

MFP&PS COMMITTEE #1  
July 23, 2009

Worksession

MEMORANDUM

July 21, 2009

TO: Management and Fiscal Policy Committee  
Public Safety Committee

FROM: Dr. Costis Toregas, Council IT Adviser  
Minna Davidson, Legislative Analyst 

SUBJECT: Public Safety Communications System (PSCS) Plan Update

Expected to participate in the discussion:

Drew Tracy, Assistant Chief of Police  
Richard Bowers, Fire Chief  
Chris Voss, Emergency Management and Homeland Security  
Arthur Wallenstein, Director, Corrections and Rehabilitation  
Steven Emanuel, Chief Information Officer

and members of the Public Safety Systems Modernization (PSSM) Work Group:

Mike Knuppel, DTS  
Albert George, MCFRS  
Chris Johnson, MCPD  
Charles Schwab, MCPD  
Dieter Klinger, DTS  
Bobby Johnson, DTS  
Debbie Greenwell, OEMHS  
Mark Wulff, DOCR  
Darren Popkin, Sheriff  
Jo Ann Ricchiuti, Sheriff  
John Cuff, OMB

Background

The FY09-14 Capital Improvements Program contains a project entitled **340901: Public Safety Communication System [PSCS] Upgrade and Mod** (©1). This project's aim is to "provide for

an upgrade and modernization of voice radio equipment used primarily by the County's public safety first responder agencies, consisting of Police, Montgomery County Fire and Rescue, Sheriff, Correction and Rehabilitation, and Emergency Management and Homeland Security.... As voice, data, and video are beginning to converge to a single platform, this project will provide a pathway to a modern PSCS which reflects the potential technology advances as well as provides efficient and reliable systems for all users." To date, \$2,988,000 has been appropriated in FY09 for equipment replacement purposes from federal grant sources.

The Executive has an opportunity to provide his recommendations regarding the strategy, funding, and deployment timetables for this upgrade and modernization during the biannual CIP submission. However, three documents have been prepared in advance of this submission, so that Committee members may become more familiar with the elements of the expected CIP project and their requirements:

1. Public Safety Systems Modernization plan (PSSM)
2. Communications Interoperability Plan
3. Computer Aided Dispatch (CAD) Roadmap Study

The transmittal letter signed by the heads of each major stakeholder department is on ©2, while the Executive Summary/Next step sections of each report are on ©3-4, ©5-9, and ©10 respectively. Full copies of the reports have been made available to Committee members in advance of this packet. In order to conserve paper, the entire reports are available as separate downloads alongside this report.

#### Worksession objective

The worksession will focus on two aspects of the PSCS: **What is in the plan** for moving forward, and **how will the County approach the needed replacement issues** within the existing budget process and current fiscal conditions.

Given the extent of the materials covered in the reports, it is expected that this worksession will be primarily dedicated to presentations and discussions aiming to **clarify the intent** of the Executive. A follow-up discussion, where the Committees will draw conclusions about the viability of moving forward under one or more of the plans presented, has been scheduled for October 1, 2009.

Five Guiding Principles have been discussed and endorsed by the Committees regarding the way in which the County should approach this complex system. They are:

- adopting a **holistic view** of the PSCS;
- **strengthening user** department involvement;
- **following technology shifts**;
- emphasizing **interoperability**; and
- developing **long-term funding tied to a strategic plan**.

These principles have been followed in the documents being submitted.

## Clarifying the suggested strategy

There are several complex systems being discussed in this worksession. They include:

1. Radio systems
2. Computer Aided Dispatch
3. Data Systems
4. Infrastructure

Each of these systems has at least three major stages:

### a. Planning

In this stage are two components: the conduct of the planning itself, and the maintenance, upgrade, and modifications necessary to the existing system that must be made while the planning is underway. Care must be exercised that upgrades to existing system components do not eliminate any new directions which the planning element itself may uncover for the go-forward.

In addition, the planning stage may include a Business Process Mapping (BPM) stage, where current processes are documented and new alternate processes with cost-saving or service level enhancement potential are explored.

### b. Implementation

Implementation of complex systems requires continued operations of the old system, an effective system specification and procurement stage, development, and testing of all necessary interfaces and live parallel testing.

### c. Operations

Operations will include necessary training, support, and staffing components to run the system over time. It is important to estimate full operations costs in the out years, as the life cycle costs are the important ones to use when making implementation decisions. This cost of operations must be shown in any analysis of new system procurement.

In order to support a full discussion of alternatives, the following table presents the information elements contained in the reports; additional data are needed to complete this display, and will be provided for the October discussion.

Table 1. Timing of system review, planning and replacement (where appropriate)

	2010	2011	2012	2013	2014	2015	2016
Radio Systems	U,P	U,P	U,P	D	D	O	O
CAD							
Data Systems							
Infrastructure			P	D	D	O	O

- U** Upgrade existing equipment
- P** Planning
- D** Implementation
- O** Operations

A parallel Table emphasizing the funding requirements is needed; as there are no cost estimates presented in this cycle of submissions, the format alone is shown here:

Table 2. Financing the PSCS effort

	2010	2011	2012	2013	2014	2015	2016	Total \$
Radio Systems								
CAD								
Data Systems								
Infrastructure								
Total cost \$								

Questions to guide the worksession discussion

**Policy issues**

1. Although there are no financial elements to the plan yet, it is evident that the magnitude of the required investment will be significant. Are there federal, state, or National Capital Region (NCR) commitments which can provide support in this undertaking? And what is the expected role of the Council in garnering such support?
2. Are the surrounding Counties and the District of Columbia facing similar issues of system replacement? And will our design and procurement processes be coordinated with theirs?

**Management issues**

3. The PSSM suggests a multi-year, multiple system approach. What mechanism is being suggested for managing the funding and careful control of such a project across multiple budget years? There is precedent in the County’s general Technology Modernization effort currently under way (which includes ERP, MC311 and MCTime) to organize a CIP

element across multiple years. Is the Executive expected to recommend such an approach as part of the TechMod project itself? Or as a separate project?

4. There are several grants under the UASI program recently secured by the Executive for planning purposes in the public safety communications area. They are:
  - \$60,000 for Interoperable Communications Planning
  - \$70,000 for CAD Upgrade/Transition Planning
  - \$25,000 for Public Safety Systems Strategic Planning for Modernization

What are the targets for these grants, and how do they relate to the PSSM?

5. The interoperability requirements for the region's public safety agencies are compounded by federal and state requirements as well. What is the current level of compliance, and are there financial impacts for non-compliance?
6. In the prior joint Committee worksession, Committee members heard from the State Director of Interoperability regarding possible collaborative activities in procurement, design, deployment, and operations of the communications system. What is the current status of those discussions?
7. The CAD roadmap report suggests that the CAD system must be replaced immediately. If so, is the Fire department prepared to review the dispatching process itself, compare it with the NFPA 1221 standards, and modify current business practices to reduce delays?
8. How can we ensure that the length of procurement and development processes does not negatively impact the expected life of the new systems?

### **Technology issues**

9. The documents provided for the Committees are not clear on the issue of system integration; although easy to support, the ability to integrate systems at the detail level can be an expensive undertaking with low chances of success. What are the current strategies to ensure integrated systems?
10. There is a major technology shift to an IP (Internet Protocol) based system, and yet very little description and justification is provided. What are the benefits and potential risks of such a shift, and how will it enhance our position as a leader in telecommunications applications?
11. Cell phone photos and videos are commonplace; the notion of using such citizen-provided information in the public safety communications system is no longer considered a fringe idea, but an effective and efficient additional input. Are there plans to integrate such reporting data?

# Public Safety Communication System Upgrade and Mod -- No. 340901

Category General Government  
 Subcategory Technology Services  
 Administering Agency  
 Planning Area Countywide  
 Service Area Countywide

Date Last Modified June 17, 2008  
 Required Adequate Public Facility No  
 Relocation Impact None.  
 Status

### EXPENDITURE SCHEDULE (\$000)

Cost Element	Total	Thru FY07	Est. FY08	Total 6 Years	FY09	FY10	FY11	FY12	FY13	FY14	Beyond 6 Years
Planning, Design, and Supervision	0	0	0	0	0	0	0	0	0	0	0
Land	0	0	0	0	0	0	0	0	0	0	0
Site Improvements and Utilities	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	0	0	0	0	0	0	0
Other	2,988	0	0	2,988	2,988	0	0	0	0	0	0
<b>Total</b>	<b>2,988</b>	<b>0</b>	<b>0</b>	<b>2,988</b>	<b>2,988</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### FUNDING SCHEDULE (\$000)

Federal Aid	2,988	0	0	2,988	2,988	0	0	0	0	0	0
<b>Total</b>	<b>2,988</b>	<b>0</b>	<b>0</b>	<b>2,988</b>	<b>2,988</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**DESCRIPTION**

This project will provide for an upgrade and modernization of voice radio equipment used primarily by the County's public safety first responder agencies consisting of Police, Montgomery County Fire and Rescue, Sheriff, Corrections and Rehabilitation and Emergency Management and Homeland Security. Upgrades will be made to the subscriber equipment by replacement of mobile and portable radios, which will also include a enterprise telecommunications management and service tracking system to properly manage communications inventory and assets. As voice, data and video are beginning to converge to a single platform, this project will provide a pathway to a modern PSCS which reflects the potential technology advances as well as provides efficient and reliable systems for all users.

**JUSTIFICATION**

The Public Safety Communications System (PSCS) requires modernization, replacement and upgrades to apply current state of the art technologies. Manufacturer's support of parts and the existing public radio system is scheduled to be phased out December 31, 2009. Beyond that date the manufacturer will only continue to provide system support on an "as available" basis, but will not guarantee the availability of parts or technical resources.

In addition, as more of the County's regional partners migrate to newer technologies, it will affect not only interoperable voice communications, but will also diminish the critical mass for the vendor to sustain technical and equipment support in this area. To ensure that the County maintains reliable and effective Public Safety (voice radio) communications for the operations of its first responders and to sustain communications interoperability for seamless mutual aid among its regional partners, the County should commence planning and implementation of a program to upgrade and modernize its portable and mobile radio units and subsequently the PSCS communications infrastructure.

**OTHER**

Future years will include an assessment of the current radio system infrastructure to determine the feasibility of using portions of the existing infrastructure along with software upgrades and new networking equipment to permit full integration with the IP-based architecture of the newer technologies. Modernization of zone controllers, network management, simulcast and prime site controllers along with new base stations and comparator equipment may be necessary. Coordination with participating departments/agencies and regional partners will continue throughout the project.

**FISCAL NOTE**

Funding in FY09 includes Urban Area Security Initiative (UASI) grant funding of \$2.0 million and Fire Act grant funding of \$988,000. Fire Act grant funding requires a County match of \$247,000 to be funded in the FY09 Operating Budget.

APPROPRIATION AND EXPENDITURE DATA	COORDINATION	MAP																																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Date First Appropriation</td> <td style="text-align: center;">FY09</td> <td style="text-align: right;">(\$000)</td> </tr> <tr> <td>First Cost Estimate</td> <td style="text-align: center;">FY09</td> <td style="text-align: right;">2,988</td> </tr> <tr> <td>Current Scope</td> <td></td> <td></td> </tr> <tr> <td>Last FY's Cost Estimate</td> <td></td> <td style="text-align: right;">0</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td>Appropriation Request</td> <td style="text-align: center;">FY09</td> <td style="text-align: right;">2,988</td> </tr> <tr> <td>Appropriation Request Est.</td> <td style="text-align: center;">FY10</td> <td style="text-align: right;">0</td> </tr> <tr> <td>Supplemental Appropriation Request</td> <td></td> <td style="text-align: right;">0</td> </tr> <tr> <td>Transfer</td> <td></td> <td style="text-align: right;">0</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td>Cumulative Appropriation</td> <td></td> <td style="text-align: right;">0</td> </tr> <tr> <td>Expenditures / Encumbrances</td> <td></td> <td style="text-align: right;">0</td> </tr> <tr> <td>Unencumbered Balance</td> <td></td> <td style="text-align: right;">0</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td>Partial Closeout Thru</td> <td style="text-align: center;">FY06</td> <td style="text-align: right;">0</td> </tr> <tr> <td>New Partial Closeout</td> <td style="text-align: center;">FY07</td> <td style="text-align: right;">0</td> </tr> <tr> <td>Total Partial Closeout</td> <td></td> <td style="text-align: right;">0</td> </tr> </table>	Date First Appropriation	FY09	(\$000)	First Cost Estimate	FY09	2,988	Current Scope			Last FY's Cost Estimate		0				Appropriation Request	FY09	2,988	Appropriation Request Est.	FY10	0	Supplemental Appropriation Request		0	Transfer		0				Cumulative Appropriation		0	Expenditures / Encumbrances		0	Unencumbered Balance		0				Partial Closeout Thru	FY06	0	New Partial Closeout	FY07	0	Total Partial Closeout		0	<p><b>COORDINATION</b></p> <ul style="list-style-type: none"> <li>Public Safety Steering Group</li> <li>Department of Technology Services</li> <li>Department of Police</li> <li>Montgomery County Department of Fire and Rescue Service</li> <li>Sheriff's Office</li> <li>Department of Corrections and Rehabilitation</li> <li>Office of Emergency Management and Homeland Security</li> <li>Department of Transportation</li> <li>Department of Liquor Control</li> <li>Montgomery County Public Schools (MCPS)</li> <li>Maryland-National Park and Planning Commission (M-NCPPC) Park Police</li> <li>Washington Metropolitan Area Transit Authority (WMATA)</li> </ul>	
Date First Appropriation	FY09	(\$000)																																																			
First Cost Estimate	FY09	2,988																																																			
Current Scope																																																					
Last FY's Cost Estimate		0																																																			
Appropriation Request	FY09	2,988																																																			
Appropriation Request Est.	FY10	0																																																			
Supplemental Appropriation Request		0																																																			
Transfer		0																																																			
Cumulative Appropriation		0																																																			
Expenditures / Encumbrances		0																																																			
Unencumbered Balance		0																																																			
Partial Closeout Thru	FY06	0																																																			
New Partial Closeout	FY07	0																																																			
Total Partial Closeout		0																																																			





DEPARTMENT OF TECHNOLOGY SERVICES

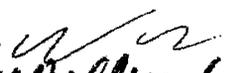
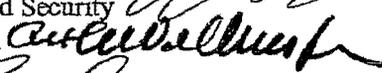
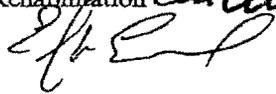
*Islah Leggett*  
County Executive

*E. Steven Emanuel*  
Chief Information Officer

MEMORANDUM

July 15, 2009

TO: Phil Andrews, Chair, Public Safety Committee  
Duchy Trachtenberg, Chair, Management and Fiscal Policy Committee

FROM: Thomas Manger, Chief of Police   
Richard Bowers, Fire Chief   
Chris Voss, Office of Emergency Management and Homeland Security   
Arthur Wallenstein, Director, Corrections and Rehabilitation   
E. Steven Emanuel, Chief Information Officer 

SUBJECT: Public Safety Communications System Plan

Pursuant to your request in the memorandum of February 2, 2009, the Executive Branch Public Safety Leadership is pleased to report the significant progress in the development of Montgomery County's Communications Interoperability Plan (MCCIP).

In concert with the MCCIP, we have made equal progress in the development of an overarching model for all of the Public Safety systems through an enterprise approach to Public Safety Systems Modernization (PSSM). The PSSM takes the communications interoperability, the radio infrastructure efforts, Computer Aided Dispatch (CAD) direction and other Public Safety system needs and creates a visible linkage to a comprehensive approach for the County's direction for technology in this area.

As directed, our goal for the MCCIP was to demonstrate the alignment with the State's program. While we had a clear expectation that the State's investments and direction would be finalized in the Spring of 2009, the final vendors and plans for the State's 700 MHz solution are still in progress. However, we continue to work with our State partners and our efforts remain in alignment with the State's interoperability planning. As such, we are presenting a first full draft of our efforts.

This program and the deliverables completed to date continue to be an excellent example of the teamwork between the Public Safety departments and DTS. We intend to continue to develop these plans as key decisions are made by the State as well as the release of technology innovations that will benefit the overall public safety systems strategy.

We look forward to your response on our efforts.

Office of the CIO

101 Monroe Street, 13th Floor, Rockville, Maryland 20850  
240 777-2900 FAX 240 777-2831

## 7 Next Steps

Montgomery County will continue to be a technology leader in Public Safety Systems. The immediate next steps in the Public Safety Systems Modernization Plan focus on the implementation of recommendations from the MCCIP Plan and the CAD Study, both designed to help establish roadmaps for modernization. The Public Safety Systems Workgroup will collaborate to identify funding sources for these initiatives.

### 7.1 MCCIP Plan Overview

The County engaged an independent public safety system's consultant to survey the state of the current Public Safety 800MHz voice and data radio systems and report on recommendations for moving forward.

The main areas of focus were:

1. Analyzing and reviewing the State of Maryland Communications Interoperability Plan (SCIP) and the Montgomery County Communications Modernization Plan to identify synergistic opportunities and any voice or data interoperability advantages the State system might provide.
2. Reviewing and documenting the current state of the 800 MHz Public Safety Radio, voice and data systems (PSRS) and documenting staff and users opinions of these systems.
3. Conducting an objective study of the future of Public Safety radio (voice and data) systems; discussing trends and best practices in 800 MHz and 700 MHz system deployments; discussing suitable transition plans from the current Public Safety radio systems to a new replacement system(s), all with a focus on interoperability in the National Capitol Region..

### 7.2 CAD Study Overview

The County engaged an independent public safety system's consultant to evaluate the current Computer Aided Dispatch (CAD) system and provide a roadmap for moving forward. A final report was delivered in February 2009.

The analysis and report had three major points of focus.

1. Identifying and documenting business needs that are not being met by the current system,
2. Making recommendations for replacing the current CAD system and enumerating the best practices for implementing a new CAD system, and
3. Providing guidance for extending the useful life of the current CAD system until a new CAD system is operational.

The study determined that the current CAD system (Altaris CAD) does not meet several current business needs and is not capable of meeting emerging business needs stemming from advances in 9-1-1 and consumer communications. The county must begin the process of



selecting and implementing a next generation CAD immediately. Later sections of the CAD Study report detail the steps that need to be followed and an estimated timeline.

The current CAD system is based on out-dated software technologies and is running on hardware that is near, and in some cases already reached the end of its useful life. The county has begun planning and acquiring replacement hardware. It is imperative that the county follow through with these plans to ensure continued operations of the current CAD system until a next generation CAD system can be implemented. Later sections of the CAD Study report describe the steps necessary to maximize the usefulness of the current system.

The county should look for a modular, standards-based solution in a new CAD system to be able to adopt and implement new technologies as needed. The county also needs to dedicate the resources to ensure that the replacement selection and implementation process is completed in a timely manner, to maximize the expected useful life of the next system.

The public safety workgroup will use the findings of this study, aligning requirements with the other systems comprising the PSCS identified in this modernization document and the MCCIP plan, and develop a Capital Improvement Plan for the design, selection and implementation of a next generation CAD system.

# I. Executive Overview

## Strategic Situation

For over seven years the existing Motorola ASTRO SmartZone public safety trunked radio system has served Montgomery County ("the County") well, eliminating many deficiencies that existed in the previous conventional radio systems used by public safety agencies including the Department of Corrections and Rehabilitation (DOCOR), Montgomery County Fire and Rescue Service (MCFRS), Montgomery County Police Department (MCPD), and the Montgomery County Sheriff's Office (MCSO). All County public safety agencies are now on a common radio platform, can and do communicate with one another on a routine basis, have better coverage than in the past, and have interoperability with most public safety agencies in the National Capitol Region (NCR) and beyond. That the County has benefitted from the existing system is beyond question, and its value has been demonstrated time and again when the public safety agencies have been on the front line of response to incidents as diverse as the Beltway sniper incidents, railway accidents, and a plethora of less publicized, but nonetheless urgent events.

Planning of the County's existing 800 MHz trunked radio system commenced in 1994, and a contract award for the network was signed with Motorola in December 1999. The trunked radio system was ready for operations in the spring of 2002, but owing to issues with the Computer Aided Dispatch (CAD) system and the Mobile Data Computer System (MDC), full operation was deferred until July, 20, 2003. At the time of implementation the system represented the current state of the art in public safety radio communications.

In the rapidly evolving telecommunications industry, generational changes in technology, standards, and electronic components tend to shorten the expected usable lifespan of network investments. Convergence between telecommunications and information technologies has rendered obsolete proprietary networking technologies and vestiges of circuit-switched telephony on which many mobile radio communications systems were based, including that of the County. Standards for digital public safety communications systems intended to improve interoperability and to stimulate competition among multiple suppliers have evolved since the County embarked on its system implementation. While beneficial in the long term, in the short term, these standards have introduced new incompatibilities that challenge the continuity of effective interoperability among public safety first responders and have hastened the obsolescence of existing systems, including that of the County. At present, the County radio communications system is nearing the end of the continuum of factory support, and little flexibility is provided for system infrastructure upgrade short of replacement.

Urbanization of segments of the County combined with increased noise levels in the 800 MHz radio frequency band has degraded the coverage performance of the existing radio system. Additional base station sites are needed in built-up areas to restore the level of coverage of the system to its original reliability. Obsolescence of the trunked radio system prohibits the needed increase in base station sites to upgrade performance of the system.

Other counties and cities in the National Capital Region with which the County public safety agencies interoperate on a routine basis have commenced system planning or implementation of radio system upgrades. To avoid incompatibilities that will affect public safety operations, it is necessary that interoperability partners make certain upgrades in, or nearly in, unison.

Montgomery County must commence planning and funding upgrades to its existing trunked radio system before factory support of the network deteriorates in the years beginning with 2012. Such upgrades will serve the dual role of maintaining the acclaimed interoperability that exists in the National Capital Region and correcting degradation of the reliability of the existing County system.

## **Goals and Objectives of the Montgomery County Communications Interoperability Plan**

### **Goal**

It is the goal of the Montgomery County Communications Interoperability Plan to ensure that the public safety first responders of Montgomery County can fulfill their missions safely and can respond promptly to the needs of the public in emergencies through the use of reliable, interoperable, and flexible voice and data radio communications to provide dispatch, coordination, and information in the mobile environment.

### **Objectives**

Objectives of the Montgomery County Communications Interoperability Plan are to:

Provide reliable radio communications system performance in terms of coverage, network availability, and quality of service to public safety first responders.

Maintain and expand the highest level of interoperability between the County's public safety first responders and their mutual aid partners from within and outside of the National Capital Region to coordinate daily and emergency events by employing subscriber radios compatible with legacy and future digital technologies.

Provide access to and transmission/reception of data and video, and to permit access to dispatch, database, collaboration, and operational applications in the mobile environment with speed and reliability comparable to a wired office connection.

Ensure that system upgrades will meet the needs of the County for a decade and that the technology selected is in keeping with the overall trend of the telecommunications and information technology industry toward open architecture, data security, quality of service metrics, and interoperability.

### **Strategy**

It is the strategy of the interoperability plan to continue the provision of a current technology trunked radio communications system that meets the current and future needs of the County public safety first responders while optimizing the utilization of current resources and through cooperation with interoperability partners. To the extent practical the County will employ resources made available by the Federal broadband initiative and other sources of interoperability funds.

### **Phased Implementation**

A multi-phased implementation schedule is proposed over a minimum five year period. A three phase schedule permits expenses to be spread over multiple funding cycles and will allow certain industry standards and regulations to be that are in development to be finalized.

In the first phase, that spans three years, short term improvements will be made by upgrading portable and mobile radios assigned to public safety first responders to more capable software-defined radios. Such radios have the ability to operate in multiple modes, thereby bridging the generations of technology that will exist in the region without loss of interoperability. Such radios enable communications with new generation P25 Phase I and Phase II standard radio systems that are in deployment in the region and are also backward compatible with legacy systems.

Work on plans and specifications for the upgrade of the trunked radio communications system also must commence in the first phase. The objective of these plans is the development of goals and objectives for a system to meet the tactical voice radio communications needs of the first responders and to plan for the eventual use of broadband wireless network for data and video communications. Options for system sharing and/or participation in a network of networks will be explored in the planning process. A detailed implementation plan and budget for network infrastructure upgrades will be produced along with a procurement document for the upgraded voice radio system.

In the second, interim, phase beginning in the fourth year the procurement and installation of voice radio system infrastructure upgrades will commence. These upgrades will affect the radio system, its interconnecting network, and the public safety communications center console equipment. At the conclusion of the installation of the improved voice communications system, some legacy subscriber equipment will be passed on to non-public safety governmental radio system users. The second phase is estimated to take two years, with a projected completion date of 2014.

The third phase is a long term action plan for the implementation of wireless data and video applications on a broadband network. Such applications and the networks themselves are still only loosely defined and final regulations have not been promulgated. It is expected that clarity will emerge over the next two years from the extensive effort being expended by public safety and the private sector to jointly or singly develop a national broadband infrastructure for public safety. As presently defined, such a broadband network will reflect some of the convergence of voice, data, and video access to and from the mobile environment. An eventual progression to the provision of tactical push-to-talk voice communications over such networks may evolve over the next decade, but is not the primary driver of this technology.

<b>Initiative</b>	<b>Short Term (Years 1-3)</b>	<b>Interim Phase (Years 3-5)</b>	<b>Long Term (&gt; 5 Years)</b>
Interoperability	Purchase subscriber units compatible with both legacy and next generation systems to maintain interoperability in NCR and to prepare for system replacement in Montgomery County	Transition subscriber units to next generation trunked system being installed by Montgomery County; cross programming or system of systems to provide interoperability with mutual aid partners	Continuing programming and networking to maintain interoperability with mutual aid partners.
Operability	Begin planning and specification of next generation trunked radio system for Montgomery County	Procurement and implementation of next generation trunked radio system	System in full operation and add subscriber units to reflect County growth
Data and video	Follow national	Definition of	Participate in

access and transmission	broadband initiative, FCC filings if necessary	advanced data and video applications to enhance public safety operations	shared national broadband network or buy services from operator
-------------------------	--	--	---

## Funding

Phase I budget requirements are to fund portable radio upgrades for public safety first responders in years one through three and to commence preparation of detailed system plans and procurement documents for an upgraded network infrastructure, and to seek grants and other sources of funding for the upgrades.

Phase II budget requirements will be established in the first year of Phase I based on a detailed system design and that will be completed during the year. This design and budget will provide two years lead time to identify sources of funding before the procurement of the network upgrade commences.

Phase III funding requirements will be known by year five of the project. This phase of the project is dedicated to the provision of wireless broadband access by public safety agencies. It is likely that such service will be provided by some partnership between a wireless network operator and a regional or national public safety consortium. The form of such a consortium and the ratio of capital versus operating expenses will be determinable by year five.

## Immediate Actions Required

Plans and specifications must be developed to ensure that any replacement system will meet the needs of the County for another decade and that the technology selected is in keeping with the overall trend of the telecommunications and information technology industry toward open architecture, data security, quality of service metrics, and interoperability. These plans will examine the network options available to the County, including a stand-alone system, a system that is a participant in a system of systems that permits resource sharing while avoiding the centralization of failures, and sharing of certain resources, such as antenna sites and backhaul networks with other governmental entities such as the State or adjoining counties and cities.

In the short term, the process of replacing subscriber units (mobile and portable radios used by first responders) with units capable of operating on legacy Motorola trunking technology and P25 Phase I and II systems, supporting roaming technology, operable on the 700 MHz frequency band and compatible with conventional analog operation.

# 1. Executive Summary

---

The Department of Technology Services (DTS), Montgomery County retained Tetra Tech to evaluate the current Computer Aided Dispatch (CAD) system and provide a roadmap for moving forward.

This analysis had three major points of focus.

1. Identifying and documenting business needs that are not being met by the current system,
2. Making recommendations for replacing the current CAD system and enumerating the best practices for implementing a new CAD system, and
3. Providing guidance for extending the useful life of the current CAD system until a new CAD system is operational.

This study has determined that the current CAD system (Altaris CAD) does not meet several current business needs and is not capable of meeting emerging business needs stemming from advances in 9-1-1 and consumer communications. The county must begin the process of selecting and implementing a next generation CAD immediately. Later sections of this report detail the steps that need to be followed and an estimated timeline.

The Tetra Tech team, through numerous interviews and review of the system documentation has compiled a comprehensive list of the deficiencies inherent in the current CAD system. This system is based on out-dated software technologies and is running on hardware that is near, and in some cases already reached the end of its useful life.

The current CAD system was proposed and designed in the late 1990's, but was not put into service until July 2003. Some of the user expectations of the system have never been realized. Contributing to the systems' limitations and issues identified since its implementation is the fact that the system is based on old technology that has not kept pace with changes in the industry. The study also found that the ability of the current CAD support vendor, Northrop Grumman, as evidenced by the long development cycles for software bug-fixes, upgrades necessitated by changes in legal requirements, and the requirement to maintain interoperability with inter-dependant systems,, does not meet the needs of the county in providing this mission critical public safety service. This further increases the importance of the county moving expeditiously to a new CAD system.

The county should look for a modular (plug & play), standards-based solution to establish the capability to adopt and implement new technologies as needed. The county also needs to dedicate the resources to ensure that the replacement selection and implementation process is completed in a timely manner, to maximize its Return on Investment (ROI) across the full useful life cycle of the new system.

The county has already begun planning and acquiring replacement hardware. It is imperative that the county follow through with these plans to ensure continued operations of the current CAD system until a next generation CAD system can be implemented. Later sections of this report describe the steps necessary to maximize the usefulness of the current system. An in-depth review of the original system architecture was also done, and recommendations are made to rectify single points of failure. Finally, through research and information gathered from four of the top CAD vendors, this report presents the latest features offered in state-of-the-art CAD systems.

Information was gathered through a brief Request for Information (RFI) that was sent to four of the top CAD vendors. The RFI responses along with the information contained on their respective Web sites demonstrates that they all provide advanced features to assist in making the call-taking and dispatch functions more efficient. A rigorous Request for Proposal (RFP) process will be required to determine which approach to these features best meets the county's needs.