

WSDOT 511 IVR Survey and Usability Testing Results

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PRR, Inc.

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Key Findings

- ✦ **Information from 511 is used to change travel plans**

Usability testing participants reported using the 511 system to determine which routes to take, mountain passes to use and times to travel. Twenty-one percent of survey respondents reported changing their plans based on the 511 information they received during their last call.
- ✦ **Users are generally satisfied with the 511 system**

Usability testing participants say it's a great system that just needs some tweaking. More than two-thirds (68%) of survey respondents indicated that they were *satisfied* or *very satisfied* with the 511 system.
- ✦ **Users are generally satisfied with 511 features**

Usability testing participants particularly appreciate the traffic conditions, roadway incidents and mountain pass information. At least three quarters or more (75% or above) of the survey respondents were satisfied with most of the features of the 511 system.
- ✦ **The voice recognition feature needs improvement**

This was the biggest frustration for usability testing participants who experienced, during the testing, the problem of the system not understanding their voice commands. Of those survey respondents that were dissatisfied with the 511 system, 26% indicated it is because the voice recognition feature does not work adequately. Less than half (45%) of all survey respondents were satisfied with the voice recognition system.
- ✦ **More information is needed about other parts of the state**

Just over a third of survey respondents (36%) felt that information was missing in the current 511 system. When asked specifically what kind of information was missing the most common response was the geographic coverage of information.
- ✦ **Respondents are very likely to use the 511 system again**

Almost all the survey respondents (87%) agree that they would be *likely* or *very likely* to use the 511 system again. All of the usability testing participants reported being very likely to use the system again, and in fact planned to use some of the new features they learned about during the testing.
- ✦ **Further refinements will increase 511's value**

511 is well received and will be used by more and more people through time. Recommended revisions will improve its ease of use and value, prompting higher numbers of travelers to modify travel plans to adjust to congestion, mountain pass, and other travel conditions.

Purpose & Methodology

Purpose

In the 1990s the Washington State Department of Transportation (WSDOT) launched a highway hotline that provided information about state highway road conditions, scheduled construction, and mountain pass conditions. In July of 2003 WSDOT was one of the first states to adopt the new FCC licensed 511 travel information number. 511 was intended to eventually replace the 10 digit toll free number in prior use, and initially converted the touch tone menu system into a voice driven approach using state of the art technology. Usability tests conducted prior to launch provided valuable information on key features and menu recommendations for easy use by different types of callers.

Washington State's 511 system now provides voice-driven access to real-time traffic reports, continually updated roadway incident and construction information, express-lane status, mountain-pass road conditions, and weather information. 511 connects callers directly to the state's ferry system and provides phone numbers for transit, passenger rail, and airlines.

If a person calls 511 from an environment where background noise exists (such as a car), the 511 computer has a difficult time separating the speech from the background sounds. This can lead to customer frustration, and so, in November 2004, WSDOT re-introduced a touch-tone option.

In January 2005 the legacy system phone numbers (1-800-695-ROAD) and (206-DOT-HIWAY) were connected directly to the 511 system, allowing the very old touch tone system to be retired.

WSDOT now wants to get customer feedback on the 511 touch-tone menu structure, and also on how similar menu improvements can be made to the voice recognition component of the 511 system.

Methodology

In collaboration with PRR, Inc. an Interactive Voice Response (IVR) survey was developed in order to gain this customer feedback.¹ From early February to late March of 2005, 511 callers were prompted to take a brief survey. If they agreed they were transferred to an automated telephone (IVR) survey.

A total of 659 customers took the survey during this time period, providing feedback on these information goals:

- Version of the 511 system used
- Primary type of information sought
- Satisfaction with 511 system
- Satisfaction with 511 system features

¹ A copy of this survey can be found in Appendix A

- Missing information that should be on the 511 system
- Likelihood to use the 511 system again

Data analysis was conducted using SPSS and involved the calculation of descriptive statistics such as frequencies, percentages, means, and medians, as well as explanatory analysis using techniques such as Cramer's V, Kendall's tau-c, and Pearson correlations. Relationships between variables that are statistically significant at the .05 level or better are reported. Detailed tables of all the survey questions showing responses are also provided in Appendix B.

Respondents to the IVR survey were also asked if they would like to participate in more in-depth usability testing of both the voice-activated and touch-tone 511 systems. A list of potential participants was compiled. PRR then followed up by calling and carefully screening potential participants to ensure that they met set on frequency of calling 511, gender, age, use of mountain passes in winter months, and type of residential location (urban, suburban, or rural).

A total of seven participants were recruited. Six of the seven recruited participated in the usability testing. Their characteristics are as follows:

1. Gender: 4 males, 2 females
2. Residential area: 3 rural, 2 suburban, 2 urban
3. Counties: King (3), Snohomish (1), Skagit (1), Okanagon (1)
4. Ages: 1 (35-39), 1 (40-44), 3 (50-54), 1 (60-64), 1 (70-74)
5. Frequency of using 511 system: 4 (at least every 2 weeks), 1 (weekly), 1 (daily)
6. Type of phone used for calling 511: all use cell phone
7. Use of mountain passes in the winter months: 5 (yes), 1 (no)

A usability testing script (see Appendix C) was designed to structure the 1.5-hour usability testing. The script was designed to introduce each participant to the testing procedure, to obtain background information about the participant, to have the participant become familiar with both the voice-activated and the touch-tone systems, to have the participant use the system to complete several scenarios, and to respond to a number of general questions regarding the system, its usability and other desired features. In general we were testing for:

- Which version do they prefer and why
- The participant's perceptions of the ease of use
- Additional features or functions that they would desire (e.g. special event traffic information, travel time estimates, average speed estimates, parking information, connection to a live operator)
- What exactly would make them more likely to use the system
- What do they think the response to the system would be for first time users
- Are the main menu directions clear
- What do they think of the system and menu organization
- Directions or terminology that is not clear or misleading
- Importance of specific features
- Usefulness of the information
- How would this type of information affect their travel or travel planning
- What benefits do they perceive from this kind of information

Testing was conducted on Wednesday, April 20, 2005 and Thursday, April 21, 2005.

During each testing session, participants were observed (through a one-way mirror) and audio-taped. Finally, information regarding participants' use of the system and their experience was recording into a laptop computer.

The following report is a summary of the findings from both the IVR survey and the usability testing. We have chosen to integrate the findings from the usability testing into our presentation of the IVR survey results to provide more in-depth detail of the survey findings.²

² The other reason we have chosen to not write a more traditional usability report (see our 2003 usability report on the voice-activated system for an example) is because most of the issues identified in our 2003 report have been addressed and in the present round of usability testing concerns centered on only a few issues that are best presented in conjunction with the IVR survey findings.

IVR Survey Respondent Profile

Half (51%) of survey respondents used the touch-tone version of the 511 system, whereas a third (33%) had used the voice recognition version. About half (52%) of the respondents had used the 511 system for the first time within the last year.

The most common type of information sought from the 511 system is *mountain pass* information (54%), *road conditions on Seattle area freeways* (25%), and *road conditions anywhere else in the state* (15%).

The average age of respondents is 46 and more than half (59%) of the respondents are male. A small minority (15%) of the respondents are commercial truck drivers.

Table 1: Complete Profile of 511 Survey Respondents

Version Used	
Touch-tone	51%
Voice Recognition	32%
Both	17%
When first Called 511	
Within the last year	52%
More than a year ago	29%
First time	16%
Don't know	2%
Type of Information Sought	
Mountain Pass	54%
Road Conditions on Seattle freeways/I-5 in Tacoma	25%
Road Conditions anywhere else	15%
Other	5%
State Ferries	1%
Express Lanes	0%
Average Age	
	46
Gender	
Male	59%
Female	41%
Commercial Truck Driver	
Yes	15%
No	85%

Survey and Usability Testing Findings

Information from 511 prompts a fifth of respondents to change their travel plans

Overall 71% of respondents indicated that the information they sought *did not* cause them to change their travel plans. However those respondents looking for information on Seattle specific area roads and freeways were slightly more likely to change their travel plans than those looking from information on roads in the rest of the state.³

In this context, however, the fact that 21% of respondents *did* change their travel behavior is highly significant. A shift of just a few percent in congested areas has measurable benefits. If all drivers called 511 and followed the same pattern, significant improvement in traffic management might be achieved.

While it was expected that calls about mountain pass conditions would prompt a higher than average likelihood to change travel plans, pass conditions were unusually good this winter when the survey was fielded and likely explains why travelers crossed the mountains anyway.

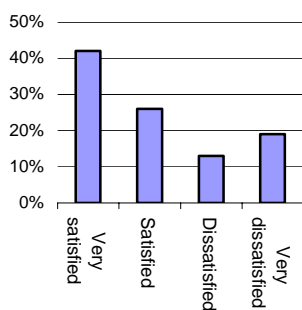
Respondents are generally satisfied with the overall 511 system, but the voice recognition feature could use some improvement

More than two-thirds (68%) of respondents indicated that they were *satisfied* or *very satisfied* with the 511 system. When asked specifically why they were satisfied with the 511 system, respondents indicated the following main reasons (n= 433):

- The system provides mountain pass information (22%)
- Just satisfied because they get good information (16%)
- Accurate information is provided (12%)
- The system is easy to use (11%)
- The information provided is up to date (10%)

About a third (32%) of respondents said that they were *dissatisfied* or *very dissatisfied* with the 511 system, mostly notably because they felt the voice response system didn't work (26%). During the usability testing each participant experienced instances of the voice-activated system not understanding their voice commands. All six usability participants mentioned this as the main reason they preferred the touch-tone system, although one participant mentioned that they do prefer to use the voice-activated system while driving because it is safer.

Satisfaction with 511



³ P = .000, Cramer's V = .12

Other reasons that survey respondents were dissatisfied with the 511 system included (n=206):

- The information provided was not up to date (19%). [During the usability testing several participants questioned whether mountain pass information was up to date because, depending on the version used (touch-tone or voice-activated) they received different information for the very same pass.]
- The system is too cumbersome and too complicated (15%). [Several usability testing participants experienced and mentioned the confusion around the use of several different commands that can be used to navigate backwards in the system. These commands include the voice commands “back” and “cancel”, as well as the use of the “pound sign” and the “number 9” within the touch-tone system. It was also confusing that the touch-tone system traffic conditions and road incidents are joined in the same menu option. Although not unanimous, most usability testing participants would prefer that these be separate (or that at least the system would prompt them on how to move from the incident information to other traffic conditions).
- The menus for the voice-activated and touch-tone systems are not the same. This was a major concern of participants, and was the primary reason Oregon 511 system users preferred that system (Oregon uses one menu with touch-tone or voice-activated choices at each juncture).
- Information provided is not accurate (12%). [One usability testing participant questioned the accuracy of traffic information because he has experienced on several occasions situations where he is literally in the area that the traffic report was referring to and the actual traffic conditions and the report did not coincide.]
- Respondents hate listening to computer generated voice as it is hard to understand (11%). [Although all of the usability testing participants would prefer an improved computer generated voice, all thought that the voice was understandable enough. However, those who listened to the Oregon 511 system believed that the computer generated voice on that system was superior. This issue may become more of a concern as more and more users become familiar with computer generated voice systems that are significantly superior (for example, Amtrak’s “Julie”).]
- The system doesn’t offer the information I need (10%). [This was particularly a concern during usability testing as participants recognized that traffic information was only available for select routes in the Puget Sound region. Also, one of the important findings from the usability testing is that users become familiar with the information that they typically use and often don’t explore the other information options. Several usability testing participants were surprised to learn about the weather information and that travel information from other states is available in the voice-activated system.]

Respondents who used both versions of the 511 system are slightly less likely to be satisfied with the overall 511 system than users of just the voice or touch tone

version.⁴ There was also a slight positive correlation between age and satisfaction. Thus, older participants are slightly more likely to be satisfied with the 511 system.⁵

Respondents are also generally satisfied with the 511 features, except for the voice recognition feature

At least three quarters or more (75% or above) of the respondents are satisfied with most of the features of the 511 system (see Table 2). However, only about two-thirds of the respondents were satisfied with the *ability to navigate backwards to other information* (69%) and with the *accuracy of the information* (67%) features of the 511 system. Less than half (45%) of the respondents were satisfied with the ability of the 511 system to understand voice commands.

Table 2: Percent of Respondents that are satisfied with Features of 511 System

Response time of system to requests [although usability testing participants liked the “wait music” because it let them know that they were still connected to the system]	82%
Effort needed to learn or use the information	80%
Types of information	79%
Number of times receive a busy signal	77%
Overall ease of use	75%
Ability to navigate to information they want	75%
Usefulness of information	75%
Organization of information [Usability testing participants thought that the weather information should be either a separate menu option or should be the first option under the “other” menu category in the voice-activated system. Otherwise the weather information is lost.]	72%
Ability to navigate backwards to other info	69%
Accuracy of the information	67%
Ability of system to understand voice	45%

Respondents using both versions of the system (voice & touch-tone) are slightly less likely to be satisfied with the *effort to learn or use the information* (possibly due to the

⁴ P=.008, Cramer’s V = .12

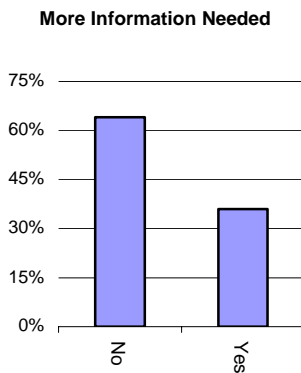
⁵ P=.002, Pearson = .13

fact that the menus are different across both systems, as usability testing participants pointed out), the *types of information available*, and the *response time of the system to requests for information*.⁶ Respondents using *both* versions or just the touch-tone version of the 511 system are less likely to be satisfied with the *ability of the system to understand voice command* features.⁷

Women were slightly more satisfied with the *effort to learn or use the information* and the *overall ease of use* of the 511 system.⁸ Respondents that are older are slightly more likely to be satisfied with the organization of the information.⁹

More information is needed about other parts of the state

Just over a third of respondents (36%) felt that information was missing in the current 511 system. Those that felt information was missing were then asked to describe the type of features or information that was missing in the system. The most commonly requested pieces of information or features included (n=199):



- Expand the system geographically (23%).
- Expand the entire system and include more information such as weather and other general types of travel information (20%)
- Provide more frequent and real time updates (17%)
- Provide a human voice, not a computer recording, as understanding the voice response is difficult (10%)
- Provide more local traffic and road options (10%).
- Make the system less cumbersome (9%)

Interestingly, respondents using voice recognition or both versions of the 511 system were slightly more likely to indicate that information was missing from the system.¹⁰ Younger respondents were also more likely to indicate that more information was needed in the 511 system.¹¹

Additional findings from the usability testing

Compared to survey research, usability testing allows more in-depth analysis and first hand observation of the user experience. Based on the usability testing we offer the following additional insights and potential changes to the system.

Mountain pass information:

- Consider using route numbers in addition to pass names since many may not be familiar with the names of infrequently used passes.

⁶ Effort: p=.029, Cramer's V=.11

Types of Info: p=.012, Cramer's V=.13

Response time: p=.001, Cramer's V=.16

⁷ p=.001, Cramer's V=.19

⁸ Effort: p=.022, Cramer's V=.10

Ease: p=.008, Cramer's V=.12

⁹ P=.002, Pearson=.14

¹⁰ P=.036, Cramer's V=.11

¹¹ P=.002, Pearson =.13

- Make it clearer that “no information available” is different from “no problems”.
- The “repeat, back”, or “main menu” message should come either before or after the pass information is provided. It is unnecessary and time consuming to hear it both before and after the pass information.

Traffic conditions:

- Ensure that when a user requests a roadway for which the system does not provide traffic conditions that the message indicating which roadways are covered comes up immediately. Especially for those using the voice-activated system, there is a tendency for the system to provide other roadways for which traffic conditions are available, leading the user to think that the system has not understood their voice command.
- Consider providing the traffic information first and then the next step options. Some testing participants found having to hear the next step options before, as well as after the traffic information unnecessary and time-consuming.
- Breakdown traffic conditions information for I-405 into chunks. Presently one must listen to information for the entire corridor or must keep skipping ahead to the section of interest.
- When reporting traffic conditions avoid the use of place names that may not have widespread understanding (such as the “roaster” as a location).

Roadway incidents:

- Consider using a word other than “incidents”. There is something about the word “incidents” that users have trouble with. Its meaning is not intuitive and the word does not appear to be common in everyday speech. Users could not offer any better alternatives.
- Having to step through the incidents sequentially is very cumbersome and time-consuming. Develop a way so that users of the voice-activated system can tell the system a section of the roadway for which they are interested in incident information. One testing participant mentioned that the Florida 511 system operates this way.
- Consider adding to the system information that indicates if traffic is moving as a result of an incident being cleared. A cleared incident doesn’t necessarily mean free-flowing traffic.

Ferries:

- Develop a way to return from the ferry information system to 511 without redialing.

Other information:

- Make sure that the reading of the phone numbers for transit agencies is slow enough so that users can write them down.

Respondents are very likely to use the 511 system again

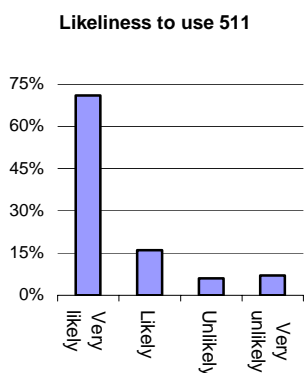
Almost all the respondents (87%) agree that they would be *likely* or *very likely* to use the 511 system again. [Similar results occurred during the usability testing, with all respondents stating that they would continue to use the system. The general feeling among participants was that the “system is good, just needs some tweaking.”]

Those survey respondents that indicated they were *unlikely* or *very unlikely* to use the 511 system again were asked what suggestions they had that would make them more likely to use the system. The most common suggestions included (n=72):

- If the system was simpler to navigate (20%)
- If I could get the information I needed (i.e. weather) (15%)
- If the system was updated more frequently (13%)
- If the system had a real human voice (12%)
- If the system worked like it did before (12%)
- If the voice response feature worked better (11%)

As expected, there is a very strong relationship between satisfaction and the likeliness to use the 511 system again. The more satisfied the respondents are the more likely they are to use the system again in the future.¹²

Once key revisions are made, call volumes will likely continue to grow and will serve traveler information needs and WSDOT traffic management objectives.



¹²p=.000, Pearson =.55

Appendix A: Survey Instrument

511 IVR Survey Script

This survey should take no more than four to five minutes. We will use this information to make improvements to the 511 system. Your answers are completely anonymous and only summaries of responses will be shared with the Washington State Department of Transportation.

Throughout the survey you will be asked to either speak your answer or use the number pad on your phone to provide responses to the questions. If for any reason you want to hear the choices repeated for any question, press 9. Now let's get started.

1. What version of the 511 system do you usually use?
 - If you use the touch-tone version, press 1
 - If you use the voice recognition version, press 2, or
 - If you use both versions, press 3

2. When did you first call the 511 travel information system?
 - If this is the first time, press 1
 - If it was within the past year, press 2
 - If it was more than a year ago, press 3, or
 - If you don't know, press 4

3. What was the primary type of information you were looking for when you called the 511 travel information system today?
 - If for road conditions on Seattle area freeways and I-5 in Tacoma, press 1
 - If for road conditions anywhere else in Washington State, press 2
 - If for mountain pass information, press 3
 - If for state ferries information, press 4
 - If for express lane information, press 5
 - If for 'other', press 6

4. Thinking about your call to the 511 system today, did the information you received cause you to change your travel plans?
 - If no, press 1
 - If yes, press 2
 - If you don't know press 3

5. Now thinking about your overall experience with the 511 service, how satisfied would you say you are?
 - If very dissatisfied, press 1 (skip to Q7)
 - If dissatisfied, press 2 (skip to Q7)
 - If satisfied, press 3
 - If very satisfied, press 4

6. After you hear the beep please tell me why you gave the 511 system a rating of “very satisfied” or “satisfied”? You have a total of 30 seconds for your response. (Ask if answered 1 or 2 to Q5)
7. After you hear the beep please tell me why you gave the 511 system a rating of “very dissatisfied” or “dissatisfied”? You have a total of 30 seconds for you response. (Ask if answered 3 or 4 to Q5)
8. Now, please think about your experience using the 511 system. I am going to describe a number of features of the system. For each feature tell me if you are satisfied or dissatisfied. (Rotate features. For each feature: Press 1 if dissatisfied, 2 if satisfied)
- The number of times you receive a busy signal
 - Usefulness of the information
 - Effort needed to learn to use the system
 - Overall ease of use
 - Accuracy of the information
 - Types of information available
 - Organization of the information
 - Ability to navigate to the information you want
 - Ability to navigate backwards to other information
 - Response time of the system to your requests for information
 - Ability of the system to understand your voice commands (ask only of those who press 2 or 3 on Q1)
9. Overall, do you think any type of information or feature is missing from the 511 system?
- If no, press 1 (skip to Q11)
 - If yes, press 2
10. After you hear the beep please tell me the information or function you think is missing? You have a total of 30 seconds of time for your response.
11. How likely are you to use the 511 system again?
- If very unlikely, press 1
 - If unlikely, press 2
 - If likely, press 3
 - If very likely, press 4 (skip to Q13)
12. After you hear the beep please tell me what would make you more likely to use the system again? You have a total of 30 seconds of time for your response.

Now I have just a few questions for analysis purposes. Remember, your answers are completely anonymous.

13. Are you a commercial truck driver?
- If no, press 1
 - If yes, press 2
14. Using the number pad on your phone, please enter your 5-digit home zip code. ____ _
15. After the beep, please say what county you reside in _____.
16. Using the number pad on your phone, please indicate your age. ____

17. Please indicate your gender.

- If male, press 1
- If female, press 2

18. Would you be interested in helping us to further improve the 511 system? This would take 1.5 hours of your time, would take place in downtown Seattle and you would be paid \$75 for your assistance. Would you be interested?

- If no, press 1 (skip to survey conclusion)
- If yes, press 2

19. After the beep please state your name and telephone number so we can call you about participating in this additional study.

Those are all the questions I have for you, thank you for participating in this survey.

Appendix B: Frequencies of Responses

Q1 - 511 system version used

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	touch-tone	326	50.2	50.9	50.9
	voice-recognition	208	32.0	32.4	83.3
	both	107	16.5	16.7	100.0
	Total	641	98.8	100.0	
Missing	System	8	1.2		
Total		649	100.0		

Q2 - When first called 511

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First time	104	16.0	16.2	16.2
	Within last year	335	51.6	52.2	68.4
	More than a year ago	187	28.8	29.1	97.5
	Don't know	16	2.5	2.5	100.0
	Total	642	98.9	100.0	
Missing	System	7	1.1		
Total		649	100.0		

Q3 - Primary type of information sought today

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Road conditions on Seattle area freeways & I-5 in Tacoma	160	24.7	25.0	25.0
	Road conditions anywhere else in WA	96	14.8	15.0	40.0
	Mountain pass	348	53.6	54.4	94.4
	State ferries	5	.8	.8	95.2
	Express lanes	1	.2	.2	95.3
	Other	30	4.6	4.7	100.0
	Total	640	98.6	100.0	
Missing	System	9	1.4		
Total		649	100.0		

Q4 - Did information cause you to change travel plans

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	453	69.8	71.0	71.0
	Yes	132	20.3	20.7	91.7
	Don't know	53	8.2	8.3	100.0
	Total	638	98.3	100.0	
Missing	System	11	1.7		
Total		649	100.0		

Q5 - How satisfied with 511 service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very dissatisfied	122	18.8	19.1	19.1
	Dissatisfied	84	12.9	13.1	32.2
	Satisfied	163	25.1	25.5	57.7
	Very satisfied	270	41.6	42.3	100.0
	Total	639	98.5	100.0	
Missing	System	10	1.5		
Total		649	100.0		

Q8 - Satisfaction/Dissatisfaction with 511 System features

	Dissatisfied		Satisfied		Don't know	
	Count	%	Count	%	Count	%
Number of times receive busy signal	78	13.0%	462	77.0%	60	10.0%
Usefulness of information	124	21.2%	437	74.6%	25	4.3%
Effort needed to learn to use the information	105	18.0%	464	79.5%	15	2.6%
Overall ease of use	126	21.8%	435	75.1%	18	3.1%
Accuracy of the information	116	20.1%	384	66.7%	76	13.2%
Types of information available	101	17.6%	455	79.4%	17	3.0%
Organization of the information	131	22.9%	411	71.9%	30	5.2%
Ability to navigate to information you want	124	21.8%	425	74.7%	20	3.5%
Ability to navigate backwards to other information	118	20.8%	393	69.2%	57	10.0%
Response time of system to your requests for information	89	15.7%	463	81.7%	15	2.6%
Ability of system to understand voice commands	185	32.8%	251	44.5%	128	22.7%

Q9 - Any type of information missing from system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	359	55.3	64.3	64.3
	Yes	199	30.7	35.7	100.0
	Total	558	86.0	100.0	
Missing	System	91	14.0		
Total		649	100.0		

Q11 - How likely to use 511 system again

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very unlikely	39	6.0	7.1	7.1
	Unlikely	33	5.1	6.0	13.1
	Likely	88	13.6	16.0	29.1
	Very likely	389	59.9	70.9	100.0
	Total	549	84.6	100.0	
Missing	System	100	15.4		
Total		649	100.0		

Q13 - Commercial truck driver

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	457	70.4	84.8	84.8
	Yes	82	12.6	15.2	100.0
	Total	539	83.1	100.0	
Missing	System	110	16.9		
Total		649	100.0		

Q16 - Age

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16	.3	.4	.4
	17	.5	.6	1.0
	18	.6	.8	1.7
	19	1.1	1.3	3.1
	20	1.4	1.7	4.8
	21	.5	.6	5.4
	22	1.4	1.7	7.1
	23	.8	1.0	8.1
	24	1.2	1.5	9.6
	25	2.0	2.5	12.1
	26	.9	1.2	13.3
	27	1.2	1.5	14.8
	28	1.1	1.3	16.2
	29	1.4	1.7	17.9
	30	1.1	1.3	19.2
	31	.6	.8	20.0
	32	1.1	1.3	21.3
	33	1.5	1.9	23.3
	34	1.4	1.7	25.0
	35	1.5	1.9	26.9
	36	1.7	2.1	29.0
	37	.5	.6	29.6
	38	1.4	1.7	31.3
	39	1.2	1.5	32.9
	40	2.6	3.3	36.2
	41	1.1	1.3	37.5
	42	2.3	2.9	40.4
	43	1.2	1.5	41.9
	44	1.2	1.5	43.5
	45	1.2	1.5	45.0
	46	1.8	2.3	47.3
	47	2.8	3.5	50.8
	48	2.5	3.1	53.8
	49	.9	1.2	55.0
	50	2.5	3.1	58.1
	51	.6	.8	58.8
	52	1.7	2.1	61.0
	53	2.0	2.5	63.5
	54	2.5	3.1	66.5
	55	2.8	3.5	70.0
	56	.9	1.2	71.2
	57	2.5	3.1	74.2
	58	2.6	3.3	77.5
	59	1.5	1.9	79.4
	60	2.0	2.5	81.9
	61	1.4	1.7	83.7
	62	.9	1.2	84.8
	63	.8	1.0	85.8
	64	1.2	1.5	87.3
	65	1.7	2.1	89.4
	66	1.7	2.1	91.5
	67	.3	.4	91.9
	68	.9	1.2	93.1
	69	.6	.8	93.8
	70	1.5	1.9	95.8
	71	.6	.8	96.5
	74	.3	.4	96.9
	75	.5	.6	97.5
	76	.5	.6	98.1
	78	.3	.4	98.5
	79	.5	.6	99.0
	81	.2	.2	99.2
	89	.2	.2	99.4
	98	.2	.2	99.6
	99	.3	.4	100.0
Total	520	80.1	100.0	
Missing System	129	19.9		
Total	649	100.0		

Q17 - Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	310	47.8	59.3	59.3
	Female	213	32.8	40.7	100.0
	Total	523	80.6	100.0	
Missing	System	126	19.4		
Total		649	100.0		

Q18 - Interested in participating in usability testing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	316	48.7	60.5	60.5
	Yes	206	31.7	39.5	100.0
	Total	522	80.4	100.0	
Missing	System	127	19.6		
Total		649	100.0		

Appendix C: Usability Testing Script

511 Travel Information System

2005 Usability Test Outline

Overall, we will observe, audiotape, and record (on a laptop using the attached form) as participants use the system. We will document comments, mistakes, difficulties, and recommendations they have.

I. Warm-up (pre-test interview, 10 minutes)

1. Welcome participant and stress that they are participating with us in testing the 511 system. Emphasize that we are not testing them. They are our partners in this process, not a subject who is being tested. Also stress that we want them to “think out loud” as they use the system. Set the tone by telling them to imagine that they are where they usually are when calling the 511 system. Instruct them about the videotaping and audiotaping and assure them that this is done only for research purposes. Emphasize that we want their candid opinions, not what they think we might want to hear.
2. Pre-test interview will collect information on:
 - Participant characteristics such as age, typical travel mode, frequency of using the existing traveler information system, purpose of using existing system, etc.
 - Which features do they usually use on the existing system?
 - Features and functionality that is expected or desired of voice-activated and touch-tone travel information systems.

II. Tier 1 – (User directed, 15 minutes)

1. Direct participants to use either the voice-activated or the touch-tone versions of the system (depending on which version they usually use). Ask participants to examine the system and become familiar with it by accessing each of the following areas. Encourage them to do this by using the system as they would for information relevant to them and their typical travel plans.
 - Main menu area
 - Road conditions on Seattle area freeways and I-5 in Tacoma
 - Road conditions anywhere else in Washington State
 - Mountain pass information
 - WA State Ferries
 - Express lane information
 - Other
2. Then have participants do the same thing with the other version of the system (either voice-activated or touch-tone).

During these tasks record (on data gathering form) any problems encountered, comments participants make, or improvements they suggest.

III. Tier 2 - (Scenario directed, 50 minutes)

Participants will be provided with the following specific travel scenarios and asked to complete those tasks using both versions of the system. Ask participants to provide *detailed* feedback on the content and usability of the system (read to them the types of questions that we will be asking them after each scenario so they are prepared). Record if the participant gets lost and if they complete the tasks. Record all information on the data gathering form. For each scenario, we will ask participants:

- Are the titles for the information in this scenario easy to understand?
- Are the voices used easy to understand?
- Were the voice prompts or touch tones required of you to receive information sensible?
- Was it easy to navigate to the desired information?
- Were you able to easily navigate backwards to other information?

Scenario #1 (Road conditions on Seattle freeways and I-5 in Tacoma)

- Imagine that you need to travel from Everett to Snoqualmie Pass. Get road traffic conditions for all routes that you would use for that trip.
- Imagine that you need to travel from Tacoma to Snoqualmie Pass. Get road traffic conditions for all routes that you would use for that trip.

Scenario #2 (Road conditions anywhere else in WA State)

- Get information for SR 16 over the Tacoma Narrows bridge
- Get information for I-405 south of Bellevue
- Get information for SR 97 between Ellensburg and Wenatchee
- Get information for SR 20 between Colville and Republic

Scenario #3 (Mountain Pass information)

- Snoqualmie Pass
- Bluett Pass
- White Pass

Scenario #4 (Other – only available on voice-activated system)

- Express lanes
- Transit services in Spokane
- Rail services in Everett
- Airline phone numbers for US Air and Delta
- Travel information for Oregon and Idaho

Scenario #5 (WA State Ferries – converts to touch tone))

- Schedule and fare for Seattle to Bainbridge Island
- Schedule and fare for Anacortes to Sydney, B.C.

IV. Wrap-up (post-test interview, 15 minutes)

Participants will be interviewed regarding the following information:

- Which version do they prefer and why
- The participant's perceptions of the ease of use
- Additional features or functions that they would desire (e.g. special event traffic information, travel time estimates, average speed estimates, parking information, connection to a live operator)
- What exactly would make them more likely to use the system
- What do they think the response to the system would be for first time users

- Are the main menu directions clear
- What do they think of the system and menu organization
- Directions or terminology that is not clear or misleading
- Importance of specific features
- Usefulness of the information
- How would this type of information affect their travel or travel planning
- What benefits do they perceive from this kind of information