National Capital Region Interoperability Program

Public Safety Wireless Broadband Network User Specification

December 14, 2005

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1 Executive Summary

From natural disasters to terrorism, the demands on public safety professionals continue to expand, and it is imperative that they are provided with the advantages of today's technologies. Among these technologies are video surveillance, digital imaging, automatic vehicle location, and biological/radiological sensors, and their true enabler – a public safety wireless broadband network. Integrating these technologies into a meaningful public safety solution is a force multiplier that can reduce cost and put the right personnel in the right place at the right time, saving lives.

Deployment of public safety wireless broadband networks, and associated technologies such as wireless video and imaging, will improve the public safety profession by increasing effectiveness and efficiency, and, ultimately, in the saving of lives. This document supports the preceding deduction – that a public safety wireless broadband network is necessary. This conclusion is derived from data obtained from the real experts on public safety, the public safety personnel themselves.

There is pent up demand for the networks and associated applications in the eyes of public safety professionals, and the impact of this technology is significant. This technology will result in more effectiveness and efficiency, as well as saved lives. Deputy Chief John Caussin of the Fairfax County Fire & Rescue said it best when he stated:

> *"Any technology that can provide the incident commander and his/her staff with additional information will certainly facilitate more informed risk benefit analysis and decision making. There would be value added regarding the safety of responders and citizens."*

Deputy Chief Caussin's words were echoed in the responses of *all* public safety professionals interviewed and surveyed – the deployment of wireless broadband networks and applications they will support will both save lives and make the responders more efficient. On this point there is no question, but that is only part of the issue at hand. It does not address the demand side. On this point, more than nine out of ten public safety personnel interviewed see the usefulness of such a system and would like to deploy today. In the case of two specific technologies, wireless video and digital imaging, pent up demand is clear. Only one in ten had it, and nine of ten wanted it. The public safety personnel have spoken, and what they have said is that public safety wireless broadband networks and applications they enable are both valuable and necessary.

There are many other questions that must be answered before public safety wireless broadband networks can become a reality. Among those are "How much spectrum is required?", "What spectrum can accommodate these needs?", and "Why can't public safety rely solely on commercial networks to address these needs?" These issues have been discussed elsewhere, and will not be addressed in detail in this document. Suffice it to say that commercial networks do not, by themselves, satisfy public safety's requirements, and an additional 30 MHz of 700 MHz spectrum is necessary for state, local, regional, and federal users.

The conclusions presented in this document are based upon interviews of public safety agencies and experience with running a pilot wireless broadband network within the National Capital Region. In addition, several facilitated scenario workshops were held in order to understand how the network would be used in worst-case situations. Supporting information has also been gathered from government documents and other public safety publications, as noted.

Just as the radio revolutionized the public safety profession starting nearly a half century ago, wireless data networking and data interoperability have the opportunity to revolutionize public safety today. Through this document, public safety personnel have expressed both an interest in deploying the technology and the benefits of doing so.

2 Introduction

The National Capital Region Interoperability Program (NCRIP) is funded through the Department of Homeland Security's Urban Area Security Initiative (UASI) and is managed by the National Capital Region's jurisdictions. The goals of the NCRIP are to develop a regional, interoperable institutional fiber and wireless broadband network (NCRnet) and a Data Exchange Hub (DEH) that organizations across the region can use to share critical information during emergency response operations and in daily interactions between the jurisdictions. In order to achieve these goals, the NCRIP must document how organizations in the region want to access and use the NCRnet and DEH. This includes the information that is exchanged, the applications that are used, the systems that utilize the information and other considerations such as security. The program director for the NCRIP is Robert LeGrande, Deputy Chief Technology Officer of the Government of the District of Columbia. This document was prepared by International Business Machines Corporation as part of the Regional Wireless Broadband Network Application Assessment (RWBN-AA) project.

The intent of this document was stated in the previous section, but centers around the answer to one primary question, "Are public safety wireless broadband networks needed?"

In order to answer this question, information was gathered using several methods. The primary method of information gathering included face-to-face and telephone interviews administered by the RWBN-AA team. These interviews were also bolstered by real world experience in operating a public safety wireless broadband network. Specifically, the RWBN-AA team had extensive dealings with both the operators of a pilot wireless broadband network operated in the District of Columbia, as well as the public safety professionals using it in their day-to-day jobs. In order to understand the most challenging requirements a network would face, information was gleaned through participation in several facilitated scenario workshops. These scenarios, based upon realistic yet fictional emergencies – terrorist attack, hurricane, and a pandemic flu – gathered public safety personnel together in an emergency operations center atmosphere to understand how they interact in an emergency and how technology can facilitate these interactions.

As stated above, interviews with first responders and other public safety personnel were a primary source of information. The agencies represented by the 50 public safety personnel interviewed are listed in Appendix A. The raw results of these interviews are included as Appendix B of this document. They include representatives from the following Emergency Service Functions (ESFs) and jurisdictions shown below in Table 1.

Municipality / Jurisdiction	Type	Police ESF 13	Fire ESF 4	Trans. ESF 1	EMS ESF 4/8	EMA ESF 5	Public Works ESF 3
Alexandria, VA	City	✓	✓		✓		
Arlington County	County	✓	✓		✓	✓	
Fairfax County, VA	County	✓	✓		✓	✓	✓
Fairfax, VA	City		✓	✓	✓	✓	✓
Falls Church, VA	City	✓		✓		✓	✓
Federal Government	Federal	✓					
Frederick County, MD	County			✓		✓	
Greenbelt, MD	City	✓					
Loudoun County, VA	County	✓	✓	✓	✓	✓	✓
Manassas, VA	City	✓	✓		✓	✓	✓
Montgomery County, MD	County	✓	✓	✓	✓		✓
Prince George's County, MD	County	✓	✓		✓		✓
Prince William County, VA	County	✓	✓		✓		
Rockville, MD	City	✓					
Takoma Park, MD	City	✓					
The State of Maryland	State			✓			
Washington, DC	State	✓	✓	✓	✓	✓	

Table 1: ESFs and Jurisdictions Interviewed by the RWBN-AA team

An additional source of information was the facilitated scenario workshops mentioned previously. The RWBN-AA team attended three separate scenario workshops. The first exercise was led by the Emergency Management Agency of Washington, DC, and included representation from most public safety and public heath agencies within the District of Columbia. A complete list of participating agencies can be found in Table C.1, Appendix C. The scenario involved an explosion near George Washington University, which by virtue of its proximity to the U.S. State Department, major bridges, the Metro system, and several hospitals, quickly escalated to an international event with terrorist undertones. The primary objective of the exercise was to demonstrate and test an online emergency operations tool (Web EOC) to the stakeholders in attendance.

The second and third exercises were sponsored by another of the NCRIP projects, the Application Inventory and Gaps Analysis (AIGA), and were held in Fairfax, VA. A complete list of participating agencies can be found in Table C.2 and C.3 in Appendix C. These scenarios included a simulation of two particularly challenging natural disasters – a pandemic flu and a hurricane. In all three workshops, public safety personnel from the region were gathered together and presented events in an ordered manner. As each event occurred, the public safety personnel were asked to list how they would react, what technology they would utilize, and with whom they would communicate. After the exercise was completed, the public safety personnel were asked a number of questions related to how things could be improved and what technology would be of benefit. As a result, a picture of both today's response and tomorrow's technology was gleaned in what are commonly understood as worst-case scenarios, and this picture has been used in preparing this document. A complete list of agencies that participated in the three workshops has been included in Appendix C at the end of this document. Detailed results of the AIGA workshops will be presented in a separate document.

Another source of information used in the preparation of this document was experience gained through the operation of the Wireless Accelerated Responder Network (WARN). This pilot wireless broadband network was deployed by the Office of the Chief Technology Officer of the Government of the District of Columbia in January 2005 and has been in continuous operation since. Users of this network include District of Columbia public safety personnel, as well as select National Capital Region (NCR) and federal

government public safety personnel. Some of the agencies currently using this network are described below in Table 2.

Agency	Agency
Alexandria, VA Police Department	Fairfax County
DC Department of Corrections	NCR Hazardous Material First Responders
DC Department of Youth and Rehabilitative Services	U.S. Department of Homeland Security
DC Emergency Management Agency	U.S. Federal Protective Service
DC Fire and Emergency Medical Service	U.S. Secret Service
DC Human Services Modernization Program	U.S. Park Police
DC Office of the Chief Medical Examiner	Washington Metropolitan Transit Authority
DC Metropolitan Police Department	

Table 2: NCR Agencies Using WARN

Usage of this network has been continuous since its inception and usage statistics of this network have been used in preparing this document. In addition, a number of users of this network were solicited for interviews with the benefit of real-life experience helping to temper what would otherwise be a theoretical network and the applications it could support.

The conclusions in this document are based upon the sources of information described above. It is worth noting that they are somewhat narrow in scope of interest. The next logical step – to understand what the requirements and solutions are for true data interoperability – will be addressed in both future documents prepared by the RWBN-AA team, as well as, several other projects under the NCRIP umbrella.

3 Justification: Are Public Safety Wireless Broadband Networks Needed?

Some threats to public safety are more predictable than others. Hurricanes provide a long lead-time, yet are difficult to predict with any accuracy. Serial snipers come out of the blue and terrorist attacks are virtually impossible to predict. Therefore those who protect the public's safety must go to where the demands of their jobs take them, and their technology tools should follow to provide the maximum benefit. The best way for this to occur would be utilizing ubiquitous, wide-area, wireless broadband networks. These networks would provide access to vital information while reinforcing critical command and control functions. In the remainder of this section, we will use lessons learned by public safety personnel in the NCR to articulate the need for wireless broadband networks.

President George W. Bush, when addressing public safety personnel in Tucson, Arizona on November 28th 2005, said:

> *"[T]echnology can help an individual agent have broader reach and more effectiveness. When agents can take advantage of cutting-edge equipment like overhead surveillance drones and infrared cameras they can do a better job for all of us."*

A wireless broadband network is the critical piece of infrastructure required to support such applications in today's ever-changing world. Documents such as *The 9/11 Commission Report*[1], the *Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission*[2], The Spectrum Coalition for Public Safety's *Public Safety Spectrum: How much do we need for data?*[3], and most recently the NPSTC's comments presented to the FCC on November 18, 2005[4] have made effective arguments in support of public safety wireless broadband networks. Other documents have described why existing solutions, such as those utilizing either commercial wireless broadband network services[5] or 4.9 GHz public safety spectrum[6], do not meet the requirements of public safety. The intent of this section is to show that the first responders and public safety personnel within the National Capital Region agree with President Bush, as well as the affirmative response to the question at hand.

3.1 Interview Summary

The interviews with public safety professionals included a total of 29 questions related to technology currently deployed or on the proverbial wish list. The intent of these questions was to assess the current deployment of technology within the NCR and assess the demand of the same technologies. Interviewees were asked to assess the following technologies:

- Automatic Vehicle Location
- Computer Aided Dispatch
- Digital Imaging
- E-Mail
- Mapping / Geographic Information System
- Remote Database Access

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[1] National Commission on Terrorist Attacks Upon the United States. The 9/11 Commission Report, July 22, 2004.
[2] Public Safety Wireless Advisory Committee. Final Report of the Public Safety Wireless advisory Committee to the Federal Communications Commission. September 11, 1996.
[3] The Spectrum Coalition for Public Safety. Public Safety Spectrum: How Much Do We Need For Data?. October 25, 2005.
[4] Please see: http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518180901
[5] Please see: http://www.spectrumcoalition.dc.gov/img/Spectrum%20Coalition%20Comments%20FCC%2005-80%20final.pdf
[6] Please see: http://www.spectrumcoalition.dc.gov/img/attachment_II.pdf

- Report Management System
- Text Messaging
- Video

These technologies were picked to cover the gamut of technologies in use today which are made more effective by continuous network access in both the office and field work environments. In each case, the interviewee was asked if the technology was used today, if it is used wirelessly today, and if they would like to use it wirelessly in the future. The answers to these questions will be summarized in the following subsection and the detailed responses to all questions are provided for review in Appendix B.

In addition to the technology demand questions described above, each interviewee was asked between two and four questions assessing the impact of specific technologies on their efficiency and ability to save lives. The exact question varied by the interviewee's ESF, but they were either asked how multimedia messaging – to include text, voice, images, and video – or how specific implementations of these technologies – like mug shots available in a squad car, or video cameras mounted in all vehicles and the feed shared amongst officers – would impact their jobs.

3.2 Interview Analysis

In review, two groups of questions were asked and answered with respect to both the demand and impact of deploying a wireless broadband network. In this section, the trends seen in both of these groups of questions will be discussed in detail. Furthermore, the conclusions that can be reached from these trends will be discussed.

Before listing the results, a brief discussion of the form of the results is in order. Please consider Table 3, below.

Application	Question	Yes	No	Total	Yes %	No %
Digital Imaging	Use	29	8	37	78.38%	21.62%
	Use Wirelessly	3	32	35	8.57%	91.43%
	Want Wirelessly	31	2	33	93.94%	6.06%

Table 3: Digital Imaging Deployment and Demand Statistics

The above table is an example summary report for a set of questions related to the use of digital imaging by the public safety personnel. The first two columns describe the questions asked. In this case, the following three:

- "Do the public safety personnel within your agency/jurisdiction use digital imaging today?"
- "Do the public safety personnel within your agency/jurisdiction use digital imaging wirelessly today?"
- "Would it be beneficial for the public safety personnel within your agency to use digital imaging in a mobile environment or when away from the office?"

The next five columns describe the responses, indicating the number of "Yes" and "No" responses, the total number of responses, and the percentage of "Yes" and "No" responses.

Looking at the trends in responses – specifically the percentage of "Yes" and "No" responses – several conclusions can be reached. First, the majority, 78%, said they use digital imaging today. Second, that an even larger percentage, 94%, responded affirmatively that they wanted to use the technology wirelessly, yet only 9% of them have already deployed it. Please note the difference between the last two statistics, in this case 83%, means that over eight of every ten public safety agencies want digital imaging wirelessly

but don't have it. This 83% can be termed the "unsatisfied demand" or "pent up demand" for wireless digital imaging.

Understanding the preceding table is a necessary prerequisite for Table 4, below, which is a summary of all the questions related to the demand side of the interview.

Application	Question	Yes	No	Total	Yes %	No %
Automatic Vehicle Location	Use	16	21	37	43.24%	56.76%
	Use Wirelessly	8	24	32	25.00%	75.00%
	Want Wirelessly	28	5	33	84.85%	15.15%
Computer Aided Dispatch	Use	27	10	37	72.97%	27.03%
	Use Wirelessly	3	21	24	12.50%	87.50%
	Want Wirelessly	12	10	22	54.55%	45.45%
Digital Imaging	Use	29	8	37	78.38%	21.62%
	Use Wirelessly	3	32	35	8.57%	91.43%
	Want Wirelessly	31	2	33	93.94%	6.06%
E-mail	Use	33	4	37	89.19%	10.81%
	Use Wirelessly	20	15	35	57.14%	42.86%
	Want Wirelessly	33	4	37	89.19%	10.81%
Mapping / Geographic Info. System	Use	28	8	36	77.78%	22.22%
	Use Wirelessly	8	19	27	29.63%	70.37%
	Want Wirelessly	30	1	31	96.77%	3.23%
Remote Database Access / Data Entry	Use	22	15	37	59.46%	40.54%
	Use Wirelessly	12	22	34	35.29%	64.71%
	Want Wirelessly	25	6	31	80.65%	19.35%
Report Management System	Use	20	11	31	64.52%	35.48%
	Use Wirelessly	0	26	26	0.00%	100.00%
	Want Wirelessly	17	8	25	68.00%	32.00%
Text Messaging	Use	32	6	38	84.21%	15.79%
	Use Wirelessly	26	11	37	70.27%	29.73%
	Want Wirelessly	32	4	36	88.89%	11.11%
Video	Use	17	20	37	45.95%	54.05%
	Use Wirelessly	4	31	35	11.43%	88.57%
	Want Wirelessly	31	3	34	91.18%	8.82%

Table 4: Technology Deployment and Demand

Using the same logic as was described with the digital imaging example earlier, the following table, Table 5, summarizes the demand and rank of the technologies:

Application	Demand	Rank
Automatic Vehicle Location	67%	3 (tie)
Computer Aided Dispatch	60%	5
Digital Imaging	85%	1
E-mail	32%	8
Mapping / Geographic Information System	67%	3 (tie)
Remote Database Access / Data Entry	45%	6
Report Management System	42%	7
Text Messaging	19%	9
Video	80%	2

Table 5: Technology Demand and Ranking

Inspecting the above table yields the following demand-based conclusions:

The most pent up demand for wireless technology is for Video, Digital Imaging, Wireless Report Management System, Mapping / Geographic Information System, and Automatic Vehicle Location. It is worth noting that numbers one, two, and three on the list are what are considered high-bandwidth multimedia applications, as will be described and quantified in more detail in section 4 of this document. Said a bit differently, the most demand for wirelessly deployed technology is in the very technologies requiring broadband to work effectively.

This need was clearly described by Major Victor Ferreira, Jr. of Price George's County Fire/EMS when asked about wireless deployment of video technology. He stated,

> *"Video can help those at the command center to see something from an angle that the firefighters can't see from the ground. This extra set of eyes could help either deploy people to the right place OR save lives by moving those at risk away from pending danger, such as an HVAC system that is about to fall through a roof which the responders on the ground may not be aware of."*

On the other end of the scale, the **least demand is for the Computer Aided Dispatch, E-mail and Text Messaging**. This makes sense, for each of these technologies is fairly well deployed today. The need has been satisfied. It is not a coincidence these technologies are also on the low end of the bandwidth requirement spectrum as these are the types of applications supported by today's commercial and public safety low speed networks.

In addition to the demand-based questions just described, a number of impact-based questions were asked to ascertain the value received by deploying multimedia applications to the public safety personnel. They are summarized in Table 6, below. The form of this data is similar to the previously described table, so it will be introduced without explanation:

Question	Yes	No	Total	Yes %	No %
(Police) Would the ability to view/share mug shots in the field be useful?	10	0	10	100.00%	0.00%
(Police) Would the ability to view/share in-car video cameras in real-time be useful?	6	1	7	85.71%	14.29%
(EMS) Would the ability to view/share real time video/imaging/text messaging with other EMS personnel or hospitals be useful?	3	1	4	75.00%	25.00%
(EMS) If so, would it save lives or make you more effective or both?	3	0	3	100.00%	0.00%
(EMS) Would the ability to view/share real time video/imaging/text messaging with other non-EMS personnel be useful?	2	1	3	66.67%	33.33%
(EMS) If so, would it save lives or make you more effective or both?	2	0	2	100.00%	0.00%
(EMA) Would the ability to view/share real time video/imaging/text messaging with other EMA personnel be useful?	3	0	3	100.00%	0.00%
(EMA) If so, would it save lives or make you more effective or both?	3	0	3	100.00%	0.00%
(EMA) Would the ability to view/share real time video/imaging/text messaging with other public safety personnel (Fire/Police/EMS) personnel be useful?	3	0	3	100.00%	0.00%
(EMA) If so, would it save lives or make you more effective or both?	3	0	3	100.00%	0.00%
(Transportation) Would the ability to view/share real time video/imaging/text messaging with other transportation personnel be useful?	7	0	7	100.00%	0.00%
(Transportation) If so, would it save lives or make you more effective or both?	6	0	6	100.00%	0.00%
(Transportation) Would the ability to view/share real time video/imaging/text messaging with other public safety personnel be useful?	6	0	6	100.00%	0.00%
(Transportation) If so, would it save lives or make you more effective or both?	6	0	6	100.00%	0.00%

Table 6: Technology Impact Details

The preceding table does not include enough references by ESF for the results to be statistically valuable[7], but when aggregated, as described below, they do show trends worth discussing:

Impact	Yes	No	Total	Yes %	No %
Intra-ESF Useful	29	2	31	93.55%	6.45%
Intra-ESF Impact	12	0	12	100.00%	0.00%
Inter-ESF Useful	11	1	12	91.67%	8.33%
Inter-ESF Impact	11	0	11	100.00%	0.00%

Table 7: Impact Summary

Table 7 groups each of the questions asked in Table 6 into one of four groups listed in the table's rows. The first two rows look at the usefulness and impact of the technology if it were only deployed within a single ESF. An example of this is sending mug shots between police departments. The next two rows look at the usefulness and impact of the technology if it were deployed across multiple ESFs. Using the same example as before, this would be sharing of mug shots between the Police and Fire, EMS, or other public safety personnel.

Again, the results are extremely clear. **More than 90% see a broadband network and the multimedia applications it can provide to be useful in their day-to-day jobs**. According to Moe Wadda of the Falls Church, VA Department of Public Works and Transportation,

> *"We could learn about traffic situations and start to resolve them in real time. We could contact the power company immediately after a signal failure to get it back on line; and we could share data with our bordering cities and counties on traffic situations affecting us or them."*

Even more impressively, **100% of the personnel interviewed who thought the multimedia applications a wireless broadband network enables would be useful also indicated that it would both make their personnel more efficient *and* save lives**. As Eric Fatzinger of the Prince George's County, MD, Police observed,

> *"The network would provide immediate access to important data, such as the sniper incident, and would go a long way to bridge a major communication gap that exists between other Divisions and Agencies. Bridging this gap can save lives and criminals can be brought to justice."*

[7] More data will be gathered from future interviews/surveys in order to make additional conclusions for each of the six ESFs. These results will be published in a future RWBN-AA report.

4 Conclusion

Just as radio technology of a half century ago revolutionized public safety, wireless broadband networking technology of today will transform public safety over the next half century. Not only will it make public safety more effective and efficient, but it will also save lives. As Major Victor Ferreira, Jr. of Prince George's Fire/EMS Department noted**:**

> *"An incident commander makes 90% of a fire assessment within 15 seconds of arriving on the scene. If we can see a fire before we arrive – via helicopter, traffic cameras, civilian picture phones, or the media – then our response time can mean the difference between life and death and can turn a major fire into much shorter event by getting the right people and equipment to the scene sooner."*

In reviewing the material presented in this document, several key conclusions were made:

- Public safety personnel have a large amount of pent up demand for a wireless network and the solutions that are enabled as a result.
- The largest amount of demand is for applications that are not deployable on the networks of today and require a broadband network by their nature.
- The types of applications, wanted the most are wireless implementations of multimedia applications – full-motion video, digital imaging, and mapping / geographic information systems.
- The impact of implementing these technologies will be increased efficiency and saved lives.

Clearly, public safety personnel within the National Capital Region have expressed, overwhelmingly that they need wireless broadband networks to increase efficiency and save lives. Existing networks and solutions will not fulfill the needs of public safety and additional spectrum is necessary. Public safety personnel should not be strapped to a desk to access data that any criminal or terrorist has access to from their pockets. The difference between public safety's ability to function anytime and anywhere is dedicated spectrum and a seamlessly interoperable regional wireless broadband network.

The authors of this document would like to extend special thanks to ALL National Capital Region first responders and public safety personnel for their commitment to the security of our nation's capital and participation in the preparation of this document.

Appendix A: Agencies Represented in Interviews

#	Agency	Date
1	Alexandria Fire	11/18/2005
2	Alexandria Fire/EMS	11/18/2005
3	Alexandria Police	11/3/2005
4	Arlington County EMA	11/10/2005
5	Arlington County Fire/EMS	11/15/2005
6	Arlington County Police	11/11/2005
7	DC Department of Transportation	11/14/2005
8	DC EMA	11/17/2005
9	DC Fire/EMS Department	11/8/2005
10	DC Metropolitan Police Department (MPD)	11/18/2005
11	Fairfax City Fire/EMS/EMA	11/10/2005
12	Fairfax City Transportation / Public Works	11/14/2005
13	Fairfax County EMA	11/15/2005
14	Fairfax County Fire	11/10/2005
15	Fairfax County Fire/EMS	11/16/2005
16	Fairfax County Police	11/17/2005
17	Fairfax County Public Works	11/15/2005
18	Falls Church Police/EMA	11/8/2005
19	Falls Church Transportation / Public Works	11/16/2005
20	Federal Protective Services (FPS)	11/18/2005
21	Frederick County EMA	11/17/2005
22	Frederick County Transportation	11/15/2005
23	Greenbelt Police	11/15/2005
24	Loudoun County EMA	11/1/2005
25	Loudoun County EMS	11/1/2005
26	Loudoun County Fire	11/1/2005
27	Loudoun County IT	11/1/2005
28	Loudoun County Public Works	11/1/2005
29	Loudoun County Sheriff's Office	11/1/2005
30	Loudoun County Transportation	11/1/2005
31	Manassas City EMS	11/9/2005
32	Manassas City Fire	11/8/2005
33	Manassas City Police	11/2/2005
34	Manassas City Police	11/2/2005
35	Manassas City Police / EMA	11/8/2005
36	Manassas City Public Works	11/17/2005
37	Maryland Department of Transportation	11/18/2005
38	Montgomery County Fire/EMS	11/9/2005
39	Montgomery County Police	11/2/2005

Table A.1: Agencies Represented in Interviews

#	Agency	Date
40	Montgomery County Transportation/Public Works	11/14/2005
41	Prince George's County Fire/EMS	11/14/2005
42	Prince George's County Police	11/14/2005
43	Prince George's County Public Works	11/17/2005
44	Prince William County EMS	11/10/2005
45	Prince William County Fire	11/7/2005
46	Prince William County Police	11/18/2005
47	Rockville Police	11/10/2005
48	Takoma Park Police	11/16/2005
49	U.S. Park Police	11/15/2005
50	Washington Metropolitan Area Transit Authority (WMATA)	11/18/2005

Table A.1: Agencies Represented in Interviews (continued)

Appendix B: Raw Interview Data

#	Organization	ESF	Jurisdiction	City / County / State / Federal	Interview Date (All 2005)
1	Alexandria City Fire/EMS	Fire/EMS	Alexandria City, VA	City	11/18
2	Arlington County Fire/EMS	Fire/EMS	Arlington County, VA	County	11/15
3	Arlington County Police	Police	Arlington County, VA	County	11/11
4	Arlington EMA	EMA	Arlington, VA	City	11/10
5	City of Fairfax Fire/EMS	Fire/EMS	Fairfax City, VA	City	11/10
6	City of Manassas EMS	EMS	Manassas City, VA	City	11/9
7	City of Manassas Fire	Fire	Manassas City, VA	City	11/8
8	City of Manassas Police Department	Police	Manassas City, VA	City	11/2
9	City of Manassas Police Department	Police/EMA	Manassas City, VA	City	11/8
10	DC Department of Transportation	Transport	Washington, DC	City	11/10
11	DC EMA	EMA	Washington, DC	City	11/9
12	DC Fire/EMS	Fire/EMS	Washington, DC	City	11/8
13	DC Metropolitan Police Department (MPD)	Police	Washington, DC	City	11/18
14	Fairfax City EMA	EMA	Fairfax City, VA	City	11/10
15	Fairfax County DPW	Public Works	Fairfax County, VA	County	11/15
16	Fairfax County EMA	EMA	Fairfax County, VA	County	11/15
17	Fairfax County Fire/EMS	Fire/EMS	Fairfax County, VA	County	11/10
18	Fairfax County Police	Police	Fairfax County, VA	County	11/17
19	Falls Church, VA DPW&T	PW&T	Falls Church, VA	City	11/16
20	Federal Protective Services (FPS)	Police	Washington, DC	Federal	11/18
21	Frederick County DOT	Transport	Frederick County, MD	County	11/14
22	Frederick County EMA	EMA	Frederick, MD	County	11/17
23	Greenbelt, MD Police	Police	Greenbelt, MD	City	11/15
24	Loudoun Co. EMA	EMA	Loudoun County, VA	County	11/1
25	Loudoun County DOT	Transport	Loudoun County, VA	County	11/1
26	Loudoun County Fire/EMS	Fire/Ems	Loudoun County, VA	County	11/1
27	Loudoun County Public Works	Public Works	Loudoun County, VA	County	11/1
28	Loudoun County Sheriff	Police	Loudoun County, VA	County	11/1
29	Manassas DPW	Public Works	Manassas, VA	City	11/17
30	Maryland DOT	Transport	State of MD	State	11/18
31	Montgomery Co. DOT	Transport	Montgomery Co., MD	County	11/14
32	Montgomery Co. Fire/EMS	Fire/EMS	Montgomery Co., MD	County	11/9
33	Montgomery Co. Police Department	Police	Montgomery Co., MD	County	11/2
34	Prince George's County DPW&T	PW & T	Prince George's Co.,	County	11/18
35	Prince George's County Fire/EMS	Fire/EMS	Prince George's Co.	County	11/14
36	Prince George's County Police	Police	Prince George's Co.	County	11/14
37	Prince William County Fire/EMS	Fire/EMS	Prince William Co.	County	11/7
38	Prince William County Police	Police	Prince William Co.	County	11/18
39	U.S. Park Police	Police	Multiple	Federal	11/15

Table B.1: Raw Interview Data

#	Organization	Automatic Vehicle Location			
		Use	Use Wirelessly	Want Wirelessly	Comments
1	Alexandria City Fire/EMS	Yes	Yes	Yes*	N/A
2	Arlington County Fire/EMS	Yes	Yes	Yes*	N/A
3	Arlington County Police	Yes	Yes	Yes*	N/A
4	Arlington EMA	No	No	Yes	N/A
5	City of Fairfax Fire/EMS	No	N/A	N/A	CAD is capable
6	City of Manassas EMS	No	No	Yes	N/A
7	City of Manassas Fire	No	No	Yes	May join with PWC to get AVL going
8	City of Manassas Police Department	No	No	Yes	N/A
9	City of Manassas Police Department	No	No	Yes	Mixed Emotions
10	DC Department of Transportation	Yes	Yes	Yes*	N/A
11	DC EMA	No	No	No	N/A
12	DC Fire/EMS	Yes	Yes	Yes*	Doesn't work most of the time
13	DC Metropolitan Police Department (MPD)	Yes	Yes	Yes*	Currently upgrading modems….Want Halo effect so CAD can read MDT's location automatically
14	Fairfax City EMA	N/A	N/A	N/A	N/A
15	Fairfax County DPW	No	No	Yes	N/A
16	Fairfax County EMA	Yes	No	No	N/A
17	Fairfax County Fire/EMS	No	No	Yes	Next 3-5 year plan
18	Fairfax County Police	Yes	No	Yes	N/A
19	Falls Church, VA DPW&T	No	No	No	N/A
20	Federal Protective Services (FPS)	Yes	No	Yes	Absolutely!
21	Frederick County DOT	No	No	Yes	To find both vehicles and staff
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police	No	No	Yes	N/A
24	Loudoun Co. EMA	No	No	Yes	County may install soon
25	Loudoun County Department of Transportation	No	No	Yes	N/A
26	Loudoun County Fire/EMS	No	No	Yes	Working on installing it
27	Loudoun County Public Works	No	No	No	N/A
28	Loudoun County Sheriff	No	No	Yes	Working on installing it
29	Manassas DPW	No	No	Yes	N/A
30	Maryland DPT	Yes	Yes	Yes*	Only on transit vehicles, very few within the NCR region
31	Montgomery County DOT	Yes	N/A	N/A	Have AVL on buses only
32	Montgomery County Fire/EMS	Yes	Yes	Yes*	N/A
33	Montgomery County Police Department	Yes	N/A	N/A	N/A
34	Prince George's County DPW&T	Yes	No	No	Only on transit vehicles
35	Prince George's County Fire/EMS	No	No	Yes	New vehicles will have it by Q4 2006
36	Prince George's County Police	No	No	Yes	N/A
37	Prince William County Fire/EMS	Yes	N/A	N/A	N/A
38	Prince William County Police	Yes	No	Yes	N/A
39	U.S. Park Police	No	N/A	Yes	Tested in July w/ Nextel GPS

Table B.1: Raw Interview Data (continued)

#	Organization	Computer Aided Dispatch			
		Use	Use Wirelessly	Want Wirelessly	Comments
1	Alexandria City Fire/EMS	Yes	Yes	Yes*	N/A
2	Arlington County Fire/EMS	Yes	N/A	N/A	N/A
3	Arlington County Police	Yes	No	Yes	N/A
4	Arlington EMA	Yes	No	Yes	N/A
5	City of Fairfax Fire/EMS	Yes	N/A	N/A	Allows MDC's to message each other
6	City of Manassas EMS	Yes	No	N/A	N/A
7	City of Manassas Fire	Yes	N/A	N/A	Dispatch uses it
8	City of Manassas Police Department	Yes	N/A	N/A	N/A
9	City of Manassas Police Department	Yes	N/A	N/A	N/A
10	DC Department of Transportation	NO	No	No	N/A
11	DC EMA	Yes	Yes	Yes*	N/A
12	DC Fire/EMS	Yes	N/A	N/A	N/A
13	DC Metropolitan Police Department (MPD)	Yes	Yes	Yes*	N/A
14	Fairfax City EMA	N/A	N/A	N/A	N/A
15	Fairfax County DPW	No	No	No	N/A
16	Fairfax County EMA	Yes	No	No	N/A
17	Fairfax County Fire/EMS	Yes	N/A	N/A	N/A
18	Fairfax County Police	Yes	No	Yes	N/A
19	Falls Church, VA DPW&T	No	No	No	N/A
20	Federal Protective Services (FPS)	Yes	No	Yes	N/A
21	Frederick County DOT	No	No	Yes	N/A
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police	No	No	Yes	N/A
24	Loudoun Co. EMA	No	No	No	N/A
25	Loudoun County Department of Transportation	No	No	No	N/A
26	Loudoun County Fire/EMS	Yes	N/A	N/A	N/A
27	Loudoun County Public Works	No	No	No	N/A
28	Loudoun County Sheriff	Yes	N/A	N/A	N/A
29	Manassas DPW	No	No	No	N/A
30	Maryland Department of Transportation	Yes	No	No	N/A
31	Montgomery County Department of Transportation	Yes	No	N/A	N/A
32	Montgomery County Fire/EMS	Yes	N/A	N/A	Accessible in field
33	Montgomery County Police Department	Yes	N/A	N/A	N/A
34	Prince George's County DPW&T	Yes	No	No	Only for transit vehicles
35	Prince George's County Fire/EMS	Yes	N/A	N/A	N/A
36	Prince George's County Police	Yes	No	Yes	N/A
37	Prince William County Fire/EMS	Yes	N/A	N/A	N/A
38	Prince William County Police	Yes	No	Yes	Already have wireless CAD
39	U.S. Park Police	No	No	Yes	N/A

Table B.1: Raw Interview Data (continued)

#	Organization	Digital Imaging			
		Use	Use Wirelessly	Want Wirelessly	Comments
1	Alexandria City Fire/EMS	Yes	No	Yes	Slight Benefit to use wirelessly
2	Arlington County Fire/EMS	No	No	Yes	Bomb unit can transmit digital photos (xray) wirelessly
3	Arlington County Police	Yes	Yes	Yes	N/A
4	Arlington EMA	Yes	No	Yes	N/A
5	City of Fairfax Fire/EMS	Yes	No	Yes	Have them onboard all vehicles. Used for doctors at hospitals. Wireless function would allow someone else to take pic after patient leaves scene on ambulance
6	City of Manassas EMS	No	No	N/A	N/A
7	City of Manassas Fire	Yes	No	Yes	Rescue Squad has camera
8	City of Manassas Police Department	Yes	No	Yes	N/A
9	City of Manassas Police Department	Yes	No	Yes	N/A
10	DC Department of Transportation	Yes	Yes	Yes	N/A
11	DC EMA	N/A	N/A	N/A	Pull video from sources such as police, fire
12	DC Fire/EMS	Yes	No	N/A	Battalion Chiefs have cameras – limited use
13	DC Metropolitan Police Department (MPD)	Yes	No	Yes	Forensics probably use them
14	Fairfax City EMA	No	No	N/A	N/A
15	Fairfax County DPW	No	No	Yes	N/A
16	Fairfax County EMA	Yes	Yes	Yes	N/A
17	Fairfax County Fire/EMS	Yes	N/A	N/A	not sure if they want it wireless
18	Fairfax County Police	Yes	No	Yes	N/A
19	Falls Church, VA DPW&T	No	No	Yes	N/A
20	Federal Protective Services (FPS)	Yes	No	Yes	N/A
21	Frederick County DOT	Yes	No	Yes	Documentation of signs, guard rails, road width
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police	Yes	No	Yes	N/A
24	Loudoun Co. EMA	Yes	No	Yes	Use to assess damage
25	Loudoun County DOT	Yes	N/A	Yes	For accidents
26	Loudoun County Fire/EMS	Yes	No	Yes	N/A
27	Loudoun County Public Works	No	No	No	N/A
28	Loudoun County Sheriff	Yes	No	Yes	Most have digital cameras manually uploaded from station
29	Manassas DPW	Yes	No	Yes	N/A
30	Maryland DOT	Yes	No	Yes	Maintenance crews have digital cameras for construction sites, accident scenes, etc.
31	Montgomery County DOT	Yes	No	Yes	N/A
32	Montgomery County Fire/EMS	Yes	No	Yes	Really want this. Used for everything now
33	Montgomery County Police Department	Yes	No	Yes	Have 400 Cameras
34	Prince George's County DPW&T	Yes	No	Yes	N/A
35	Prince George's County Fire/EMS	Yes	No	Yes	JPEG format
36	Prince George's County Police	No	No	Yes	Would like for field stops to verify name/photo as many perps. give false names. They could cross check names with faces in real time.
37	Prince William County Fire/EMS	Yes	No	Yes	N/A
38	Prince William County Police	No	No	Yes	N/A
39	U.S. Park Police	Yes	No	No	11 cars have them. Issued Pocket PC's with cameras on the back. For evidence, they must have disc and could not send wirelessly

Table B.1: Raw Interview Data (continued)

#	Organization	E-Mail			
		Use	Use Wirelessly	Want Wirelessly	Comments
1	Alexandria City Fire/EMS	Yes	Yes	Yes*	Use Blackberries
2	Arlington County Fire/EMS	Yes	Yes	Yes*	Use Blackberries, not on MDC's because of encryption
3	Arlington County Police	No	No	Yes	N/A
4	Arlington EMA	Yes	No	Yes	now via blackberry
5	City of Fairfax Fire/EMS	Yes	Yes	Yes*	Having the capability to use would be nice, but they wouldn't use it operationally
6	City of Manassas EMS	Yes	No	Yes	N/A
7	City of Manassas Fire	Yes	No	Yes	N/A
8	City of Manassas Police Department	Yes	Yes	No	Many don't want it. Not necessary
9	City of Manassas Police Department	Yes	Yes	Yes	Want for everyone
10	DC Department of Transportation	No	No	No	N/A
11	DC EMA	Yes	Yes	Yes	N/A
12	DC Fire/EMS	Yes	Yes	Yes*	Wireless use is limited
13	DC Metropolitan Police Department (MPD)	Yes	Yes	Yes*	Some have laptops, blackberries
14	Fairfax City EMA	N/A	N/A	N/A	N/A
15	Fairfax County DPW	Yes	No	Yes	N/A
16	Fairfax County EMA	Yes	Yes	Yes	N/A
17	Fairfax County Fire/EMS	Yes	Yes	Yes*	All units have MDT's
18	Fairfax County Police	No	No	Yes	N/A
19	Falls Church, VA DPW&T	Yes	No	No	N/A
20	Federal Protective Services (FPS)	yes	Yes	Yes*	Use Blackberries
21	Frederick County DOT	Yes	Yes	Yes	N/A
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police	Yes	No	Yes	Implementing EVDO now
24	Loudoun Co. EMA	Yes	No	Yes	Can't afford wireless
25	Loudoun County DOT	Yes	N/A	Yes	N/A
26	Loudoun County Fire/EMS	Yes	Yes	Yes*	Would deploy if others paid and others worried about maintenance
27	Loudoun County Public Works	Yes	N/A	Yes	N/A
28	Loudoun County Sheriff	Yes	Yes	Yes*	N/A
29	Manassas DPW	Yes	No	No	N/A
30	Maryland DOT	Yes	No	Yes	Via Nextel now and some MDTs for mobile assistance drivers on the highways
31	Montgomery County DOT	Yes	No	Yes	Would be very useful!
32	Montgomery County Fire/EMS	Yes	Yes	Yes*	Use blackberries - No return on investment for MDC's
33	Montgomery County Police Department	Yes	Yes	Yes*	N/A
34	Prince George's County DPW&T	Yes	Yes	Yes	via 12 Blackberries
35	Prince George's County Fire/EMS	Yes	Yes	Yes*	Management has blackberries or EVDO
36	Prince George's County Police	Yes	No	Yes	N/A
37	Prince William County Fire/EMS	Yes	Yes	Yes*	N/A
38	Prince William County Police	No	No	Yes	N/A
39	U.S. Park Police	Yes	Yes	Yes*	Use Blackberries - Not all offices are on e-mail yet

Table B.1: Raw Interview Data (continued)

#	Organization	Mapping / Global Information System			
		Use	Use Wirelessly	Want Wirelessly	Comments
1	Alexandria City Fire/EMS	Yes	Yes	N/A	N/A
2	Arlington County Fire/EMS	Yes	Yes	Yes*	Use Maverick Mapping on all MDC's
3	Arlington County Police	No	No	Yes	N/A
4	Arlington EMA	Yes	Yes	Yes	N/A
5	City of Fairfax Fire/EMS	Yes	N/A	Yes	Want to replace 3 ring binders with live data
6	City of Manassas EMS	Yes	No	Yes	City uses mapping, not accessible by public safety personnel though
7	City of Manassas Fire	No	No	Yes	N/A
8	City of Manassas Police Department	Yes	No	Yes	Used only for crime analysis. Want in cars
9	City of Manassas Police Department	Yes	N/A	N/A	N/A
10	DC Department of Transportation	No	Yes	Yes	N/A
11	DC EMA	Yes	Yes	Yes	N/A
12	DC Fire/EMS	Yes	No	Yes	Dispatch uses Mapping/GIS. Data is printed out at station
13	DC Metropolitan Police Department (MPD)	Yes	N/A	Yes	N/A
14	Fairfax City EMA	N/A	N/A	N/A	N/A
15	Fairfax County DPW	Yes	No	Yes	N/A
16	Fairfax County EMA	Yes	Yes	Yes	N/A
17	Fairfax County Fire/EMS	Yes	N/A	N/A	N/A
18	Fairfax County Police	Yes	No	Yes	N/A
19	Falls Church, VA DPW&T	Yes	No	Yes	N/A
20	Federal Protective Services (FPS)	No	No	Yes	Working with GSA to get this working
21	Frederick County DOT	Yes	No	Yes	N/A
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police	No	No	Yes	N/A
24	Loudoun Co. EMA	Yes	No	Yes	Have mapping, no GIS, would use wireless if it were secure.
25	Loudoun County DOT	No	No	Yes	N/A
26	Loudoun County Fire/EMS	Yes	No	N/A	N/A
27	Loudoun County Public Works	Yes	N/A	No	Use GIS
28	Loudoun County Sheriff	N/A	N/A	N/A	N/A
29	Manassas DPW	No	No	Yes	N/A
30	Maryland DOT	Yes	No	Yes	N/A
31	Montgomery County DOT	Yes	N/A	Yes	N/A
32	Montgomery County Fire/EMS	Yes	Yes	Yes*	N/A
33	Montgomery County Police Department	Yes	N/A	N/A	N/A
34	Prince George's County DPW&T	Yes	No	Yes	N/A
35	Prince George's County Fire/EMS	Yes	N/A	Yes	IT people use it, that's about it
36	Prince George's County Police	Yes	Yes	Yes	N/A
37	Prince William County Fire/EMS	Yes	N/A	Yes	Feature coming soon
38	Prince William County Police	Yes	No	Yes	N/A
39	U.S. Park Police	No	No	Yes	Current PC's couldn't handle – files too large. Few people are trained to operate software

Table B.1: Raw Interview Data (continued)

#	Organizations	Remote Database Access / Remote Data Entry			
		Use	Use Wirelessly	Want Wirelessly	Comments
1	Alexandria City Fire/EMS	Yes	Yes	Yes*	N/A
2	Arlington County Fire/EMS	Yes	Yes	Yes*	Through EVDO
3	Arlington County Police	Yes	No	Yes	N/A
4	Arlington EMA	No	No	Yes	N/A
5	City of Fairfax Fire/EMS	No	No	Yes	Need it badly
6	City of Manassas EMS	Yes	No	N/A	N/A
7	City of Manassas Fire	Yes	No	No	Might want Palms
8	City of Manassas Police Dept.	Yes	Yes	No	Don't really use it
9	City of Manassas Police Dept.	Yes	Yes	Yes*	N/A
10	DC Department of Transportation	N/A	Yes	Yes*	Yes
11	DC EMA	Yes	Yes	Yes*	N/A
12	DC Fire/EMS	No	No	N/A	N/A
13	DC Metropolitan Police Department (MPD)	Yes	Yes	Yes	N/A
14	Fairfax City EMA	No	No	N/A	N/A
15	Fairfax County DPW	No	No	No	N/A
16	Fairfax County EMA	Yes	Yes	Yes*	N/A
17	Fairfax County Fire/EMS	Yes	N/A	N/A	Not sure
18	Fairfax County Police	Yes	No	Yes	N/A
19	Falls Church, VA DPW&T	No	No	Yes	N/A
20	Federal Protective Services (FPS)	No	No	Yes	N/A
21	Frederick County DOT	No	No	Yes	N/A
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police	No	No	Yes	N/A
24	Loudoun Co. EMA	No	No	No	N/A
25	Loudoun County DOT	No	No	No	N/A
26	Loudoun County Fire/EMS	No	No	N/A	Few would use it
27	Loudoun County Public Works	Yes	N/A	No	Palm work orders would be nice
28	Loudoun County Sheriff	Yes	N/A	N/A	N/A
29	Manassas DPW	Yes	No	Yes	N/A
30	Maryland DOT	No	No	Yes	N/A
31	Montgomery County DOT	Yes	No	Yes	App is internet based
32	Montgomery County Fire/EMS	Yes	Yes	Yes*	Use into CAD system. If they had the bandwidth, they would use it
33	Montgomery County Police Department.	Yes	Yes	Yes*	Can enter data, send it back
34	Prince George's County DPW&T	No	No	Yes	N/A
35	Prince George's County Fire/EMS	Yes	Yes	Yes*	N/A
36	Prince George's County Police	Yes	No	Yes	N/A
37	Prince William County Fire/EMS	Yes	N/A	N/A	VPN into county system through Nortel
38	Prince William County Police	No	Yes	Yes*	Would like to have it but there are 'serious security issues'
39	U.S. Park Police	Yes	No	Yes	Wireless might not be allowed

Table B.1: Raw Interview Data (continued)

#	Organization	Report Management System			
		Use	Use Wirelessly	Want Wirelessly	Comments
1	Alexandria City Fire/EMS	Yes	No	Yes	Will have wireless function working by 5/06
2	Arlington County Fire/EMS	Yes	N/A	N/A	N/A
3	Arlington County Police	No	No	Yes	N/A
4	Arlington EMA	Yes	No	Yes	N/A
5	City of Fairfax Fire/EMS	No	No	Yes	Absolutely need
6	City of Manassas EMS	Yes	No	Yes	N/A
7	City of Manassas Fire	Yes	No	Yes	N/A
8	City of Manassas Police Department	Yes	No	N/A	MDT's can create reports but not do lookups
9	City of Manassas Police Department	Yes	No	Yes	N/A
10	DC Department of Transportation	NO	No	Yes	N/A
11	DC EMA	N/A	N/A	N/A	N/A
12	DC Fire/EMS	Yes	No	No	N/A
13	DC Metropolitan Police Department (MPD)	N/A	N/A	N/A	Not sure about this
14	Fairfax City EMA	N/A	N/A	N/A	N/A
15	Fairfax County DPW	Yes	No	No	N/A
16	Fairfax County EMA	Yes	No	No	N/A
17	Fairfax County Fire/EMS	Yes	N/A	N/A	N/A
18	Fairfax County Police	Yes	No	Yes	N/A
19	Falls Church, VA DPW&T	No	No	No	N/A
20	Federal Protective Services (FPS)	Yes	No	Yes	Web based, so wireless would be great!
21	Frederick County DOT	No	No	Yes	N/A
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police	No	No	Yes	N/A
24	Loudoun Co. EMA	Yes	No	Yes	N/A
25	Loudoun County DOT	No	No	No	N/A
26	Loudoun County Fire/EMS	N/A	N/A	N/A	N/A
27	Loudoun County Public Works	Yes	N/A	No	N/A
28	Loudoun County Sheriff	N/A	N/A	N/A	N/A
29	Manassas DPW	No	No	No	N/A
30	Maryland DOT	Yes	No	No	N/A
31	Montgomery County DOT	No	No	N/A	Use hard copy forms
32	Montgomery County Fire/EMS	N/A	N/A	N/A	Want tablets for EMS w/ network (Sprint). Having issues with software working on network. Have 90 Hammerhead Tablet PC that will be distributed soon.
33	Montgomery County Police Department	Yes	N/A	N/A	N/A
34	Prince George's County DPW&T	No	No	Yes	N/A
35	Prince George's County Fire/EMS	N/A	N/A	N/A	N/A
36	Prince George's County Police	Yes	No	Yes	N/A
37	Prince William County Fire/EMS	Yes	N/A	N/A	N/A
38	Prince William County Police	Yes	No	Yes	N/A
39	U.S. Park Police	No	No	Yes	Currently working on getting this technology

Table B.1: Raw Interview Data (continued)

#	Organization	Text Messaging			
		Use	Use Wirelessly	Want Wirelessly	Comments
1	Alexandria City Fire/EMS	Yes	Yes	Yes	N/A
2	Arlington County Fire/EMS	Yes	Yes	Yes	Use on MDCs and phones. Direct Connect
3	Arlington County Police	Yes	Yes	Yes	N/A
4	Arlington EMA	Yes	Yes	Yes	N/A
5	City of Fairfax Fire/EMS	No	No	Yes	Use personal cell phones
6	City of Manassas EMS	Yes	Yes	Yes	Alphanumeric Pagers
7	City of Manassas Fire	No	No	Yes	Useful if radio doesn't work
8	City of Manassas Police Department	Yes	Yes	Yes	N/A
9	City of Manassas Police Department	Yes	Yes	Yes	Blackberries
10	DC Department of Transportation	Yes	Yes	Yes	N/A
11	DC EMA	Yes	Yes	Yes	N/A
12	DC Fire/EMS	Yes	Yes	Yes	Use is limited
13	DC Metropolitan Police Department (MPD)	Yes	Yes	Yes	Trying to get CAPWIN working
14	Fairfax City EMA	No	No	N/A	N/A
15	Fairfax County DPW	Yes	Yes	Yes	At director level - approximately 25 users
16	Fairfax County EMA	Yes	Yes	Yes	N/A
17	Fairfax County Fire/EMS	Yes	Yes	Yes	Blackberries
18	Fairfax County Police	Yes	No	Yes	N/A
19	Falls Church, VA DPW&T	Yes	Yes	Yes	N/A
20	Federal Protective Services (FPS)	Yes	Yes	Yes	Usually over blackberry
21	Frederick County DOT	Yes	no	Yes	N/A
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police	Yes	Yes	Yes	Senior staff I Ms on Nextel
24	Loudoun Co. EMA	Yes	No	Yes	N/A
25	Loudoun County DOT	No	No	No	Gets in the way
26	Loudoun County Fire/EMS	Yes	No	No	N/A
27	Loudoun County Public Works	No	No	No	N/A
28	Loudoun County Sheriff	Yes	Yes	Yes	Have it on MDC's
29	Manassas DPW	Yes	Yes	Yes	N/A
30	Maryland DOT	Yes	Yes	Yes	Via Nextel and Arch pagers
31	Montgomery County DOT	Yes	Yes	Yes	Use Blackberries (management only)
32	Montgomery County Fire/EMS	Yes	Yes	Yes	Can message between MDC's
33	Montgomery County Police Department	Yes	N/A	N/A	N/A
34	Prince George's County DPW&T	Yes	No	No	Via Nextels
35	Prince George's County Fire/EMS	No	No	Yes	N/A
36	Prince George's County Police	Yes	Yes	Yes	N/A
37	Prince William County Fire/EMS	Yes	Yes	Yes	MDT works with CAD
38	Prince William County Police	Yes	Yes	Yes	N/A
39	U.S. Park Police	Yes	Yes	Yes	Use Capwin

Table B.1: Raw Interview Data (continued)

#	Organization	Video			
		Use	Use Wirelessly	Want Wirelessly	Comments
1	Alexandria City Fire/EMS	No	No	Yes	N/A
2	Arlington County Fire/EMS	Yes	Yes	Yes	2.4 GHz imager into command unit
3	Arlington County Police	No	No	Yes	N/A
4	Arlington EMA	Yes	No	Yes	N/A
5	City of Fairfax Fire/EMS	No	No	Yes	Want Videoconferencing
6	City of Manassas EMS	Yes	N/A	N/A	Cmd. Unit has camera
7	City of Manassas Fire	No	No	No	N/A
8	City of Manassas Police Department	Yes	No	Yes	In car video Goes to VHS
9	City of Manassas Police Department	Yes	No	Yes	N/A
10	DC Department of Transportation	No	No	Yes	N/A
11	DC EMA	Yes	Yes	Yes	Via WARN
12	DC Fire/EMS	No	No	Yes	Use Thermal Cameras
13	DC Metropolitan Police Department (MPD)	Yes	No	Yes	Some patrols have video cameras, Command bus has them
14	Fairfax City EMA	No	No	N/A	N/A
15	Fairfax County DPW	Yes	No	Yes	Now for sewer line inspections
16	Fairfax County EMA	No	No	Yes	Planning to use in near future
17	Fairfax County Fire/EMS	N/A	N/A	N/A	Not sure if they have it
18	Fairfax County Police	Yes	No	Yes	N/A
19	Falls Church, VA DPW&T	No	No	Yes	N/A
20	Federal Protective Services (FPS)	Yes	No	Yes	Had wireless capability until they went to DHS
21	Frederick County DOT	No	No	Yes	N/A
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police	No	No	Yes	N/A
24	Loudoun Co. EMA	Yes	Yes	Yes	Have video conferencing, want to use wirelessly on command bus
25	Loudoun County DOT	No	No	No	Sewer Cameras. They believe there is no need for wireless video for their application.
26	Loudoun County Fire/EMS	No	No	Yes	Yes for fire, not EMS
27	Loudoun County Public Works	Yes	N/A	N/A	N/A
28	Loudoun County Sheriff	No	No	Yes	Currently testing. Want video in all cars
29	Manassas DPW	Yes	No	Yes	N/A
30	Maryland DOT	Yes	No	Yes	Fixed highway cameras are probably all they need
31	Montgomery County DOT	Yes	No	Yes	Cameras on buses + 160 traffic cameras
32	Montgomery County Fire/EMS	No	No	Yes	No value - too much bandwidth. MCD's can display live thermal video, but they don't use that feature
33	Montgomery County Police Department	No	No	Yes	Union won't let them, but they want it
34	Prince George's County DPW&T	No	No	Yes	N/A
35	Prince George's County Fire/EMS	No	No	Yes	Have DriveCam on most vehicles to record accidents
36	Prince George's County Police	Yes	No	Yes	Now use VHS. Would like to record traffic stops
37	Prince William County Fire/EMS	No	No	Yes	Don't have enough bandwidth
38	Prince William County Police	No	No	No	N/A
39	U.S. Park Police	Yes	Yes	Yes	2 Digital Hi-8, Helicopter to Mobile Command

Table B.1: Raw Interview Data (continued)

#	Organization	Other Comments
1	Alexandria City Fire/EMS	N/A
2	Arlington County Fire/EMS	They will be buying 7.1 Motorola System
3	Arlington County Police	N/A
4	Arlington EMA	N/A
5	City of Fairfax Fire/EMS	Each unit has a Nextel to talk. They want a hotspot to push out updates to MDC's.
6	City of Manassas EMS	Had MDT's 9 years ago, but they were taken away. They want them back, but they don't have a lot of use for technology
7	City of Manassas Fire	N/A
8	City of Manassas Police Department	N/A
9	City of Manassas Police Department	N/A
10	DC Department of Transportation	N/A
11	DC EMA	N/A
12	DC Fire/EMS	N/A
13	DC Metropolitan Police Department (MPD)	N/A
14	Fairfax City EMA	N/A
15	Fairfax County DPW	N/A
16	Fairfax County EMA	N/A
17	Fairfax County Fire/EMS	They will be going to tablet PC's for EMS in the next year or so
18	Fairfax County Police	N/A
19	Falls Church, VA DPW&T	N/A
20	Federal Protective Services (FPS)	N/A
21	Frederick County DOT	N/A
22	Frederick County EMA	N/A
23	Greenbelt, MD Police	N/A
24	Loudoun Co. EMA	N/A
25	Loudoun County DOT	N/A
26	Loudoun County Fire/EMS	N/A
27	Loudoun County Public Works	N/A
28	Loudoun County Sheriff	N/A
29	Manassas DPW	N/A
30	Maryland DOT	N/A
31	Montgomery County DOT	N/A
32	Montgomery County Fire/EMS	N/A
33	Montgomery County Police Department	Have 55 blackberries
34	Prince George's County DPW&T	N/A
35	Prince George's County Fire/EMS	Stations have digital display to show address and call type
36	Prince George's County Police	N/A
37	Prince William County Fire/EMS	MDT's are wireless in all vehicles
38	Prince William County Police	N/A
39	U.S. Park Police	N/A

Table B.1: Raw Interview Data (continued)

#	Organization	Police	
		Would the ability to view/share mug shots in the field be useful?	Would the ability to view/share in-car video cameras in real-time be useful?
1	Alexandria City Fire/EMS		
2	Arlington County Fire/EMS		
3	Arlington County Police	Yes	Yes
4	Arlington, VA EMA		
5	City of Fairfax Fire/EMS		
6	City of Manassas EMS		
7	City of Manassas Fire		
8	City of Manassas Police Department	Yes	N/A
9	City of Manassas Police Department	Yes	N/A
10	DC Department of Transportation		
11	DC EMA		
12	DC Fire/EMS		
13	DC Metropolitan Police Department (MPD)	Yes	Yes
14	Fairfax City EMA		
15	Fairfax County DPW		
16	Fairfax County EMA		
17	Fairfax County Fire/EMS		
18	Fairfax County Police	Yes	Yes
19	Falls Church, VA DPW&T		
20	Federal Protective Services (FPS)	Yes	No
21	Frederick County DOT		
22	Frederick County EMA		
23	Greenbelt, MD Police	Yes	Yes
24	Loudoun Co. EMA		
25	Loudoun County DOT		
26	Loudoun County Fire/EMS		
27	Loudoun County Public Works		
28	Loudoun County Sheriff	N/A	N/A
29	Manassas DPW		
30	MDOT		
31	Montgomery County Department of Transportation		
32	Montgomery County Fire/EMS		
33	Montgomery County Police Department	Yes	N/A
34	Prince George's County DPW&T		
35	Prince Georges County Fire/EMS		
36	Prince George's County Police	Yes	Yes
37	Prince William County Fire/EMS		
38	Prince William County Police	Yes	Yes
39	United States Park Police	N/A	N/A

Table B.1: Raw Interview Data (continued)

#	Organization	Emergency Medical Services (EMS)			
		Would the ability to view/share real time video or imaging or text messaging with other EMS personnel or hospitals be useful?	If so, would it save lives or make you more effective or both?	Would the ability to view/share real time video or imaging or text messaging with other non-EMS personnel (Fire or Police) be useful?	If so, would it save lives or make you more effective or both?
1	Alexandria City Fire/EMS	Yes	Both	Yes	Both
2	Arlington County Fire/EMS	N/A	N/A	N/A	N/A
3	Arlington County Police				
4	Arlington, VA EMA				
5	City of Fairfax Fire/EMS	N/A	N/A	N/A	N/A
6	City of Manassas EMS	No	N/A	No	N/A
7	City of Manassas Fire				
8	City of Manassas Police Department				
9	City of Manassas Police Department				
10	DC Department of Transportation				
11	DC EMA				
12	DC Fire/EMS	N/A	N/A	N/A	N/A
13	DC Metropolitan Police Department (MPD)				
14	Fairfax City EMA				
15	Fairfax County DPW				
16	Fairfax County EMA				
17	Fairfax County Fire/EMS	N/A	N/A	N/A	N/A
18	Fairfax County Police				
19	Falls Church, VA DPW&T				
20	Federal Protective Services (FPS)				
21	Frederick County DOT				
22	Frederick County EMA				
23	Greenbelt, MD Police				
24	Loudoun Co. EMA				
25	Loudoun County Department of Transportation				
26	Loudoun County Fire/EMS	Yes	Both	N/A	N/A
27	Loudoun County Public Works				
28	Loudoun County Sheriff				
29	Manassas DPW				
30	MDOT				
31	Montgomery County DOT				
32	Montgomery County Fire/EMS	N/A	N/A	N/A	N/A
33	Montgomery County Police Dept.	N/A	N/A	N/A	N/A
34	Prince George's County DPW&T				
35	Prince Georges County Fire/EMS	Yes	Both	Yes	Both
36	Prince George's County Police				
37	Prince William County Fire/EMS	N/A	N/A	N/A	N/A
38	Prince William County Police				
39	United States Park Police				

Table B.1: Raw Interview Data (continued)

#	Organization	Emergency Management Agency (EMA)			
		Would the ability to view/share real time video/imaging/text messaging with other EMA personnel be useful?	If so, would it save lives or make you more effective or both?	Would the ability to view/share real time video/imaging/text messaging with other first responders (Fire/Police/EMS) personnel be useful?	If so, would it save lives or make you more effective or both?
1	Alexandria City Fire/EMS				
2	Arlington County Fire/EMS				
3	Arlington County Police				
4	Arlington, VA EMA	Yes	Both	Yes	Both
5	City of Fairfax Fire/EMS				
6	City of Manassas EMS				
7	City of Manassas Fire				
8	City of Manassas Police Department				
9	City of Manassas Police Department	N/A	N/A	N/A	N/A
10	DC Department of Transportation				
11	DC EMA	Yes	Both	Yes	Both
12	DC Fire/EMS				
13	DC Metropolitan Police Department (MPD)				
14	Fairfax City EMA	N/A	N/A	N/A	N/A
15	Fairfax County DPW				
16	Fairfax County EMA	Yes	Both	Yes	Both
17	Fairfax County Fire/EMS				
18	Fairfax County Police				
19	Falls Church, VA DPW&T				
20	Federal Protective Services (FPS)				
21	Frederick County DOT				
22	Frederick County EMA	N/A	N/A	N/A	N/A
23	Greenbelt, MD Police				
24	Loudoun Co. EMA	N/A	N/A	N/A	N/A
25	Loudoun County DOT				
26	Loudoun County Fire/EMS				
27	Loudoun County Public Works				
28	Loudoun County Sheriff				
29	Manassas DPW				
30	MDOT				
31	Montgomery County DOT				
32	Montgomery County Fire/EMS				
33	Montgomery County Police Department				
34	Prince George's County DPW&T				
35	Prince Georges County Fire/EMS				
36	Prince George's County Police				
37	Prince William County Fire/EMS				
38	Prince William County Police				
39	United States Park Police				

Table B.1: Raw Interview Data (continued)

#	Organization	Transportation			
		Would the ability to view/share real time video/imaging/text messaging with other transportation personnel be useful?	If so, would it save lives or make you more effective or both?	Would the ability to view/share real time video/imaging/text messaging with other first responders (Fire/Police/EMS) be useful?	If so, would it save lives or make you more effective or both?
1	Alexandria City Fire/EMS				
2	Arlington County Fire/EMS				
3	Arlington County Police				
4	Arlington, VA EMA				
5	City of Fairfax Fire/EMS				
6	City of Manassas EMS				
7	City of Manassas Fire				
8	City of Manassas Police Department				
9	City of Manassas Police Department				
10	DC Department of Transportation	Yes	Both	Yes	Both
11	DC EMA				
12	DC Fire/EMS				
13	DC Metropolitan Police Department (MPD)				
14	Fairfax City EMA				
15	Fairfax County DPW	Yes	Both	Yes	Both
16	Fairfax County EMA				
17	Fairfax County Fire/EMS				
18	Fairfax County Police				
19	Falls Church, VA DPW&T	Yes	Both	Yes	Both
20	Federal Protective Services (FPS)				
21	Frederick County DOT	Yes	Both	Yes	Both
22	Frederick County EMA				
23	Greenbelt, MD Police				
24	Loudoun Co. EMA				
25	Loudoun County DOT	N/A	N/A	N/A	N/A
26	Loudoun County Fire/EMS				
27	Loudoun County Public Works	N/A	N/A	N/A	N/A
28	Loudoun County Sheriff				
29	Manassas DPW	N/A	N/A	N/A	N/A
30	MDOT	Yes	Both	Yes	Both
31	Montgomery County DOT	Yes	N/A	N/A	N/A
32	Montgomery County Fire/EMS				
33	Montgomery County Police Department				
34	Prince George's County DPW&T	Yes	Both	Yes	Both
35	Prince Georges County Fire/EMS				
36	Prince George's County Police				
37	Prince William County Fire/EMS				
38	Prince William County Police				
39	United States Park Police				

Table B.1: Raw Interview Data (continued)

Appendix C: Facilitated Scenario Workshop Participating Agencies

Agency
DC DOT
DC Fire Department
DC Public Schools
Department of Health
Department of Homeland Security
Federal Protective Services
George Washington University
JFHQ-NCR
Local Hospitals
OCTO
US Coast Guard
WMATA

Table C.1: Explosion Scenario Participating Agencies

Agency
The Centre for Management and Technology
Virginia Department of Emergency Management
County of Fairfax DOT
Metropolitan Washington Council of Governments
The Centre for Management and Technology
Joint Force Headquarters
Alexandria Police
JFHQ-NCR/PA
Fairfax County Health Dept
Maryland Department of Transportation
Alexandria Health Department
Prince George's County Office of Emergency Management
Prince George's County Health Dept
Fairfax County
Centre for Management and Technology
Montgomery County Department of Public Works & Transportation
Montgomery County Sheriff's Office
Prince George's County Health Department

Table C.2: Pandemic Flu Scenario Participating Agencies

Agency
Alexandria Police Department
Alexandria Transit Company
Consultant for VDOT
DC EMA
DC OCTO
Dept of Vehicle Services, Fairfax County Government
Division of Environmental Health, Prince George's County Health Department
Fairfax County Police Department
Fairfax County Radio Services Center
Fairfax Water
Frederick County
Joint Force Headquarters – National Capital Region (JFHQ-NCR)
Maryland Department of Transportation
Maryland Institute for Emergency Medical Services Systems
Maryland State Highway Administration
Montgomery County Sheriff's Office
Prince George's County Health Department
Prince William County, VA Public Safety Communications
The Centre for Management and Technology International
Trafficland
Virginia Department of Emergency Management

Table C.3: Hurricane Scenario Participating Agencies