

Final Research Report
Agreement T2695, Task 25
TrafficTV

TrafficTV

by

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Executive Summary

TrafficTV is a traffic and traveler information resource available on cable television (UWTV2 Channel 76). It began operation June 1, 1998, as part of the SmartTrek Operational Deployment under the name Traffic Channel. The SmartTrek evaluation of May 2001 identified several problems with Traffic Channel and recommended some improvements. This project made those changes and renamed the application TrafficTV.

A series of meetings was held in June 2003. These meetings involved personnel from the Washington State Department of Transportation (WSDOT) Northwest Region, WSDOT Advanced Technology Branch, WSDOT Olympia office, the University of Washington's UWTV, and the UW Intelligent Transportation Systems Research Program. From these meetings came a set of recommended changes. These changes were made to TrafficTV and are documented in this report.

Battelle Institute conducted a focus group in May 2004 to evaluate the resulting program. This focus group concluded that TrafficTV is a useful traveler information tool but has not had sufficient public exposure to make it widely known to the traveling public.

A market penetration audit conducted by Media Audit in June and July 2004 indicated that when viewers were asked about TrafficTV, over 94,000 had seen the program within the last week. This was deemed surprisingly high, given the lack of external exposure and that viewers would have found TrafficTV only by word of mouth or by "channel surfing." Again, a conclusion of the audit was that additional exposure would make TrafficTV more valuable as a traveler information tool.

As a result of the publicity recommendations, a banner was added to the Northwest Region's traveler information page to alert users to the availability of TrafficTV. The banner was displayed for a period of time and later removed.

1. Introduction and Background

TrafficTV is a traffic and traveler information resource available on cable television (UWTV2 Channel 76). It began operation June 1, 1998, as part of the SmartTrek Operational Deployment under the name Traffic Channel. The SmartTrek evaluation of April 1999 identified several problems with Traffic Channel and recommended some improvements. This project made those changes and renamed the application TrafficTV.

TrafficTV receives traffic congestion information from the regional Intelligent Transportation Systems (ITS) Backbone (in self-describing data format) and live traffic video (provided over a fiber optics network by the Washington State Department of Transportation (WSDOT)). A computer program fuses the data, adds digital video effects, and supplies the resulting presentation to a cable television provider for cablecasting (see Figure 1). For the TrafficTV project, the cable television headend is located at the University of Washington's UWTV, and the program is cablecast on Comcast Cable Channel 76.

The traffic congestion information is displayed on a regional map; different colors on roadway segments indicate current travel speeds. TCI Cable, Inc., the predecessor to Comcast Cable, estimated in early 1999 that as of March 2000, about 485,000 households would have the ability to access TrafficTV.

Focus groups and an overall evaluation conducted by Battelle under the SmartTrek project in April 1999 suggested several improvements for the Traffic Channel presentation. A summary of the evaluation report, with notes about user preferences, is attached as Appendix I. Meetings with WSDOT and UWTV were also held at the end of the SmartTrek project (August 1998), and these produced additional discussion points. Notes from this meeting appear as Appendix II. The ideas and suggestions from these sources were used to improve the hardware, software, and user interface of TrafficTV.

The remainder of this report describes the hardware and software for TrafficTV, discusses the selection process for programming features, describes the selected options that were implemented, and presents the conclusions and recommendations of two evaluations that were conducted after these changes had been made.

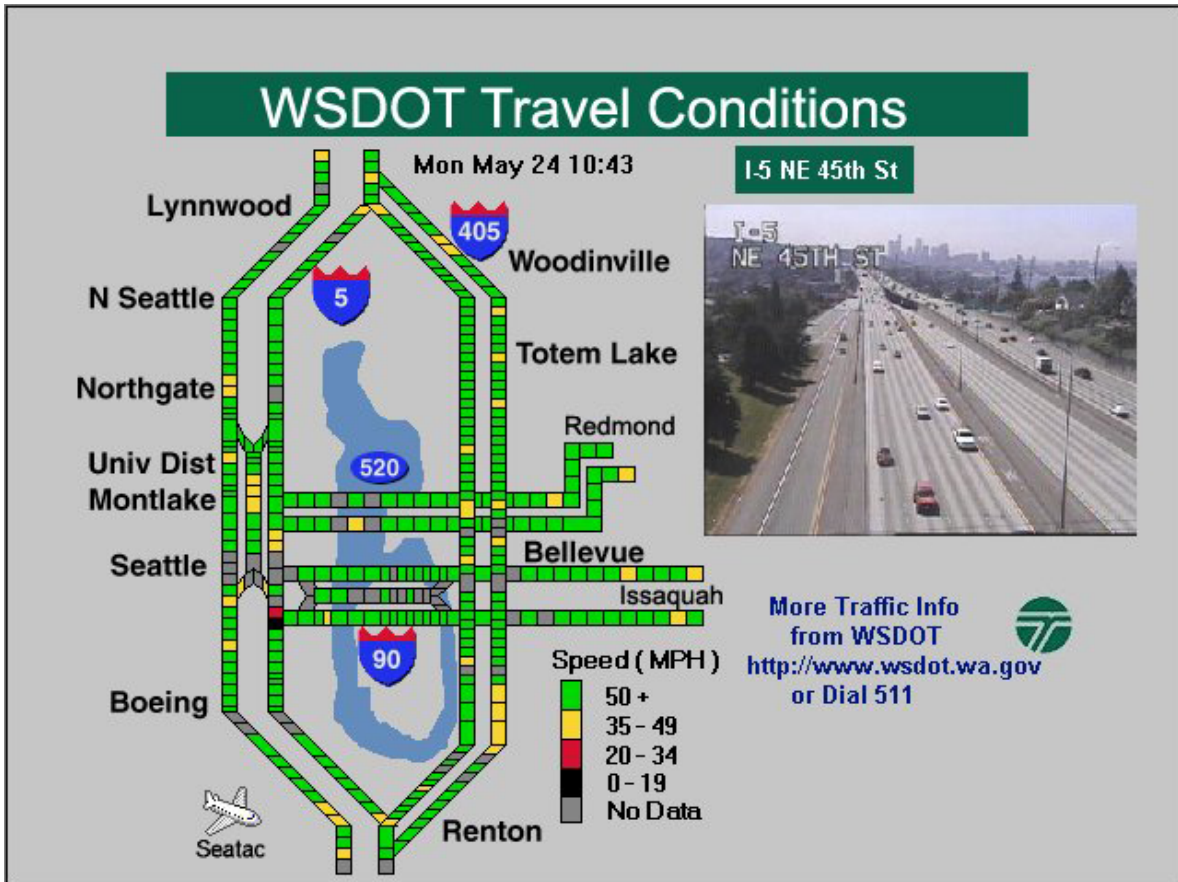


Figure 1: TrafficTV image as supplied to the cable provider.

2. Hardware and Software

The TrafficTV application was designed to be modular, and this newest implementation is represented pictorially in Figure 2. The installation instructions for the original Traffic Channel application can be found in WSDOT Report WA-RD 505.1 *SmartTrek: A Model Deployment Initiative*, May 2001. This section summarizes the design and highlights the changes and improvements made to the original software.

The basic platform is a computer running Windows NT, represented by the large rectangle in Figure 2. This computer has a GeniePlus digital video effects (DVE) card that mixes the output from the computer display (converted into NTSC (National Television System Committee) with a hyperconverter) with the NTSC video from the WSDOT video switch. The SegmentLogger software obtains loop data in self-describing data (SDD) format from the ITS Backbone and reformats it for suitable use by the TrafficChannel.exe program. The TrafficChannel program uses the loop data to create the colored map, shown in Figure 1, and combines that map with information about the data location for the camera view and any text labels that have been added to the TextServer by way of the TextMessageControl Web application. The ability to change the text message on the screen in near real time is an addition to previously deployed features.

The TrafficTV screen combines the traffic map just mentioned with real-time video obtained from the WSDOT Traffic Systems Management Center (TSMC). At the TSMC, a computer runs both a Switcher program and a CameraServer program. The Switcher program sends a series of ASCII commands to the WSDOT video switch so that it will output a specified camera view for a specified period and then switch to the next camera in the sequence. The CameraServer maintains the list, sequence order, and timing information for the display of the camera sequence. The CameraControl Web application allows the manager of the TrafficTV system to obtain the current sequence of cameras from the CameraServer, consult the master camera list for camera locations, change the properties of the camera display sequence, and then instruct the CameraServer to implement the new sequence.

The servers at WSDOT are kept locked to Network Time Protocol (NTP) time over the ITS Backbone. In parallel, the TrafficTV Server, located in the UWTV control room, is also locked on NTP time. The screen changes at both the TSMC and UWTV are coordinated by using

only this time base; there is no direct timing connection between the computer at UWTV control and the one at the TSMC (CameraServer).

It is also possible to have the TrafficTV Server output audio by supplying a WAV file for replay. The video, NTSC, and audio outputs from the TrafficTV Server are provided to UWTV2 Station Automation, and that output is provided to Comcast Cable for cable broadcast on Channel76.

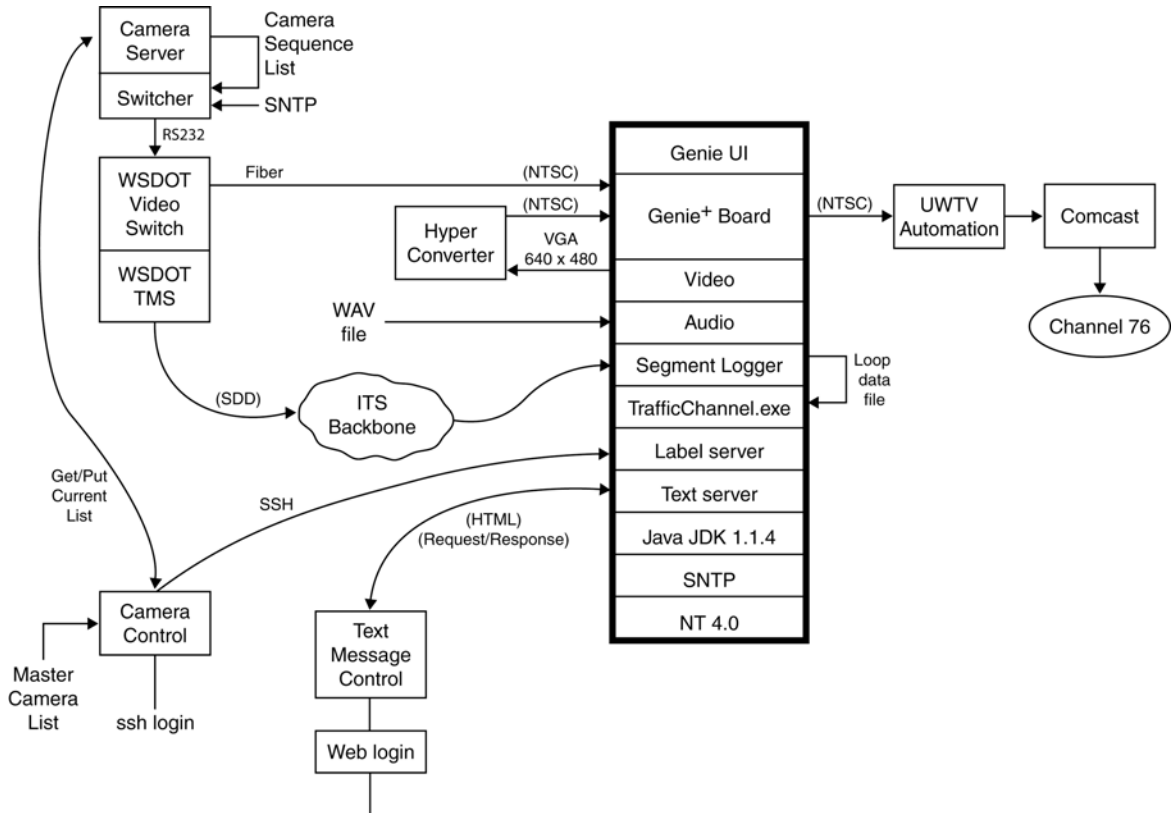


Figure 2: Diagram of the TrafficTV implementation.

3. Programming

The principle purpose of this project was to modify the programming of Traffic Channel in response to the results of the evaluations and reviews that took place at the close of the SmartTrek Operational Test. The Battelle evaluation of Traffic Channel appears in Appendix I. The minutes of a meeting involving representatives of Battelle, WSDOT, UWTV, and the ITS Research Program (the creators of Traffic Channel) appear in Appendix II.

3.1 Selection Process

At the outset of this project, the observations and requests resulting from these two evaluations were examined, and the researchers identified a set of possible alternatives. A prototype screen for each of the options was storyboarded. A meeting at the TSMC was held with representatives from the WSDOT TSMC, WSDOT Advanced Technology Branch WSDOT Olympia office, and the UW ITS Research Program to review these options. The options presented, on videotape, were as follows:

3.1.1 Traffic Channel Options

Each sequence was about 3 to 4 minutes long (about 15 minutes total).

1. One-minute cycle: 30 seconds for the traffic map, 30 seconds for full-screen traffic video.

Because the video is not tied to the map, this would offer the flexibility of being able to easily change the camera locations (but would have the downside of showing the camera switching transients).

2. One-minute cycle: traffic map would be up all the time, with eight different traffic video locations “swooshed in.”

(Note: In the demo, the origin points of the “swooshes” were not tied to the actual camera locations, but they would be in the production version. Also, in the demo tape, only four camera locations were shown, but in the production version there would be eight different locations.)

3. Two-minute cycle: 1 minute of the traffic map with eight traffic camera shots (as in version 2) and 1 minute of the traffic map with travel times (in four groups of 15 seconds each).
4. One-minute cycle: 45 seconds of the traffic map with six swooshed cameras shots and 15 seconds of full-screen travel times.
5. Same as version 2, but with blinking red instead of black segments to represent the 0-19 mph speed range.

As a result of extended discussions and email, a set of features was identified for implementation. Acceptable features were limited by the technical restriction imposed by NTSC/TV, as well as by budget restrictions for elements such as a live host for incident reports.

3.2 Selected Option

Figure 1 shows a still version of the screen chosen for TrafficTV. The principle features that are new to the interface are as follows:

1. Only the mainline roadways are represented, as opposed to switching between the mainline and HOV facilities.
2. Sixteen camera views are presented in sequence, as opposed to four.
3. The camera views sweep or swoosh from the approximate location of the camera on the map.
4. Speed is the variable presented.
5. The presentation is “branded” in WSDOT colors
6. The WSDOT logo, WSDOT URL, and 511 information have been added.
7. The overall cycle for the 16 cameras is now 2 minutes.
8. Individual views are present for 7.5 seconds.
9. Camera locations are textually identified above the real-time video.
10. Alternative cameras can be selected by using a CameraControl Web application, and when the sequence is changed, the appropriate label is added above the real-time imagery.

11. New loop locations have been added that fill out parts of north I-405 that had been without data in Traffic Channel.
12. Additional roadways are now represented on the traffic map. The traffic map now includes Redmond, Bellevue, and Issaquah.
13. A timeout feature has been added so that the map transitions to grey, the color for no data available, if the loop data feed is interrupted for more than 10 minutes.
14. Timing errors that made the previous version “jumpy” have been corrected.
15. The ability has been added to change screen controls, such as text messages, on each cycle through the set of views. This allows near real-time display of changing text messages, should these be available in the future.

These new features responded to the majority of the concerns expressed in all reviews.

3.3 Details of the Implementation

Details for the Traffic Channel deployment are available in the SmartTrek report, WSDOT Report WA-RD 505.1 *SmartTrek: A Model Deployment Initiative*, May 2001. Presented below is the equivalent information for the new TrafficTV implementation.

3.3.1 Timing Cycle

The sequence and timing for TrafficTV have changed. The sweep video effect takes 433 milliseconds (msec). The effect is run at the start of a cycle, and then the same effect is run in reverse toward the end.

| Time (in msec) | |
|----------------|--------------------------------------|
| 0 | display new map, start video effect. |
| 433 | end of sweep |
| 6900 | start reverse effect |
| 7333 | end of reverse sweep |
| 7500 | end of cycle |

The overall 2-minute period encompasses 16 cycles. Although each cycle displays a new map, in effect, the visible map display remains the same throughout, and the selected video effect (and label) changes.

This is theoretically the timing scheme on the Genie card. However, there was a little time lag in actually executing the effect, so a fixed time “offset” was added on the Switcher to adjust things and to ensure better synchronization so that the camera switches would not be apparent. The offset is now set to 100 msec, so the switcher on the WSDOT end switches 100 msec after the initiation of a cycle on the TrafficTV Server computer (assuming the computers on both ends are in good synch). (This is also the reason for leaving a little time between the supposed end of the reverse video effect and the nominal end of the cycle.)

3.3.2 Map Layout

The map has changed from that described in the SmartTrek report. The details of the map description for the new TrafficTV are included in Appendix III.

3.3.3 Timing Sequence Description

The sequence and timing for the live video presentation has changed. This information is found in the file sequencer.txt and is included as Appendix IV.

3.3.4 Map Segment Layout

The segments drawn on screen to represent the roadways and the relationship to individual loops and stations have changed. This information is found in the PugetSound.seg file and is included in Appendix V.

4. Evaluation and Conclusions

A focus group evaluation of the new TrafficTV by Battelle on May 18, 2004, can be found in Appendix VI. The findings and conclusions of that evaluation are as follows:

- TrafficTV, along with other traffic information, provides a resource in the Seattle region, where traffic is increasingly difficult. TrafficTV fills a niche not offered by other traffic information services. Participants who may rarely or never have used TrafficTV before this focus group said that they would consider using TrafficTV just before leaving for their commute or other trip from home. With improvements, they might use it more regularly.
- Although used infrequently by these participants, TrafficTV provides a useful, quick snapshot that tells the viewer if more information is needed from other sources, and it helps prevent travelers from being blind-sided by adverse traffic conditions.

Comment: "TrafficTV offers 80% of what you need in the morning to plan your trip. The traffic map is the key; it gives you a complete picture of the whole network; it gives a good overall sense of the region's traffic by cycling through all the camera images; the other information enhances travel planning. I don't have time to boot up my computer or wait for radio traffic reports; TrafficTV gives me a quick read right before I leave."

- TrafficTV could be improved in a number of ways to make it more attractive, accessible, and useful to Puget Sound travelers. Without making such improvements, these participants said they would at best use it infrequently.

Comment: "If some improvements were made to TrafficTV, I would use it more often."

- Marketing TrafficTV more effectively so that more people could benefit from it might broaden usage. Most people find it by accident, channel flipping or by reference from a friend or co-worker. Before this focus group, awareness of TrafficTV among these participants was low.

Comment: "Advertise TrafficTV on the highway VMS. Show TrafficTV onboard the ferries."

In addition, a market penetration, share, and target audience evaluation was done by *The Media Audit* in June-July 2004. Based on 1,047 interviews conducted in June-July 2004 of adults

who were asked if they had watched TrafficTV in the last week, the evaluation concluded that 94,000 people watched TrafficTV during that period. A description of the audit and the actual numerical results are attached as Appendix VII. This audience was a result solely of word-of-mouth communication and channel surfing discovery. A conclusion from these results is that WSDOT should put some information about TrafficTV on the Travel Information Web page to make more travelers aware of this additional source of information for the Puget Sound region. To this end, a banner, linked to <http://www.its.washington.edu/traf-chan.html>, has been provided to the TSMC (see Figure 3). Clicks on this banner will be counted at the UW at www.its.washington.edu/analog/traftv.html.



Figure 3: Banner on the WSDOT web site.

Appendix I - Seattle Traffic Channel Cable Broadcasts: Customer Satisfaction Evaluation

Christopher Cluett

This information is based on a draft report dated October 5, 1999, by Battelle Memorial Institute.

SUMMARY

Satisfaction with Traffic Channel

The survey asked respondents who had ever seen Traffic Channel to agree or disagree with opinion statements describing different aspects of program, such as how information is presented, the content of the program, and its value to the viewer. As shown in Table 8, overall viewers responded as follows:

- 60.5% of the respondents would like to hear a voice describing what is happening on the maps;
- 45.0% feel that the way in which the screens change from one view or map to another is distracting;
- 54.7% feel that the explanation of the different traffic speeds is too small to read easily;
- 48.5% can interpret the display maps easily;
- 63.8% would like the broadcasts to suggest alternative route possibilities when there are conditions that slow or block traffic;
- 63.9% would like the same type of information to always appear on the same part of the screen;
- 75.4% would like to be given more information about the type and extent of incidents, special events, and trouble spots;
- 65.4% want an indication of the direction of traffic flow as shown on the camera view;
- 26.0% would like to have a number they could phone with suggestions for improvements to Traffic Channel; and,

- 53.2% would like the broadcast to help them decide whether road conditions make it unsafe to drive.

In addition, several statements ask about the usefulness and accuracy of Traffic Channel:

- 44.6% agree that the broadcasts provide adequate coverage about travel conditions along the routes they travel;
- Only 5.0% find that the information on Traffic Channel is inaccurate;
- 43.1% find the weather information on Traffic Channel useful;
- 47.9% agree that Traffic Channel helps them to avoid traffic congestion; and,
- 34.2% report that Traffic Channel lets them estimate how long their trip will take.

Frequent viewers tend to be more likely to agree with positive statements and more likely to disagree with negative statements about Traffic Channel, indicating general satisfaction with the product and product features. Those who watch Traffic Channel more than once a week are significantly more likely to disagree with the statement that the way the screens change is distracting. They are also more likely than less frequent viewers to report that they can easily interpret the display maps. They are more likely to disagree that they need some indication of the direction. Less frequent viewers tend to be predominantly neutral with regard to whether they would like a number to phone with suggested improvements to Traffic Channel, while the frequent viewers are split and hold stronger opinions. On balance they are more likely to say they would like such a phone number.

Not surprisingly, frequent viewers find Traffic Channel to be more useful and accurate than less frequent viewers. When asked directly to rate the usefulness of the program, 85.2% of the frequent viewers said it is somewhat or very useful, while only 32.7% of the infrequent viewers rated it as somewhat or very useful. Frequent viewers are significantly more likely to agree that the broadcasts adequately cover the routes they travel than non-frequent users (67.9% compared to 28.2%). Frequent viewers also tend to be more likely than less frequent viewers to find the information on Traffic Channel to be accurate. Frequent views are more likely to find the weather information on Traffic Channel useful. 70.2% of frequent viewers report that Traffic Channel helps them to avoid traffic congestion, compared with 36.7% of the less frequent viewers who report this. Almost half (49.1%) of the frequent viewers compared to less than one-

quarter (22.8%) of the less frequent viewers report that Traffic Channel lets them estimate how long their trip will take.

Overall, the majority of viewers felt that the amount of time spent on each map was just about right or too short. Specifically, 5.0% felt that too much time was spent on each map, while 33.6% said it was just about right, 39.8 % said it was somewhat too short, and 21.5% said it was much too short. This variable did not differ by frequency of use.

Those who had ever viewed Traffic Channel were also asked if they had any other comments about how Traffic Channel could be improved to make it more useful. Far and away the most commonly suggested improvement was for more cameras and camera coverage. Many respondents requested more cameras and coverage - “Cover arterials and major intersections.” In addition, several mentioned specific areas that they would like to see added to Traffic Channel:

Table 8. Opinions About *Traffic Channel* Among Viewers

| Opinions Statements | Opinions about <i>Traffic Channel</i> | | |
|--|---------------------------------------|-----------------|---------------|
| | Percent Disagree | Percent Neutral | Percent Agree |
| The broadcasts provide adequate coverage about travel conditions along the routes I travel. | 28.7% | 26.7% | 44.6% |
| I would like to hear a voice describing what is happening on the maps. | 15.4% | 24.6% | 60.0% |
| The way in which the screens change from one view or map to another is distracting. | 21.4% | 33.6% | 45.0% |
| The explanation of the different traffic speeds is too small to read easily. | 17.6% | 27.7% | 54.7% |
| I can interpret the display maps easily. | 25.4% | 26.1% | 48.5% |
| I find the information on <i>TrafficTV</i> to be accurate. | 5.0% | 51.1% | 44.0% |
| When there are conditions that slow or block traffic, the broadcasts should suggest alternative route possibilities. | 10.1% | 26.1% | 63.8% |
| I wish that the same type of information would always appear on the same part of the screen. | 4.1% | 32.0% | 63.9% |
| I would like to be given more information about the type and extent of incidents, special events, and trouble spots. | 3.5% | 21.1% | 75.4% |
| I find the weather information on <i>TrafficTV</i> useful. | 10.3% | 46.7% | 43.1% |

| | | | |
|--|-------|-------|-------|
| I need some indication of the direction of the traffic shown on the camera view. | 9.3% | 25.3% | 65.4% |
| I'd like to have a number I could phone with my suggestions for improvements to <i>TrafficTV</i> . | 13.4% | 60.6% | 26.0% |
| <i>TrafficTV</i> helps me to avoid traffic congestion. | 12.3% | 39.8% | 47.9% |
| I would like the broadcast to help me decide whether road conditions make it unsafe to drive. | 10.6% | 36.2% | 53.2% |
| <i>TrafficTV</i> lets me estimate how long my trip will take. | 21.7% | 44.1% | 34.2% |
| I would pay an additional \$1 a month on my cable bill to continue to receive <i>The Weather Channel</i> . | 73.9% | 13.1% | 13.0% |
| I would pay an additional \$1 a month on my cable bill to continue to receive <i>TrafficTV</i> . | 75.2% | 17.9% | 6.9% |

- “Additional arteries covered. North to Everett, south to Tacoma, east to North Bend, ferry traffic coverage (i.e. Camano, Bainbridge), Narrows Bridge, Hood Canal.”
- “Nothing provides information on Highway 99. This is my main route of travel. Also, information on West Seattle Freeway/viaduct is missing.”
- “Additional information on SR99 ... as well as West Seattle Freeway.”
- “A close up of downtown arterials would be useful to my commute.”
- “Need camera at Northgate, Ship Canal Bridge.”
- “Add cameras and coverage on Montlake! It’s often worse than 520, and less predictable.”

As shown above, viewers would like to have some narrative or voice describing the situation, they would like to see the direction of traffic shown, they would like the display of each map to last longer, they would like larger maps, and they would like the same information displayed in the same place on each map.

- “Sometimes it takes too much mental work to figure out what the display means. The colors, the destiny, the screen changes sometimes take too much thinking; each time I have to relearn what I’m doing.”
- “More explanation of conditions, traffic direction, and area being described.”

- “Keep the same information on the same place on the screen – the pictures and maps seem to change just as I get oriented.”
- “Consistent placement of information – keep ‘problem areas’ on screen longer than maps showing no problems.”
- “Too much color coding to decipher – simplify it! Make map larger and indicate direction of cars shown, slower scrolling.”
- “Slower screen changes.”

In addition, some comments were about entirely different issues. Some respondents felt that Traffic Channel should be better publicized - “Have you ever thought about publicizing TrafficTV?” A few viewers suggested showing maps by districts and collecting and displaying additional information:

- “Divide program into districts.”
- “Change the camera views for each region (maybe 3 or 4 per area). You could list the different shots in order and highlight the one shown. That way you can see where you are going. Do this for each – Eastside, Seattle, Everett, etc.”
- “Reader board at bottom of screen to describe hot spots and tell alternate routes, statistical information during 3, 6, and 9 month periods to get idea of when to use alternate means of transportation.”

Conclusions and Recommendations

Conclusions based on this analysis of the use of Traffic Channel by Seattle subscribers to cable TV are summarized below:

We sampled approximately 10,000 households in the Seattle area from an estimated 105,000 households who had cable access to Traffic Channel. Out of that sample mailing, 1,705 questionnaires were returned, for a response rate of 17%. Among those returned, 13.3% said they had ever watched the traffic information broadcasts. TCI Cable, Inc. estimates there will be about 485,000 households with the ability to access Traffic Channel by the time their buildout program is completed around March 2000. At the rate of usage identified in this survey, that would imply that about 65,000 households in the Puget Sound region will be viewing this

program. Since many people are not even aware that the program exists, any promotional efforts that might be undertaken to inform people about Traffic Channel and its benefits will almost certainly lead to an increase in this number of viewers.

Out of the 223 respondents who said they had ever watched the Traffic Channel broadcasts, 85% said they found out about the broadcast while flipping through the channels on their TV. This is similar to what we learned about the traffic TV program in Tempe, Arizona, and indicates a fairly low level of awareness and use of this program in the population. It also suggests the potential value of promotional efforts to let cable viewers know about this program. Respondents even suggested more attention be given to promoting the program. Viewers of Traffic Channel are much more likely to report that they regularly watch television weekday mornings or evenings (63.2%) than those who say they have not viewed the Traffic Channel broadcasts (45.2%), and this is consistent with how they stumbled upon the Traffic Channel program.

Demographically, our sample was split evenly between males and females, but viewers of Traffic Channel are much more likely to be male (62%) rather than female (38%), and the proportion of morning viewers is even more likely to be male (67%). While the representative sample was older, better educated, and came from households with higher incomes than the region's population averages, education and income were not significantly related to whether or not the respondent had ever viewed Traffic Channel. What does seem to make a difference is older age and higher incomes; retirement aged respondents (66 years and older) are less likely to have ever watched these traffic broadcasts, and higher income respondents (\$100,000 and over) are less likely to be frequent viewers.

The viewers in the sample have mostly come to the program recently, with about half (51%) saying they had only been watching for two months or less. The most frequent viewers (more than once a week) have mostly been viewing for more than two months (72%), while among the less frequent viewers (less than once a month) less than 31% have been viewing for more than two months. This suggests that viewers who are finding value in the broadcasts tend to stay with the program, and those who find less value either view sporadically or stop viewing after trying it out a few times.

Viewers of Traffic Channel viewers report that they also use a variety of other technologies, such as personal computers, the Internet, and pagers and are more likely to use these compared with non-viewers. However, when we look at the subset of viewers who are the most frequent users of Traffic Channel, we find they are less likely to use these other technologies, though the differences generally are not statistically significant. These frequent users of television for traffic information fit the segment profile called “low-tech pre-trip info seekers” as defined and analyzed in a companion report.

Among all the users of Traffic Channel, 45% say they use the broadcasts for commuting, and among just the regular commuters (who represent 75% of our entire sample), 55% use Traffic Channel for commuting. The non-commuters are much more likely than commuters to use the program for other purposes, such as visiting friends, shopping, and recreation. Frequent viewers of the broadcasts also say they use the program for a wider variety of trip purposes compared with the infrequent viewers.

Most commuters (80%) experience congestion that, on average, lengthens their normal trip by 8.6 minutes over what it would be if traffic were free-flowing. Most commuters (83%) disagree (mild to strong disagreement) with the statement: “I rarely encounter unexpected traffic congestion,” and almost half (48%) agree with the statement: “At least twice a week there’s an unexpected delay on my route.” The frequent viewers of Traffic Channel are much more likely to experience congestion than less frequent viewers and non-viewers. On average, congestion adds 13.2 minutes to their commute every day, unless an unexpected event occurs to lengthen their commute even further.

Route changes were the most likely choice for viewers who commute and said they had consulted any source of traffic information. The most frequently indicated behaviors are route changes (31% take a mostly different route; 22% make small route changes) and trip timing changes (20% leave earlier and 14% leave later). The reasons for these changes are to avoid congestion (94% say this is important to them), saving time (91%), using time more effectively (80%), reducing stress (74%), reducing the risk of an accident (40%), saving gasoline (32%), and saving miles (18%).

Severe weather occurs from time to time in the Puget Sound region, and we asked commuters how they respond when learning from Traffic Channel broadcasts about weather-

related problems on their route. Under these conditions, such as high wind, heavy rain, snow and ice, leaving earlier or postponing the trip altogether are much more likely responses than under normal congestion.

In this survey we asked viewers of Traffic Channel how they would respond when they learned that their trip from home to work/school would take 15 minutes longer than normal. Then we asked the same question under the condition of a 30 minute delay. Both these times exceed their average congestion delays by large amounts. Leaving earlier is the most frequently selected response given a 15 minute delay, followed by small route changes and large route changes. But when the delay is doubled to 30 minutes, respondents select each of these three options more often, and are much more likely to select a large route change. Among those who say they are less likely to make the small route change when faced with the 30 minute delay, 74% of them increase the frequency of selecting a large route change.

In general, the most frequent viewers of Traffic Channel are more likely to have some degree of flexibility in arriving at work (81.0%) compared with all other commuters, including less frequent viewers and non-viewers (68.4%), and leaving from work (88.6%) compared with all other commuters (75.5%). Thus, frequent viewers are somewhat more flexible in their commutes, and may therefore feel they have more to gain from the broadcasts.

Safety, while an issue for some of these respondents, is apparently not a major concern. Only 3% of the respondents strongly agree with the statement: "It isn't safe to get off the freeway and drive through any part of Seattle that you are not familiar with," and 28% strongly disagree with it. When commuters were asked to indicate the importance of a set of reasons for making their preferred behavior change in the face of traffic congestion, 40% noted "reduce my risk of an accident." This was quite a bit less important than four other reasons, including avoiding congestion, saving time and reducing stress, each of which was listed by between 74% and 94% of respondents as among their important reasons. In response to opinion statements about Traffic Channel broadcasts, 53% of the viewers agreed with the statement: "I would like the broadcast to help me decide whether road conditions make it unsafe to drive."

Overall, viewers of Traffic Channel, and especially the frequent viewers, appear to be very satisfied with the program. When asked directly to rate the usefulness of the program, 85.2% of the frequent viewers said it is somewhat or very useful, while only 32.7% of the

infrequent viewers rated it as somewhat or very useful. Frequent viewers are significantly more likely to agree that the broadcasts adequately cover the routes they travel than non-frequent users (68% compared to 28%), and frequent viewers also tend to be more likely to find the information to be accurate. Seventy percent of frequent viewers report that Traffic Channel helps them to avoid traffic congestion, compared with 37% of the less frequent viewers who report this.

Frequent users place significantly greater value on Traffic Channel than do less frequent viewers. While, overall, only 5 percent of the viewers report that they would be willing to pay an extra \$1 each month with their cable bill for Traffic Channel, frequent viewers are much more likely to report that they would be willing to pay (16 percent versus 1 percent).

Based on this assessment, we would recommend that the capabilities of Traffic Channel be reviewed in line with user suggestions and that the broadcasts be promoted much more aggressively to those who have cable access to this programming. TCI Cable, Inc. plans to continue their buildout and make this programming available to many more potential viewers in the Puget Sound region who can benefit from this traffic information resource. We are learning from the series of Customer Satisfaction evaluations conducted under the MMDI program at several sites around the country that assuring the availability of a variety of different ways of accessing traveler and traffic information is important to customers. Some segments of the traffic information market in Seattle and elsewhere find television a more appealing medium than other high technology ways of acquiring the information. In Seattle the evidence from multiple surveys indicates that having a variety of sources of information for use under different circumstances is also valuable. Traffic conditions and congestion in Seattle and the greater Puget Sound region is currently very bad and likely to get even worse. This survey of Seattle households makes it clear that travelers are using and valuing a variety of sources of good traffic and transit information, including Traffic Channel. It therefore makes good sense to continue to provide, improve upon, and promote this service to Seattle's cable TV viewers.

Appendix II – Traffic Channel Meeting, August 27, 1998

Requested Changes:

Slower Presentation:

- Less Views

- Longer duration

- Different program

Credit page

- Content

- Duration

No Page Turn

- Other effect?

Keep map in one place

- Screen real-estate e.g. city labels

Too much information on the page

- What should the content be?

Voice Over

- Content: standard MSG, scene responsive MSG, traffic condition message

Additional labels on key

Survey information page

Time and Date more visible

Highlight selected areas

Full screen video + Voice + full screen map

- Timing? Duration

HOV lane presentation (now black where there are none)

- I90 bridge?

Focus groups

- How

- When (now or after changes)

- Who (market identification and outreach)

Camera direction

- n/s/e/w

off road

Technical issues

scan converter

VDE Board changes (hardware/software)

Airtime Costs/ Reimbursement for Content

Alternative /more cameras

Appendix III – Details of Map Layout

```
# TrafficChannel Map/Layout Configuration
# Definition to display mainline traffic data on the left side
# of the display and video on the right
#

# Number of video effects for this sequence
1

# The Genie effect definitions and start times.
#   starts are specified as msec from the start of the sequence
#   first time starts effect; second time starts reverse effect
#   for sweep out, sweep in of video
c:\TrafficChannel\Effects\tv1.eff    0    6900

# Map origin:
#   Origin is in the screen coordinate system. Used
#   to adjust the relative position of the segment display and the
#   components that are displayed relative to the segments
0 0

#
# Color Table Definition
#   The color table must contain 16 entries numbered 0-15. Each
#   color table entry is used to lookup a given object on the display.
#
0 0    0 0    # Black;
1 255  0 0    # Flash Red;
2 0    24 127 # Dark Blue;
```

```

3 36 53 231 # Bright Blue, i.e. road sign bkgs
4 98 143 189 # Light Blue, i.e. lake background
5 0 0 0 # UNUSED
6 192 192 192 # Light Gray;
7 135 135 135 # Medium Gray;
8 75 75 75 # Dark Gray;
9 211 17 53 # Red;
10 0 210 0 # Green;
11 243 209 49 # Yellow;
12 255 116 4 # Orange
13 0 0 0 # UNUSED
14 0 0 0 # UNUSED
15 200 200 200 # White;

# segment closure information: -file name- -closure color ix- -bad data
ix-
Closures\closures.seg 0 7

# Segment Type Definitions
# segment record:
# type# : 0 - (N-1) where N is the number of segment types
# capStyle : horizontal | vertical
# width : width of the segment in pixels
# borderWidth : width of the segment border in pixels
# colorIndex : 0-15 segment border color from the above color table
2 # number of segment types
0 horizontal 8 0 8
1 vertical 8 0 8

# Segment Definitions
399 # number of segments

```


SegmentDefinitions\PugetSound.seg

```
# Static filled regions
0 # number of polygons to draw
# -x0- -y0- -x1- -y1- -x2- -y2- -x3- -y3- -color for fill- -color for
flash-
# If the foreground and background colors are equal, do no
flashing
# Color values are indexes to the above color table
# Regions are restricted to 4-point polygons
#NOT USED; Speed color boxes replaced by gif, in 'decorations' below

# Decoration Declarations
# Decorations are pre-defined bitmaps to place on the display
25 # Number of decorations

# filename ux uy (position is relative to the map origin) refresh
# refresh=1 means read the file again, in case of changes
# otherwise, refresh=0 files are just read at program start up time
StaticImages\BackgroundWest.png 0 0 0 # background must come first
StaticImages\wsdotbanner.gif 86 35 0
StaticImages\I405.png 240 105 0
StaticImages\I5.png 165 140 0
StaticImages\520.png 185 240 0
StaticImages\I90.png 190 336 0
StaticImages\Lynnwood.png 75 100 0
StaticImages\NorthSeattle.png 43 150 0
StaticImages\Northgate.png 38 200 0
StaticImages\University.png 43 240 0
StaticImages\Montlake.png 43 260 0
StaticImages\Seattle.png 55 295 0
```

```

StaticImages\Boeing.png 55 370 0
StaticImages\Renton.png 235 440 0
#StaticImages\Factoria.png 280 360 0
StaticImages\Bellevue.png 280 288 0
#StaticImages\Kirkland.png 280 230 0
StaticImages\redmond.png 290 220 0
StaticImages\issaquah.png 320 312 0
StaticImages\TotemLake.png 275 180 0
StaticImages\Woodinville.png 270 130 0
StaticImages\Plane.png 100 420 0
StaticImages\speed2.gif 295 345 0      #legend for speed colors
StaticImages\label1.gif 395 75 1      #dynamic camera location label
StaticImages\textbox.gif 400 300 1    #dynamic text area
StaticImages\wsdott.gif 545 315 0     #WSDOT logo
StaticImages\1.gif 570 120 0          #small sequence number in upper
right corner, for debugging

```

```
#
```

```
# ITS data file created by the Generic redistributor
```

```
c:\segmentLogger\sdd.output
```

```
# Data segments are alternated between the data dependent
```

```
# color and the static color to affect flashing
```

```
# -color index of data independent color-
```

```
6
```

```
# number of speed quanta for dividing colors
```

```
# speeds are in triplets:
```

```
# -upperbound data value- -color index- -is flashable-
```

```
4      # the number of colors to use
```

```
20 0   0
```

```
34 9 0
49 11 0
50 10 0 # the top-end speed doesn't really need a lower bound

# Video Source:,
# -Camera ID- -Segment Name- -new image- -image to replace-
# -Camera ID-: Text string descript of camera to use
# -Segment Name-: Data as referenced in the loops data stream
# -new image-: Image file used to replace existing image file
# -image to replace-: The existing default image
# Not used in this implementation; we switch camera views with WSDOT
video switcher
# this entry left just to avoid error condition
520Bridge no_hilite no_image no_image
```


Appendix IV - Timing Sequence Description (sequencer.txt)

```
# sequencer.txt
# The sequence definition for the UWTV TrafficChannel video presentation
#
# The UWTV presentation uses four maps, presented for 7500 milliseconds
# each for a total sequence time of thirty seconds.
#

16          # Number of maps in the sequence

# If map segments, defined in the following map file definitions
# have different foreground and background colors, then the specified
# colors are alternated this frequency
#500        # Duration in msec of flashing map segments
0

# Sequence Sound File:
# This sound file is started at the beginning of the first map
# in the sequence and is repeated each time the first map is displayed.
Sounds\incidents.wav

#time interval for playing sound, seconds; 0 for no play, -1 to loop
without timing
0

120        # time sync; The start of the sequence is scheduled
           # by the current time in seconds modulus this value

# The Map Definitions:
# -map definition filename-      -duration of map display in msec-
```

| | |
|-----------------------|------|
| TrafficMaps\ttv1.txt | 7500 |
| TrafficMaps\ttv2.txt | 7500 |
| TrafficMaps\ttv3.txt | 7500 |
| TrafficMaps\ttv4.txt | 7500 |
| TrafficMaps\ttv5.txt | 7500 |
| TrafficMaps\ttv6.txt | 7500 |
| TrafficMaps\ttv7.txt | 7500 |
| TrafficMaps\ttv8.txt | 7500 |
| TrafficMaps\ttv9.txt | 7500 |
| TrafficMaps\ttv10.txt | 7500 |
| TrafficMaps\ttv11.txt | 7500 |
| TrafficMaps\ttv12.txt | 7500 |
| TrafficMaps\ttv13.txt | 7500 |
| TrafficMaps\ttv14.txt | 7500 |
| TrafficMaps\ttv15.txt | 7500 |
| TrafficMaps\ttv16.txt | 7500 |

Appendix V - Map Segment Layout (PugetSound.seg)

```
149 267 157 267 1 ES-502D:_MW_Stn # 520 west
157 267 166 267 1 ES-504R:_MW_Stn #
166 267 175 267 1 ES-506R:_MW_Stn #
175 267 184 267 1 ES-000R:_MW_Stn # no loops on bridge, except
midspan
184 267 193 267 1 ES-511D:_MW_Stn # midspan
193 267 202 267 1 ES-000R:_MW_Stn # no loops
202 267 211 267 1 ES-514D:_MW_Stn #
211 267 220 267 1 ES-516R:MMW_Stn #
220 267 229 267 1 ES-519R:_MW_Stn #
229 267 238 267 1 ES-520D:_MW_Stn #
238 267 245 267 1 ES-521R:MMW_Stn #
253 267 257 267 1 ES-524R:MMW_Stn # (gap for 405 s)
257 267 262 267 1 ES-528D:_MW_Stn #
270 267 274 267 1 ES-531R:MMW_Stn # (gap for 405 n)
274 267 283 267 1 ES-533D:_MW_Stn #
283 267 292 267 1 ES-535D:_MW_Stn #
292 267 301 267 1 ES-537R:MMW_Stn #
301 267 310 267 1 ES-539D:_MW_Stn #
306 263 306 254 0 ES-540R:MMW_Stn #
306 254 306 245 0 ES-542R:MMW_Stn #
306 245 306 236 0 ES-544D:_MW_Stn #
310 240 319 240 1 ES-545R:MMW_Stn #
319 240 328 240 1 ES-547D:_MW_Stn #
149 280 157 280 1 ES-502D:_ME_Stn # 520 east
157 280 166 280 1 ES-504R:MME_Stn #
166 280 175 280 1 ES-506R:MME_Stn #
175 280 184 280 1 ES-000R:_ME_Stn # no loops on bridge, except
midspan
```

```

184 280 193 280 1 ES-511D:_ME_Stn # midspan
193 280 202 280 1 ES-000R:_ME_Stn # no loops
202 280 211 280 1 ES-514D:_ME_Stn #
211 280 220 280 1 ES-516R:_ME_Stn #
220 280 229 280 1 ES-519R:MME_Stn #
229 280 238 280 1 ES-520D:_ME_Stn #
238 280 245 280 1 ES-521R:_ME_Stn #
253 280 257 280 1 ES-525R:MME_Stn # (gap for 405 s)
257 280 262 280 1 ES-528D:_ME_Stn #
270 280 274 280 1 ES-531R:_ME_Stn # (gap for 405 n)
274 280 283 280 1 ES-533D:_ME_Stn #
283 280 292 280 1 ES-535D:_ME_Stn #
292 280 301 280 1 ES-538R:MME_Stn #
301 280 322 280 1 ES-539D:_ME_Stn #
318 276 318 267 0 ES-541R:MME_Stn #
318 267 318 258 0 ES-543R:MME_Stn #
318 258 318 249 0 ES-544D:_ME_Stn #
322 253 331 253 1 ES-546D:_ME_Stn #
331 253 340 253 1 ES-547D:_ME_Stn #
161 311 166 319 0 ES-827D:_RE_Stn # I90 Reversible
161 327 166 319 0 ES-827D:_RE_Stn #
166 319 175 319 1 ES-852D:_RE_Stn #
175 319 184 319 1 ES-854D:_RE_Stn #
184 319 193 319 1 ES-857D:_RE_Stn # midspan
193 319 202 319 1 ES-860D:_RE_Stn #
202 319 207 319 1 ES-863R:_RE_Stn #
207 319 211 319 1 ES-876R:_RE_Stn #
211 319 216 319 1 ES-878D:_RE_Stn #
216 319 220 319 1 ES-881R:_RE_Stn #
220 319 225 319 1 ES-883D:_RE_Stn #
229 319 234 315 0 ES-889R:_RE_Stn #

```


229 319 234 324 0 ES-889R:_RE_Stn #
234 315 238 311 0 ES-891D:_RE_Stn #
234 324 238 328 0 ES-891D:_RE_Stn #
225 319 229 319 1 ES-885D:_RE_Stn #
149 307 157 307 1 ES-818D:_MW_Stn # I-90 west
157 307 166 307 1 ES-826D:_MW_Stn #
166 307 175 307 1 ES-852D:_MW_Stn #
175 307 184 307 1 ES-854D:_MW_Stn #
184 307 193 307 1 ES-857D:_MW_Stn # midspan
193 307 202 307 1 ES-860D:_MW_Stn #
202 307 207 307 1 ES-863R:MMW_Stn #
207 307 211 307 1 ES-876R:NNW_Stn #
211 307 216 307 1 ES-879R:MMW_Stn #
216 307 220 307 1 ES-881R:_MW_Stn #
220 307 225 307 1 ES-883D:_MW_Stn #
225 307 229 307 1 ES-887R:MMW_Stn #
229 307 234 307 1 ES-889R:_MW_Stn #
234 307 238 307 1 ES-891D:_MW_Stn #
238 307 245 307 1 ES-896D:_MW_Stn #
253 307 262 307 1 ES-900R:MMW_Stn # (gap for 405 s)
270 307 278 307 1 ES-903D:_MW_Stn # (gap for 405 n)
278 307 287 307 1 ES-908R:MMW_Stn #
287 307 296 307 1 ES-910D:_MW_Stn #
296 307 305 307 1 ES-912D:_MW_Stn #
305 307 314 307 1 ES-916D:_MW_Stn #
314 307 323 307 1 ES-920R:MMW_Stn #
323 307 332 307 1 ES-924D:_MW_Stn #
332 307 341 307 1 ES-928D:_MW_Stn #
341 307 350 307 1 ES-932D:_MW_Stn #
350 307 359 307 1 ES-935R:MMW_Stn #
359 307 368 307 1 ES-940D:_MW_Stn #

368 307 377 307 1 ES-945R:MMW_Stn #
149 331 157 331 1 ES-812D:_ME_Stn # I-90 east
157 331 166 331 1 ES-822R:MME_Stn #
166 331 171 331 1 ES-825R:MME_Stn #
171 331 175 331 1 ES-852D:_ME_Stn #
175 331 184 331 1 ES-855D:_ME_Stn #
184 331 193 331 1 ES-858D:_ME_Stn # midspan
193 331 202 331 1 ES-861D:_ME_Stn #
202 331 207 331 1 ES-863R:_ME_Stn #
207 331 211 331 1 ES-876R:_ME_Stn #
211 331 216 331 1 ES-879R:_ME_Stn #
216 331 220 331 1 ES-881R:MME_Stn #
220 331 225 331 1 ES-883D:_ME_Stn #
225 331 229 331 1 ES-885D:_ME_Stn #
229 331 234 331 1 ES-889R:MME_Stn #
234 331 238 331 1 ES-891D:_ME_Stn #
238 331 245 331 1 ES-896D:_ME_Stn #
253 331 262 331 1 ES-900R:_ME_Stn # (gap for 405 s)
270 331 278 331 1 ES-903D:_ME_Stn # (gap for 405 n)
278 331 287 331 1 ES-908R:_ME_Stn #
287 331 296 331 1 ES-910D:_ME_Stn #
296 331 305 331 1 ES-912D:_ME_Stn #
305 331 314 331 1 ES-916D:_ME_Stn #
314 331 323 331 1 ES-920R:_ME_Stn #
323 331 332 331 1 ES-924D:_ME_Stn #
332 331 341 331 1 ES-928D:_ME_Stn #
341 331 350 331 1 ES-932D:_ME_Stn #
350 331 359 331 1 ES-935R:_ME_Stn #
359 331 368 331 1 ES-940D:_ME_Stn #
368 331 377 331 1 ES-945R:_ME_Stn #
124 229 128 236 1 ES-154D:_RN_Stn # I5 express lanes, north entrance

```

128 236 133 241 1 ES-152D:_RN_Stn #
133 241 138 236 1 ES-152D:_RN_Stn #
138 236 141 229 1 ES-154D:_RN_Stn #
133 241 133 244 0 ES-148D:_RN_Stn #
133 244 133 247 0 ES-146R:_RN_Stn #
133 247 133 253 0 ES-143D:_RN_Stn #
133 253 133 259 0 ES-139R:_RN_Stn #
133 259 133 265 0 ES-136R:_RN_Stn #
133 265 133 274 0 ES-132D:_RN_Stn #
133 274 133 283 0 ES-126D:_RN_Stn #
133 283 133 289 0 ES-125R:_RN_Stn #
133 289 133 296 0 ES-124D:_RN_Stn #
133 296 133 308 0 ES-123D:_RN_Stn #
124 317 128 312 1 ES-111R:_RN_Stn # express lanes, south entrance
128 312 133 308 1 ES-118R:_RN_Stn #
133 308 138 312 1 ES-118R:_RN_Stn #
138 312 141 317 1 ES-111R:_RN_Stn #
198 89 206 97 0 ES-764D:_MN_Stn # east side outer loop, 405 north
bound
206 97 215 106 0 ES-763D:_MN_Stn #
215 106 220 111 0 ES-762D:_MN_Stn #
220 111 226 117 0 ES-759D:_MN_Stn #
226 117 232 123 0 ES-757D:_MN_Stn #
232 123 237 128 0 ES-756R:MMN_Stn #
237 128 243 134 0 ES-754D:_MN_Stn #
243 134 249 140 0 ES-752D:_MN_Stn #
249 140 254 145 0 ES-750D:_MN_Stn #
254 145 260 151 0 ES-748R:_MN_Stn #
260 151 266 157 0 ES-746D:_MN_Stn #
266 157 266 162 0 ES-744R:_MN_Stn #
266 162 266 167 0 ES-742D:_MN_Stn #

```

266 167 266 172 0 ES-741R:MMN_Stn #
266 172 266 177 0 ES-740R:_MN_Stn #
266 177 266 182 0 ES-739D:_MN_Stn #
266 182 266 187 0 ES-738D:_MN_Stn #
266 187 266 192 0 ES-736D:_MN_Stn #
266 192 266 197 0 ES-734D:_MN_Stn #
266 197 266 202 0 ES-731R:MMN_Stn #
266 202 266 207 0 ES-730R:_MN_Stn #
266 207 266 212 0 ES-726R:_MN_Stn #
266 212 266 217 0 ES-724D:_MN_Stn #
266 217 266 222 0 ES-722D:_MN_Stn #
266 222 266 227 0 ES-720D:_MN_Stn #
266 227 266 232 0 ES-717R:MMN_Stn #
266 232 266 237 0 ES-716R:_MN_Stn #
266 237 266 242 0 ES-711R:MMN_Stn #
266 242 266 247 0 ES-710R:_MN_Stn #
266 247 266 252 0 ES-709D:_MN_Stn #
266 252 266 257 0 ES-708D:_MN_Stn #
266 257 266 262 0 ES-706D:_MN_Stn #
266 262 266 267 0 ES-704D:_MN_Stn #
266 267 266 272 0 ES-698D:_MN_Stn # (at SR520)
266 272 266 277 0 ES-696D:_MN_Stn #
266 277 266 282 0 ES-694R:MMN_Stn #
266 282 266 287 0 ES-687R:MMN_Stn #
266 287 266 292 0 ES-684D:_MN_Stn #
266 292 266 297 0 ES-682R:MMN_Stn #
266 297 266 302 0 ES-678D:_MN_Stn #
266 302 266 307 0 ES-677D:_MN_Stn #
266 307 266 317 0 ES-676D:_MN_Stn # (at I90)
266 317 266 322 0 ES-672D:_MN_Stn #
266 322 266 327 0 ES-667D:_MN_Stn #

266 327 266 332 0 ES-665D:_MN_Stn #
 266 332 266 337 0 ES-662R:_MN_Stn #
 266 337 266 342 0 ES-659D:_MN_Stn #
 266 342 266 347 0 ES-657D:_MN_Stn #
 266 347 266 352 0 ES-656D:_MN_Stn #
 266 352 266 357 0 ES-654R:MMN_Stn #
 266 357 266 362 0 ES-651D:_MN_Stn #
 266 362 266 367 0 ES-648R:MMN_Stn #
 266 367 266 377 0 ES-645D:_MN_Stn #
 266 377 266 387 0 ES-643R:MMN_Stn #
 266 387 266 400 0 ES-638R:MMN_Stn #
 266 400 261 405 0 ES-634R:MMN_Stn #
 261 405 256 410 0 ES-632D:_MN_Stn #
 256 410 251 415 0 ES-630D:_MN_Stn #
 251 415 246 420 0 ES-628D:_MN_Stn #
 246 420 241 425 0 ES-626D:_MN_Stn #
 241 425 236 430 0 ES-623D:_MN_Stn #
 236 430 231 435 0 ES-621D:_MN_Stn #
 231 435 226 440 0 ES-619D:_MN_Stn #
 226 440 221 445 0 ES-617R:MMN_Stn #
 221 445 214 452 0 ES-614D:_MN_Stn #
 214 452 206 460 0 ES-612D:_MN_Stn #
 170 77 170 83 0 ES-211D:_MS_Stn # west side outer loop, I5 south
 170 83 170 89 0 ES-210D:_MS_Stn #
 170 89 170 95 0 ES-209D:_MS_Stn #
 170 95 170 101 0 ES-207R:MMS_Stn #
 170 101 170 107 0 ES-205D:_MS_Stn #
 170 107 165 112 0 ES-203R:MMS_Stn #
 165 112 160 117 0 ES-201D:_MS_Stn #
 160 117 155 122 0 ES-196D:_MS_Stn #
 155 122 150 127 0 ES-193R:MMS_Stn #

150 127 145 132 0 ES-191D:_MS_Stn #
145 132 140 137 0 ES-189D:_MS_Stn #
140 137 135 142 0 ES-187R:MMS_Stn #
135 142 130 147 0 ES-186D:_MS_Stn #
130 147 125 152 0 ES-184R:_MS_Stn #
125 152 120 157 0 ES-182R:MMS_Stn #
120 157 120 163 0 ES-179D:_MS_Stn #
120 163 120 169 0 ES-177D:_MS_Stn #
120 169 120 175 0 ES-174R:MMS_Stn #
120 175 120 181 0 ES-174R:MMS_Stn #
120 181 120 187 0 ES-172R:MMS_Stn #
120 187 120 193 0 ES-170D:_MS_Stn #
120 193 120 199 0 ES-167D:_MS_Stn #
120 199 120 205 0 ES-165D:_MS_Stn #
120 205 120 211 0 ES-163R:MMS_Stn #
120 211 120 217 0 ES-161D:_MS_Stn #
120 217 120 220 0 ES-158R:MMS_Stn #
120 220 120 223 0 ES-156R:_MS_Stn #
120 223 120 235 0 ES-154D:_MS_Stn #
120 235 120 238 0 ES-152D:_MS_Stn #
120 238 120 241 0 ES-149R:MMS_Stn #
120 241 120 247 0 ES-145D:_MS_Stn #
120 247 120 253 0 ES-143D:_MS_Stn #
120 253 120 259 0 ES-141R:MMS_Stn #
120 259 120 262 0 ES-136R:MMS_Stn #
120 262 120 265 0 ES-134R:MMS_Stn #
120 265 120 274 0 ES-130D:_MS_Stn #
120 274 120 283 0 ES-126D:_MS_Stn #
120 283 120 289 0 ES-125R:MMS_Stn #
120 289 120 295 0 ES-124D:_MS_Stn #
120 295 120 301 0 ES-123D:_MS_Stn #

120 301 120 307 0 ES-121R:MMS_Stn #
120 307 120 313 0 ES-118R:_MS_Stn #
120 313 120 319 0 ES-111R:_MS_Stn #
120 319 120 325 0 ES-108D:_MS_Stn #
120 325 120 331 0 ES-105D:_MS_Stn #
120 331 120 337 0 ES-102R:_MS_Stn #
120 337 120 343 0 ES-100R:MMS_Stn #
120 343 120 349 0 ES-093D:_MS_Stn #
120 349 120 355 0 ES-090D:_MS_Stn #
120 355 120 361 0 ES-088D:_MS_Stn #
120 361 120 367 0 ES-085R:MMS_Stn #
120 367 120 373 0 ES-083D:_MS_Stn #
120 373 120 379 0 ES-082D:_MS_Stn #
120 379 120 382 0 ES-081D:_MS_Stn #
120 382 126 388 0 ES-080D:_MS_Stn #
126 388 132 394 0 ES-079D:_MS_Stn #
132 394 144 406 0 ES-077R:_MS_Stn #
144 406 150 412 0 ES-075R:MMS_Stn #
150 412 156 418 0 ES-074D:_MS_Stn #
156 418 163 425 0 ES-073R:_MS_Stn #
163 425 169 431 0 ES-071R:MMS_Stn #
169 431 176 438 0 ES-069D:_MS_Stn #
176 438 182 444 0 ES-068D:_MS_Stn #
182 444 182 450 0 ES-061R:MMS_Stn #
182 450 182 456 0 ES-059D:_MS_Stn #
182 456 182 462 0 ES-057D:_MS_Stn #
182 462 182 470 0 ES-055D:_MS_Stn #
197 77 197 83 0 ES-211D:_MN_Stn # west side inner loop, I5 North
197 83 197 89 0 ES-210D:_MN_Stn #
197 89 197 95 0 ES-209D:_MN_Stn #
197 95 197 101 0 ES-208R:MMN_Stn #

197 101 197 107 0 ES-205D:_MN_Stn #
195 107 190 112 0 ES-204D:_MN_Stn #
190 112 185 117 0 ES-201D:_MN_Stn #
185 117 180 122 0 ES-196D:_MN_Stn #
180 122 175 127 0 ES-193R:_MN_Stn #
175 127 170 132 0 ES-191D:_MN_Stn #
170 132 165 137 0 ES-189D:_MN_Stn #
165 137 160 142 0 ES-188R:MMN_Stn #
160 142 155 147 0 ES-186D:_MS_Stn #
155 147 150 152 0 ES-184R:MMN_Stn #
150 152 145 157 0 ES-181R:_MN_Stn #
145 157 145 163 0 ES-179D:_MN_Stn #
145 163 145 172 0 ES-177D:_MN_Stn #
145 172 145 181 0 ES-175R:MMN_Stn #
145 181 145 187 0 ES-172R:_MN_Stn #
145 187 145 193 0 ES-170D:_MN_Stn #
145 193 145 199 0 ES-168R:MMN_Stn #
145 199 145 205 0 ES-165D:_MN_Stn #
145 205 145 214 0 ES-163R:_MN_Stn #
145 214 145 220 0 ES-159R:MMN_Stn #
145 220 145 223 0 ES-156R:_MN_Stn #
145 223 145 235 0 ES-154D:_MN_Stn # reversible lanes merge to NB here
145 235 145 238 0 ES-151R:MMN_Stn #
145 238 145 241 0 ES-148D:_MN_Stn #
145 241 145 247 0 ES-146R:MMN_Stn #
145 247 145 253 0 ES-143D:_MN_Stn #
145 253 145 259 0 ES-139R:MMN_Stn #
145 259 145 265 0 ES-137R:MMN_Stn #
145 265 145 274 0 ES-130D:_MN_Stn # 520 meets I-5 NB lanes
145 274 145 283 0 ES-126D:_MN_Stn #
145 283 145 289 0 ES-125R:_MN_Stn #

145 289 145 295 0 ES-124D:_MN_Stn #
145 295 145 304 0 ES-123D:_MN_Stn #
145 304 145 313 0 ES-118R:MMN_Stn # I-90 meets I-5 NB lanes
145 313 145 319 0 ES-111R:MMN_Stn #
145 319 145 325 0 ES-108D:_MN_Stn #
145 325 145 331 0 ES-104D:_MN_Stn #
145 331 145 337 0 ES-102R:_MN_Stn #
145 337 145 343 0 ES-094R:MMN_Stn #
145 343 145 349 0 ES-093D:_MN_Stn #
145 349 145 355 0 ES-090D:_MN_Stn #
145 355 145 361 0 ES-088D:_MN_Stn #
145 361 145 364 0 ES-087R:MMN_Stn #
145 364 145 367 0 ES-086R:MMN_Stn #
145 367 145 373 0 ES-083D:_MN_Stn #
145 373 145 379 0 ES-082D:_MN_Stn #
145 379 145 382 0 ES-081D:_MN_Stn #
145 382 151 388 0 ES-080D:_MN_Stn #
151 388 157 394 0 ES-079D:_MN_Stn #
157 394 169 406 0 ES-077R:MMN_Stn #
169 406 175 412 0 ES-076R:MMN_Stn #
175 412 181 418 0 ES-074D:_MN_Stn #
181 418 187 424 0 ES-073R:MMN_Stn #
187 424 194 431 0 ES-070R:_MN_Stn #
194 431 200 437 0 ES-069D:_MN_Stn #
200 437 207 444 0 ES-068D:_MN_Stn #
205 444 205 456 0 ES-059D:_MN_Stn #
205 456 205 462 0 ES-057D:_MN_Stn #
205 462 205 470 0 ES-055D:_MN_Stn #
198 106 204 112 0 ES-764D:_MS_Stn # east side inner loop 405 south
204 112 211 119 0 ES-763D:_MS_Stn #
211 119 215 123 0 ES-762D:_MS_Stn #

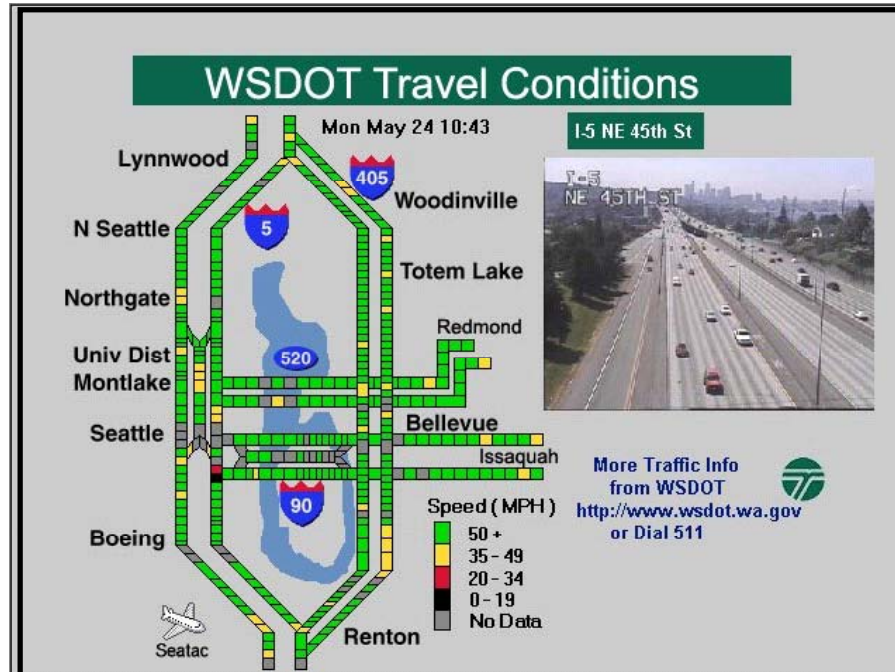
215 123 219 127 0 ES-759D:_MS_Stn #
219 127 224 132 0 ES-757D:_MS_Stn #
224 132 228 136 0 ES-756R:_MS_Stn #
228 136 233 141 0 ES-754D:_MS_Stn #
233 141 237 145 0 ES-751D:_MS_Stn #
237 145 240 148 0 ES-750D:_MS_Stn #
240 148 245 153 0 ES-748R:MMS_Stn #
245 153 249 157 0 ES-746D:_MS_Stn #
249 157 249 162 0 ES-744R:MMS_Stn #
249 162 249 167 0 ES-742D:_MS_Stn #
249 167 249 172 0 ES-741R:_MS_Stn #
249 172 249 177 0 ES-740R:MMS_Stn #
249 177 249 182 0 ES-739D:_MS_Stn #
249 182 249 187 0 ES-738D:_MS_Stn #
249 187 249 192 0 ES-736D:_MS_Stn #
249 192 249 197 0 ES-734D:_MS_Stn #
249 197 249 202 0 ES-731R:_MS_Stn #
249 202 249 207 0 ES-730R:MMS_Stn #
249 207 249 212 0 ES-726R:MMS_Stn #
249 212 249 217 0 ES-724D:_MS_Stn #
249 217 249 222 0 ES-722D:_MS_Stn #
249 222 249 227 0 ES-720D:_MS_Stn #
249 227 249 232 0 ES-717R:_MS_Stn #
249 232 249 237 0 ES-716R:MMS_Stn #
249 237 249 242 0 ES-711R:_MS_Stn #
249 242 249 247 0 ES-710R:MMS_Stn #
249 247 249 252 0 ES-709D:_MS_Stn #
249 252 249 257 0 ES-708D:_MS_Stn #
249 257 249 262 0 ES-706D:_MS_Stn #
249 262 249 267 0 ES-704D:_MS_Stn #
249 267 249 277 0 ES-698D:_MS_Stn #

249 277 249 282 0 ES-696D:_MS_Stn #
249 282 249 287 0 ES-689R:MMS_Stn #
249 287 249 292 0 ES-684D:_MS_Stn #
249 292 249 297 0 ES-681R:MMS_Stn #
249 297 249 302 0 ES-678D:_MS_Stn #
249 302 249 307 0 ES-677D:_MS_Stn #
249 307 249 317 0 ES-676D:_MS_Stn #
249 317 249 322 0 ES-672D:_MS_Stn #
249 322 249 327 0 ES-667D:_MS_Stn #
249 327 249 332 0 ES-665D:_MS_Stn #
249 332 249 337 0 ES-662R:MMS_Stn #
249 337 249 342 0 ES-659D:_MS_Stn #
249 342 249 347 0 ES-657D:_MS_Stn #
249 347 249 352 0 ES-656D:_MS_Stn #
249 352 249 357 0 ES-653R:MMS_Stn #
249 357 249 362 0 ES-651D:_MS_Stn #
249 362 249 367 0 ES-647R:MMS_Stn #
249 367 249 377 0 ES-645D:_MS_Stn #
249 377 249 387 0 ES-642R:MMS_Stn #
249 387 249 400 0 ES-638R:_MS_Stn #
245 404 249 400 0 ES-633R:MMS_Stn #
241 408 245 404 0 ES-632D:_MS_Stn #
238 411 241 408 0 ES-630D:_MS_Stn #
234 415 238 411 0 ES-628D:_MS_Stn #
230 419 234 415 0 ES-625D:_MS_Stn #
227 422 230 419 0 ES-622D:_MS_Stn #
224 425 227 422 0 ES-621D:_MS_Stn #
220 429 224 425 0 ES-619D:_MS_Stn #
216 433 220 429 0 ES-616R:MMS_Stn #
213 436 216 433 0 ES-614D:_MS_Stn #
209 440 213 436 0 ES-612D:_MS_Stn #

205 444 209 440 0 ES-610D:_MS_Stn #

Final Report

**UW Traffic TV
Focus Group: 5/18/04**



Prepared for:

**Washington State Department of Transportation
1107 NE 45th St., Suite 535
Seattle, WA 98105-4631**

by:

Battelle

July 26, 2004

Battelle
The Business of Innovation

UW Traffic TV Focus Group

Summary Report

Introduction

On 18 May 2004, the Washington State Department of Transportation (WSDOT) sponsored a focus group at the University of Washington to identify ways to improve the usefulness of *Traffic TV*, a real-time traffic information program presented via cable over UW₂TV, Monday through Friday, 5am-8am and 3pm-7pm. The Battelle Seattle Research Center moderated the focus group discussion on behalf of WSDOT (see Appendix A for discussion guide). WSDOT and UWTV staff attended as observers (Appendix B). Battelle selected 10 participants to reflect diversity of routes traveled in the Puget Sound region, as well as a balance between men and women. Every invited participant attended. The focus group session lasted about an hour and a half.

The first part of the focus group, after general introductions, was to view on a television monitor the *Traffic TV* program. Viewing reacquainted participants with the program's content and presentation of traffic information. From there the moderator led the group through each of the topics in the discussion guide. Researchers took notes to create a written record of comments; however, no attempt was made to provide a verbatim transcript of this focus group.

The intent of this report is to present the results of the discussion in a format that will be useful to WSDOT and UWTV in their consideration of possible future modifications of the Traffic TV program that might make it even more beneficial to the viewer.

Participant Recruitment

Participants were sought initially by means of a "banner" posted on the *Traffic TV* program. The banner was posted on April 5, 2004 and removed about April 19, 2004. It said:

Suggestions for improving Traffic TV? For focus group, call Todd @ Battelle, [phone number].

The intent was to recruit regular users of traveler information obtained from this cable TV program, with the idea that their experience and perspective gained from viewing this program and using it to plan their travel would offer the most useful insights and suggestions for possible improvements. An incentive was offered for participation, though that could not be mentioned on the recruitment banner as a matter of policy. In addition, *Traffic TV* had been off the air for four months (October 2003 through January 2004) prior to the recruitment. For these reasons, very few individuals responded to the banner. Thus, it appeared that it would not be fruitful to continue recruitment for the focus group in this way.

The next approach was to post a banner on the WSDOT website traffic conditions and traffic camera pages inviting participation in the focus group. This banner was posted on May 6, 2004 and removed after only six days on May 12, 2004, after receiving more than 18 responses. This banner was designed in two parts: the first was short so it could fit on a small space on the web site, and more information was provided separately on a linked page. The posted short banner said: *Earn \$50 by giving feedback on Traffic TV.* Respondents who clicked on this banner were shown the following message: *WSDOT is looking for feedback on TrafficTV that now appears on channel 76 on cable TV. If you have experience using this Traffic TV program, earn \$50 by participating in a focus group. Contact Todd at Battelle, phone [phone number] or email [email address].* The advantages to this approach were access to a much wider audience of users of traffic information for trip planning and the ability to post more details including the incentive, resulting in better prospects for being able to quickly recruit participants for the focus group. Also, *Traffic TV* presents traffic images that closely resemble the mapped information used on the WSDOT traffic conditions webpage, coupled with similar camera images. The disadvantage was that few users of the WSDOT website were likely to also be users of *Traffic TV*. Also, *Traffic TV* makes traffic information accessible to many individuals who may not otherwise have access to the Internet, and these individuals are likely to have different characteristics and needs compared with users of the Internet. The assumption in pursuing this recruitment approach was that active users of traffic information from any source would yield a knowledgeable group of travelers who could provide useful perspective on this particular way of presenting traffic information via cable TV programming, even though they were not likely to be regular viewers of the program. The recruitment approach thus risks missing valuable

perspectives from segments of the population who don't use the Internet. Response to the WSDOT banner was immediate and strong with more applicants than spots available in the discussion group.

Individuals who are active users of traffic information on the Internet are different from the general population, and also different from users of traffic information derived from other sources. It is known from prior research that they are better educated, more comfortable with the newer information technologies, and generally more adept in researching this kind of information compared with the general population. However, the point of this study was not to solicit feedback from a general population; rather, the study sought to recruit individuals who were users of traffic information, who represented a range of travel patterns and demographic and economic characteristics that are known to be related to traffic information needs, and who could be expected to provide useful feedback on the *Traffic TV* programming. As a way to compensate for the fact that most of the participants who responded were infrequent users of *Traffic TV*, each was asked to view the program before attending the focus group session and to consider ways that the program might be made more useful to them.

Normally qualitative research of this type would involve several focus groups in order to explore more fully issues associated with the use of *Traffic TV* in the region, and to assure a broader coverage of user characteristics. In this case, WSDOT wanted to explore the uses and reactions to the program in an efficient, more limited way to see whether any issues or suggestions that had not previously been considered might emerge from a single focus group. In addition, WSDOT had only limited resources to devote both to the research and to any possible restructuring or reprogramming of the *Traffic TV* program.

Participant Characteristics

The 10 Caucasian participants included four men and six women. Many were professionals who travel extensively in the Puget Sound region, all were active users of traffic information on the WSDOT website, and most used this information primarily to aid them in commuting. By definition they were Internet users. Some had used *Traffic TV* but none used it regularly.

The following sections summarize the general themes and specific suggestions provided by the participants, and include a few additional comments submitted by individuals who were

unable to attend the focus group. The themes and suggestions represent individual opinions as well as consensus positions on the matters discussed. Given the limited experience of this group with *Traffic TV*, the moderator actively guided the discussion in order to elicit as many opinions and suggestions as possible.

Themes

Several general themes emerged from the discussion (participants' comments are paraphrased in italics):

- *Traffic TV*, along with other traffic information, provides a resource in the Seattle region where traffic is increasingly difficult. *Traffic TV* fills a niche not offered by other traffic information services. Participants who may rarely or never have used *Traffic TV* prior to this focus group said they would consider using *Traffic TV* just before leaving for their commute or other trip from home. With improvements, they might use it more regularly.
- Although used infrequently by these participants, *Traffic TV* provides a useful quick snapshot that tells the viewer if more information is needed from other sources, and it helps prevent travelers from being blind-sided by adverse traffic conditions.
Comment: Traffic TV offers 80% of what you need in the morning to plan your trip. The traffic map is the key; it gives you a complete picture of the whole network; it gives a good overall sense of the region's traffic by cycling through all the camera images; the other information enhances travel planning. I don't have time to boot up my computer or wait for radio traffic reports; Traffic TV gives me a quick read right before I leave.
- *Traffic TV* could be improved in a number of ways to make it more attractive, accessible and useful to Puget Sound travelers. Without making such improvements, these participants said they would at best use it infrequently.
Comment: If some improvements were made to Traffic TV, I would use it more often.
- Marketing *Traffic TV* more effectively so more can benefit from it may broaden usage. Most find it by accident, channel flipping or by reference from a friend or co-worker. Prior to this focus group, awareness of *Traffic TV* among these participants was low.
Comment: Advertise Traffic TV on the highway VMS. Show Traffic TV onboard the ferries.

Participants' Suggestions

Focus group participants offered the following specific suggestions for improving *Traffic TV*:

- Extend the hours when *Traffic TV* is broadcast at least until 9 a.m. Participants mostly use *Traffic TV* in the morning for last minute pre-trip planning.

Comment: Traffic in the Puget Sound region is now so challenging and unpredictable that Traffic TV-type information is needed at all times of the day.

- Dedicate a channel to *Traffic TV* so it can be viewed at all times of the day.

Comment: Traffic TV is but a band-aid for our terrible traffic.

- Improve the clarity of the *Traffic TV* visual presentation, particularly the clarity of the text.

Comment: Traffic TV looks like it was designed for a PC monitor not a TV screen.

- The graphic design of the road segments on the map seems overly rigid. For example, the extension of SR520 to Redmond doesn't represent the road curves very well.

- Eliminate the accompanying music.

Comment: Replace the music with a voice-over providing information about traffic developments and accidents. Provide audio cues to signal users that traffic summaries are imminent. Users could then derive value from both watching and listening to Traffic TV and know to pay close attention when traffic summaries were forthcoming.

- Do a better job of orienting viewers as to which camera and which camera angle and direction are being shown. It is now hard to determine the location to which camera images refer.

Comment: Provide an icon with an indicator to show which way the camera is pointing.

- Add scrolling information to the bottom of the screen, similar to information presented on VMS. Consider showing actual VMS messages on *Traffic TV*.

- Make more efficient, more graphically pleasing use of the *Traffic TV* screen "real estate." For example, the "WSDOT Travel Conditions" title at the top of the screen takes up too much space—90% of the viewers will know what they are looking at without the title.

- Provide average trip times in relation to current traffic conditions.
- Provide predictive information: for example, if you wait half an hour this is what your trip will be like, compared with what will happen if you leave now.
- Translate color codes into travel times.
Comment: You need to use Traffic TV a lot to really understand what it's telling you and to get the most out of it. Using the program a lot allows estimating trip times based on the color-coding and adjusting trip timing or route selection accordingly.
- Provide coverage, using color-coding, for car pool lanes.
- Feed WSDOT website images directly into *Traffic TV*.
- Extend the geographical coverage of *Traffic TV* north and south, and provide information on the main arterials.
- Show the location of the very worst traffic situation. More generally, provide reports of specific incidents as they are identified, and show where they are on the map.
- Post information about sporting events and incidents affecting traffic – information similar to that available on 511.
- Provide an explanation when any of the cameras is not operating.

In sum, *Traffic TV* offers a valuable resource for Puget Sound travelers faced with increased congestion and travel uncertainty. While overall public awareness and use of this source of traffic information is currently low, with additional improvements as suggested by these focus group participants, *Traffic TV* can help fill an information niche for many travelers.

Appendix A

UW Traffic TV Focus Group Discussion Guide

Moderator:

- Introduce moderator, recorder and observers
- Purpose of the focus group
- The sponsor
- How the information will be used
- General ground rules for conduct of discussions.

Opening Question

Please introduce yourself and tell us (briefly) about your experiences driving in the Puget Sound region.

Play the Traffic TV tape

Introductory Question

How have you used traffic information in the past to plan your trips around the Puget Sound region? Tell us what sources of information you use, and a little about how you use the information. (Probe: types of trips; pre-trip vs. en-route; trip decisions, such as changing timing, routes, etc.)

Transition Question

What do think of Traffic TV as a source of traffic information?

Main Discussion Questions

How did you first learn about Traffic TV?

When did you first start using it?

How often do you view Traffic TV?

In what ways is Traffic TV useful to you?

Where does Traffic TV fit into the sources you use for planning travel in the Puget Sound region? (Probe: Do you use other sources of traffic information in addition to Traffic TV? If so, tell us about your uses and sense of the relative advantages/benefits of Traffic TV.)

What kind of information would you like Traffic TV to provide? (Is there anything missing that you think should be provided?)

What do you think of the “look and feel” of Traffic TV? (Probe: arrangement of information; sequence; details; colors; readability; geographic coverage; availability by time of day, etc.)

What are the best aspects of Traffic TV?

How could Traffic TV be improved?

Probe: In terms of specific content regarding presentation; access; time of presentation; and production values (clarity of images, speed of image presentation, etc.)

How could WSDOT attract a wider viewing audience to Traffic TV?

Ending Questions

***All Things Considered Question:** (Participants state their final position on areas of particular concern.) Of all the issues we discussed, which is most important to you?*

***Summary Question:** (Moderator gives a two minute summary of the key points that emerged from the discussion, then asks “Is this an adequate summary?”)*

***Final Question:** Have we missed anything?*

Appendix B

Focus Group Observers and Moderator

Matthew Beaulieu, WSDOT, Traffic Engineering

Morgan Balogh, WSDOT, Traffic Engineering

Jamie Holter, WSDOT Public Information

Stan Suchan, WSDOT Public Information

Dan Dailey, UW, Department of Electrical Engineering

Catherine McConnell, UWTV

Todd Peterson, Battelle, Focus Group Moderator

Chris Cluett, Battelle, Evaluation Manager

THE MEDIA AUDIT

COMPOSITION REPORTS
ADULTS

Report Market: SEATTLE-TACOMA, WA
Report Period: JUN-JUL 2004
MEDIA: TRAFFIC TV

CUME STATISTICAL
REPORT

TOTAL AUDIENCE: 2,836,500 IN MEDIA AUDIENCE: 3.3% NUMBER IN MEDIA AUDIENCE: 94,200

| TARGET | MARKET PERSONS | MEDIA PERSONS | MEDIA RATING | AUDIENCE COMPOSITION | TARGET INDEX |
|--|----------------|---------------|--------------|----------------------|--------------|
| MEN--AGE 18 + | 1,398,900 | 38,200 | 2.7 | 40.6 | 82 |
| WOMEN--AGE 18 + | 1,437,600 | 56,000 | 3.9 | 59.4 | 117 |
| ANNUAL HOUSEHOLD INCOME--\$15,000-\$24,999 | 266,500 | 10,600 | 4.0 | 11.3 | 120 |
| ANNUAL HOUSEHOLD INCOME--\$25,000-\$34,999 | 447,400 | 11,800 | 2.6 | 12.5 | 79 |
| ANNUAL HOUSEHOLD INCOME--\$35,000-\$49,999 | 549,300 | 24,900 | 4.5 | 26.4 | 136 |
| ANNUAL HOUSEHOLD INCOME--\$50,000-\$74,999 | 713,000 | 29,300 | 4.1 | 31.1 | 124 |
| ANNUAL HOUSEHOLD INCOME--\$35,000 PLUS | 2,038,000 | 71,900 | 3.5 | 76.3 | 106 |
| MTV GENERATION--AGE 18-44/VIEW MTV AND/OR VH-1 | 522,800 | 33,500 | 6.4 | 35.6 | 193 |
| YUPPIES--AGE 21-34/COLLEGE GRAD/TECH-PROF-MGR JOB | 163,900 | 0 | 0.0 | 0.0 | 0 |
| MATURING YUPPIE--25-44/C. GRAD/TECH-PROF-MGR/KIDS | 149,600 | 7,200 | 4.8 | 7.6 | 145 |
| AFFLUENT EMPTY NESTER--\$50K+/NO KIDS HOME/AGE 45+ | 386,700 | 13,200 | 3.4 | 14.0 | 103 |
| AFFLUENT FULL NESTERS--\$75K +/KIDS AT HOME | 400,400 | 9,600 | 2.4 | 10.2 | 72 |
| GRAYING AFFLUENTS--AGE 50+/FAMILY INCOME \$50,000+ | 416,100 | 22,100 | 5.3 | 23.5 | 160 |
| ADULTS--AGE 25-54 | 1,723,300 | 61,600 | 3.6 | 65.4 | 108 |
| OCCUPATION--PROFESSIONAL/TECHNICAL | 393,700 | 18,700 | 4.7 | 19.9 | 143 |
| OCCUPATION--PROPRIETOR/MANAGERIAL | 437,800 | 13,800 | 3.2 | 14.6 | 95 |
| OCCUPATION--CLERICAL/SALES WORKER | 391,600 | 9,200 | 2.3 | 9.8 | 71 |
| OCCUPATION--BLUE COLLAR WORKERS | 532,100 | 20,500 | 3.9 | 21.8 | 116 |
| EDUCATION--SOME HIGH SCHOOL OR LESS | 134,300 | 10,600 | 7.9 | 11.3 | 238 |
| EDUCATION--HIGH SCHOOL GRADUATE | 827,700 | 29,800 | 3.6 | 31.6 | 108 |
| EDUCATION--SOME COLLEGE | 725,400 | 9,400 | 1.3 | 10.0 | 39 |
| EDUCATION--COLLEGE GRADUATE [ONE DEGREE] | 800,600 | 31,600 | 3.9 | 33.5 | 119 |
| EDUCATION--ADVANCED COLLEGE DEGREE | 334,400 | 8,700 | 2.6 | 9.2 | 78 |
| BUSINESS OWNER/PARTNER/CORPORATE OFFICER | 205,800 | 7,400 | 3.6 | 7.9 | 108 |
| INFLUENCE BUSINESS BANKING DECISIONS | 250,800 | 12,700 | 5.1 | 13.5 | 152 |
| TWO INCOME FAMILY | 838,100 | 32,500 | 3.9 | 34.5 | 117 |
| DUAL INCOME FAMILY--NO CHILDREN AT HOME | 346,600 | 23,600 | 6.8 | 25.1 | 205 |
| PRIMARY BUSINESS AIR TRAVELERS | 464,200 | 24,000 | 5.2 | 25.5 | 156 |
| LIVE IN--SNOHOMISH COUNTY--TOTAL | 477,700 | 15,600 | 3.3 | 16.6 | 98 |
| LIVE IN--NORTHWEST METRO AREA OF SNOHOMISH | 109,800 | 5,300 | 4.8 | 5.6 | 145 |
| LIVE IN--NORTH METRO AREA OF SNOHOMISH | 267,900 | 6,000 | 2.2 | 6.4 | 67 |
| LIVE IN--KING COUNTY--TOTAL | 1,410,400 | 43,800 | 3.1 | 46.5 | 94 |
| LIVE IN--NORTH KING COUNTY | 125,300 | 10,800 | 8.6 | 11.5 | 260 |
| LIVE IN--SEATTLE CITY AREA OF KING COUNTY | 357,200 | 0 | 0.0 | 0.0 | 0 |
| LIVE IN--EAST SIDE AREA OF KING COUNTY | 261,200 | 10,500 | 4.0 | 11.1 | 121 |
| LIVE IN--SOUTH KING COUNTY | 285,400 | 2,900 | 1.0 | 3.1 | 31 |

[CABLE = 7-DAY CUME]

MEDIA AUDIENCE ANALYSIS BASED ON 34 RESPONDENTS OUT OF THE
TOTAL SAMPLE OF 1,040 ADULTS AGE 18+

Information is Subject to All Limitations and Restrictions as Stated in the original Survey.
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SEA204



The Media Audit

SEATTLE-TACOMA, WA

June – July, 2004 Survey

THE MEDIA AUDIT is a syndicated, local market, multimedia, qualitative audience survey covering radio, radio dayparts, television channels viewed in total and by dayparts, television newscast viewing, cable TV channel viewing, daily newspapers and other local and regional print publications. Measurement of exposure to other media includes: outdoor billboards, direct mail, and local market internet web sites. Ten different types of local market media are measured. In addition to media exposure information, The Media Audit covers an extensive array of demographic, socioeconomic and consumer shopping information. This consumer information can be used to analyze the quality of each media audience as well as define the composition of each consumer-shopping category covered in the survey.

INTERVIEWING METHODOLOGY: All interviews are conducted by telephone—five days a week, Tuesday through Saturday, during the day and evening. A minimum of six call attempts are made to reach each designated respondent in an effort to include in the survey those people who are frequently away from home.

SAMPLING METHODOLOGY: A random-digit-dialing sample selection process is used to select telephone households to be surveyed. This sample selection methodology insures that all telephone households, both those with listed and those with unlisted phone numbers, have an equal opportunity of being included in the survey sample.

RESPONDENT SELECTION: One person age 18+ in each survey household is selected at random to be interviewed for this study. The adult 18 years or older with the most recent birthday is used to achieve random selection.

SURVEY AREA: Telephone numbers for the Seattle-Tacoma survey area were drawn at random from all existing telephone exchanges in Island, King, Kitsap, Pierce, Snohomish and Thurston counties, Washington.

SAMPLE SIZE: Interviews were completed with 1047 adults age 18 or older for this report.

INTERVIEWING DATES: June 15, 2004 through August 3, 2004.

ACCURACY OF DATA IN REPORT: At a 95% confidence level, percentages based on total respondents in this report have a maximum accuracy range of plus or minus 3 percentage points.

SOFTWARE: THE MEDIA AUDIT data is available in THE MEDIA AUDIT Software and in these third-party programs: Strata, Tapscan, IMS, Telmar, Marketron, and New Age Media Services.

THE MEDIA AUDIT is a syndicated service of International Demographics.

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Appendix VIII- Human Subjects Waiver

Form HS EX- 1 Template (rev 3/02)

UNIVERSITY OF WASHINGTON
Human Subjects Division, Grant and Contract Services

THIS FORM MUST BE TYPED

CERTIFICATION OF EXEMPTION

University procedures provide for departmental review of research involving human subjects exempt under federal, state, and university regulations. The exempt categories and exceptions are described on the back of this form. Exempt research may be approved by the department chair, director, or dean provided it is in accord with the general principles stated in the UW Handbook, Vol. IV, Part II, Ch. 2, Sect. I (see back of form). This form, properly endorsed, certifies that the research described here qualifies for exemption. **This Certification of Exemption must be administratively reviewed and approved by the Human Subjects Division before you begin your research.** A copy of this form should be kept by the PI, and a copy should be forwarded to the Human Subjects Division for review, at Box 351412. If you have questions about whether your research will qualify for Exemption, please call the Human Subjects Division before submitting this form.

You can call the Human Subjects Division at 543-0098 if you have not heard about the results of the review within 7 working days.

PRINCIPAL INVESTIGATOR Daniel J. Dailey ACADEMIC TITLE Professor
 DEPARTMENT/DIVISION Electrical Engineering MAIL STOP 353500 TELEPHONE 3-2493
 PROJECT TITLE Traffic TV
 STARTING DATE 8/15/03 ANTICIPATED TERMINATION 10/31/03 E-MAIL dan@its.washington.edu
 FACULTY SPONSOR (IF PRINCIPAL INVESTIGATOR IS A STUDENT) _____
 GRANT TITLE (IF DIFFERENT FROM PROJECT TITLE) _____
 PRINCIPAL INVESTIGATOR ON GRANT (IF DIFFERENT FROM PI LISTED ABOVE) _____
 FUNDING AGENCY AND APPLICATION DUE DATE (IF APPLICABLE) WSDOT

I. Check category(ies) under which this research qualifies for exemption (see next/back sheet for description of exempt categories):
 1 2 3 4 5 6

II. ABSTRACT: State briefly a) the purpose(s) of the research, b) what subjects will do (if applicable), c) the nature of the data to be obtained, and d) how anonymity or confidentiality will be maintained. Add sheets if necessary.

The traffic TV, channel 76, will have a phone number posted to request watchers to participate in a focus group. Battle Inc will do the focus group.

| | YES | NO |
|---|--------------------------|-------------------------------------|
| III. HUMAN SUBJECTS: Are any subjects under 18 years of age? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are any subjects confined in a correctional or detention facility? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Is pregnancy a prerequisite for serving as a subject? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are fetuses in utero subjects in this research? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are all subjects presumed to be legally competent? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are personal records (medical, academic, etc.) used without written consent? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are data from subjects (responses, information, specimens) directly or indirectly identifiable? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are data damaging to subjects' financial standing, employability or reputation? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Is material obtained at autopsy used in the research? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are facilities, staff, or patients from CHMC involved? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

IV. PRINCIPAL INVESTIGATOR: I certify that the information provided above is correct and that, to the best of my ability to judge, this research qualifies for exemption and will be conducted in accord with the general principles stated in the UW handbook, Vol. IV, Part II, Ch. 2, Sect. 1.

PRINCIPAL INVESTIGATOR'S SIGNATURE *[Signature]* DATE 8/15/03

V. CHAIR, DIRECTOR, OR DEAN: I certify that this research is exempt from federal regulations and that it is in accord with the general principles stated in the UW handbook, Vol. IV, Part II, Ch. 2, Sect. 1.

SIGNATURE *[Signature]* TITLE Chair DATE 8/15/03

* VALID FOR FIVE YEARS AS LONG AS APPROVED PROCEDURES ARE FOLLOWED *