	28949		28949	838044601	28949	27970	5843	5
	43,399	137,367						
				Total Calls:		180,766		
				Average Duration:		1.88		
				Total Annual Minutes		339,840		

Table 9: 3-period/Month Specific Regression Table

Time Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3-period Monthly Regression Analysis at a 95% Confidence Interval												
0										25	507	708
1	617	1006	859	825	547	604	557	673	592	606	791	729
2	1409	6779	6337	5867	8577	6928	6998	8552	7075	7883	8823	23322
3	9948	24337	16093	10598	10284	12827	12941	14953	12626	12760		
4												
Lower 4	13321	34037	-73664	8507	-126661	9404	7963	-11059	-2262	-6941	-134517	-479154
Upper 4	13775	20957	119658	22563	159073	28611	30466	55734	39855	40318	166212	540888

	Lower Confidence Interval		
2004	Limit	(761,026)	Or "0"
2004	Upper Confidence Interval Limit	1,238,110	

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Table 10: 2005 Forecasts Based on % Increase and a Conservative Growth Rate

Forecast Based on Percentage Increase from 2002 to 2003												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2002	1409	6779	6337	5867	8577	6928	6998	8552	7075	7883	8823	23322
2003	9948	24337	16093	10598	10284	12827	12941	14953	12626	12760	19340	Not Avail
% Increase from 2002	N/A	259%	154%	81%	20%	85%	85%	75%	78%	62%	119%	N/A
F2004	9948	63034	24776	8546	2047	10922	10990	11192	9906	7894	23053	23322
205,630	**Total Expected Calls in 2004**											
Forecast Based on Conservative Growth Rate												
2003*Growth Rate	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Forecast for 2004	10943	26771	17702	11658	11312	14110	14235	16448	13889	14036	21274	25654
198,032	**Total Expected Calls in 2004**											

* Growth Rate is based on the adoption rate increases for 2 six month periods (1st year & 1st 18 months)

511 Virginia Evaluation

January 2004

**In-Depth Case Study
Appendix 1-E**

Figure 1: CMS's Effect on 511 Call Volumes Based on an August 9, 2002 Case Study
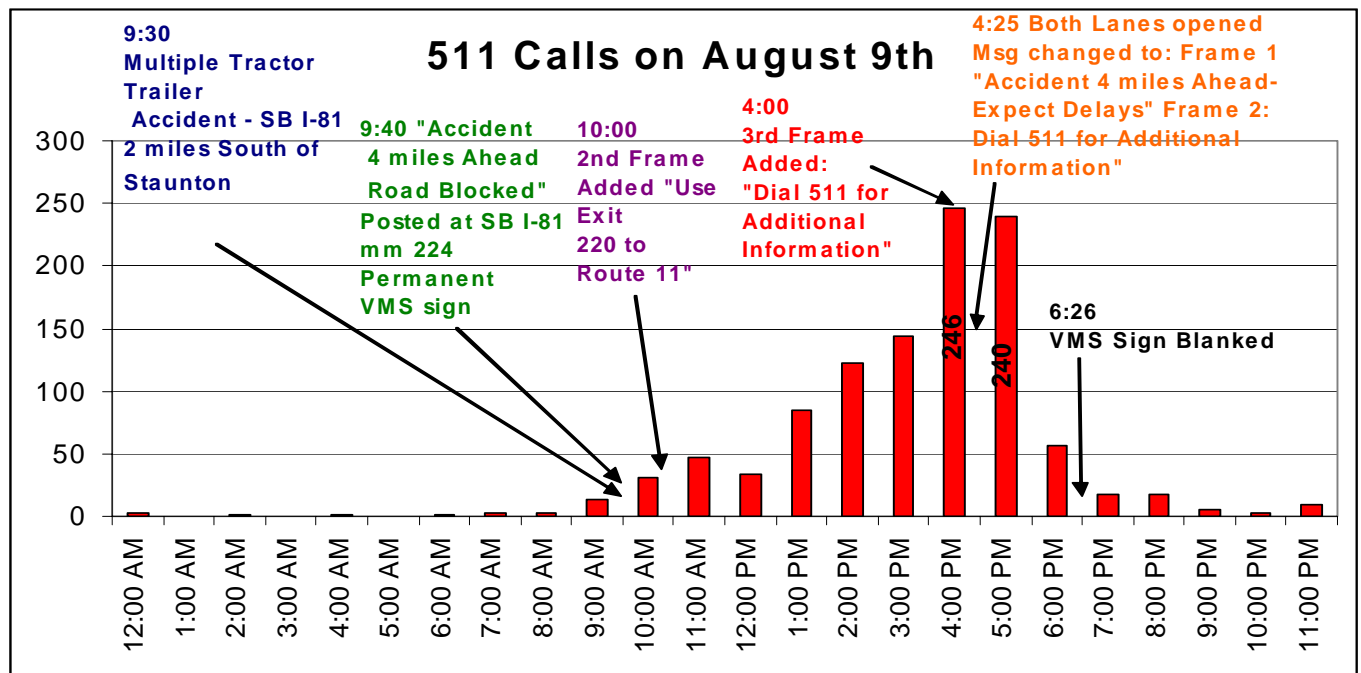
In-Depth Case Study

Accident: August 9, 2002

Location: Southbound I-81 Staunton, Virginia
Mile Marker: 220
Type: Multiple (3) Tractor Trailer Accident
VMS Sign Utilized: I-81 southbound mile marker 224. I-64 may also have posted
                              VMS signs about the accident.
Reported by: Appomattox Virginia State Police

Final Phone System Message:

Multi Tractor Trailer Accident: I-81 southbound, just south of mile marker 220, about 2 miles south of Staunton. Detour suggested at exit 227 or 225 to Route 11. Expect lengthy delays.

Timeline of Information at VTTI

9:28 am   Accident entered into CADS (Incident # 302078357)

9:30 am   Accident information entered into Clearinghouse

9:44 am   VMS sign posted, "Accident 2 miles ahead. Expect Delays."

9:46 am   VMS sign changed, "Accident 4 miles ahead. Detour in place." Second
            Frame: "Use Exit 220 to Route 11"

9:53 am   VMS sign changed (minor word/spelling)

9:54 am   VMS sign changed (minor wording/spelling)

9:56 am   VMS sign changed (minor wording)

10:02am   Matt Shyley called to request that it be changed to indicate all lanes are
            blocked. "All Lanes Blocked" did not fit on one line, so changed to say,
            "Road Blocked" instead.

10:08 am   Message read, "Accident 4 miles Ahead. Road Blocked." Second Frame:
            "Use Exit 220 to Route 11"

4:04 pm   3rd Frame added, "Dial 511 for additional information"

4:30 pm   Both lanes opened. VMS sign changed. Frame 1: "Accident 4 miles ahead. Expect
            Delays." Second frame: "Dial 511 for additional information."

4:50 pm   VMS sign changed to read, "Congested Area Ahead. Expect Delays."
            Second Frame: "Dial 511 For Additional Information"

6:26 pm   LT Marshall of the Appomattox VSP called to authorize the blanking of
            the message on VMS SB I-81 mm 224. VMS sign was blanked at
            6:28pm.

Dispatchers received calls from the State Police and VDOT regarding the incident. Dean
Gustafson, Staunton ITS Program Manager, personally drove around to get a visual on the incident
that day, and probably has more detailed information about what occurred, and specifically what was
posted on portable VMS signs, if they were used. Also, we believe he may have been the one to
request 511 be posted on the permanent VMS sign at mile marker 224.

What did the Callers Experience?

Currently, there is no historical data kept on voice files for 511. The voice file for any particular incident is written over when a new entry is recorded. This ensures that only the most recent and up-to-date information is available to callers. However, this also means there is no historical record of the actual voice files heard by callers.

The best we can do to understand what they heard when they called is to look at the documentation maintained by the dispatchers, and refer to the final entry for the incident, which is historically maintained. (See: Final Phone System Message above)

Basic Summary of VDOT's Policy on Number of Frames Used in VMS

1st Frame: Usual Method for displaying information

2nd Frame: Used if serious conditions warrant it

3rd Frame: Generally not used, since it can be dangerous for drivers to attempt to read

Was the information on 511 better than what was available on VMS?

On this occasion it was. The VMS sign was physically located at mile marker 224. The accident was at mile marker 220. The exit recommended by VMS was Exit 220, which was available at mile marker 224. The exit recommended on 511 recommended using Exits 227 or 225. However, the recommendation to call 511 was located on the VMS sign – at mile marker 224, which was too late for using exits 227 or 225, and which led to using the same exit as the VMS sign recommended (Exit 220). However, if callers were prompted to call by the blue 511 static signs, and those signs are located far enough upstream from the accident, users could have been alerted early enough to use the earlier exits, and consequently, have a better driving experience.

Should "Dial 511 for additional information" have been posted earlier?

The timing after the accident appears to be less important than the geographic location of the permanent VMS signs. If the location where the VMS sign does not support the timelier exit information on 511, the post-accident timing of the message is irrelevant.

Unresolved Issues and Raised Questions

Everyone who works with 511 and VMS signs could benefit from having a better geographic understanding of where the triggers for information available to drivers are located on the road (i.e. portable VMS, static signs for HAR and 511, permanent VMS signs, etc.).

Who (at VDOT?) has the responsibility or authority to authorize putting up "Dial 511 for Additional information" on VMS?

What are the locations of the static 511 signs on I-81? And, can we get this information into the hands of decision makers for posting signs?

Locations of Static 511 Signs around the Accident

On I-81:

???

On I-64:

West bound just west of Exit 91 (near Fisherville)

511 Virginia Evaluation

January 2004

511 Virginia-Covered Counties:
Pertinent Census Data
Appendix 1-F

511 Virginia Covered-County	Mean Travel Time to Work	Median Household Income	Population > 16 < 85
Allegheny	24.6	$38,545	13,336
Augusta	23.7	$43,045	52,752
Bath	24.4	$35,013	4,065
Bedford	27.8	$43,136	48,528
Bland	33.4	$30,397	5,654
Botetourt	26.7	$48,731	24,812
Buchanan	33.4	$22,213	21,168
Carroll	26.5	$30,597	23,299
Clarke	32.4	$51,601	10,427
Craig	34.7	$37,314	3,996
Dickenson	35.8	$23,431	13,027
Floyd	33.6	$31,585	11,222
Franklin	29.1	$38,056	38,381
Frederick	27.3	$46,941	47,926
Giles	28.2	$34,927	13,419
Grayson	29	$28,676	13,244
Henry	22.5	$31,816	45,418
Highland	32	$29,732	1,959
Lee	29.5	$22,972	18,429
Montgomery	19.2	$32,330	72,078
Page	32.5	$33,359	18,263
Patrick	27.9	$28,705	15,396
Pulaski	21.3	$33,873	28,069
Rappahannock	38.7	$45,943	5,789
Roanoke	20.7	$47,689	67,725
Rockbridge	25.1	$36,035	16,573
Rockingham	22.8	$40,748	52,867
Russell	31.2	$26,834	23,168
Scott	30.6	$27,339	18,538
Shenandoah	27.1	$39,173	28,483
Smyth	22.5	$30,083	26,081
Tazewell	26.6	$27,304	35,348
Warren	39.1	$42,422	25,077
Washington	24.2	$32,742	41,306
Wise	23.6	$26,149	33,322
Wythe	24.2	$32,235	22,005
Bedford City	20.0	$28,792	4,789
Bristol City	18.0	$27,389	13,494
Harrisonburg City	14.8	$29,949	34,783

511 Virginia Covered-County	Mean Travel Time to Work	Median Household Income	Population > 16 < 85
Lexington City	10.5	$28,982	6,057
Martinsville City	18.1	$27,441	11,727
Radford City	16.1	$24,654	13,742
Roanoke City	20.7	$47,689	71,520
Salem City	17.0	$38,997	19,932
Staunton City	19.9	$32,941	18,873
TOTAL	1,167	$1,538,525	1,136,067
Median	26.5	$32,330	19,932

511 Virginia Evaluation

January 2004

Phone Survey Correlations
Appendix 1-G

Phone Survey Safety Question

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31.153[a]	8	.000
Likelihood Ratio	31.296	8	.000
Linear-by-Linear Association	16.369	1	.000
N of Valid Cases	400		

a. 3 cells (20.0%) have expected count less than 5. The minimum expected count is 1.43.

Traveler Type
1 = Resident
2 = Tourist
3 = CVO

Group Statistics

	TravellerType	N	Mean	Std. Deviation	Std. Error Mean
safe_likert	1	227	3.36	1.231	.082
	2	154	3.89	1.208	.097

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	
safe_likert	Equal variances assumed	2.449	.118	-4.143	379	.000	-.53	.128	-.779	-.278	
	Equal variances not assumed			-4.159	332.758	.000	-.53	.127	-.778	-.278	

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TravellerType	400	1	3	1.48	.588
safe_likert	400	1	5	3.59	1.247
Valid N (listwise)	400				

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
TravellerType * safe_likert	400	99.8%	1	.2%	401	100.0%

TravellerType * safe_likert Crosstabulation

Count

		safe_likert						Traveler Type
		1	2	3	4	5	Total	**1 = Resident**
TravellerType	1	21	45	29	95	37	22	**2 = Tourist**
	2	8	18	19	47	62	15	**3 = CVO**
	3	1	2	2	6	8	1	
Total		30	65	50	148	107	400	

	Not Safe at All	Somewhat Not Safe	Neutral	Somewhat Safe	Very Safe		Mean	
	1	2	3	4	5			
	21	90	87	380	185		3.4	**Neutral - Somewhat Safe**
Resident	21	45	29	95	37	227		
	8	36	57	188	310		3.9	**Somewhat Safe**
Tourist	8	18	19	47	62	154		
	1	4	6	24	40		3.9	**Somewhat Safe**
CVO	1	2	2	6	8	19		
						400		

Figure 1: How Safe Drivers Feel in the I-81 Region by Traveler Type
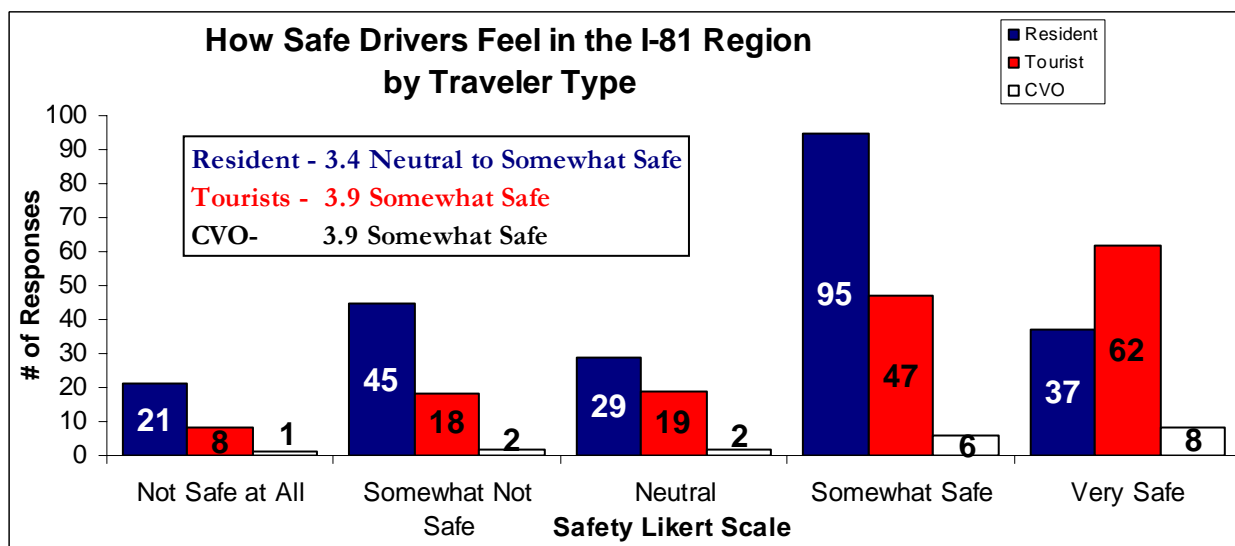
Phone Survey Usefulness Question

Frequencies

useful_likert

	Observed N	Expected N	Residual
0	5	66.7	-61.7
1	12	66.7	-54.7
2	10	66.7	-56.7
3	15	66.7	-51.7
4	95	66.7	28.3
5	263	66.7	196.3
Total	400		

Useful Question Coding
0 = Don't Know/Refused
1 = Not Useful at All
2 = Not Very Useful
3 = Neutral
4 = Somewhat Useful

Chi Square Tests by Traveler Type

TravellerType

	Observed N	Expected N	Residual
1	227	133.3	93.7
2	154	133.3	20.7
3	19	133.3	-114.3
Total	400		

Traveler Type Coding
1 = Resident
2 = Tourist
3 = CVO

Test Statistics

	useful_likert	TravellerType
Chi-Square[a,b]	780.320	167.045
df	5	2
Asymp. Sig.	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 66.7.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 133.3.

Cross Tabulations

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
TravellerType * useful_likert	400	99.8%	1	.2%	401	100.0%

366

TravellerType * useful_likert Crosstabulation

Count

		useful_likert						Total
		0	1	2	3	4	5	
TravellerType	1	4	5	4	5	49	160	227
	2	1	7	6	9	40	91	154
	3				1	6	12	19
Total		5	12	10	15	95	263	400

Figure 2: 511 Usefulness by Traveler Type
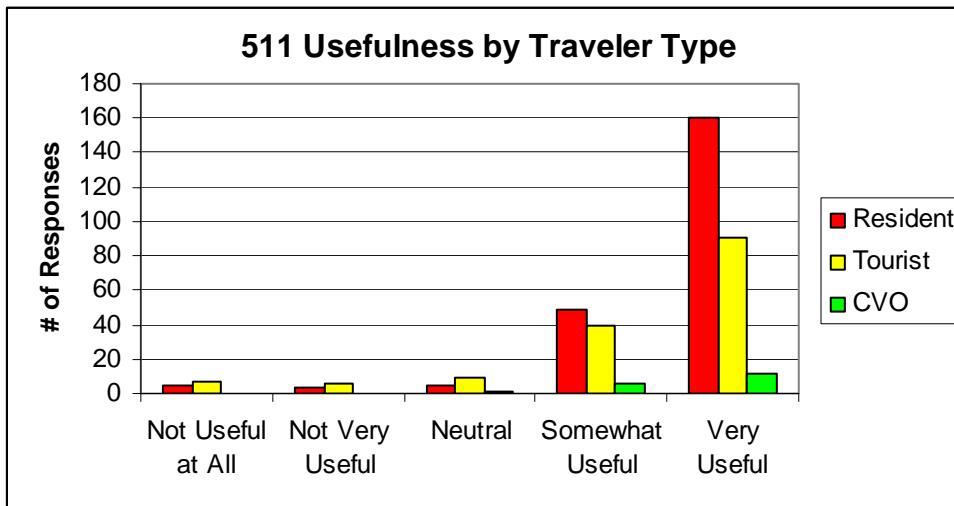
Traveler Type Means
Resident = 4.5
Tourist = 4.3
CVO = 4.6
Mean = 4.5

Chi Square Tests by Gender

GENDER

	Observed N	Expected N	Residual
1	176	200.0	-24.0
2	224	200.0	24.0
Total	400		

Gender Coding
1 = Female
2 = Male

Test Statistics

	useful_likert	GENDER
Chi-Square[a,b]	780.320	5.760
df	5	1
Asymp. Sig.	.000	.016

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 66.7.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 200.0.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
GENDER * useful_likert	400	99.8%	1	.2%	401	100.0%

GENDER * useful_likert Crosstabulation

Count

		useful_likert						Total
		0	1	2	3	4	5	
GENDER	1	3	5	5	5	35	123	176
	2	2	7	5	10	60	140	224
Total		5	12	10	15	95	263	400

Figure 3: 511 Usefulness by Gender
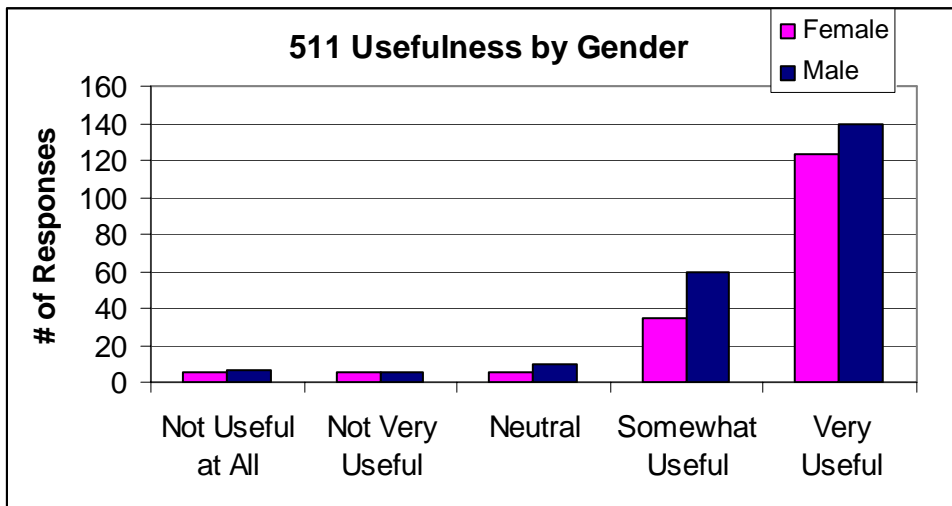
Gender Means
Female = 4.5
Male = 4.4
Mean = 4.4

Chi Square Test by Age

AGE

	Observed N	Expected N	Residual
1	110	66.7	43.3
2	77	66.7	10.3
3	99	66.7	32.3
4	83	66.7	16.3
5	25	66.7	-41.7
6	6	66.7	-60.7
Total	400		

Age Coding
1 = 18 to 29 years old
2 = 30 to 39 years old
3 = 40 to 49 years old
4 = 50 to 59 years old
5 = 60 to 69 years old
6 = 70 years old or older

Test Statistics

	useful_likert	AGE
Chi-Square[a]	780.320	130.700
df	5	5
Asymp. Sig.	.000	.000

a. 0 cells (.0%) have expected frequencies less than
5. The minimum expected cell frequency is 66.7.

Cross Tabulations

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
AGE * useful_likert	400	99.8%	1	.2%	401	100.0%

AGE * useful_likert Crosstabulation

Count

		useful_likert						Total
		0	1	2	3	4	5	
AGE	1	1	1	2	2	31	73	110
	2	1	1	2	4	19	50	77
	3	2	3	2	5	24	63	99
	4	1	2	4	3	17	56	83
	5		3		1	4	17	25
	6		2				4	6
Total		5	12	10	15	95	263	400

Age	1	2	3	4	5		
	Not Useful at All	Not Very Useful	Neutral	Somewhat Useful	Very Useful	Total	Mean
18-29	1	2	2	31	73	110	**4.5**
30-39	1	2	4	19	50	77	**4.5**
40-49	3	2	5	24	63	99	**4.4**
50-59	2	4	3	17	56	83	**4.4**
60-69	3		1	4	17	25	**4.3**
70 or older	2				4	6	**3.7**
Total	**12**	**10**	**15**	**95**	**263**	**400**	**4.3**

Figure 4: Usefulness of Phone Service by Age
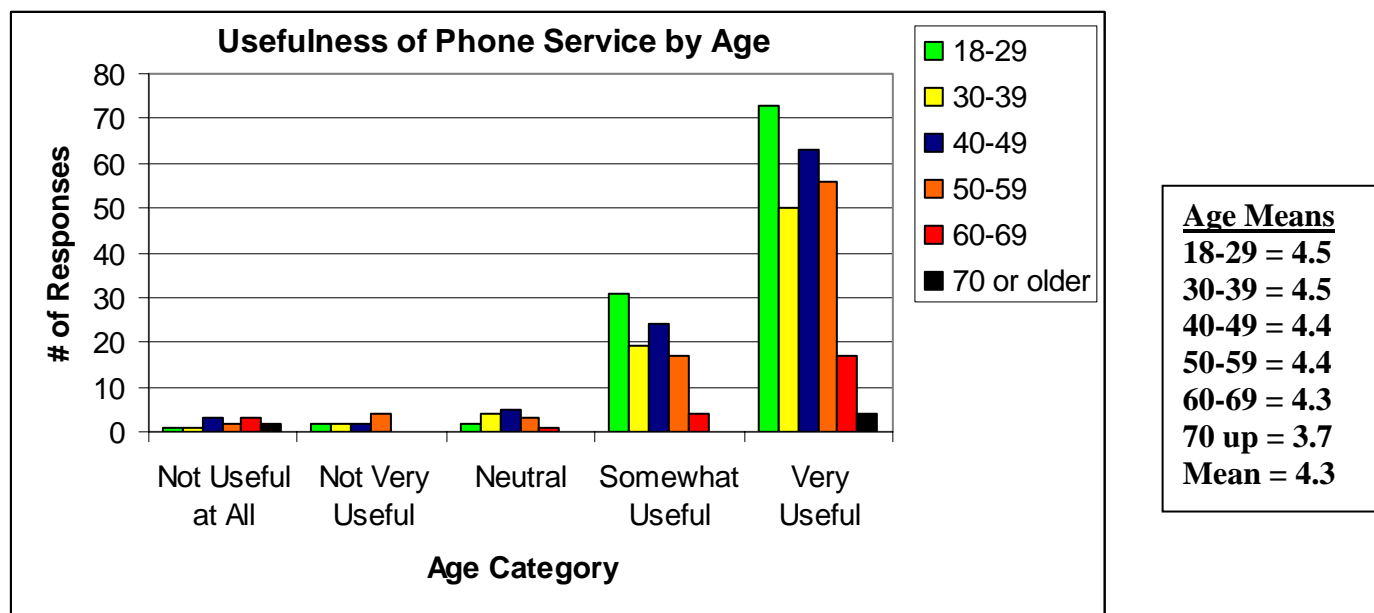
511 Virginia Evaluation

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Useful Responses
Appendix 1-H

Needs Usage #11

<div style="background-color: yellow;">

Useful Information (Accurate, Accessible, Specific, Timely): 50

</div>

- Accurate information it seems.
- Accurate.
- All of it.
- Better information Great.
- Cause it is pretty timely and pretty accurate as far as how long backups are and where they are located.
- Currency, timeliness of it. I hope it is up to date.
- Current and helps plan routing (alternate. to Route 11).
- Easy and up to date. A sign can't change as quick as 511.
- Fairly easy to use, straight forward. The information is serious.
- Gave me what I wanted accurate complete options are great.
- Getting me information that I would not have access to otherwise. Pretty accurate.
- Had potential to be useful, just curious really.
- I appreciated knowing what the conditions were like up ahead on our trip as well as what the traffic was like. Gave peace of mind. Excellent how it was set up. Instructions were clear and concise, easy to follow. Likes being able to go back the main menu. Well set up, accurate.
- I can call it whenever to find out.
- I can check construction told exactly where it was and any delays or whatnot -- very specific.
- I hear about the information that I want.
- I think it is well updated. I like it while I am driving.
- Information - safety – timeliness.
- Informative, rainy foggy day - Afton Mountain in particular - didn't actually find any about Afton! But, still happy with it.
- Instant information, I know what I am coming up against. If I know I am going to run into construction I can go around it on Rt. 11.
- It can be very useful. Preparing you and helping you be aware especially with weather. It helps you know what to do and how to react. The information that most people need is on the service.
- It is a handy way to get information with a cell phone. It is interactive.
- It is instant access. Timely. Easy to use. Good for out of state travelers.
- It is nice to get it right there in the car. It is very convenient.
- It is up to date almost by the minute, timely in updates, explicit about mile marker it is at. Also tells if East Bound or west bound and tells you how to avoid.
- It is up to date it is very current.
- It is very specific as far as if there is an accident or if certain sections of the road are bad it is very specific.
- It was specific and up to date.
- It was useful because I was able to find what I was looking for specifically and where it was. Connected through to the hotel. The information was not vague. Got more than she expected.
- It will put him on a different route. Time sensitive information.
- Just that it is there I reckon.

- Just the idea that it gives me the information that I need in a prompt fashion.
- Knowing that it is there. If you did not know what exit to take you can call, or if there is something dramatic with the weather you can call.
- Never had a problem, accurate.
- Quickly updated and changed. Seems to be very accurate.
- Tells you specifically where things are and what is happening the information is very updated you can tell if it going to affect you when you are traveling.
- The accuracy.
- The first time: the data was new, able to advise on fog the advice was timely.
- The information it provides.
- The information provided good to know.
- The timeliness to know now what the conditions are.
- Timeliness when up to date.
- Useful because she can get information soon and take an alternative route. Can call home and tell husband to start supper.
- Useful information. Like construction information.
- Useful once got to where wanted to be.
- VDOT does a lot to help travelers out, gives useful information, makes feel safe. HAR is a good system.
- Well it told me what I needed to know.
- When I was in New York there was a shadow traffic number could talk to a live person this is the closest thing he has found here in Virginia.
- When it has been current.
- When you are in traffic you don't know what is going on, it gives information to help calm you down.

Quality Information (Breadth, Concise, etc.): 10

- A lot of other options, back roads you can take if needed
- Comprehensive, mile locations of events, alt route choices
- Don't have in MI, there was so much information. Very handy because they were unfamiliar with the territory. Impressed with the range of services offered.
- Gave me what I wanted accurate complete options are great
- It can be very useful. Preparing you and helping you be aware especially with weather. It helps you know what to do and how to react. The information that most people need is on the service.
- It gave a lot of other options.
- It gives you the facts, not a lot of fluff.
- More options than what he needed. Got more than he expected. Nice to have the data at your finger tips. Get information by exit numbers for lodging and tourism information.
- Precise information, to the point, get many options to increase your information. Plain and simple voice activation.
- Type of information being given, straight forward.

Connecting to businesses and services: 6

- Being able to access a hotel, get directions, make a reservation. Felt safer being able to know about alerts for weather or traffic.
- Being able to connect directly with a hotel, being able to book the room right there, cut down on cost.
- I liked getting the phone number that I needed and the directions.
- It was useful because I was able to find what I was looking for specifically and where it was. Connected through to the hotel. The information was not vague. Got more than she expected.
- Saved a whole lot of long distance phone calls. Liked the connections.
- The type of different categories of restaurants and the fact that you can call directly.

Easy and Convenient to Use: 44

- Be able to call from cell phone determine if need to take another route.
- Convenience.
- Convenient access when you wanted it, like being in the internet
- Ease of access.
- Ease of use.
- Ease of use. Easy to find out the information you wanted to get. Don't have to listen to everything at once. Can select specific routes not everything at once.
- Ease of use. Loves VMS.
- Easy and up to date. A sign can't change as quick as 511
- Easy to access
- Easy to use, being able to get mile marker information, the fact that its voice activated, very helpful
- Fairly easy access, voice response helps, safer no hands.
- Fairly easy to use, straight forward. The information is serious.
- Finding construction areas and times that they were going to be doing the work. Likes that weather is given as of a certain time. Very easy to use.
- Flexibility and finding out the information needed. On the spot travel arrangement.
- Helps me to get home at the regular time instead of later. easy to access. get what I need.
- I appreciated knowing what the conditions were like up ahead on our trip as well as what the traffic was like. Gave peace of mind. Excellent how it was set up. Instructions were clear and concise, easy to follow. Likes being able to go back the main menu. Well set up, accurate.
- I can find out what the weather is if there are delays, constructions, everything. every state should have it. You can get it no matter where you are at.
- I like that you don't have to listen to everything about an accident you have the option to get more information. Very useful it has helped to reroute on the way to work.
- I liked the idea of the service, being able to all while on the road.
- It is a handy way to get information with a cell phone. It is interactive.
- It is automated. You can specifically say what you want, don't have to talk to anybody. Easy to remember. It is convenient, don't have to be on line.
- It is easy to use. It works for me the way it is.

- It is great because when I call I can find out if there is any delays, accidents, construction, the weather, can find a restaurant. I can get access to everything I need. It is a really awesome service
- It is instant access. Timely. Easy to use. Good for out of state travelers.
- It is nice to get it right there in the car. It is very convenient.
- It is pretty easy, the menu comes up and the automatic voice tells you. Likes to find where the restaurants are.
- It was an automated service, had choices, could stop at anytime.
- It was convenient, easy to remember, easy to use, user friendly.
- It was easy to bring up the information.
- Just the easy access.
- Likes knowing what is ahead, if need to take a detour, going to be delayed. Weather was a big help. Easy to navigation.
- Likes that it is interactive.
- More options than what he needed. Got more than he expected. Nice to have the data at your finger tips. Get information by exit numbers for lodging and tourism information.
- Pretty fast and easy to pick up information.
- Quick access to information that I am looking for.
- The ability when you are on the road.
- The convenience of the service, not having to dial a bunch of numbers to find out anything.
- The fact that you can pick up your cell phone and figure out exactly what is going on.
- The information is so readily available. It is voice activated, so it is easy to use. Works well.
- To make travel more convenient, to be more aware.
- Type of information being given, straight forward.
- Voice activation technology, set up like a website, easy to find what looking for. Friendly voice.
- We got the road conditions fairly easy. It wasn't hard to find.
- Well because the 3 numbers -- easier to remember than the other number call right away and have access to it.

Coverage area: 3

- Likes new time stamp and specific mile markers. It is important to keep that up. Nice that it covers the I-77 corridor.
- The fact that it covers the entire 81 corridor get an idea of what is ahead.
- Trying to find road conditions, could get information for the entire stretch of the road.

Increases Awareness: 44

- Alerted us to fog at border at NC knew about it before got to it. Made us more cautious.
- Avoid traffic backups and pileups (Afton Mtn one) - at least he was aware of what happened, was able to turn around to find another way.
- Because they had said that it cleared up in certain spots

- Getting to know what's going on
- Helped to know why I was stopped
- I appreciated knowing what the conditions were like up ahead on our trip as well as what the traffic was like. Gave peace of mind. Excellent how it was set up. Instructions were clear and concise, easy to follow. Likes being able to go back the main menu. Well set up, accurate.
- I like knowing before I get on into a mess
- I love it. It is so nice to know where construction is for example. It is nice to know what is going on.
- Impatient, I like to know what I am doing.
- Instant information, I know what I am coming up against. If I know I am going to run into construction I can go around it on Rt. 11.
- It can shorten my route because I can get off and go a different direction. You can avoid things and know what to expect.
- It gives you a good overview of what's happening on the roads.
- It is helpful to know what is going on.
- It lets me know what is ahead.
- It tells why she is backed up. Knows why.
- It was telling me about the interstate and if there were any problems. I knew what was predicted and what was working.
- It was wonderful. Liked it could tell you what was going on ahead of you. But could also find out other things like gas stations or where to stop for lunch. Don't have to think about it.
- Just because it lets you know what's going on, delays, take another route.
- Just knowing what's ahead
- Just the knowledge that this why we are stopped and hopefully we will be going soon.
- Knowing what was going on.
- Let me know what is ahead and what the delay was.
- Lets me know ahead of time what is up ahead.
- Lets me know what I am looking at.
- Lets me know what is going on.
- Likes knowing what is ahead, if need to take a detour, going to be delayed. Weather was a big help. Easy to navigation.
- Likes to know what is going on. It did not help me change my plans but kept me from being surprised.
- More information/road conditions/got no one at VDOT's number
- So you can know what's ahead where you are going. Easiest way to get a weather report along the corridor.
- Stuck in traffic, wondering what was going on
- Tells me where there is a problem and what type of problem it is
- Tells you specifically where things are and what is happening the information is very updated you can tell if it going to affect you when you are traveling.
- The fact that it covers the entire 81 corridor get an idea of what is ahead.
- The fact that it prepares me as a driver as to what traffic lies ahead or what may be causing the traffic -- feel a little safer 2 miles ahead accident. then get passed.
- The fact that you can pick up your cell phone and figure out exactly what is going on.

- The fact that you know that something is blocking the highway or that there is a delay or whatever
- To find out if they should detour. Knew what it was and how far it was backed up.
- To find out what was going on.
- To make travel more convenient, to be more aware.
- Updates on the travel.
- We have a fleet of drivers, many time a driver will call and say that traffic is backed up 511 will tell you the information just like that.
- Well it gives you alternate routes and lets you be aware of problems -- it doesn't give you alt. routes, but if you travel, you know to pick alternate routes.
- Well we're right on main street when there are tractor trailers going by on 11 call something on 81.
- What's going on in the area

Helps make informed travel decisions: 140

- A lot of other options, back roads you can take if needed
- Ability to better plan in case need to take detour or alternate route.
- Able to avoid the road blocks
- Able to plan alt. routes (i.e. onto Route 11)
- Able to re-route around back up from accident
- Accidents on the road information have helped to reroute.
- Allows you to make decisions.
- Alternate Route - can choose to.
- Avoid traffic backups and pileups (Afton Mtn one) - at least he was aware of what happened, was able to turn around to find another way.
- Basically I can alternate my route if I need to and I know where I am going to hit delays
- Be able to call from cell phone determine if need to take another route.
- Because I have two children and don't want to get stuck sitting.
- Because I know what exit the accident is at so I know what exit to get off to avoid the traffic
- Because I know when to take alternative routes.
- Because I know where I am at -- can call sister and she can tell him different ways to go.
- Because if I can anticipate where the problem is I can get off at an earlier exit and travel down 11 or some alternate route.
- Because if I know that there is an accident up ahead I know that I can get off instead of sitting on the interstate.
- Because it helps us to be prepared and aware of what we might find along the way
- Being able to know when construction delays and stuff giving myself extra time to get to my appointments.
- By letting me know where accident is I can go around it using alternate routes
- Can change route if there is traffic problems and it's great to know what the weather is before you get there.
- Can change travel routes according to delays can use time more -- not sitting still.
- Can choose an alternate route

- Cause if your are going on a long trip you know how long it will take you, any construction and any accidents you can be prepared to slow down.
- Change your route if you hear an accident.
- Choose to take an alternate route.
- Current and helps plan routing (alt. to Route 11).
- Definitely saves time especially in the corridor between Harrisonburg and Winchester. I can take an alternate route if I know ahead of time.
- Don't want to sit on the interstate- can choose to use Route 11 or another Route 11
- Figure if needed to take an alt. route (route 11 or Ironto)
- Finding out if I can avoid the traffic at all by avoiding the accident and getting off and taking back roads.
- For instance weather conditions will give me an idea if I need to seek an alternate route or not. Construction information too.
- For planning ahead.
- Gave expectations to determine whether to go or not
- Gives him a heads up --uses all the time --uses from home to get the weather and stuff --drives to Harrisonburg every other weekend more accurate weather than TV or seems so
- Gives me an idea when to drive home.
- Good to know if there is a delay ahead so I can take an alternate route
- Got off the road, took alternate route and avoid back-ups.
- Got the information was able to decide not to go.
- Hear what's coming/problems - when to take a alt route
- Helped to avoid delay of the traffic.
- Helped to plan a safe trip.
- Helps me determine whether or not I want to stay on i-81 or if I want to get off and use US routes.
- His kids have used it several times and avoided places with accidents and gotten off of the roads.
- I avoided blocks in the road and delays. Able to take alternate routes.
- I can avoid bad areas that has delays.
- I can avoid certain areas. Places to eat.
- I can make changes to my trip if there is something up ahead I can find an alternate route or I can stop off and get something to eat or get some work done.
- I can pick an alternate route.
- I can plan another route if there is traffic snarls. If I need the location of something I can look first and save time and patience. I hate sitting in traffic.
- I can tell in advance if there is going to be a traffic problem and find out if it is construction related or accident and how long it will hold me up so I can find an alternate route.
- I don't want to be stuck in traffic for hours.
- I have limited time and it allows me to reroute if need be.
- I know how to get around delays if I know about it ahead of time.
- I know if I need to take a detour around an accident know the weather.
- I know what the traffic is and can avoid slow traffic.
- I like that you don't have to listen to everything about an accident you have the option to get more information. Very useful it has helped to reroute on the way to work.

- I like the way it tells specific mile markers so I know where to get off and go around. Weather information is useful.
- I like to know if I should be expecting a three hour trip or a five hour trip. I know whether to take an alternate route or not. Like timestamp.
- I think that it helped because I was able to detour but not able to tell if back up or not because on delay.
- I travel often, it saves me a lot of time. I can avoid delays because I know where they are.
- If conditions are bad I can always change my route to another.
- If I am coming down heading north on 81 and there is an accident on 581 I can get off earlier and come down route 11 and avoid the whole situation.
- If I hear the road is blocked I'll try to get around it.
- If I know ahead of time I can take an alternate route before the back-up and get around it. If it won't take long then I will sit there.
- If I need to take a different route I will know in advance
- If there is a delay we can plan on getting off somewhere else save some time
- If there is an accident I can take a different road.
- If there is congestion I can use alternative routes. It allows me to make a more informed travel choice. It is a good way of making the road conditions smarter.
- If there is snow, I know what the conditions are to get to work or not get to work. If there is an accident I can take an alternate route home. You know before hand before you are stuck.
- If you get up there and you know traffic is backed up able to get off the road and go around accidents.
- Instant information, I know what I am coming up against. If I know I am going to run into construction I can go around it on Rt. 11.
- It aids and abets planning. if there is an accident I can get off early to avoid
- It allows to plan travel , can find out about delays, can plan to get off and avoid the delays.
- It can be very useful. Preparing you and helping you be aware especially with weather. It helps you know what to do and how to react. The information that most people need is on the service.
- It can shorten my route because I can get off and go a different direction. You can avoid things and know what to expect.
- It gives you an idea of what is going on, I don't have to take that I can take the side roads --take twice as long allows for time.
- It helps me to know if I need to use route 11 instead of i-81 to go to work.
- It helps me understand if there is a traffic jam etc. so I can go another way and figure out how to get around it.
- It is helpful, I know if I need to find another route.
- It is nice to anticipate if need to take an alternate route. Can advise daughter from school.
- It is nice to know in advance prior to get on the road, can take an alternate route. have made detours before.
- It is so informative. Helps to make travel decisions.
- It is useful by letting me know where the accident or back up is it lets me decide to select an alternate route or not.

- It just gives you locations of where problems are occurring heads up of what is ahead can get around it if I need to.
- It keeps me from having to sit in traffic forever.
- It keeps me informed and able to avoid any holdups that I may experience
- It lets me know ahead of time if I have to get off and get onto another road for due to accidents, heavy constructions. I can avoid delays.
- It lets me know if there is a bad area I can avoid it by taking another route.
- It the only way to learn about road conditions that might affect my travel. has allowed to plan according to conditions"
- It will put him on a different route. Time sensitive information.
- Just because if there is going to be a backup you can find an alternate route
- Just because it lets you know what's going on, delays, take another route.
- Just that they provide the exit numbers and I can tell that this accident or construction will affect me. The weather information on fog is useful. not always provided. construction useful can call before I leave to see if there is going to be a problem.
- Know were the accidents and road conditions are so I know how to react to them
- Know you can get off and get on highway 11
- Knowing in advance that there is an accident ahead then I can change my route.
- Knowing where accident is and what exit can get off to get around it.
- Lets me know if I need to get off the interstate if there is a tie up
- Liked the voice activated service.
- Liked to ahead of time what you were going to run into.
- Likes knowing what is ahead, if need to take a detour, going to be delayed. Weather was a big help. Easy to navigation.
- Likes that it is free to the user, likes to know if she needs to detour.
- Mainly that it lets you know if you need to take an alternate or different route. Met all needs she has had.
- Mile marker; how long; chance to take an alternate route
- One time I called and there was an accident sought an alternative route so that I could get to work on time
- Plan the trip to decide what to see based on the weather conditions; knew it was going to be slower - could only do one of the two things they had planned - chose Roanoke based on what they heard about the weather
- Planning detours. We do another route and if the bridge was closed we were going to take that way.
- Road closures - able to take a different route.
- Saving time and frustration not sitting in back-up if can avoid it.
- See problems ahead of time, can pick alternate route; accurate information about weather - cancelled trip because of it
- So that I know whether or not I need to get off at an earlier exit
- Tells you what will happen in advance so can make decisions, find ways around it on the map if there is construction.
- The ability to get off the interstate
- The fact that I know if I need to leave earlier to make deadline to work on time.
- The fact that it prepares me as a driver as to what traffic lies ahead or what may be causing the traffic -- feel a little safer 2 miles ahead accident. then get passed.

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- The fact that the information is specific to the region that she drives, she will know if it is moderate or severe and she can choose another road if necessary.
- The information got us out of the traffic jam immediately. It allowed us to make a decision to exit.
- The information has helped her to turn off.
- This past winter she was able to know what was going to be ahead on the roads weather wise helps to plan whether or not to travel
- To avoid traffic
- To find out before getting on the interstate if there is a problem. Can take back road option if there is a back up.
- To find out if they should detour. Knew what it was and how far it was backed up.
- To know if there is an accident or construction ahead and to help me time my trip better.
- To know what is up ahead and can divert and take another route if necessary
- Useful because she can get information soon and take an alternative route. Can call home and tell husband to start supper.
- Useful to know if there is anything that will block, can take an alternative route. Traffic information.
- Useful to make decisions about travel home. helps with scheduling, can use alternative routes. It keeps out of trouble at work, can call ahead to let know will be late.
- VDOT has done a great job with the signs and with this service. Advance warning of upcoming accidents. With 460 and 11 being on either side you can get off and continue without being delayed.
- Weather in the winter is great. having been a resident of Virginia for so long it allows me to take an alternate route and allows him to anticipate in advance weather conditions.
- Weather information was useful. telling me not to go on some of the other roads because they were worse.
- Well it gives you alternate routes and lets you be aware of problems -- it doesn't give you alt. routes, but if you travel, you know to pick alternate routes.
- Well to know how far the delay would be and to know if I should take another route to go around or not
- Well, I can get any road that I want, say I am going up 81 and want to cut across to 64, and I can know what I am heading into., I can take 11 or change my plan.
- When I have found that there is congestion I can get off and bypass any of that
- Where on accidents and delays, and able to stop and get gas if a long delay.
- You can change plan if needed, you can gauge time if there is something ahead like an accident or construction.
- You can make a decision to get off an use 11 or to wait it out.
- You can plan better if you know you are going to be coming up on construction. Can plan rest break.
- You can plan if you need to be somewhere at a certain time. You can change routes if you need to if there is an accident or construction ahead.

Information on accidents: 28

- Accident information. When it rains there used to be many accidents, arrow on curves have helped with less accident. Construction information is helpful.
- Accident on the VMS, said dial 511 for more information.
- Accidents and hold-ups.
- Accidents on the road information have helped to reroute.
- Allows to keep informed about accidents. Will call prior to get on 81. Saves time if there is an incident or back up. Worth the call.
- Because it gives not real time but within an hour or two when an accident or construction is happening.
- Being able to know if there was an accident on the road to travel.
- I can tell in advance if there is going to be a traffic problem and find out if it is construction related or accident and how long it will hold me up so I can find an alternate route.
- I like how it gives construction, weather and accident alerts. I know you can find out about restaurants. That is really neat.
- I observed an accident on the opposite side I was on, 511 told me it was cleared. I use it for that.
- If there is snow, I know what the conditions are to get to work or not get to work. If there is an accident I can take an alternate route home. You know before hand before you are stuck.
- It is great because when I call I can find out if there is any delays, accidents, construction, the weather, can find a restaurant. I can get access to everything I need. It is a really awesome service.
- It is useful by letting me know where the accident or back up is it lets me decide to select an alternate route or not.
- It lets me know whether there is an accident or if there is bridge work related or road work and how far away it may be
- It was very helpful. It told us of the few accidents that were on the road. gave peace of mind, was scared about conditions.
- Know the construction is know if there are any accidents.
- Know were the accidents and road conditions are so I know how to react to them
- Knowing if there are accidents on the road or delays.
- Knowing in advance that there is an accident ahead then I can change my route.
- Knowing that there is an accident, where it was, and what exit I was at.
- Knowing where accident is and what exit can get off to get around it.
- The road condition information traffic construction locations accidents.
- Traffic accidents.
- Useful to know if there is anything that will block, can take an alternative route. Traffic information.
- VDOT has done a great job with the signs and with this service. Advance warning of upcoming accidents. With 460 and 11 being on either side you can get off and continue without being delayed.
- Voice activated don't have to take hands off wheel. Accident information helps especially on weekends.

- Weather wise if I need to take a detour, accidents and construction. Weather is good, lets me know about conditions up ahead.
- Where on accidents and delays, and able to stop and get gas if a long delay.

<div style="background-color: yellow; text-align: center; font-weight: bold;">Information on construction, alternate routes, and road closures: 49</div>

- Accident information. When it rains there used to be many accidents, arrow on curves have helped with less accident. Construction information is helpful.
- Accurate information on traffic, construction,
- All of the information on detours, road construction is vital to someone who applies it to drive several times a year.
- Alternate Route
- Alternate route, when to take it or how long sitting there; able to jump around.
- Alternate Routes
- Alternate routing
- Alternate routing (460 & 11 vs. I-81).
- Basically location of construction sites
- Because it gives not real time but within an hour or two when an accident or construction is happening.
- Being able to know when construction delays and stuff giving myself extra time to get to my appointments.
- Calling about construction that was helpful
- Cause it lets me know where I need to get off the interstate when I need to go a different route.
- Comprehensive, mile locations of events, alt route choices.
- Construction delays, assists tourism
- Finding construction areas and times that they were going to be doing the work. Likes that weather is given as of a certain time. Very easy to use.
- For instance weather conditions will give me an idea if I need to seek an alternate route or not. Construction information too.
- Gave information to find an alternate route. Found everything quickly.
- Have some knowledge of construction and traffic tie ups.
- I can check construction told exactly where it was and any delays or whatnot -- very specific
- I can find out what the weather is if there are delays, constructions, everything. every state should have it. You can get it no matter where you are at.
- I can tell in advance if there is going to be a traffic problem and find out if it is construction related or accident and how long it will hold me up so I can find an alternate route.
- I knew that there was construction.
- I like how it gives construction, weather and accident alerts. I know you can find out about restaurants. That is really neat.
- I liked getting the construction and weather information.
- I love it. It is so nice to know where construction is for example. It is nice to know what is going on.
- If there is construction or weather you know what there is and can find out ahead of time.
- It gave me specific information about routes that were open and those that weren't.

- It gives detailed information as to where the construction is.
- It is great because when I call I can find out if there is any delays, accidents, construction, the weather, can find a restaurant. I can get access to everything I need. It is a really awesome service
- It lets me know whether there is an accident or if there is bridge work related or road work and how far away it may be
- It saved him 1/2 hour. Saw an accident and took an alternate route. Construction is helpful
- It tells you how far the traffic is how far it is and how to get around it.
- It tells you if there is construction and where it is located.
- Just that they provide the exit numbers and I can tell that this accident or construction will affect me. The weather information on fog is useful. not always provided. construction useful can call before I leave to see if there is going to be a problem.
- Know the construction is know if there are any accidents.
- Knowing to use an alternate.
- Lowers stress level to be told about an accident, maybe an alt. route.
- Nice to know where the construction is. Weather, is it raining?
- Road closures - able to take a different route
- Road conditions - were good when the weather is bad, construction is good
- Sitting in traffic the other day called 511 and got the road work information. Pretty cool.
- Storm, road closure information.
- Tells me where to get off to bypass blockages. Voice activated.
- The road condition information traffic construction locations accidents
- The weather information was useful. The area attractions. Road work information too.
- Useful information. Like construction information.
- Weather wise if I need to take a detour, accidents and construction. Weather is good, lets me know about conditions up ahead.
- You can plan better if you know you are going to be coming up on construction. Can plan rest break.

Information on tourism and attractions: 3

- Gave me what time things were playing at theater and what was nearby.
- The weather information was useful. The area attractions. Road work information too.
- Construction delays, assists tourism.

Information on traffic and delays: 34

- Able to learn no traffic delays - reassuring
- Accidents and hold-ups
- Accurate information on traffic, construction,
- Basically I can alternate my route if I need to and I know where I am going to hit delays
- Being able to access a hotel, get directions, make a reservation. Felt safer being able to know about alerts for weather or traffic.

- Being able to know when construction delays and stuff giving myself extra time to get to my appointments.
- Can change travel routes according to delays can use time more -- not sitting still.
- Good to know if there is a delay ahead so I can take an alternate route
- Has information I need about slowdowns or stoppages and at what mile marker
- Have some knowledge of construction and traffic tie ups.
- I appreciated knowing what the conditions were like up ahead on our trip as well as what the traffic was like. Gave peace of mind. Excellent how it was set up. Instructions were clear and concise, easy to follow. Likes being able to go back the main menu. Well set up, accurate.
- I can find out what the weather is if there are delays, constructions, everything. every state should have it. You can get it no matter where you are at.
- I can give a town and it can tell me what lodging is available, weather, traffic issues before we run smack into it.
- I can tell in advance if there is going to be a traffic problem and find out if it is construction related or accident and how long it will hold me up so I can find an alternate route.
- I know what the traffic is and can avoid slow traffic.
- If I saw traffic this service would be the number 1 most useful thing for him.
- It allows to plan travel , can find out about delays, can plan to get off and avoid the delays.
- It helps me understand if there is a traffic jam etc. so I can go another way and figure out how to get around it.
- It is great because when I call I can find out if there is any delays, accidents, construction, the weather, can find a restaurant. I can get access to everything I need. It is a really awesome service
- It lets me know how long it will take me to get to my destination.
- It tells you how far the traffic is how far it is and how to get around it.
- Just because it lets you know what's going on, delays, take another route.
- Just knowing ahead of time what to expect in the way of traffic.
- Knowing if there are accidents on the road or delays.
- Knowing when the anticipated delay was.
- Likes the feature to find local restaurant. Traffic was helpful.
- Telling where shut downs are.
- The road condition information traffic construction locations accidents.
- Traffic accidents.
- Traffic information.
- Traffic was very useful, but the other information wasn't impressed
- Useful to know if there is anything that will block, can take an alternative route. Traffic information.
- Weather report and traffic report
- Well to know how far the delay would be and to know if I should take another route to go around or not.

- Basic travel advisories which would be important if I needed it. Services nearby like restaurants and gas.
- Being able to access a hotel, get directions, make a reservation. Felt safer being able to know about alerts for weather or traffic.
- I can avoid certain areas. Places to eat.
- I can give a town and it can tell me what lodging is available, weather, traffic issues before we run smack into it.
- I like how it gives construction, weather and accident alerts. I know you can find out about restaurants. That is really neat.
- Interested in finding a restaurant in the area. Found what he wanted
- It is great because when I call I can find out if there is any delays, accidents, construction, the weather, can find a restaurant. I can get access to everything I need. It is a really awesome service.
- It is pretty easy, the menu comes up and the automatic voice tells you. Likes to find where the restaurants are.
- It was wonderful. Liked it could tell you what was going on ahead of you. But could also find out other things like gas stations or where to stop for lunch. Don't have to think about it.
- Likes the feature to find local restaurant. Traffic was helpful.
- The type of different categories of restaurants and the fact that you can call directly.

- It the only way to learn about road conditions that might affect my travel. Has allowed to plan according to conditions.
- Weather information was useful. telling me not to go on some of the other roads because they were worse.
- All of the information on detours, road construction is vital to someone who applies it to drive several times a year.
- If there is snow, I know what the conditions are to get to work or not get to work. If there is an accident I can take an alternate route home. You know before hand before you are stuck.
- It told me about foggy conditions and road construction on part of 64.
- It told me the areas of highway 81 and 77 that were problematic and we gave mile markers and ranges and conditions of the road.
- Just that they provide the exit numbers and I can tell that this accident or construction will affect me. The weather information on fog is useful. not always provided. construction useful can call before I leave to see if there is going to be a problem.
- Know were the accidents and road conditions are so I know how to react to them
- Liked the voice activated service.
- More information/road conditions/got no one at VDOT's number
- Road conditions - were good when the weather is bad, construction is good
- Road conditions are useful. Pretty clear.
- The first time: the data was new, able to advise on fog the advice was timely.
- The road condition information traffic construction locations accidents

- This past winter she was able to know what was going to be ahead on the roads weather wise helps to plan whether or not to travel
- We got the road conditions fairly easy. It wasn't hard to find.

<table>
<tr><td>Information on weather: 33</td></tr>
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- Being able to access a hotel, get directions, make a reservation. Felt safer being able to know about alerts for weather or traffic.
- Can change route if there is traffic problems and it's great to know what the weather is before you get there.
- Finding construction areas and times that they were going to be doing the work. Likes that weather is given as of a certain time. Very easy to use.
- For instance weather conditions will give me an idea if I need to seek an alternate route or not. Construction information too.
- Gives him a heads up --uses all the time --uses from home to get the weather and stuff --drives to Harrisonburg every other weekend more accurate weather than TV or seems so
- I can find out what the weather is if there are delays, constructions, everything. every state should have it. You can get it no matter where you are at.
- I can give a town and it can tell me what lodging is available, weather, traffic issues before we run smack into it.
- I know if I need to take a detour around an accident know the weather
- I like how it gives construction, weather and accident alerts. I know you can find out about restaurants. That is really neat.
- I like the way it tells specific mile markers so I know where to get off and go around. Weather information is useful.
- I like the weather. You get a whole weeks weather.
- I liked getting the construction and weather information.
- If there is construction or weather you know what there is and can find out ahead of time.
- It can be very useful. Preparing you and helping you be aware especially with weather. It helps you know what to do and how to react. The information that most people need is on the service.
- It is great because when I call I can find out if there is any delays, accidents, construction, the weather, can find a restaurant. I can get access to everything I need. It is a really awesome service.
- Just that it at least tells the weather and that it is available in different menus and the voice activation -- didn't have to push any buttons.
- Just that they provide the exit numbers and I can tell that this accident or construction will affect me. The weather information on fog is useful. Not always provided. construction useful can call before I leave to see if there is going to be a problem.
- Knowing that it is there. If you did not know what exit to take you can call, or if there is something dramatic with the weather you can call.
- Likes knowing what is ahead, if need to take a detour, going to be delayed. Weather was a big help. Easy to navigation.
- Nice to know where the construction is. Weather, is it raining?

- Plan the trip to decide what to see based on the weather conditions; knew it was going to be slower - could only do one of the two things they had planned - chose Roanoke based on what they heard about the weather
- See problems ahead of time, can pick alternate route; accurate information about weather - cancelled trip because of it
- So you can know what's ahead where you are going. Easiest way to get a weather report along the corridor.
- Storm, road closure information.
- The fact that you know what the weather is going to be like were you are going.
- The weather information was useful. The area attractions. Road work information too.
- Trying to figure out what the weather was going to be like and it told me.
- Was raining and wanted to see if it was going to clear up.
- Weather in the winter is great. Having been a resident of Virginia for so long it allows me to take an alternate route and allows him to anticipate in advance weather conditions.
- Weather information was useful. telling me not to go on some of the other roads because they were worse.
- Weather report and traffic report
- Weather wise if I need to take a detour, accidents and construction. Weather is good, lets me know about conditions up ahead.
- What is useful is the voice activation not having to look at buttons, safer, checking the weather the travel alerts.

Location specific information (Mile marker, Exit, City, Region, Road, etc.): 22

- Because I know what exit the accident is at so I know what exit to get off to avoid the traffic.
- Comprehensive, mile locations of events, alternate route choices.
- Ease of use. Easy to find out the information you wanted to get. Don't have to listen to everything at once. Can select specific routes not everything at once.
- Easy to use, being able to get mile marker information, the fact that its voice activated, very helpful.
- Has information I need about slowdowns or stoppages and at what mile marker.
- I can plan another route if there is traffic snarls. If I need the location of something I can look first and save time and patience. I hate sitting in traffic.
- I like the way it tells specific mile markers so I know where to get off and go around. Weather information is useful.
- I like were they say the mile post or exit if there is a delay.
- I liked getting the phone number that I needed and the directions.
- It gives you opportunities or more of a way about the regional area --what places are where.
- It is up to date almost by the minute, timely in updates, explicit about mile marker it is at. Also tells if East Bound or west bound and tells you how to avoid.
- It just gives you locations of where problems are occurring heads up of what is ahead can get around it if I need to.
- It told me the areas of highway 81 and 77 that were problematic and we gave mile markers and ranges and conditions of the road.

- Just that they provide the exit numbers and I can tell that this accident or construction will affect me. The weather information on fog is useful. not always provided. construction useful can call before I leave to see if there is going to be a problem.
- Knowing the -- giving the mile marker for an incident, crash, work zones.
- Like the Mile marker.
- Likes new time stamp and specific mile markers. It is important to keep that up. Nice that it covers the I-77 corridor.
- Mile marker; how long; chance to take an alternate route.
- More options than what he needed. Got more than he expected. Nice to have the data at your finger tips. Get information by exit numbers for lodging and tourism information.
- The fact that the information is specific to the region that she drives, she will know if it is moderate or severe and she can choose another road if necessary.
- Voice activation, being able to request information specific to a city.
- Well, I can get any road that I want, say I am going up 81 and want to cut across to 64, and I can know what I am heading into., I can take 11 or change my plan.

Voice Response: 22

- Easy to use, being able to get mile marker information, the fact that its voice activated, very helpful.
- Fairly easy access, voice response helps, safer no hands.
- It is automated. You can specifically say what you want, don't have to talk to anybody. Easy to remember. It is convenient, don't have to be on line.
- It is pretty easy, the menu comes up and the automatic voice tells you. Likes to find where the restaurants are.
- It was an automated service, had choices, could stop at anytime.
- Just that it at least tells the weather and that it is available in different menus and the voice activation -- didn't have to push any buttons.
- Like the way that you can just talk to the system.
- Liked the voice activated service.
- Precise information, to the point, get many options to increase your information. Plain and simple voice activation.
- Tells me where to get off to bypass blockages. Voice activated.
- The information is so readily available. It is voice activated, so it is easy to use. Works well.
- The voice activation feature.
- There is someone there to give you an answer. Feel like she is talking to a person.
- Voice activated don't have to take hands off wheel. Accident information helps especially on weekends.
- Voice activated was okay.
- Voice activation technology, set up like a website, easy to find what looking for. Friendly voice.
- Voice activation, being able to request information specific to a city.
- Voice activation.
- Voice activation. Hitting button is not fun.

- Was impressed with how it worked with the voice recognition. Had a good experience.
- Weather information was useful. Telling me not to go on some of the other roads because they were worse.
- What is useful is the voice activation not having to look at buttons, safer, checking the weather the travel alerts.

Peace of mind: 9

- Able to learn no traffic delays - reassuring.
- Being able to access a hotel, get directions, make a reservation. Felt safer being able to know about alerts for weather or traffic.
- Feeling there is another added bonus of security.
- I appreciated knowing what the conditions were like up ahead on our trip as well as what the traffic was like. Gave peace of mind. Excellent how it was set up. Instructions were clear and concise, easy to follow. Likes being able to go back the main menu. Well set up, accurate.
- It was very helpful. It told us of the few accidents that were on the road. gave peace of mind, was scared about conditions.
- Lowers stress level to be told about an accident, maybe an alternate route.
- VDOT does a lot to help travelers out, gives useful information, makes feel safe. HAR is a good system.
- Wasn't any real problems to worry about - compared to the delays reported by Triptik AAA.
- When you are in traffic you don't know what is going on, it gives information to help calm you down.

Safe (hands-free): 6

- Easy to use, hands free kit, able to use voice prompts not buttons, kept hands on the wheels.
- Very helpful. (Participant is blind - enjoys hand free)
- What is useful is the voice activation not having to look at buttons, safer, checking the weather the travel alerts.
- Voice activation. Hitting button is not fun.
- Fairly easy access, voice response helps, safer no hands.
- Voice activated don't have to take hands off wheel. Accident information helps especially on weekends.

Free Service and Saves money: 2

- Being able to connect directly with a hotel, being able to book the room right there, cut down on cost.
- Likes that it is free to the user, likes to know if she needs to detour.

Saves time: 20

- Allows to keep informed about accidents. Will call prior to get on 81. Saves time if there is an incident or back up. Worth the call.
- Because I have 3 children and they don't have the patience for delays.
- Can change travel routes according to delays can use time more -- not sitting still.

- Definitely saves time especially in the corridor between Harrisonburg and Winchester. I can take an alternate route if I know ahead of time.
- Helps me to get home at the regular time instead of later. Easy to access. Get what I need.
- I can plan another route if there is traffic snarls. If I need the location of something I can look first and save time and patience. I hate sitting in traffic.
- I don't want to be stuck in traffic for hours.
- I have limited time and it allows me to reroute if need be.
- I travel often, it saves me a lot of time. I can avoid delays because I know where they are.
- If there is a delay we can plan on getting off somewhere else save some time.
- Impatient, I like to know what I am doing.
- It helps to save time.
- It saved him 1/2 hour. Saw an accident and took an alternate route. Construction is helpful.
- Keeps him from being tied up, saves time.
- Kept her from having a 4 hour delay.
- One time I called and there was an accident sought an alternative route so that I could get to work on time
- Saves me time.
- Saving time and frustration not sitting in back-up if can avoid it.
- Traveling for work (delivers suitcases lost from airport) delays are money so if he can avoid them that is money.
- You can save time.

Ability to alert others about being late: 4
- Alerts her office about the accidents to tell them you will behind schedule
- Able to call ahead with how late to be.
- Useful to make decisions about travel home. helps with scheduling, can use alternative routes. It keeps out of trouble at work, can call ahead to let know will be late.
- Useful because she can get information soon and take an alternative route. Can call home and tell husband to start supper.

Time stamp: 2
- I like to know if I should be expecting a three hour trip or a five hour trip. I know whether to take an alternate route or not. Like timestamp.
- Likes new time stamp and specific mile markers. It is important to keep that up. Nice that it covers the I-77 corridor.

Information on travel advisories: 1
- Basic travel advisories which would be important if I needed it. Services nearby like restaurants and gas.

Miscellaneous: 4
- Access to road help at the time.
- Only called that one time and had to hang up because help came.

- I had never known that kind of thing existed.
- Flexibility and finding out the information needed. On the spot travel arrangement.

- Couldn't remember
- None
- Haven't used it in a critical time.
- Can't remember

Needs/Usage #12

Difficult to navigate system: 50

- Better explanations about accessing specific information; lots of hotels - a system for limiting the listings or categories
- Difficult to go through so many prompts. How current is the information? Broadcast future traffic problems, such as future construction in advance.
- Had to spend a lot of time to get the information. But was easier the second time. Out more signs up to let people know about the service.
- Go through too many menus to get information. Should just have one menu for problems. Can say, "If you want to know what the problems are on X say yes.".... The closer the information can be to real time the better.
- More information about construction, how many miles is it from what marker to what marker. Know more about accidents, how many lanes are open? Where is it at, give option to get off the highway. Was difficult to get to the information, it was ridiculous and difficult. Could not go backwards, had to get out come back in and do it again. Nice if there was an automated feature that asks what mile marker you are interested in and then you get the list that is relevant to that mile marker.
- Wanted to talk to a person, who give could distance based on your current mile marker, even an automated service that could tell how far.
- Too difficult to use. Too much to sort through, would like it to be tied to mile marker ranges. Voice activated menu is not useful, should have digital (push button) options. The voice recognition program did not comprehend. Tremendous amount of immigrants might not have a good experience. Should test out each voice prior to each person using. Recommend that we do some quality control, VDOT look into how well tested the system is. Construction in the I-95 region would be an important type of information.
- 15 miles pushing buttons the cell phone - way too many menu choices. The voice activated parts were good, but it didn't take you to delays more quickly, expected delays to be by mile marker
- When called 511 it gave a report of what was going on south of us, it took a while to get to the information we needed on 81 North. It would be helpful to get to the direction we needed quickly. The information was for way farther South than we needed. More information on how far the backup is and where it originated.

- Instead of having to say yes, or no. Go to push buttons because sometimes the voice recognition sometimes does not work.
- Break it down into regions. Many times you don't know the mile marker right away and then you guess the wrong information. If could start in a broader designation like Northern, etc. then break down further.
- Kept getting along the corridor -- not just the section that you are in.
- Specify mileage range --don't have to listen to Winchester --only want to know what is in front of you.
- Cut out all the jargon in front. Don't ask if they would like to hear accident information. That is why they are calling. They will get the point that it is not a 911 number without us telling them. After the accident then go to general information, main menu.
- Maybe if it was easier to find the road that you wanted.
- It took a couple of false start to get the hang of it, difficult to navigate through it. Once got the hang of it, it was fine. Let people know they can interrupt.
- Got caught in a cycle that did not give an option to get, finally hung up. Give more clear direction and an easy way to maneuver around.
- The actual maneuvering through the system. It didn't send her where she wanted to go in the system. Trouble with the application, improve it.
- Was looking for directions to a specific establishment. Menu confusing, hard to pick where it might be.
- One time I called for restaurants I kept getting called up in loop. Make it more user friendly. It said that there was nothing available in her city but did not tell her of others nearby.
- options no results for food
- I had some trouble navigating the menu options.
- There is a need for 511 to be touch tone--if I use hands free it won't be dangerous.
- Not very user friendly the prompts were cumbersome hate anything that have to go through 55 prompts especially while driving perhaps should pull over think that there are so many darn prompts that by the time you get to the end result it is crazy. Some brief categories and then be able to prompt.
- Did not know if there was traffic/backup caused by the construction. It took a long time to get to what he wanted to find out about. Menu is hard to get through.
- The cue jockey -- so many selections, choices -- could be simplified somewhat. Perhaps personalized -- if person on other end to talk to.
- The main menu is long. Could prioritize things up front that are of the most importance. Keep services to the bottom of the list.
- Some of the menus are a little too long to get where you want to go.
- Menus more efficient, faster
- Make the first menu easier.
- More aware of all the services that it provides. Not too much information that it difficult to sit through. At end of the message like they do like on cell phones.
- phone -- more understanding of when you are supposed to say something-- more when to talk more updates -- so it can understand you

- If you could more specific about directions for using the system--it couldn't find her exit when she spoke it into the system
- When used it, did not know how to check traffic in specific location. Would like to say "accident, Fairfax Virginia" More natural language.
- Instructions are not repeated. Provide for people who were not paying attention. Repeat if not responsive within a certain amount of time.
- Too long of a process, make the process shorter
- The survey was annoying, since it asked every time - it didn't understand the no - had to complete every time
- More VMS; speed it up
- Directions on phone and a customer service person
- Would like to talk to a person, human contact.
- I would like to be able talk to someone who could address a hazardous issue.
- Widening the scope to surrounding areas, 95. Would prefer to be able to talk to a live person.
- Gave you something around the mile marker instead of cities that were farther away or more towards towns and exit numbers. Other pronunciations for towns that are pronounced uniquely.
- Provide information on rest areas that is easy to get to.
- Better accent recognition - also offer the keypad option - especially if someone has a cold, etc. Limit the keys, but still use yes/no use 1 or 2
- I think if they would let you do it with numbers instead of voice software. Not sure if southern accent or noise in the car but the software seems lacking. Easier sometimes to touch in one number than to try to go through voice recognition.
- It did not seem like it was updated very often. The information was not very useful, the information was better on the radio. The traffic information was difficult to navigate through, a mile marker indicator would be better for those who are not familiar with the area.
- Well it could tell you how long the backup is. Told her to get off 114 and follow signs but no signs, like to know how long backup was and weather the construction zones are causing a backup. How long delay versus interstate and alternate route. A comparison i81 and alternate route 11 - -difference. Trouble navigating the system.
- One time was trying to get in touch with a specific store could not connect. Voice recognition was working 2/3 of the time. Information structured as well as it could be structured, but had to go through several option to get where wanted to go. Nice to have it elsewhere.
- The second time: something was wrong with the recording, the information was old (6 hours old), the option for more information, when he asked it didn't respond, and it skipped the area. Make more user friendly, would like to be able to push a button for more information. When they tell the time they're talking about, need to be able to tell if there is actually back ups associated with the construction or not.

Expand coverage area: 20

- Widening the scope to surrounding areas, 95. Would prefer to be able to talk to a live person.
- It would be more useful if it was more places than 81.
- If it was available on other interstates in Virginia especially all of 64 and 66.
- If I had more interstates covered, all the way to Richmond.
- Expand the coverage area.
- Include the other interstates like 64 and 95 that would be much more useful.
- Go national go all VA
- Get it on 95.
- Other areas - towards the outer banks, 168, further on 64
- Expand it out to the 64 and 95.
- He only called one time to check weather on Afton Mountain. When tried to get that information kept getting referred back to Lexington or Staunton, but not Afton Mountain. No information on 64.
- More lanes. Covered more areas.
- More roads included (more interstates)
- It could probably have more accident information -- more that are major accidents and it has not been updated to include these accidents. Add route 7 to system -- bad road.
- If reception was available on cell phone. A broader range would be nice.
- Provide information accurately. Did not find information for the area she was in. Did not seem timely. Did not get access to it each time called (Sprint cell user)
- Put more local business participation. A lot of people use it, all the district managers of our company. Would like it to cover a bigger area.
- Publicize it more. Available in more areas.
- Too difficult to use. Too much to sort through, would like it to be tied to mile marker ranges. Voice activated menu is not useful, should have digital (push button) options. The voice recognition program did not comprehend. Tremendous amount of immigrants might not have a good experience. Should test out each voice prior to each person using. Recommend that we do some quality control, VDOT look into how well tested the system is. Construction in the I-95 region would be an important type of information.
- One time was trying to get in touch with a specific store could not connect. Voice recognition was working 2/3 of the time. Information structured as well as it could be structured, but had to go through several option to get where wanted to go. Nice to have it elsewhere.

Group information differently: 9

- Gave you something around the mile marker instead of cities that were farther away or more towards towns and exit numbers. Other pronunciations for towns that are pronounced uniquely.

- Instead of mile makers give me associated cities. I don't know mile markers well enough. Give me cities. Publicize it broadly so that I can remember to call it. Get the number out to the public, especially during winter months when it is snowing and icing. It helped me to decide to stay home when the conditions were dangerous. It aids public safety. I consider this number as an excellent public service to prevent accidents.
- When I was able to get information it was useful but I just entered exits it didn't work. Every time I said food it said roadways it always when to roadways. So that sucked.
- The biggest problem is that when you use the 511 you tell them where you are at so couldn't get it to tell you what was down the road.
- being able to pick which road instead of hearing all of the roads
- Update it faster; exits that are better choice, add towns to the exit information
- Alternate route information. It gave traffic reports by town; she did not know where the towns were. Would like to have it given by exit numbers as well for those who are not familiar with the area.
- To be able to press or say the mile marker you are at and the route number you are trying to get to for directions and distances. 'I'm on I-81 South at mile maker 14 and I want to get to route 66' and it would tell you how far you have to get to that route.
- I wish you could not go through long lists (for construction). It would be nice if it would provide information for a specific mile marker or region. Wish it was faster and concise

Improve accident information: 13

- It could probably have more accident information -- more that are major accidents and it has not been updated to include these accidents. Add route 7 to system -- bad road.
- Weather more, accident information, road work
- More frequent updates when there is either an accident or construction particularly accidents -- get one get there it is clear yet an accident on I-81 two hours, etc.
- I guess more timely information on the accidents.
- When I called in a couple days ago it had information on events that were going on in Roanoke on Franklin graham but it wasn't the most timely -- had information but wasn't the current information on an accident that happened. Nothing about the information on the accident -- need immediate information going on not just planned events that might back up the roads possibly. I think that if a policeman saw a wreck or responded would be going into 511 and inputting the information about what's going on.
- If there is a way to update accidents, have more current information on the accidents.
- If they could predict/forecast accidents!
- accident updates if you had those posted
- It is hard for him to place things geographically, not enough information to help him figure out where the incident is. Ex, where is Vinton? What is the I-81 corridor?

- No way to say exactly where you're located - in the alerts
  construction alerts were confusing - too many alerts - needs to be faster
  pinpoint area where you are
- Probably more along the lines of when they expect to clear the incident away or
  when police officers are going to arrive on the scene
- Traffic situation are sometimes not listed on 511. Including accident, construction.
  Main concern is to get timely information. Would be good to have a way to report.
  Get better real-time data.
- Is there a way to make it more update? More information on when it clears.

Improve availability: 14

- If reception was available on cell phone. A broader range would be nice.
- I have noticed that I do not have connectivity at all places along the corridor.
- Well I guess that main reason is that when I use cell phone is SW VA it doesn't work
  only works from Harrisonburg north.
- Be able to dial only 511 instead of 800 number from cell phone
- Verizon cell phone user, could not access the service.
- If it didn't have to cut into your minutes like if you call your cell phone service and
  those minutes aren't counted.
- If they had along the interstate a radio that you could tune to so that you wouldn't
  have to be on the cell phone just for safety reasons.
- If I could have picked it up on a radio station. Audio tapes of what happened along
  area in Civil War for people to listen to as they travel through region.
- Activate 511 on payphones. Make it work on Verizon Wireless.
- Palm pilot
- Sometime it is not up to date. It seems like there are accidents that have clearly been
  going on for hours, but they are not on the alerts. Sometimes 511 does not connect.
- Get the information there as quickly as possible. Make the information available via
  radio for people who do not use a cell phone.
- Put the information on a CB channel (other than 19) - a designated channel. Current
  information.
- Provide information accurately. Did not find information for the area she was in.
  Did not seem timely. Did not get access to it each time called (Sprint cell user)

Improve information quality: 16

- Provide information accurately. Did not find information for the area she was in.
  Did not seem timely. Did not get access to it each time called (Sprint cell user)
- More specificity. Sometimes generic congestion in Roanoke -- not tell what kind
  sometimes not there. More specific road condition -- during snowstorms -- the
  message just said winter conditions and nothing much about it other than that.
- Wasn't specific enough. Needed to give you updates about Provide more
  information about delays and location. Need to know where you are in jam and
  alternate routes.

- Was disappointed once, the roads were reported as minor and 64 was actually severe. Ensure reporting accurate information.
- Sign said 511 to find out what was going on and it did not tell me anything.
- Maybe more detailed information
- I did not get any information. Give useful information.
- Did not get much useful information.
- More detail - which lane is closed
- It did not seem like it was updated very often. The information was not very useful, the information was better on the radio. The traffic information was difficult to navigate through, a mile marker indicator would be better for those who are not familiar with the area.
- More immediate information; no explanation - need better quality information
- The more current it is the more useful and worthwhile it is and the more I would use it. If it is inaccurate I wouldn't want to call anymore. Want to trust accuracy and timeliness.
- More detail, re-routing information etc.
- More detailed reports -- specific locations (i.e., mile marker)
- The voice recognition did not recognize "thank you". Did not provide answers for why there was so much traffic.
- More information about construction, how many miles is it from what marker to what marker. Know more about accidents, how many lanes are open? Where is it at, give option to get off the highway. Was difficult to get to the information, it was ridiculous and difficult. Could not go backwards, had to get out come back in and do it again. Nice if there was an automated feature that asks what mile marker you are interested in and then you get the list that is relevant to that mile marker.

Improve quality of traffic information: 12

- Traffic situation are sometimes not listed on 511. Including accident, construction. Main concern is to get timely information. Would be good to have a way to report. Get better real-time data.
- Would be nice to know about mowing. Could be updated more, incident information. Would be nice to have a way for travelers interact with the system so the information is more timely.
- Nothing. You wanted traffic, construction on local highways. Main highway. Route 58 and Route 16.
- Maybe I don't use it correctly, but it is something like punch in what road and then what area, it will go all the way to Bristol and work its way back to when want Roanoke. Flips, doesn't go in order of cities. So if it were more in order.
- More traffic alerts
- Traffic.
- Traffic information does not seem to be timely. 511 seems focused on construction not traffic. If on interstate at 27 going to 312 and I know exactly where a big backup.
- More real time traffic information as opposed to expectations for traffic. "Say traffic is stopped" instead of 'expect slow downs". Traffic is not real time.

- Construction was reported, no construction was visible. There was a car that caused the back up but nothing was reported on 511. More accurate traffic information.
- Asked for traffic delays, just a huge list - would have appreciated a smaller list - by mile marker, more relevant
- Road safety/traffic patterns
- There are some improvements to the voice response, sometimes doesn't' recognize words especially in services. Listing construction and traffic delays in a geographic order instead of chronological to key in to when to listen. Need hours of gas stations, would be helpful when traveling late at night. Where nearest open gas station and food are located.

Improve road condition information: 2

- More specificity. Sometimes generic congestion in Roanoke -- not tell what kind sometimes not there. More specific road condition -- during snowstorms -- the message just said winter conditions and nothing much about it other than that.
- Road information/weather information

Improve services information: 18

- Provide information on rest areas that is easy to get to.
- Put more local business participation. A lot of people use it, all the district managers of our company. Would like it to cover a bigger area.
- More entries for listings of restaurants etc. Could make judgment of quality of services provided by 511 based on few selections of establishments. Could also not be objective, could classify themselves as fine dining but may not be. Need objective classifications. Want weather for farther locations, even other states.
- Would like to know all restaurants and hours etc. It was tough to get down to the construction information that he wanted, there were so many option. Information on how to bypass the construction and accident.
- Improve services information instead of having to hang up and dial 411. Some times construction lists are too large, would like to have them narrowed down to specific mile markers.
- Told a little bit about times of days, anticipated events. State a different route especially for those who are not local.
- There were no markers or anything to tell you where to get off for VMI, Washington Lee University. Wanted to find out where to get off. Include major universities and other major sites with directions.
- One time was trying to get in touch with a specific store could not connect. Voice recognition was working 2/3 of the time. Information structured as well as it could be structured, but had to go through several option to get where wanted to go. Nice to have it elsewhere.
- The numbers for the number, didn't connect to the hotel very well
- Provide information on regional malls.
- Everything not listed. IF I need an automotive shop some or not listed. Not complete enough listings of attractions and services. Weather is fine which I mainly use.

- Need more items on the phone, get more people on board--was only 1 tourism item for Roanoke.
- Include information on campgrounds, hotels, gas stations.
- Better explanations about accessing specific information; lots of hotels - a system for limiting the listings or categories
- Having an option for getting more detailed weather. Alerts for tourist information, such as "you may not want to look for a hotel due to VT graduation"
- Current weather information, current road conditions. Provide weather for more specific regions. More complete listing of services.
- Help to provide high level directions to major VA cities. Nice to have more information, but concern over state endorsing private enterprise.
- There are some improvements to the voice response, sometimes doesn't' recognize words especially in services. Listing construction and traffic delays in a geographic order instead of chronological to key in to when to listen. Need hours of gas stations, would be helpful when traveling late at night. Where nearest open gas station and food are located.

Improve weather information: 14

- Road information/weather information
- Having an option for getting more detailed weather. Alerts for tourist information, such as "you may not want to look for a hotel due to VT graduation"
- Current weather information, current road conditions. Provide weather for more specific regions. More complete listing of services.
- More weather that was specific to where he was; used mile markers - was 30 miles away. Make the weather information more immediate; cell phone was GPS capable, it would be cool that could be related directly GPS position
- When I hit 511, I said weather in Winchester and it kept on giving me Roanoke. I didn't get the information he needed. Also couldn't understand him and was frustrated.
- Possibly weather conditions
- Better way to find the weather, construction dominated
- Include the weather and keep it posted on the incidents sections.
- Weather - more information
- Maybe if they had weather conditions.
- Winchester weather is a bit messed up. The Christiansburg weather comes in as Roanoke. When leaves Baltimore -- to come home typically calls. Blacksburg weather would be better as it is different from Roanoke by like 10 degrees.
- More entries for listings of restaurants etc. Could make judgment of quality of services provided by 511 based on few selections of establishments. Could also not be objective, could classify themselves as fine dining but may not be. Need objective classifications. Want weather for farther locations, even other states.
- Make it more current, weather was an hour and half old day called.
- Weather more, accident information, road work

Information not current: 39

- Update it faster; exits that are better choice, add towns to the exit information
- Is there a way to make it more update. More information on when it clears.
- Sometime it is not up to date. It seems like there are accidents that have clearly been going on for hours, but they are not on the alerts. Sometimes 511 does not connect.
- Get the information there as quickly as possible. Make the information available via radio for people who do not use a cell phone.
- Put the information on a CB channel (other than 19) - a designated channel. Current information.
- It did not seem like it was updated very often. The information was not very useful, the information was better on the radio. The traffic information was difficult to navigate through, a mile marker indicator would be better for those who are not familiar with the area.
- More immediate information; no explanation - need better quality information
- The more current it is the more useful and worthwhile it is and the more I would use it. If it is inaccurate I wouldn't want to call anymore. Want to trust accuracy and timeliness.
- Make it more current, weather was an hour and half old day called.
- The information is not current and fails to register major backups. When he called for the survey while he was on the phone he ended up in a major backup for 20 minutes that was not reported on the service. Only information was on construction. Never heard accurate information on traffic accidents or major congestion. Uses once every two months. This service would be a "joke" in Washington. Couldn't compete with Radio/TV. Need better than single pre recorded message about possible construction activity.
- Can they update it as quickly as possibly as possible and to tell us what exit to get off of on the interstate?
- Called several times and it doesn't have the information yet -- someway to get immediate information and alternate routes.
- Sometimes it is not update little more informative about backups, more information -- approximately how long the backup is, when it was last updated.
- More timely. Sometimes the accident will be cleaned up but the accident is still on the system. Reasonable wait or delay times. Routes to get around accident and where to get back on original route. Tell us how long the back-up is at an accident and how to re-route. Or how slowly the traffic is moving and expectation of delay
- Update more frequently, get better information. Users should be able to report an accident.
- The second time: something was wrong with the recording, the information was old (6 hours old), the option for more information, when he asked it didn't respond, and it skipped the area. Make more user friendly, would like to be able to push a button for more information. When they tell the time they're talking about, need to be able to tell if there is actually back ups associated with the construction or not.
- Have not always found that information is current. How old is the information?

- It would be more helpful if I new how current that information is. Wonder if it is current.
- Updated more frequently
- More updates on conditions through out the day. As close to real time as possible.
- Information could be more timely.
- Timeframe from when something happens to when it gets on the line. Up to date.
- It would help if it was updated more often. The information that was available was old.
- Real-time immediate updates.
- Timeliness of information. Would like more VMS along the interstate.
- Updated more frequent during inclement weather
- Don't know how frequently update information, good current information would be really vital. Current information would be great.
- Updates. Has not always got the information looking for. Heard the same thing he heard the day before.
- Maybe if it were updated a little more frequently.
- If it was updated a little more often
- Incidents reported sooner
- More up to date. For example there was a fog alert on Afton and it was not listed on 511. I don't know how long it takes to report the information.
- Information is not always current. Like construction and traffic. Felt that it should have been picked up.
- If you could tell when the update was last done. Time stamp.
- The service was worthless for what he was looking for. Hit a huge back up and had to drive back on Northbound and called 511 to see if the backup was still there. Since no time of reporting, had no idea if for sure everything was fine. Must have a time stamp for no information as well as for incidents. Try NJ turnpike radio service for reference. Like having phone and radio as options for travelers. Also had technical issues.
- Would be nice to know about mowing. Could be updated more, incident information. Would be nice to have a way for travelers interact with the system so the information is more timely.
- If they had a projected time of how long the backup is or update the status of backup
- Difficult to go through so many prompts. How current is the information? Broadcast future traffic problems, such as future construction in advance.
- Provide information accurately. Did not find information for the area she was in. Did not seem timely. Did not get access to it each time called (Sprint cell user)
- There are some improvements to the voice response, sometimes doesn't' recognize words especially in services. Listing construction and traffic delays in a geographic order instead of chronological to key in to when to listen. Need hours of gas stations, would be helpful when traveling late at night. Where nearest open gas station and food are located.

- Publicize it more. Available in more areas.
- More publicizing. Option to get possible detours.
- Should put 1 800 number on the sign on the road.
- Making it more know that 511--more awareness
- I didn't understand the connection between 1-800 number and 511
- Had to spend a lot of time to get the information. But was easier the second time. Out more signs up to let people know about the service.
- Instead of mile makers give me associated cities. I don't know mile markers well enough. Give me cities.   Publicize it broadly so that I can remember to call it. Get the number out to the public, especially during winter months when it is snowing and icing. It helped me to decide to stay home when the conditions were dangerous. It aids public safety. I consider this number as an excellent public service to prevent accidents.

More cameras: 1

- If they had some cameras- more cameras

Nothing: 97

- No think alright as it is.
- None. Got the information I wanted.
- Keep up the good work.
- No thought it was pretty good.
- Can't think of anything great, wish every highway system had one.
- Nothing. It is excellent
- Nothing. It is great right now. Maybe if the voice was a little more pleasant like yours.
- None. It is pretty up to date and informative.
- No - love it!
- Perfect.
- No it was absolutely wonderful.
- Not really pretty much covers everything as far as traveling on the interstate.
- Improve road construction not 511.
- User friendly
- Nothing. Pretty tickled with it.
- Pretty much do a good job with it
- I think it is good the way it is right now.
- nothing I can think of
- everything seems fine now
- Pretty good
- It is pretty good right.
- You can indicate where there is a speed trap. :) It meets the basic needs she has.

- Was as useful as that information could be.
- Nothing, she is satisfied.
- Doing a good job!
- It is pretty good the way it is.
- Make trucks stay in the right hand lane; nothing with the phone
- You are doing great.

<div align="center">**Provide better construction information: 21**</div>

- Construction was reported, no construction was visible. There was a car that caused the back up but nothing was reported on 511. More accurate traffic information.
- Could tell you during what times the lanes will be blocked for construction. Suggest alternate routes. In construction areas what hours is it going on? Daylight? 24 hours?
- I wish you could not go through long lists (for construction). It would be nice if it would provide information for a specific mile marker or region. Wish it was faster and concise
- Construction information could be more immediate, how far traffic is backed up and where any other tie ups are
- Telling the specific construction areas rather than multiple especially if it is bridgework.
- A lot of times there is a long list of construction. Easier way to get through the list to what you really want to hear.
- Subsystem that would let him know about upcoming construction
- More detail about construction, how long delay will be, how many lanes are open, and when it will be taking place.
- More detail on where road works are and back-ups from road works.
- Go through too many menus to get information. Should just have one menu for problems. Can say, "If you want to know what the problems are on X say yes."…. The closer the information can be to real time the better.
- Weather more, accident information, road work
- More frequent updates when there is either an accident or construction particularly accidents -- get one get there it is clear yet an accident on I-81 two hours, etc.
- Nothing. You wanted traffic, construction on local highways. Main highway. Route 58 and Route 16.
- Would like to know all restaurants and hours etc. It was tough to get down to the construction information that he wanted, there were so many option. Information on how to bypass the construction and accident.
- Improve services information instead of having to hang up and dial 411. Some times construction lists are too large, would like to have them narrowed down to specific mile markers.
- The information is not current and fails to register major backups. When he called for the survey while he was on the phone he ended up in a major backup for 20 minutes that was not reported on the service. Only information was on construction. Never heard accurate information on traffic accidents or major congestion. Uses once every two months. This service would be a "joke" in

Washington. Couldn't compete with Radio/TV. Need better than single pre recorded message about possible construction activity.

- There are some improvements to the voice response, sometimes doesn't' recognize words especially in services. Listing construction and traffic delays in a geographic order instead of chronological to key in to when to listen. Need hours of gas stations, would be helpful when traveling late at night. Where nearest open gas station and food are located.
- Traffic situation are sometimes not listed on 511. Including accident, construction. Main concern is to get timely information.   Would be good to have a way to report. Get better real-time data.
- Difficult to go through so many prompts. How current is the information? Broadcast future traffic problems, such as future construction in advance.
- No way to say exactly where you're located - in the alerts construction alerts were confusing - too many alerts - needs to be faster pinpoint area where you are
- The second time: something was wrong with the recording, the information was old (6 hours old), the option for more information, when he asked it didn't respond, and it skipped the area. Make more user friendly, would like to be able to push a button for more information. When they tell the time they're talking about, need to be able to tell if there is actually back ups associated with the construction or not.

Provide detour information: 20

- Alternate route information. It gave traffic reports by town, she did not know where the towns were would like to have it given by exit numbers as well for those who are not familiar with the area.
- More detail, re-routing information etc.
- Anything that indicates weather information, information about delays closings accidents, alternate route suggestions.
- Detour information.
- Not much you might suggest alternate routes when there is blocked traffic
- If there is an accident and the traffic is backed up would like to suggest alternate routes.
- Providing an alternate route.
- If there was a major tie up offering alternate routes.
- Offering alternate routes information.
- Would like alternate route information.
- More information about construction, how many miles is it from what marker to what marker. Know more about accidents, how many lanes are open? Where is it at, give option to get off the highway. Was difficult to get to the information, it was ridiculous and difficult. Could not go backwards, had to get out come back in and do it again. Nice if there was an automated feature that asks what mile marker you are interested in and then you get the list that is relevant to that mile marker.
- Told a little bit about times of days, anticipated events. State a different route especially for those who are not local.
- Can they update it as quickly as possibly as possible and to tell us what exit to get off of on the interstate?

- Called several times and it doesn't have the information yet -- someway to get immediate information and alternate routes.
- More publicizing. Option to get possible detours.
- Could tell you during what times the lanes will be blocked for construction. Suggest alternate routes. In construction areas what hours is it going on? Daylight? 24 hours?
- Well it could tell you how long the backup is. Told her to get off 114 and follow signs but no signs, like to know how long backup was and weather the construction zones are causing a backup. How long delay versus interstate and alternate route. A comparison i81 and alternate route 11 - -difference. Trouble navigating the system.
- Would like to know all restaurants and hours etc. It was tough to get down to the construction information that he wanted, there were so many option. Information on how to bypass the construction and accident.
- Wasn't specific enough. Needed to give you updates about Provide more information about delays and location. Need to know where you are in jam and alternate routes.
- More timely. Sometimes the accident will be cleaned up but the accident is still on the system. Reasonable wait or delay times. Routes to get around accident and where to get back on original route. Tell us how long the back-up is at an accident and how to re-route. Or how slowly the traffic is moving and expectation of delay

Provide directions: 6

- Help to provide high level directions to major VA cities. Nice to have more information, but concern over state endorsing private enterprise.
- If it had directions.
- Once time tried to get directions. Had a difficult time.
- Wanted to talk to a person, who give could distance based on your current mile marker, even an automated service that could tell how far.
- There were no markers or anything to tell you where to get off for VMI, Washington Lee University. Wanted to find out where to get off. Include major universities and other major sites with directions.
- To be able to press or say the mile marker you are at and the route number you are trying to get to for directions and distances. 'I'm on I-81 South at mile maker 14 and I want to get to route 66' and it would tell you how far you have to get to that route.

Provide information by mile marker: 13

- To be able to press or say the mile marker you are at and the route number you are trying to get to for directions and distances. 'I'm on I-81 South at mile maker 14 and I want to get to route 66' and it would tell you how far you have to get to that route.
- More detailed reports -- specific locations (i.e., mile marker)
- Asked for traffic delays, just a huge list - would have appreciated a smaller list - by mile marker, more relevant
- The biggest problem last time was that it was too broad it was not narrow enough. Narrowed by mile marker would be helpful.

- Because not familiar with the towns, have to check map -- say mile marker then you would know that you are coming up on it. Maybe have both.
- Didn't know area and what she was near. Near intersection --no clue where was. Mile markers right there.
- 15 miles pushing buttons the cell phone - way too many menu choices. The voice activated parts were good, but it didn't take you to delays more quickly, expected delays to be by mile marker
- I wish you could not go through long lists (for construction). It would be nice if it would provide information for a specific mile marker or region. Wish it was faster and concise
- When it says that there are backups if it tells how far back -- if backups, be prepared, what is the mile marker range for the backup.
- Go through too many menus to get information. Should just have one menu for problems. Can say, "If you want to know what the problems are on X say yes.".... The closer the information can be to real time the better.
- Improve services information instead of having to hang up and dial 411. Some times construction lists are too large, would like to have them narrowed down to specific mile markers.
- More information about construction, how many miles is it from what marker to what marker. Know more about accidents, how many lanes are open? Where is it at, give option to get off the highway. Was difficult to get to the information, it was ridiculous and difficult. Could not go backwards, had to get out come back in and do it again. Nice if there was an automated feature that asks what mile marker you are interested in and then you get the list that is relevant to that mile marker.
- It did not seem like it was updated very often. The information was not very useful, the information was better on the radio. The traffic information was difficult to navigate through, a mile marker indicator would be better for those who are not familiar with the area.

Provide information on location of user: 3

- No way to say exactly where you're located - in the alerts construction alerts were confusing - too many alerts - needs to be faster pinpoint area where you are
- More weather that was specific to where he was; used mile markers - was 30 miles away. Make the weather information more immediate; cell phone was GPS capable, it would be cool that could be related directly GPS position
- Wasn't specific enough. Needed to give you updates about Provide more information about delays and location. Need to know where you are in jam and alternate routes.

Provide information on road safety: 1

- Road safety/traffic patterns

Provide information on start and length of backup: 9

- Well it could tell you how long the backup is. Told her to get off 114 and follow signs but no signs, like to know how long backup was and weather the construction zones are causing a backup. How long delay versus interstate and alternate route. A comparison i81 and alternate route 11 - -difference. Trouble navigating the system.
- When it says that there are backups if it tells how far back -- if backups, be prepared, what is the mile marker range for the backup.
- If there is an accident, I want to know how long ago it happened and when it is expected to be clear. I want a timeframe of how long the delay will be--until the specific time - i.e. - 3:00 p.m.
- If they'd identify the Provide more information about delays or backup.
- How far was the traffic backed up
- I think if they put a time marker -- wreck at 4:20 and then if calling at 4:45 know that more than likely going to be out of the way. time of accident or time of expected delay --expect a 20 minute delay at 4:20
- When called 511 it gave a report of what was going on south of us, it took a while to get to the information we needed on 81 North. It would be helpful to get to the direction we needed quickly. The information was for way farther South than we needed. More information on how far the backup is and where it originated.
- Sometimes it is not update little more informative about backups, more information -- approximately how long the backup is, when it was last updated.
- More timely. Sometimes the accident will be cleaned up but the accident is still on the system. Reasonable wait or delay times. Routes to get around accident and where to get back on original route. Tell us how long the back-up is at an accident and how to re-route. Or how slowly the traffic is moving and expectation of delay

Provide more information about delays: 11

- If they had a projected time of how long the backup is or update the status of backup
- If there could be some notification of when the traffic will start flowing again--time of delays. If the police were searching a vehicle or person if they would post the vehicle description there, help us be more active in enhancing safety.
- delays knowledge of delays before hand
- Maybe by letting us know how long the delay will be or even classify as minor or major.
- Finding out how long the backup was going to be.
- More information on the delays that are caused what are the delays.
- Wasn't specific enough. Needed to give you updates about Provide more information about delays and location. Need to know where you are in jam and alternate routes.
- More timely. Sometimes the accident will be cleaned up but the accident is still on the system. Reasonable wait or delay times. Routes to get around accident and where to get back on original route. Tell us how long the back-up is at an accident and how to re-route. Or how slowly the traffic is moving and expectation of delay

- Construction information could be more immediate, how far traffic is backed up and where any other tie ups are
- Anything that indicates weather information, information about delays closings accidents, alternate route suggestions.
- If there is an accident, I want to know how long ago it happened and when it is expected to be clear. I want a timeframe of how long the delay will be--until the specific time -i.e. - 3:00 p.m.

Provide State Police information: 3

- Including the traffic assistance number to help motorists. Might need to ad more signage.
- Getting road side assistance as soon as you can if necessary.
- If there could be some notification of when the traffic will start flowing again--time of delays. If the police were searching a vehicle or person if they would post the vehicle description there, help us be more active in enhancing safety.

Provide way for user to report: 4

- way to give feedback on what you're experiencing - able to report slower travel
- Ability to report bad drivers. Some of the truck drivers are very dangerous.
- Update more frequently, get better information. Users should be able to report an accident.
- Would be nice to know about mowing. Could be updated more, incident information. Would be nice to have a way for travelers interact with the system so the information is more timely.

Voice recognition not working: 21

- Better accent recognition - also offer the keypad option - especially if someone has a cold, etc. Limit the keys, but still use yes/no use 1 or 2
- I think if they would let you do it with numbers instead of voice software. Not sure if southern accent or noise in the car but the software seems lacking. Easier sometimes to touch in one number than to try to go through voice recognition.
- The voice recognition did not recognize "thank you". Did not provide answers for why there was so much traffic.
- There are some improvements to the voice response, sometimes doesn't' recognize words especially in services. Listing construction and traffic delays in a geographic order instead of chronological to key in to when to listen. Need hours of gas stations, would be helpful when traveling late at night. Where nearest open gas station and food are located.
- Sometimes if you have music or the radio on it will misinterpret outside sounds for a voice command. It seems to respond more to sound than to a particular word. Yes takes to help.
- It is so sensitive. Have to turn everything off, nobody can talk, you can't cough.
- Limited by the voice activation. Would like to ask for "traffic in Lexington"
- The one thing I don't like is that it is very voice sensitive if the kids make noise it puts her into a different menu and she has to start over.

- It picks up car noise, stops and says I didn't get that. Would like it to return to the point that it left you at.
- The new system is very sensitive, if your radio is too loud it picks up that sound.
- Reception, wasn't reading correctly what said.
- It does not recognize what he is saying. Improve the voice recognition.
- It is hard to get it to understand what exits you are asking for.
- Sometimes you get lost with the voice commands, you get sent to where you did not want to be.
- Voice recognition doesn't work very well all the time.
- Voice commands don't pick up, have to repeat everything.
- Instead of having to say yes, or no. Go to push buttons because sometimes the voice recognition sometimes does not work.
- When I was able to get information it was useful but I just entered exits it didn't work. Every time I said food it said roadways it always when to roadways. So that sucked.
- One time was trying to get in touch with a specific store could not connect. Voice recognition was working 2/3 of the time. Information structured as well as it could be structured, but had to go through several option to get where wanted to go. Nice to have it elsewhere.
- When I hit 511, I said weather in Winchester and it kept on giving me Roanoke. I didn't get the information he needed. Also couldn't understand him and was frustrated.
- The second time: something was wrong with the recording, the information was old (6 hours old), the option for more information, when he asked it didn't respond, and it skipped the area. Make more user friendly, would like to be able to push a button for more information. When they tell the time they're talking about, need to be able to tell if there is actually back ups associated with the construction or not.

Miscellaneous/ not related to 511: 9

- Get some of the trucker traffic off
- Getting through to the number of the number just to fix the voice mail.
- I would like to see alerts on the VMS signs, he doesn't know what they are used for and he thinks that this would be a good use.
- More VMS about what's going on
- On the internet for I-81
- Maybe if the signs actually worked (the overhead vs. signs)
- Flashing message signs warning of an alert - more of those so that you don't get stuck in the backup
  More VMS signs.
- Wide area internet access by radio.
- Decided to participate because of the variance between the TV (saying call 511) and the actual system.

511 Virginia Evaluation

January 2004

National 511 Issues
Appendix 1-I

SETTING A GOAL FOR FIRST YEAR 511 AWARENESS: WHAT IS REASONABLE?

What should be a goal for awareness for a regional, rural 511 system? The national organization of 511 has been growing dramatically since it was designated by the FCC in July 2000, making it difficult to pinpoint an awareness goal that is more than arbitrary. In order to set a reasonable goal, The Virginia Tech Transportation Institute (VTTI) looked to the recently updated National 511 Guidelines (version 2.0) to locate meaningful awareness goals against which to compare those of the 511 Virginia service. However, the national 511 goals do not translate well to a rural 511 system because they lack an appropriate level of gradation. For example, according to the National 511 Guidelines (version 2.0), the national awareness goals include the following by 2005:

- For 25 or more sates to have operational 511 systems,
- 30 of the 60 major metropolitan areas and more than 50% of the population areas to have access to 511,
- For more than 25% of the nation's population to be aware of 511, and
- For more than 90% of the 511 users to be satisfied with the service provided.

Unfortunately, these goals do not help to define what a new deployer should be able to accomplish in its first year. However, in November 2001 ITS America published the findings of a Gallup Poll conducted to determine baseline statistics regarding national awareness. The poll found that nationally there was a 53% awareness of automated telephone traveler information systems, and a 9% awareness of 511, specifically. One method for determining the meaning of 511 Virginia's Awareness results would be to compare it to the baseline established by this national awareness survey. Table 1 shows this comparison.

Table 1: Sources for 511 Awareness: National Gallup Poll 2001 vs. 511VA Phone Survey 2003

2001 Gallup Poll 511 Sources	Vs. 2003 511 Virginia Awareness Phone Surveyed Sources
72% Television	4% Television
70% Radio	7.4% Radio
40% Internet	2.4% Internet
20% Telephone System	None Reported

While the number one source for awareness in Virginia was the road signs, at 61.8% (233 of 377), signs were not mentioned at a national level.

Another comparison that might be of value is to Minnesota's pre- and post- 511 marketing campaign awareness levels from 2001. The awareness levels before and after the marketing campaigns are outlines in table 2 and are compared to 511 Virginia's results from 2003:

Table 2: 2002 Minnesota 511 vs. 2003 511 Virginia Awareness Survey Results

2002 Minnesota 511 Awareness Survey Results	Vs. 511 Virginia's 2003 Awareness Survey Results
Statewide	**Statewide**
Before Marketing Campaign: **13%**	**19%**
After Marketing Campaign: **25%**	Single Measure Only
Metropolitan Area	**511 Coverage Area Only**
Before Marketing Campaign: **11%**	**10%**
After Marketing Campaign: **28%**	Single Measure Only

Based on these comparisons, it is clear that, until there is a national measure of what can be considered a success for new deployers' awareness levels, deployers will need to establish their own baseline awareness levels as a benchmark, preferably before they launch a 511 service. Since 511 Virginia did not have this advantage, and because no other traveler information phone number awareness surveys were conducted in Virginia before the launch, 511 Virginia's awareness levels will have to be considered as baselines for statewide implementation in the future.

SETTING 511 VIRGINIA'S EVALUATION GOALS WITHOUT NATIONAL 511 EVALUATION GOALS: HOW DID VTTI DO IT?

511 Virginia was the one of the first three-digit traveler information numbers deployed. It primarily converted a previously existing ten-digit number into an enhanced voice recognition traveler information service. However, the majority of the system's development occurred before the National 511 Guidelines were published. As such, the goals for the system and for its evaluation were more locally driven. However, a post-evaluation comparison between the goals used to evaluate 511 Virginia and those developed to evaluate Intelligent Transportation Systems (ITS) in Virginia, as well as the National 511 guidelines show that similar themes were reached independently.

While a large majority of the National 511 goals were addressed in some way by the 511 Virginia evaluation, a few goals were not included such as national interoperability, sustainability, and public good vs. value added services. However, these goals were predominantly business model issues, and given that Shentel, Inc. was primarily responsible for the business model, it was determined by the Virginia Department of Transportation (VDOT) that VTTI was not the appropriate agency to evaluate business model issues.

Table 3: Comparison of National 511 Goals, Virginia's I-81 ITS Goals, & 511 Virginia Evaluation Measures

National 511 Goals	Virginia's I-81 ITS Goals	511 Virginia Evaluation Measures
Have a customer focus	• Meet traveler needs/improve traveler experience • Increase traveler awareness of 511 service	• Measure % of travelers using 511 service
Serve local users, visitors, and through travelers	• Meet traveler needs/improve traveler experience • Reduce Travel Delays	• Measure travelers' perception of level of access to travel information • Measure % of travelers using 511 service • Measure change in traveler confidence in safety of I-81 • Measure change in traveler behavior (i.e., when provided with real time information about an accident, what effect does the information have on traveler behavior?)
Have ubiquitous brand awareness and coverage	• Increase traveler awareness of 511 service	• Measure percentage of travelers using 511 service
Provide timely, accurate and reliable information	• Meet traveler needs/improve traveler experience • Create corridor traveler awareness of real-time condition information • Reduce Travel Delays	• Measure travelers' perception of level of access to travel information • Measure travelers' perceptions the timeliness of traveler information data • Measure change in traveler confidence in safety of I-81 • Measure self-reported changes in traveler behavior due to access to 511 Virginia (i.e., when provided with real time information about an accident, what effect does the information have on traveler behavior?)

National 511 Goals	Virginia's I-81 ITS Goals	511 Virginia Evaluation Measures
Be consistent in content, interface, and quality of service	• Meet traveler needs/improve traveler experience • Create corridor traveler awareness of real-time condition information	• Measure travelers' perception of the level of access to travel information • Measure travelers' perceptions of the timeliness of traveler information data
Be mission critical to travelers/users, transportation system operators, emergency and homeland security providers, and the information services industry	• Meet traveler needs/improve traveler experience • Increase traveler awareness of 511 service • Reduce Travel Delays	• Measure travelers' perception of level of access to travel information • Measure percentage of travelers using 511 service • Measure travelers' perceptions the timeliness of traveler information data • Measure self-reported changes in traveler behavior due to access to 511 Virginia (i.e., when provided with real time information about an accident, what effect does the information have on traveler behavior?)
Have a mix of "public good" and "value added" information	Defined by 511 Virginia's business model, and the PPA between VDOT and Shentel, Inc.	Defined in the business model, which was not addressed in this evaluation
Be sustainable and permanent	State-wide RFP to address this issue for future state-wide implementation	To be decided
Be continually improving	• Meet traveler needs/improve traveler experience	• Measure travelers' perception of level of access to travel information

National 511 Goals	Virginia's I-81 ITS Goals	511 Virginia Evaluation Measures
Strive for complete customer satisfaction	• Meet traveler needs/improve traveler experience • Increase traveler awareness of 511 service • Reduce Travel Delays	• Measure travelers' perception of level of access to travel information • Measure percentage of travelers using 511 service • Measure self-reported changes in traveler behavior due to access to 511 Virginia (i.e., when provided with real time information about an accident, what effect does the information have on traveler behavior?)
Be nationally interoperable	Not yet state-wide, not applicable	To be decided

LEVERAGING THE 511 INVESTMENT: CASE STUDIES

See Appendix E for an in-depth analysis of a peak call period for 511 Virginia, as well as an initial case study that generated the discussion about what type of information should be posted on 511 and what type of information should be posted on Changeable Message Signs (CMS). In addition, it highlights the need to focus case studies on traveler experience. For example, when, what type, and what quality of information was available to the travelers during a peak call period or incident? VTTI conducted case studies using 511 call volumes as the demand function. 511 provides a unique opportunity to finally be able to estimate traveler demand for travel information. Until now, ITS had very little direct feedback of demand. The 511 phone and web traveler information system provides that essential traveler demand function.

Throughout the evaluation, VTTI provided VDOT with mini-case studies from peak days. See Appendix C for details of these case studies. However, in general, for each monthly 511 call volume/web peak day, VTTI correlated the following elements in an effort to outline what a driver on the road might have experienced, and what might have driven her/him to call 511 for information:

- Rank of that month's peak amongst all peaks
- Call Volume
- Maximum ports used
- Day of the week
- Peak hours of that day
- Order in which the information was posted (i.e., CADS, CMS, 511)
- Peak-hour accidents posted in the Virginia State Police database, Computer Automated Dispatch (CADs)
- Relevant 511 Postings (based on peak call hours)
- Relevant CMS Signs posted (general measure of severity and based on peak phone hours)
- Relevant weather events (based on fog CMS sign postings and Severe Weather Alerts)
- Any other corridor events that may have been a factor (NASCAR races, flea markets, college holidays, etc.)

FORECASTING 511 CALL VOLUME WITH AND WITHOUT HISTORICAL DATA

Forecasting 511 call volume is of primary interest to new deployers, as well as seasoned deployers negotiating new per-minute contracts (as will be the case in the state-wide Request for Proposals for 511 Virginia).

For brand new 511 systems, the forecasting system used for purchasing minutes will not have historical call volume data from which to generate a forecast, since an unknown base increase from any previous phone service will occur as a result from the rollout advertisement and media attention and from ease of use of a three digit number. For the purpose of determining a rough estimate of

how many minutes should be purchased, VTTI chose to use historical I-81 traffic volumes in order to determine an average daily traffic volume for trucks and cars. Then, based on the adoption curve used by marketers for new products, VTTI estimated the initial percentage of early adopters of the new service. VTTI chose to use a conservative initial early adopter estimate of 2%. It is conservative on the high side because it was decided that it was better to purchase too many minutes than too few to avoid having to pay the penalty per-minute fee. Based on these assumptions, VTTI estimated high and low call volumes of 609,550 and 152,205, respectively. However, the actual call volume for this period was 112,331. Therefore, both estimates were high. In retrospect, a 1% adoption rate would probably be more appropriate for future deployers.

For an estimate of the cost of the per-minute plan, VTTI used the fact that nationally, calls have stabilized at about two-minute durations. The cost of a call to 511 Virginia per-minute was $0.20. The cost of transferring callers on to other services was $0.25 per transfer. Based on these costs, VTTI estimated the cost of the total plan for the minute-provider contract. See Appendix D for the actual calculations.

A more comprehensive database of traffic volumes on more of the roads covered by 511 would also be preferable as a basis for the traffic volume assumption, especially for coverage areas that include more than a single primary road. In other deployments and in 511 Virginia's future, being able to utilize this information will depend upon the infrastructure in place for collecting traffic volume data.

Several accepted forecasting methods are available for forecasting minutes for an already existing 511 service that has historical data available. Table 5 presents the Mean Average Deviations (MAD) from each forecasting method applied to one year of 511 call volume data:

Table 4: Mean Average Deviation for Methods of Forecasting Call Volumes with Historical Data

Formal Forecasting Method	Mean Average Deviation (MAD)
3 period Moving Average	4007.2
3 period Weighted Moving Average	3917.6
4 period Weighted Moving Average	9109.5
5 period Weighted Moving Average	9920.9
Exponential Smoothing	31878.1
Regression	1667.2

See Appendix D for method descriptions, actual calculations, and tables of data.

Using the regression method, 511 Virginia's call volume for 2004 was broken into high and low estimates: not taking into account any growth in the coverage area based on a three-month regression analysis by month, VTTI forecasted that 511 Call Volumes will fall in 2004 to between 0 and 1,238,110. As more years of data are collected, the regression method will probably become more accurate. See Table 2 for more detailed data.

Table 5: 3-period Monthly Regression Analysis at a 95% Confidence Interval

3-period Monthly Regression Analysis at a 95% Confidence Interval											
Time Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000/0										25	507	708
2001/1	617	1006	859	825	547	604	557	673	592	606	791	729
2002/2	1409	6779	6337	5867	8577	6928	6998	8552	7075	7883	8823	23322
2003/3	9948	24337	16093	10598	10284	12827	12941	14953	12626	12760		
Forecast/4												
Lower 2004	13321	34037	-73664	8507	-126661	9404	7963	-11059	-2262	-6941	-134517	-479154
Upper 2004	13775	20957	119658	22563	159073	28611	30466	55734	39855	40318	166212	540888

	2004	Lower Confidence Interval Limit	(761,026)	Or "0"
	2004	Upper Confidence Interval Limit	1,238,110	

For more global-type forecasting methods, VTTI applied a monthly percentage-increase method and a growth-rate method, which together provide a more localized forecast range of between 198,032 and 205,630 calls to 511 Virginia in 2004, without taking into account any growth in coverage area. In VTTI's opinion, this range (198,000 to 205, 600) is the most accurate estimate of the minutes that will be necessary in 2004 for the current coverage area (see Table 7 below).

Table 6: Percentage Increase and Growth Rate Forecasts for 2004 511 Virginia Call Volumes

Forecast Based on Percentage Increase from 2002 to 2003												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2002	1409	6779	6337	5867	8577	6928	6998	8552	7075	7883	8823	23322
2003	9948	24337	16093	10598	10284	12827	12941	14953	12626	12760	19340	Not Avail
% Increase from 2002	N/A	259%	154%	81%	20%	85%	85%	75%	78%	62%	119%	N/A
F2004	9948	63034	24776	8546	2047	10922	10990	11192	9906	7894	23053	23322
205,630 **Total Expected Calls in 2004**												
Forecast Based on Conservative Growth Rate												
2003*Growth Rate	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Forecast for 2004	10943	26771	17702	11658	11312	14110	14235	16448	13889	14036	21274	25654
198,032 **Total Expected Calls in 2004**												

* Growth Rate is based on the adoption rate increases for 2 six-month periods (1st year & 1st 18 months)

REPEAT USAGE

The primary source VTTI used for conducting repeat usage analysis is Call Detail Records, or CDRs, produced by TellMe, Inc. The data used to determine discrete callers is available through log files that can be accessed directly and downloaded from the TellMe, Inc.'s website.   These records are used across the telecommunications industry. In order to bypass manually downloading them, VTTI's software programmer used a PERL script to get the records directly from TellMe, VTTI's recommendation regarding obtaining these records is to request the raw ANI_II data (which includes the ii digits) from the provider when negotiating a contract; this method will ensure access to this type of data in the future.

A primary issue in determining repeat usage is the fact that the telecommunication industry uses numbers called private branch exchanges, or PBXs. The following is the searchNetworking.com definition of a PBX, accessed December 24, 2004:

> A PBX (private branch exchange) is a telephone system within an enterprise that switches calls between enterprise users on local lines while allowing all users to share a certain number of external phone lines. The main purpose of a PBX is to save the cost of requiring a line for each user to the telephone company's central office. The PBX is owned and operated by the enterprise rather than the telephone company (which may be a supplier or service provider, however). Private branch exchanges used analog technology originally. Today, PBXs use digital technology (digital signals are converted to analog for outside calls on the local loop using plain old telephone service).
> A PBX includes:
> - Telephone trunk (multiple phone) lines that terminate at the PBX.
> - A computer with memory that manages the switching of the calls within the PBX and in and out of it.
> - The network of lines within the PBX.
> - Usually a console or switchboard for a human operator.

In some situations, alternatives to a PBX include centrex service (in which a pool of lines are rented at the phone company's central office), key telephone systems, and, for very small enterprises, primary rate Integrated Services Digital Network.

Among the larger manufacturers of PBXs are Lucent Technologies, Northern Telecom (NORTEL), Rolm/Siemens, NEC, GTE, Intecom, Fujitsu, Hitachi, and Mitel.

Because VTTI was unaware of this issue at first, researchers ran a repeat usage query on the three months worth of raw CDR data and discovered that three numbers came up with 2,500 calls each. This seemed unlikely, given that the total call volume for those three months was only 20,000. When the numbers were reversed using the reverse look-up files available on the Internet, the numbers were unlisted. After a taking a closer look, it was determined that these were public exchange numbers, collective numbers coming from either large companies, or in one case, one of ten numbers used by Virginia Tech. However, to date, it has been impossible to go back and determine how many individual callers the 2,500 calls actually represent. This problem has provided a tough road block to conducting truly individual repeat usage analysis, unless a telecommunication company is willing to break it down further. Another option would be to treat each PBX number as one number and to simply acknowledge its effect on the analysis. However, the effect of PBX numbers will be more extreme if they represent a large portion of all calls to a system.

One of the primary motivations for analyzing repeat users is to determine users' loyalty and, ultimately, satisfaction. However, another motivation is to determine performance measures for success that could be comparable across all 511 deployers. Based on this motivation, another possible solution for determining a means to compare phone systems nationally might be to compare the day-of-the-week curves for all users (maybe just repeat users including PBX numbers to isolate the core users). For example, the day-of-the-week curves for the Minnesota's 511 repeat users mirrored the day-of-the-week call volume curve that 511 Virginia had had for May for all users. If a similar curve exists across deployers, even given the difference between Minnesota's users and 511 Virginia's primarily rural users, one year's worth of day-of-the-week call volume graphs from each deployer could be collected and collated. From these graphs, there may be enough similarity between deployers to be able to generate a basic month-to-month curve shape, even given rural and urban and seasonal variations. If a standardized curve, or a series of standardized curves, could be used as measures for general call volumes, each deployer could set the curve to the call volume level they currently realize (i.e., set the amplitude of the curve), and each could measure an average percent increase per day-of-the-week over a single month or year. If the standardized curve is used as a base the resulting percent increases could then be compared across all deployers. This solution is based on the supposition that a standardized day-of-the-week curve per month actually exists. There are differences between deployers, but a general curve may exist. Moreover, individual deployers could compare volumes to traffic counts to see penetration rates as a secondary "check" measure, (i.e., a 25% increase in a year might only correlate with a 5% penetration rate for the 511 Virginia System.) In other words, the increases would have to be compared to the national goals of awareness to see the actual large-scale effect.

VTTI's initial recommendation for accomplishing this type of analysis would include the following three steps:

(1) Establish deployer baseline usage rates to benchmark against, based on each individual deployer and valid for each deployer (i.e., to be used as the amplitude for the standardized curve).

(2) Calculate a standardized, national day-of-the-week curve.
(3) Calculate the deployers' percent increase with respect to the standardized curve, and compare nationally across all deployers.

Below is a sample of the data obtained from ANI data (industry standard call data) contained in the CDRs from TellMe, Inc. While it does give the Local Exchange Carrier (LEC) (in bold below), the location that is listed is actually for the individual's home phone registration (regardless of the location from which the caller is making the 511 call: i.e., roaming):

ani_info
status_flag1/status_flag
identifying_statusunclassified/identifying_status
linetypewireless/linetype
is_payphone0/is_payphone
is_private /
ani_value5405569834/ani_value
area_code540/area_code
local_exchange_carriertriton pcs operating company
llc/local_exchange_carrier
cityroanoke/city
state_namevirginia/state_name
state_codeva/state_code
city_stateroanoke@va/city_state
lata244/lata
zip24012/zip
timezone_offset-4/timezone_offset
daylight_savingsy/daylight_savings
is_toll_free0/is_toll_free
is_valid1/is_valid
/ani_info

Once this data is accessed, the next issue may be determining the ratio of wireless to landline users. This ratio and the breakdown of telecommunication providers can be used to facilitate the development of a more focused and effective marketing plan. For example, 511 Virginia used the telecommunication providers and wireless percentage to isolate the top wireless carrier and to purchase an in-bill direct mailing, which targeted users who already showed a propensity for using 511.

Determining wireless users versus landline users is a bit more difficult, since the full information (such as carrier details) requires an ANI database. However, for just determining how many calls are landline versus wireless, you can get a good idea from ANI_II (which is in the CDR's on the TellMe, inc. extranet). If you see a code of 23, 61, 62, or 63, it is typically wireless. Anything else is typically landline. These codes are sometimes referred to as "ii" digits. See http://www.nanpa.com/number_resource_info/ani_ii_assignments.html for information on ANI_II data.

Another potential tool for log file analysis might be the second three digits of the phone number (e.g., 231 in (540) 231-5555). These are referred to as NXX numbers. The NXX databases are

available for purchase for around $70.00. The following research into this information's availability was provided by Mr. Pete Costello from PBS&J, Inc. (Post, Buckley, Schuh, and Jernigan, Inc.):

> NPA-NXX Database
> 511 deployers are interested in the NPA-NXX Database to ascertain whether calls from a certain number are from a wireline or wireless caller. The knowledge of whether a call is of a wireless or wireline nature is helpful in making marketing and other system-related decisions. The 511 Deployment Coalition tracks the percentage of wireless and wireline calls from deployers on a monthly basis, but only a few deployers regularly report this information to date.
>
> The North American Numbering Plan Administration (NANPA) administers the NPA-NXX database. NANPA has the NPA-NXX database available in .zip files on its Central Office Code Assignments webpage:
>
> http://www.nanpa.com/number_resource_info/co_code_assignments1.html#table
>
> The AllCodes.zip file contains all assigned, unassigned, and vacant NPA-NXX combinations. Some effort to determine whether the company associated with a particular NPA-NXX is wireless or wireline needs to be undertaken.
>
> The NPA-NXX database is compiled by third parties and available for sale (for as little as $70):
>
> http://www.quentinsagerconsulting.com/phonecodes.htm
>
> This vendor's website also has a free NPA-NXX Lookup Utility available for individual NPA-NXX.

TellMe, Inc. volunteered to provide a list of telecommunication providers. This is an invaluable marketing tool, and it is highly recommended that the availability of the information be negotiated at the time of the contract development. The following is TellMe, Inc.'s CDR Data Format:

> CALL_ID: unique only for this file
> UUID: universal unique ID for the call (32-char)
> SESSION_DID: inbound number
> ANI: incoming number
> START: (YYYY/MM/DD:HH:MM:SS)
> DURATION: in seconds
> ANI_II: 2 digit ANI II code
> ANI_PRIVATE: privacy bit from the ISDN setup message
> END_STATUS: overall end status (okay or failure -- see
> below)

END_STATUS results:
0 Normal
1 Internal Hardware Error
2 Failed Outbound
3 Internal Software Error
4 Early disconnect - called party disconnected

These can be used for more in-depth performance analysis in the future.

CONCLUSIONS

With this national 511 issues report, VTTI attempted to document some of the lessons learned and to identify some of the more important issues raised through VTTI's experience developing, managing, and evaluating the 511 Virginia service. It is hoped that through this process other deplorers and the company responsible for the expansion of 511 Virginia state-wide will benefit from VTTI's experiences developing evaluation and awareness goals, forecasting future minute usage, and gaining better performance data from the phone system. While the issues that have been raised are far from being solved, perhaps as a result of documenting the current situation, national resources can be directed to further investigating these issues to continue to ease the process of 511 expansion, both nationally and state-wide in Virginia.