Montgomery County
Public Safety Systems
Modernization Plan
July 2009

Message from the Public Safety Department Directors

In Montgomery County, we take pride in the proactive adoption of technology that enables us to serve our residents, employees and visitors. The technology that serves the Public Safety organizations is one of the most important areas and serves as the focus of our strategic efforts to maintain efficient and highly reliable operations systems.

As the leaders of the Public Safety Departments and in alignment with the Department of Technology Services, we have developed a comprehensive plan that demonstrates our commitment to the ongoing assessment of the technology used be responsive to the urgent needs of our community. This Public Safety Systems Modernization plan is a summary of this most recent effort and is inclusive of the input from many talented and dedicated individuals across these many departments.

Our combined mission is to ensure that Montgomery County has a defined plan for the continuous review of Public Safety Systems with a forward vision for technology improvements that will assist our workforce in providing responsive services and quality information emergent and crisis situations. We believe the continued investment in modern solutions will notably benefit those in need for emergency or safety services and we are committed to working together to develop interoperable communications and other technology systems that provide for public and personnel safety.

We remain focused on our County Executive's commitment to service and *"Together, we can accomplish great things"*.

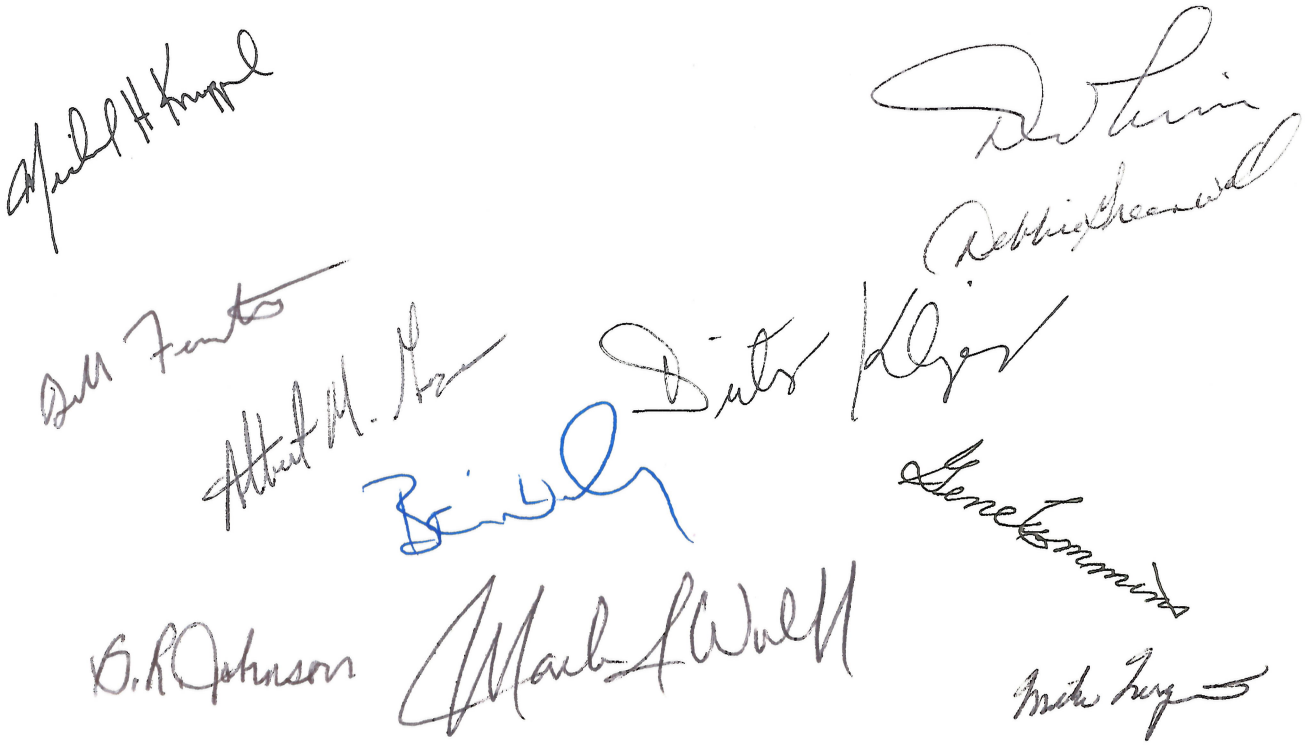
Richard Bowers, Chief, Montgomery County Fire and Rescue Service
Tom Manger, Chief, Montgomery County Police Department
Arthur Wallenstein, Director, Department of Corrections
Chris Voss, Director, Office of Emergency Management and Homeland Security
Steven Emanuel, Director, Department of Technology Services

Message from the Public Safety Systems Modernization Workgroup

Montgomery County Government (MCG) Public Safety Departments have made significant advances by embracing technology solutions that improve business response to its citizens as well as streamlining the internal business processes. To continue the positive contributions from our investment in Information Technology (IT) solutions and innovations, it is essential to articulate our interpretation of Executive guidance as well as business mission objectives to prepare for future technology choices.

The purpose of this Public Safety Systems Modernization plan (PSSM) is to describe and document Public Safety's interpretation of the direction of technical issues and to set the baseline for how information technology solutions are approached. While the PSSM is a point-in-time assessment of current processes and methods, it also illustrates the significant achievements and streamlining from previous efforts. PSSM sets a definitive road map for new objectives and methods.

This is a "living" document that will be reviewed on a periodic basis both internally as well as through the MCG Executive Leadership to ensure that it continues to support the Public Safety business mission and strategies. The use of the PSSM to guide our Information Technology investments and activities will allow us to maintain a sustainable alignment between our corporate mission and technology improvement expectations.



The members of the Public Safety Systems Modernization Workgroup are: Charles Bailey, Gene Cummins, Bill Ferretti, Albert George, Debbie Greenwell, Bobby Johnson, John Kinsley, Dieter Klinger, Michael Knuppel, David Linn, Brian Melby, David Scibelli, Michael Tarquinio, and Mark Wulff.

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1 Introduction

Montgomery County takes advantage of mature technologies in areas of data, voice and radio networking, datacenter operations and monitoring, hardware and software systems deployment, and application development. The purpose of this Public Safety Systems Modernization (PSSM) plan is to set the course for fully defining the Montgomery County objectives surrounding how the organization will approach public safety systems and technology from an enterprise perspective. The outcome of this effort will aid in the development of a long term systems strategy guiding pubic safety agencies. The strategy should determine what the organization's capabilities are today, where the public safety and other county leaders want to be tomorrow and, most importantly, how as an organization we can achieve the most desirable and sustainable enterprise public safety solutions.

In early 2009, Montgomery County was introduced to a new, enterprise technology strategic plan. This plan endeavors to create a more sustained focus on the development of business driven dynamics as the key starting point for introducing new technologies that support the enterprise as a whole, or at the very least, provide opportunities that cross departmental boundaries. This "theming" approach is at the forefront of the teaming process that has been undertaken with the development of the Public Safety Systems Modernization effort.

Public Safety Executives, in concert with Technology Services are at the core of this effort to ensure an outcome that is representative of the continued leadership that Montgomery County exemplifies in many areas. With the concerns over life/safety systems that are quickly reaching obsolescence, the significant costs involved with upgrade and/or replacement, and the increasingly important trend of interoperability, Montgomery County leaders have made the commitment to develop and support a modernization plan that will result in the most viable approach to modernizing these critical systems.

Public Safety as a theme encompasses numerous County departments. The keystone departments for County public safety immediately include the Montgomery County Police Department (MCPD) and Montgomery County Fire and Rescue Service (MCFRS). However, given the significant change in the past decade, other departments have joined as equally crucial members of the Public Safety community. Included in this new model, the Office of Emergency Management and Homeland Security (OEMHS), the Department of Corrections and Rehabilitation (DOCR) and the Department of Technology Services (DTS) play a role in citizen and community safety.

Montgomery County Police Department
The Montgomery County Department of Police is committed to providing the highest quality of police services to the people who live, work and visit our County. The MCPD pledges to constantly evaluate and improve efforts to enhance public safety with the goal of improving the quality of life within Montgomery County, while at the same time maintaining respect for individual rights and human dignity.

Montgomery County Fire and Rescue Service
The vision of the Montgomery County Fire and Rescue Service is to keep Montgomery County communities safe and healthy by providing the best fire, rescue, and emergency medical services, utilizing career and volunteer resources.

Department of Emergency Management and Homeland Security
The Office of Emergency Management and Homeland Security plans, prevents, prepares and protects against major threats that may harm, disrupt or destroy our communities, commerce and institutions.

Department of Corrections and Rehabilitation
The Montgomery County Department of Correction and Rehabilitation is a civilian agency managed by professionals in the correctional field. Established in 1972, it provides progressive and comprehensive correctional services through the use of pre-trial supervision, secure incarceration and community treatment and reintegration programs. The Montgomery County Correctional Facility (MCCF), Montgomery County Detention Center (MCDC) and Pre-Release Center (PRC) achieved 100% compliance with the Maryland Commission on Correctional Standards (MCCS) during the last audit cycle in 2007.

Department of Technology Services
The mission of the Department of Technology Services is to ensure that Montgomery County Government is a fully integrated enterprise in which all Montgomery County Government Departments and Offices have the ability to utilize reliable, accurate and secure information to perform the government services and functions essential to the citizens of Montgomery County.

1.1 Users

There are Federal, Local Jurisdictional and County Government users of the Public Safety System. These users include:

- Montgomery County Police Department (MCPD)
- Montgomery County Fire and Rescue Service (MCFRS)
- Office of Emergency Management and Homeland Security (OEMHS)
- Department of Correction and Rehabilitation (DOCR)
- Department of Technology Services (DTS)
- Montgomery County Sheriff's Office (MCSO)
- Department of Health and Human Services (DHHS), Public Health
- Department of General Services (DGS), Facilities
- Chevy Chase Village Police Department
- City of Gaithersburg Police Department
- City of Rockville Police Department
- City of Takoma Park Police Department
- National Naval Medical Center Fire Department
- National Institutes of Health (NIH) Fire Department
- National Institute of Standards and Technology (NIST) Fire Department
- Walter Reed Army Medical Center Fire Department
- David Taylor Model Basin Fire Department
- Maryland State Police (MSP)
- Maryland National Capital Park Police (MNCPPC)

2 Mission

2.1 Key Mission Statements

County Executive's Mission Statement
We pursue the common good by working for and with Montgomery County's diverse community members to provide:

- ***A Responsive and Accountable County Government***
- ***Affordable Housing in an Inclusive Community***
- ***An Effective and Efficient Transportation Network***
- ***Children Prepared to Live and Learn***
- ***Healthy and Sustainable Communities Safe Streets and Secure Neighborhoods A Strong and Vibrant Economy***
- ***Vital Living for All of Our Residents***

As dedicated public servants, the employees of the Montgomery County Government strive to embody in our work these essential values:

Collaboration	**Competence**	**Fiscal Prudence**
Inclusiveness	**Innovation**	**Integrity**
Knowledge	**Respect for the Individual**	**Transparency**

2.2 Key Goals

The mission of the **Montgomery County Department of Police** is to safeguard life and property, preserve the peace, prevent and detect crime, enforce the law, and protect the rights of all citizens. We are committed to working in partnership with the community to identify and resolve issues that impact public safety.

- Pride- We are committed to conducting ourselves in a manner that brings honor to ourselves, the department, and the county.
- Respect- We are committed to respecting the individual rights, human dignity and the value of all members of the community and the department.

The mission of the **Montgomery County Fire and Rescue Service** is to protect lives, property, and the environment with comprehensive risk reduction programs; and safe, efficient, and effective emergency response provided by skilled, motivated, and compassionate career and volunteer service providers representing Montgomery County's diverse population.

The mission of the **Office of Emergency Management and Homeland Security** is to effectively manage and coordinate the County's unified response, mitigation, and recovery from the consequences of such disasters or events should they occur. It also serves to educate the public on emergency preparedness for all hazards and focused outreach to our diverse and special populations to protect, secure and sustain critical infrastructures to ensure the continuity of essential services.

- Pride- We are committed to conducting ourselves in a manner that brings honor to ourselves, the department, and the county
- Respect- We are committed to respecting the individual rights, human dignity and the value of all members of the community and the department.
- Integrity- We are committed to nurturing the public trust by holding ourselves accountable to the highest standards of professional conduct and ethics.
- Dedication- We are committed to providing the highest quality of law enforcement service to the community with the goal of enhancing the quality of life within Montgomery County.
- Excellence- We are committed to achieving a level of performance that exceeds all expectations.

We begin with Pride, and end with Excellence.

The mission of the **Department of Correction and Rehabilitation** is:

- To protect the public and citizens of Montgomery County by providing a wide range of constructive, professional correctional services for pretrial and convicted detainees.
- To ensure the safety and welfare of staff, visitors, and offenders by operating facilities and programs in a secure, humane environment which meets professional and standards and constitutional requirements.
- To reduce the rate to reincarceration by providing offenders with the opportunity for self improvement and the inner resources necessary to make a successful adjustment within the community.
- To meet the future correction and rehabilitation needs of the County by means of effective planning and responsible fiscal and resource management.

The **Montgomery County Department of Technology Services** mission is to use information technology to:

- Enable our employees to provide quality services to our citizens and businesses,
- Deliver information and services to citizens at work, at home, and in the community,
- Increase the productivity of government and citizens

3 Focus on Public Safety Enterprise Systems

Montgomery County Government leadership has been strategic and forward thinking with regards to the investment in technology.

3.1 Business Strategy

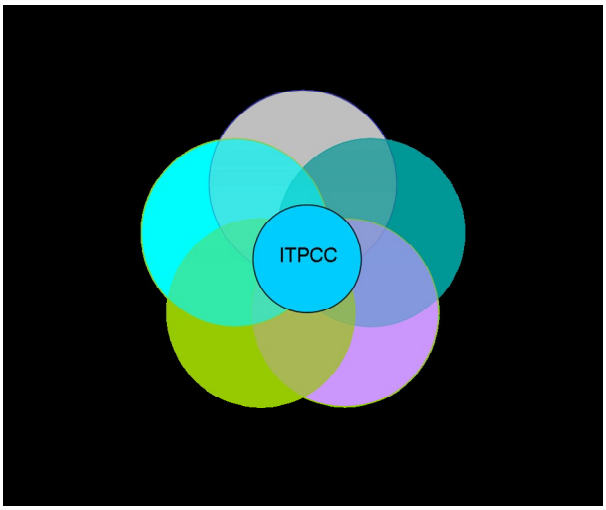
For the departments responsible for the County's Public Safety, collaboration is a key element of the overarching business strategy. In Montgomery County, where large, decentralized components of IT exist in parallel with centralized IT functions and responsibilities, the challenge of an organized strategy, management of customer expectations and definitive measures of success requires proactive focus. This focus is essential at all levels of the business strategy to affect the support of vision, change and prudence in innovation adoption.

Montgomery County's leadership has welcomed and promoted the collaboration process. This is clearly evident by senior leadership's encouragement, the cross departmental workgroups, and actions relative to numerous public safety initiatives.

3.1.1 Internal Collaboration

Montgomery County has an established tradition between agencies for idea and solutions exchange. The formation of the County's Interagency Technology Policy and Coordination Committee (ITPCC), is the method by which elected governance ensure that common technology strategies are vetted for cross agency benefit and standardization.

Figure 1 - ITPCC



With the advent of a separate funding, the Inter-Agency Technology Fund (ITF), solely for the facilitation of cross agency initiatives, each county agency has an opportunity to contribute to the development, assessment and evaluation of common technology programs. These initiatives provide the basis for escalation to individual agency leadership, with the proven benefits and expectations outlined through the inter-agency trials.

Additionally, the ITPCC has an obligation to annually review the overall investment, across agency lines, to assess the overall state of technology and the risks and consequences of technology lifecycle. This is an important aspect of monitoring the highest view of technology investment and is a mandate from the elected County officials.

In addition to inter-agency information exchanges, collaborative mechanisms have been created within the Executive Branch to facilitate inter-departmental exchanges of information, validation of departmental technology recommendations during annual technology investment considerations as well as routine exchange of management principles, standards and processes.

At the senior level, this element of collaboration is evidenced by the IT Policy Advisory Committee (IPAC) and Executive Steering Committees for key projects and programs.

The IPAC is a legislatively created committee, required to meet bi-annually to discuss business drivers for technology policies and make recommendations to the Chief Information Officer (IPAC Chairperson) for formal review, development and adoption. While the recommendation for this committee is bi-annual, an established pattern of quarterly association has been managed and interim issues have been discussed and adopted at a more appropriate pace for more urgent issues. This committee has been instrumental in the cross departmental communication of technology challenges and has instigated policy changes to keep pace with technology industry challenges.

3.1.2 External Collaboration

Montgomery County is an avid partner in the development of inter-jurisdictional activities in support of its residents and businesses. The technology leadership of the County is equally participatory in these exchanges.

As a member of the Metropolitan Washington Council of Governments (MWCOG) for the National Capital Region (NCR), Montgomery County actively participates with strategic technology developments that serve the 21 jurisdictional members. These efforts clearly demonstrate the cooperation between governmental agencies that link technology solutions, best practices and programs that serve constituents. In addition to general technology solutions, the cooperative has a significantly high focus on public safety initiatives which mandates a complex governance process that ensures robust and quality services as a part of joint technological efforts.

Over the past 5 years, the programs have developed innovations in support of the many focus group disciplines that are participants in the NCR, including:

- Institutional Network (I-Net) Interconnects
- Data Exchange Architecture and Standards
- Regional Broadband Wireless Development
- Shared Data Technology Policy and Governance
- Current Trend Technology Assessments

The benefits of this collaborative effort are enormous for all agencies. In addition to providing valuable lessons learned for technology programs, the information exchange on leveraging public contracts (through bridging), knowledge sharing and technology investment strategies demonstrate the effective use of funds that are demanded by taxpayers.

The provision of mutual aid to neighboring jurisdictions and the ability to communicate with personnel of other jurisdictions is called “interoperability.” Simply put, interoperability is the

ability of first response agencies, whether fire, police, or emergency medical services, to work together and to communicate with each other during an incident, emergency, or disaster. Radio communications is integral and essential to this ability. During these events radios of personnel of both jurisdictions must be able to talk to each other. Operating procedures for communication and clear lines of authority must be pre-established and practiced.

Since 2003, Montgomery County has enjoyed the ability to seamlessly interoperate with its neighbors in the MWCOG/NCR and central Maryland in voice radio communications. A number of current NCR and State initiatives are under way that will extend the intercommunication capabilities to include data. Examples of this include the MWCOG/NCR Urban Areas Security Initiative (UASI) funded CAD-to-CAD Interoperability project and the Maryland Safety Interoperable Communications Grant funded NCR Data Exchange Hub/Common Operating Picture Project.

The Counties which abut or are in proximity to Montgomery County and the District of Columbia operate daily as mutual aid partners. In addition to the District, these include Frederick, Howard, Carroll, Charles, and Prince Georges Counties in Maryland, and Fairfax, Arlington, Loudoun, Stafford, and Prince William Counties and the City of Alexandria in Virginia. The Metropolitan Washington Airports Authority (MWAA) is also a mutual aid partner within the region.

Each of these jurisdictions provides law enforcement and fire-rescue services within their own boundaries. They also cross jurisdictional boundaries to provide public safety mutual aid to neighboring entities.

(Prince Georges County, Maryland, does not yet have, as of this writing in July of 2009, the same ability to directly interoperate with Montgomery County as the other neighbors, but has a new radio system under construction which will bring them up to and beyond the same capabilities of their neighbors.)

The National Capital Region has been cited by Michael Chertoff, the nation's Secretary of Homeland Security, 6/2007-1/2009, as an example of how mutual aid ought to be provided and of how interoperability ought to work. In his words:

> "A great example of what a region can do with effective interoperable communications is right here in the national capital region. Today, as we speak, all first responders in the NCR, whether they're from Maryland, D.C., or Virginia, can communicate with each other, either directly or through the use of bridging or gateway technology. What this means in real life is that firefighters and police can talk to each other, not only within the same political jurisdiction, but across jurisdictions."

Montgomery County has been and continues to be a leader in the development of the technology, the operating standards and procedures, and the use of inter-jurisdictional interoperability.

3.2 Application Strategy

A long-term application strategy is essential to rise above the endless cycle of performing reactive stop-gap measures to support existing technology solutions as they inevitably age. The

first step is to take inventory of all existing technology applications supporting the business. The Application Portfolio Management process identifies, measures and justifies the benefits of each existing application in comparison to the costs of the application's maintenance and operations.

New applications, supporting ever-changing business requirements, must be developed based on a set of proven, repeatable processes to ensure the technology delivers on the anticipated value to the business. A critical component of introducing new applications to the portfolio is performing a "build vs. buy" analysis. In recent years, Geographic Information Systems (GIS) services have been a vital component the development of new applications.

3.2.1 Portfolio

In 2008, the Department of Technology Services began the effort to identify all applications currently in use supporting the business functions of the Montgomery County Government. By creating an enterprise application portfolio, Montgomery County is better able to:

- Establish a consistent view of applications and their attributes across the enterprise
- Prioritize and align technology assets within the County's mission statement
- Balance technology investments across the organization
- Identify multiple systems that support the same function across different organizations
- Use rational decision-making processes for large initiatives like the Enterprise Resource Planning (ERP) implementation
- Reassess and rebalance priorities in an ever-changing environment
- Adhere to mandated compliance and regulatory requirements

The critical component in establishing an enterprise application portfolio is the definition of an application. Montgomery County Government has defined an application as a business system having all of the following characteristics:

1. It enables the manipulation of data to serve a specific business need of Montgomery County
2. It automates a business process or a part of a business process
3. It is used to make business decisions
4. It is accessed by multiple users
5. It is shared across the network

The Application Portfolio will be the primary repository of business system information for the Montgomery County Government. For each application, the following major categories of information must be collected and maintained in order to realize the benefits of the portfolio:

1. General Application Information
2. Platform Characteristics
3. Operational Characteristics
4. Business Characteristics
5. Cost Information
6. Interface Characteristics
7. Data Conversion Information (for the ERP Implementation)

The Application Portfolio is the summary of all applications supporting the business, whether localized to one department or serving the needs of multiple departments. The process of bringing the business together to collect this information has raised the awareness of the number of applications in place today, the costs of maintaining these applications and the

opportunities for collaboration going forward. A well maintained Application Portfolio will provide business decision makers the information necessary to prioritize technology investments based on the priorities of the business.

3.2.2 System Development Life Cycle

Montgomery County Government's System Development Life Cycle (SDLC) process establishes the foundation for making the development and operations of technology applications a consistent and repeatable process. By following the established SDLC, the County can expect application development projects will result in a high quality system that meets or exceeds customer expectations, reaches completion within time and budget projections, provides value to the organization and can be operated and maintained in a predictable, efficient manner.

As technology systems have become more complex, a number of popular SDLC models have evolved in the industry: waterfall, spiral, rapid application development (RAD), iterative, etc. Each of these approaches has strengths and weaknesses relative to the size and functions of the proposed applications as well as the specific technologies and interfaces required during systems development.

Montgomery County Government has developed a Project Life Cycle consistent enough to provide a solid, repeatable framework for developing applications, yet flexible enough to allow for varying SDLC approaches. This Project Life Cycle is based on the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK) guide.

3.2.3 Build vs. Buy

One of the most critical decisions at the beginning of any new technology project is performing a "build vs. buy" analysis. Which path will most efficiently address the business problem at hand: building a custom application from scratch or purchasing something off the shelf? The answer differs depending on the details of the specific business need and the "maturity" and "fitness" of the industry offerings available for purchase.

New application requests must be analyzed from the business need perspective. In finding a technology solution to solve these business needs, the following questions should be asked:

- Is the business need unique to the County?
- Do any off-the-shelf applications exist to meet the business need?
- Are required interfaces so complex that the work involved to integrate a packaged solution will exceed the effort to build from scratch?
- Will an off-the-shelf solution add structure to a poor business process?
- Will an off-the-shelf solution be implemented quicker?
- Is the business willing (or able) to change business processes to avoid expensive customizations to an off-the-shelf package?
- What are the future costs for operations and maintenance?

The key strategic element in performing "build vs. buy" analysis is to separate the business need from technology requests for specific technology solutions. Ensuring that this analysis is

performed with careful consideration will increase the probability that the County's future investments in technology solutions will be the most efficient.

3.3 Operations & Infrastructure

3.3.1 Standards

Operational

Law Enforcement Operational Standards affect both 9-1-1 Dispatch and Records Management Functions. 9-1-1 Dispatch Systems must take into account and/or comply with:

- State of Maryland Public Safety Article Section 1-301 to 1-312 that define and provide a set of basic requirements for Enhanced 9-1-1 Systems in the state.
- State of Maryland COMAR Title 12, Subtitle 11, Chapter 3 which outlines minimum standards for enhanced 9-1-1 systems to include system capacity, capabilities, and call answer times.
- Maryland Emergency Number Systems Board 9-1-1 Policy Manual which establishes guidelines for Primary, Secondary, and Back-up Public Safety Answering Points (PSAP).
- Commission on Accreditation for Law Enforcement Agencies (CALEA) Standards which establish a set of professional standards in the areas of Radio Communications, ECC Resource Coordination; Event Recordation; and the Routing of Calls for Service.
- FCC Rules and Regulations governing Public Safety Radio Systems and Spectrum.
- The National Emergency Numbers Association (NENA) publishes both operational and technical guidelines in the 9-1-1 arena.
- The Association of Public-Safety Communications Officials – International (APCO) publishes guidelines and standards in the Public Safety Radio, 9-1-1, and Call Handling/Computer Aided Dispatch arenas. They are an American National Standards Institute (ANSI) accredited Standards Developer.
- Law Enforcement Information Technology Standards Council (LEITSC) Standard Functional Specifications for Law Enforcement Computer Aided Dispatch (CAD) Systems.
- National Information Exchange Model (NIEM) contains published Information Exchange Package documents (IEPD) that set standard for the exchange of CAD event, unit, and message data.
- National Incident Management System (NIMS) sets standards for the establishment of Incident Command Systems.

Records Management Systems must take into account and/or comply with:

- Maryland State Laws regarding the reporting and submission of Uniform Crime Reports (UCR) data.
- Maryland State Laws to include the Maryland Public Information Act pertaining to the dissemination, retention, and expungement of Criminal Justice Records.
- Federal National Incident Based Reporting Standards (NIBRS).
- Commission on Accreditation for Law Enforcement Agencies (CALEA) Standards which establish a set of professional standards in the areas of event and arrest data record collection and retention.

- Law Enforcement Information Technology Standards Council (LEITSC) Standard Functional Specifications for Law Enforcement Records Management Systems (RMS).
- National Information Exchange Model (NIEM) contains published Information Exchange Package documents (IEPD) that set standard for the exchange of Incident, Arrest, Citation, and Warrant data.
- National Incident Management System (NIMS) sets standards for the establishment of Incident Command Systems.
- FBI National Crime Information Center (NCIC) standards for the entry and query of Law Enforcement Data.

As the secondary PSAP, Montgomery County Fire/Rescue relies heavily on the Primary PSAP to ensure adherence to applicable rules, regulations, and laws especially as they apply to call routing, and initial call management. Of the Law Enforcement Operational Standards that affect both 9-1-1 Dispatch and Records Management Functions the following also apply to the operation of the secondary PSAP:

- Maryland Emergency Number Systems Board 9-1-1 Policy Manual which establishes guidelines for Primary, Secondary, and Back-up Public Safety Answering Points (PSAP).
- FCC Rules and Regulations governing Public Safety Radio Systems and Spectrum.
- The Association of Public-Safety Communications Officials – International (APCO) publishes guidelines and standards in the Public Safety Radio, 9-1-1, and Call Handling/Computer Aided Dispatch arenas. They are an American National Standards Institute (ANSI)-accredited Standards Developer.
- National Incident Management System (NIMS) sets standards for the establishment of Incident Command Systems

Additionally, Fire/Rescue Communications must ensure compliance with:

- State of Maryland COMAR Title 30 which governs Emergency Medical Response and Reporting
- National Fire Incident Reporting System (NFIRS) which is also along with NIMS a primary requirement for federal grant funding
- National Fire Protection Association (NFPA) consensus standard, especially with regards to resource allotments and response time criteria
- Washington Metropolitan Council of Governments (COG) agreements

Technical

The Public Safety systems follow the County's overall infrastructure architecture and standards for hardware, software and technical operations. Some of the public safety systems are proprietary by nature or design, however all systems must meet minimum architecture and supportability requirements. Moving forward, the County anticipates that as future systems are selected and deployed, they will continue the trend of meeting or exceeding the county standards at increasing levels.

Mobiles

As the County has gained experience with using and managing the mobile infrastructure, we have found that the enterprise best practices also work well in a public safety environment. The County has moved to a single standard for mobile computers. The

County now deploys only ruggedized units from a single model family from an industry leading provider. This has dramatically increased the reliability, reparability, and manageability of the mobile inventory.

The mobiles are not included in the Enterprise Desktop Computer Modernization (DCM) replacement program. The County funded one year of a four year replacement plan in FY09. An ongoing replacement program is imperative to meet continued business and operational needs, and is anticipated when fiscal conditions allow. The mobiles are used for both dispatch and department business process functions as illustrated in the following diagram.

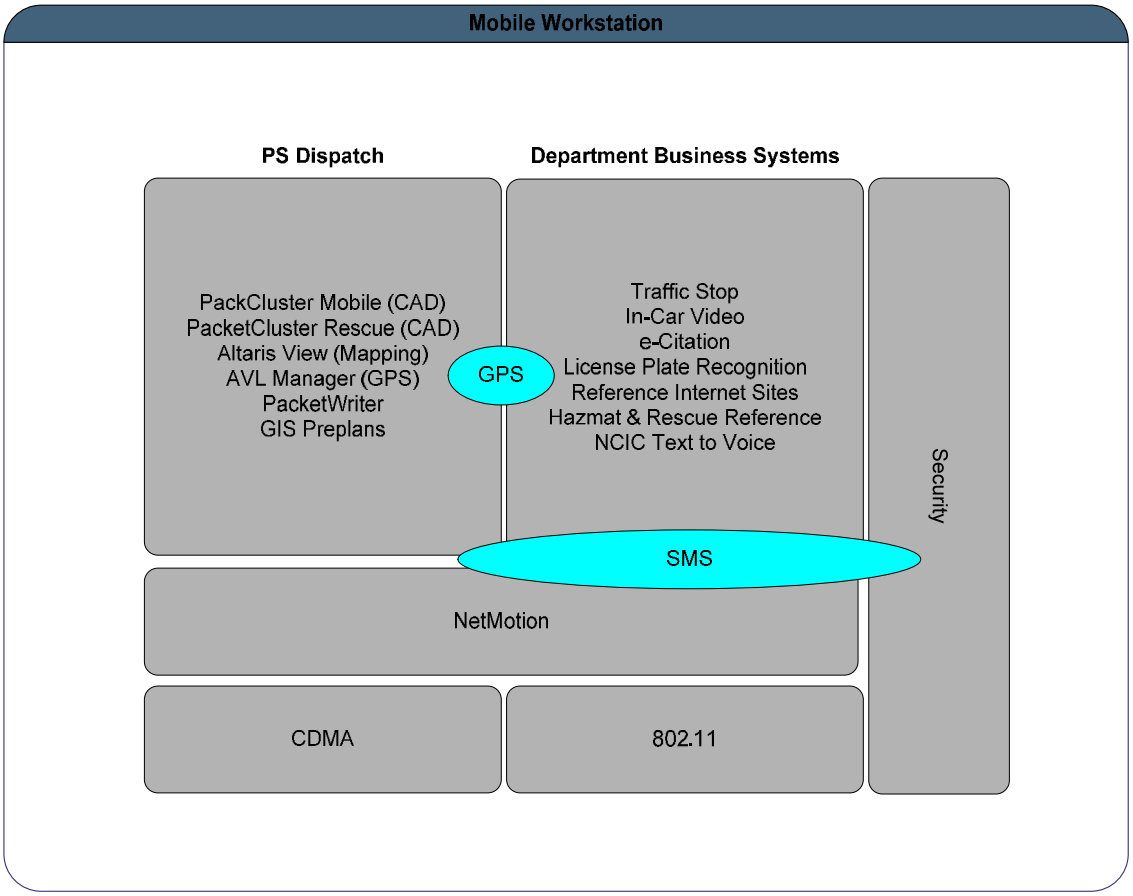


Figure 2- Mobile Workstation

Workstations

The public safety fixed workstations are full seat PCs under the Enterprise DCM program and are replaced on the Enterprise 4-5 year replacement cycle. The workstations are based on standard high-end PCs with some enhancements such as larger monitors and dual monitors PSCC dispatch workstations. The workstations are used exclusively for public safety functions as illustrated in the following diagram.

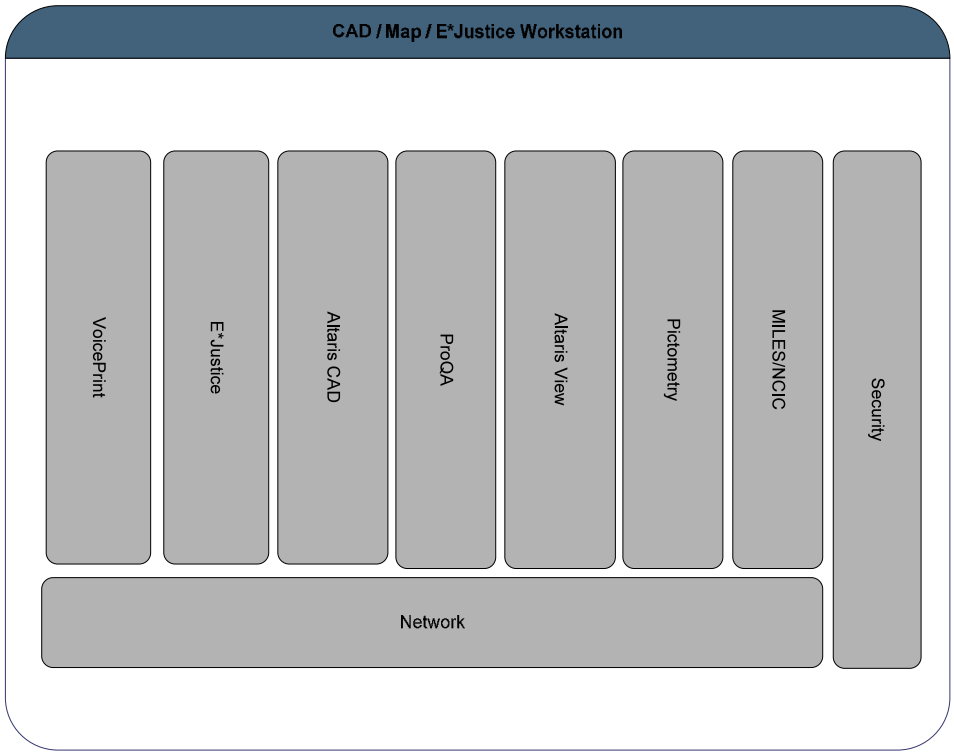


Figure 3- CAD/ Map / E*Justice Workstation

Servers

The County was an early adopter of virtualization, and has been recognized by commercial vendors and government peers as a leader in application of server virtualization. DTS has implemented this technology in the public safety infrastructure bringing improved services, processes and savings in the areas of server consolidation and server cloning.

As in the enterprise, DTS reduced the time for public safety server provisioning from weeks to minutes. DTS maintains master copies of the server standard operating systems it supports and can respond to project and department requests for servers in near real-time.

In conjunction with the adoption of virtualization, DTS also updated server hardware specifications to optimize the advantages virtualization offered, including matching the storage configuration to allow for making and storing “snap shots” of the virtual servers at any point in time. This had a dramatic effect on server patching and upgrades and server recovery. Server failures from patching and upgrades has been eliminated, reversion from a failed upgrade can be done easily by going back to the “snap shot.”

Server standardization and virtualization has been applied to core system support servers. DTS plans to implement the same standardization and virtualization to the core CAD and RMS systems as they are upgraded and replaced.

As with hardware in the Enterprise, both mobiles and servers have a defined life span that is dictated by hardware aging and continuous software evolution, and must be

replaced periodically. The PSCS workgroup is working to establish a replacement plan for both mobiles and servers.

Open source Software

DTS has been selective in the application of open source, targeting areas where open source is mature and where a high return of investment could be realized. A list of the current open source software employed in public safety systems and interfaces to other County systems is given below.

Figure 4- Currently employed open source software

Infrastructure Function	Open Source Software
Virtual Server	VMware
Operating System	CENTOS Linux
J2EE Middleware	JBOSS
Enterprise Services Bus	MULE
Webserver	Apache
Version Control	SVN (subversion)

DTS will continue to investigate opportunistically and adopt open source when it is found to meet the needs of business and fit into the County and public safety IT architecture.

Open standards (i.e., LDAP, XML, J2EE, etc.)

The Service Enabled Domain promotes the development of robust, scalable and flexible services for business integration with the County infrastructure. The goal is to achieve a cooperative and secure service and data sharing environment, and to avoid data replication

The County recognizes the importance of developing Services capable of integration with internal and external systems. To maximize the interoperability of Public Safety and County systems, the platform adheres to open architecture, conforming to open standards. The following table lists the County's supported standards and protocols.

Figure 5- County's supported standards and protocols

Open Database Connectivity (ODBC)
Lightweight Directory Access Protocol (LDAP)
Transmission Control Protocol (TCP/IP)
Extensible Markup Language (XML, XSLT)
HyperText Markup Language (HTML, XHTML)
Java, J2EE
Enterprise Java Bean (EJB)
Java Messaging Services (JMS)
Service Oriented Access Protocol (SOAP)
Secure Hypertext Transfer Protocol (HTTPS)
Web Services Description Language (WSDL)
Universal Description Discovery and Integration (UDDI)

An event-based, messaging model was adopted to help avoid stovepipes (rigid, self-contained functionally organized service solutions for each department, not acting as a

single-entity). To do this, the County hosts a healthy mix of services. Some have been developed in-house, and some are Commercial Off- The-Shelf (COTS) solutions. Each application will document and publish well-defined interfaces to the protocols identified in this section.

An events-based messaging service will foster the maturation of service implementations based on Service Oriented Architecture (SOA). The County encourages the use of XML to define event messages, Web Services technologies for integrating .NET and J2EE services and Enterprise Java Bean (EJB) for integrating J2EE services.

3.3.2 Environment

Public Safety Communications Center

The Public Safety Communications Center (PSCC) opened in 2003 and is a two-story leased building located in Gaithersburg. This facility is occupied by staff from the Department of Police (MCPD), Department of Fire Rescue Services (MCFRS), Office of Emergency Management and Homeland Security (OEMHS), Department of Transportation (DOT) and the Department of Technology Services (DTS).

The PSCC consists of operational floor areas, support offices, IT and communications rooms, and support facilities (locker rooms, kitchen/break room, bunk room) to support 24 hour operations. Three Primary Operational Functions are located within the PSCC:

1. Emergency Communications Center (ECC): MCPD and MCFRS are co-located performing Primary and Secondary 9-1-1 Public Safety Answering Point (PSAP) and Public Safety Dispatch Operations.

2. Traffic Management Center (TMC): Management and monitoring of DOT's Traffic Signal System Control and Traffic Surveillance Cameras. Provides central communications for Ride On Transit Bus System.

3. Emergency Operations Center (EOC): Staffed onsite by OEMHS in support of the Emergency Management Group (EMG) to effectively manage and coordinate the County's unified response, mitigation, and recovery from the consequences of major threats that may harm, disrupt or destroy our communities, commerce and institutions should they occur.

Alternate Emergency Communication Center

The Alternate Emergency Communications Center (AECC) is a three-story building located in Rockville. This facility serves as an unmanned back up center for the ECC should that center became operationally degraded or destroyed. The AECC has the same operational capabilities as the ECC, but at a 70% capacity. The Communications equipment, 9-1-1 Phone System and Public Safety Radio System are in a hot standby mode while the Public Safety Data Systems, CAD, RMS, etc, are in a warm standby mode.

The facility is maintained and is capable of being staffed and operational at any time. 9-1-1 PSAP and Dispatch Operations are completely transferred to this center at least quarterly in order to exercise the equipment under live conditions and to exercise the ECC Emergency Action and Evacuation Plan.

800 MHz Voice Radio Network

The 800 MHz voice radio system is a network of radio receiving and transmitting stations at various locations around the County. The radio system provides trunked voice radio communications for its users, in particular for public safety users (Police, Fire/Rescue, Sheriff, et al.).

The system provides command and control voice communications between the headquarters elements and field personnel of various customer departments. The system consists of the central infrastructure components (Figure 6.0) and the subscriber radios. The central infrastructure includes the Master Site at the PSCC, the Prime Site, the radio remote sites, and the interconnecting circuitry. The Prime Site equipment provides the trunking functions of the radio system and controls the transmitters and receivers of the individual remote radio sites. The Master Site equipment provides the control and switching of the audio paths for the entire voice radio system, and the interface to the dispatchers' consoles. The eleven individual radio remote sites are the locations of the transmitters, receivers, antennas, and ancillary equipment. The interconnecting circuitry includes a combination of Fiber Optic and microwave links.

The primary dispatch center at the PSCC houses dispatchers as well as the radio system Master Site. In the event of having to abandon the primary dispatch center, there is a secondary dispatch center at the AECC with full radio console and CAD capability, which can be used by the dispatchers.

There are a number of locations, in and around the County, equipped with low powered bi-directional amplifiers (BDA's). The BDA's rebroadcast signals from the radio remote site antennas, to mobile or handheld radios operating in areas of poor or restricted signal coverage. Examples of these locations include the Potomac River basin, the WMATA subway tunnels and certain buildings. Vehicular repeaters are also used to enhance the coverage of the radio system's signals in areas of poor coverage.

The radio system is maintained by the Communications Technicians of the DTS Radio Communications Services Section.

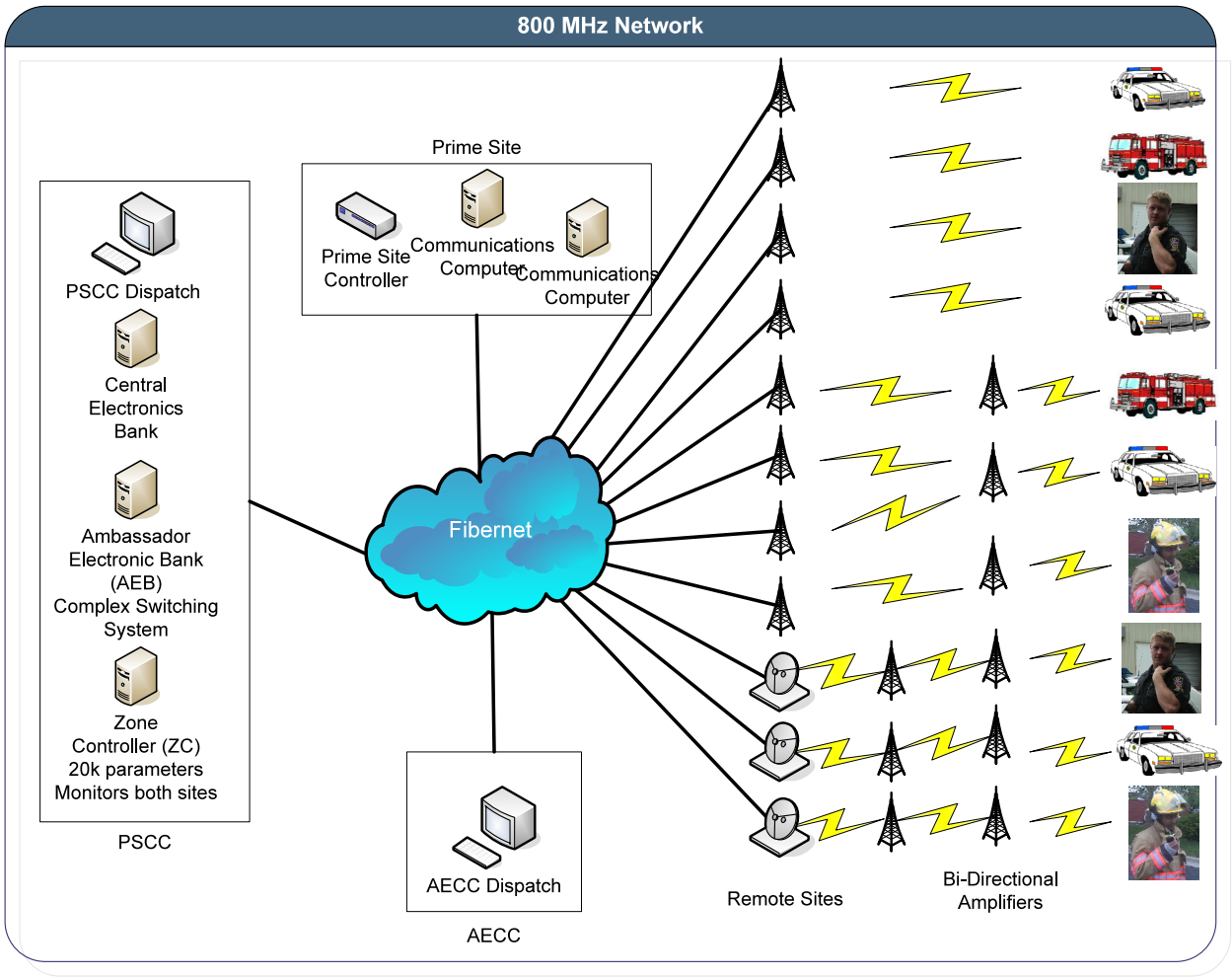


Figure 6- 800 MHz Digital Radio Network Architecture

In the County's trunked radio system, radio users are grouped by functional teams, and communicate by selecting pre-programmed radio functions called talkgroups. There are approximately 290 talkgroups in the County's voice radio system. These talkgroups provide communication for members of different workgroups, departments, geographic sub-units of departments (e.g., police districts), and agencies. The voice system's control computers provide data to the Computer Aided Dispatch system which automatically identifies units and field personnel as they transmit. The system also provides for automatic fire station alerting.

Nextel Rebanding

On August 6, 2004, the Federal Communications Commission (FCC) issued a Report and Order that modified its rules governing the 800 MHz band. The stated purpose of the order was to reconfigure the 800 MHz band to eliminate harmful interference to public safety radio communications systems in the band. (The source of the harmful interference was the transmitters of Nextel.) The requirement levied upon Montgomery

County and all other public safety radio licensees, nationwide, operating in the 800 MHz band is to change the frequencies of all transmitters and receivers, both subscriber and infrastructure. This process is called rebanding. The requirements levied upon Nextel and its nationwide corporate structure, including its parent companies, are to pay the entire cost of the process of rebanding and to provide to the public safety licensees, after rebanding is completed, facilities and operations which are comparable to those which the licensees had prior to the start of rebanding.

The FCC's Report and Order guaranteed certain rights to the public safety licensees. In addition to the right to comparable facilities after the completion of rebanding, these also included a guaranteed right to continuity of service during the process, the right to avoid any more than a "minimal" disruption of operations during the process, the right to a redundant system, if rebanding was projected to entail more than a minimal disruption of service, and the right to full reimbursement of all reasonable costs.

The Commission appointed a "Transition Administrator" to oversee and administer the rebanding process. The Transition Administrator established a calendar which mandated, among other things, completion of all rebanding activities by June 26, 2008. That date was not met.

The Federal Communications Commission, the Transition Administrator, and Nextel have grossly underestimated the complexity of the rebanding process, have grossly underestimated its impact on the public safety radio licensees of the nation, have grossly underestimated the costs of the process, and have grossly underestimated the length of time necessary to accomplish the goals of the program.

One area in which the complexity has been underestimated is the impact of rebanding on the interoperability of the licensees in the National Capital Region. As was noted above the NCR has an extensive and highly developed system of interoperable communications. Rebanding without extremely tight coordination among the NCR members will destroy the ability of the NCR partners to interoperate effectively, which would constitute a disastrous impact on the public safety of the region.

On June 30, 2008, the FCC acknowledged that its deadline of June 26 would not be met.

The entire program for the rebanding of the 800 MHz public safety band is so far behind schedule, that it is impossible to project when the County will be operating on its new frequencies. The commission has not even chosen to set a new deadline, for fear (a near certainty) that it will miss that one, too.

The unpredictability of the rebanding program is significant to the timing of the procurement of new radio equipment for the County, because some equipment may need to be replaced as part of the rebanding process.

9-1-1 CAD Operations

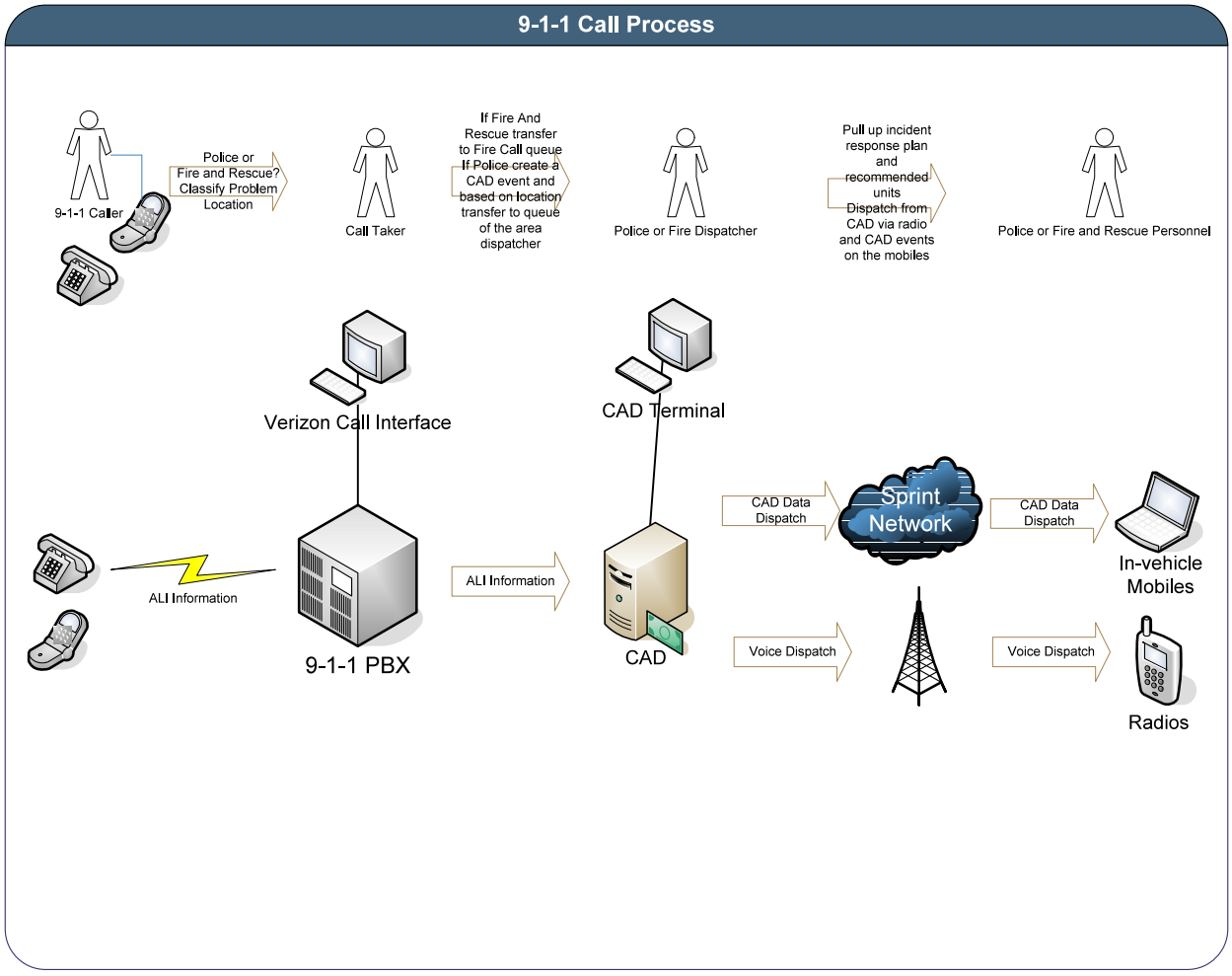


Figure 7- 9-1-1 Call Process

The Call Center Software is set up to handle multiple call taking queues. When a 9-1-1 call is taken into the system it is assigned to a queue. Multiple dispatchers are assigned to the queues. Dispatchers take the next call in the queue and run through their business process.

When a 9-1-1 call comes in it is assigned to the Emergency queue. When the next dispatcher assigned to that queue takes the call and the ALI (Automatic Location Identification) information shows up on the call taking screen. They ask the caller what the emergency is. If the emergency is Fire or Medical then they are transferred to the Fire Call taker queue. Essentially, the call is transferred to a different bucket on the switch.

If the call is for police than they look at the location of the caller and decide which police have jurisdiction. If the caller is in a park then the call is forwarded to Park Police, if it is on 270 the call is forwarded to Maryland State Police, if it is in Takoma Park the call is forwarded to Takoma Park Police, etc. If the call is not meant for another department then it goes to Montgomery County Police.

Fire/Rescue

Fire/Rescue 911 calls are routed to a Fire/Rescue Call Taker. They first ask the 911 caller if it is a fire emergency or a medical emergency. If it is a medical emergency, then the Fire/rescue Call taker follows a scripted process using Emergency Medical Dispatch (EMD) Protocols in the Proactive Quality Assurance (ProQA) software integrated with CAD. EMD is a process mandated by the State of Maryland in COMAR Title 30, which requires the Fire/Rescue Call Takers to use a scripted protocol to categorize the 911 caller's medical condition and provide appropriate Dispatch Life Support pre-arrival instructions to the 911 caller.

There are three Talk-Group Operators, with one Dispatcher (7-alpha) utilized for dispatch of units and routine radio traffic, the second Operations (7-bravo) for managing units assigned to and operating on events, and the third for managing units assigned to and operating on major events. The Dispatcher receives the CAD event, brings up a suggested response plan that recommends units, and then dispatches the units. The CAD system sends information to the dispatched unit's mobile computers and the stations are alerted through the Station Alerting System. The Station Alerting System contains light queues, sound queues, video information, and voice.

Once the units are on their way to the call they are managed by the Operations Dispatcher.

Police

The Call Taker will triage and classify the call and create a new CAD Event. The CAD Event will have the ANI/ALI (Automatic Number Identification and Automatic Location Identification) information from the switch. The CAD event is assigned to the proper district dispatcher based on the location. The Dispatcher pulls up the response plan defined in CAD and the recommended units. They then dispatch the units. The CAD event will be downloaded to the vehicles mobile computer and the dispatcher calls the unit through the 800 MHz radio system. The dispatcher manages the officers that are in their area all the time.

Voice Print

The VoicePrint Audio Logging System provides for 24/7/365 recording of the 9-1-1 Telephone Systems at the ECC and the AECC and of the recording of 800 MHz Trunked Radio talk groups and analog channels associated with the County's Public Safety Radio System. The system was refreshed and upgraded in 2008 and consists of multiple server sets geographically distributed between the ECC and the AECC to support redundancy and survivability. Both thin and thick clients are located within the Communications Centers. The system has audio and data interfaces to the 9-1-1 Telephone and Public Safety Radio Systems.

This system records, timestamps and catalogs every telephone and radio transaction between public safety providers, ECC staff and the public when emergency services are requested. The recordings determine who said what, when and on which channel. Recordings (data) collected

are used to study the evolution of incidents, facilitate State mandated QA processes and by the State's Attorney Offices to prosecute cases.

E*Justice Records Management System

The E*Justice Records Management System supports Montgomery County Police and Sheriff and includes the police arrests, citations, crime reports and warrants that are now maintained in Criminal Justice Information System(CJIS). The E*Justice System is owned and developed by CrimeCog Technologies. Montgomery County has purchased the RMS component in the E*Justice System.

The RMS component is a case management system for inputting and retrieval of police incident reports and field arrest data. The Police and Sheriff In-Vehicle Mobile Data Computers run a software package called PacketWriter. With PacketWriter police officers fill out incident and arrest information in the field. The information follows a workflow with the information being forwarded to a supervisor for review and approval. Following approval the data is sent to E*Justice. E*Justice will contain all the MCPD arrest information. It will maintain a replicated server that will support an Inquiry Adapter.
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Public Safety Enterprise Service Bus

The Public Safety Enterprise Service Bus (ESB) is an instance of the Enterprise Service Bus defined in the base Montgomery County Information Technology Architecture. The Public Safety ESB only handles public safety data. It provides a modern Service Oriented Architecture service bus for exchanging public safety data between the Montgomery County Public Safety Systems as well as with external Public Safety data sources such as the State of Maryland.

An example of one Public Safety exchange is with the State of Maryland Arrest Booking System. The Public Safety ESB receives a daily feed of arrest information for arrests that took place within Montgomery County. The ESB receives the feed and splits the data into MCPD arrests and non-MCPD arrests. The MCPD arrests are sent to the E*Justice system and the non-MCPD arrests are sent to the IJIS Arrest History database.

The use of a modern ESB allows the County to reduce expensive point to point data exchanges and allows systems to register for common data feeds. This reduces the cost to maintain the individual systems.

MCPD Mobile data computers (MDCs)

The MCPD In-Vehicle Mobile Computers are ruggedized Panasonic laptops that officers can use to carry out their police functions. The mobile computers are connected to a CDMA network and have access via the IP protocol to various functions. Specifically, MCPD Mobiles allow officers to:

- View and respond to CAD events
- Create Police Incident Reports
- Run background checks via:
    - Maryland Interagency Law Enforcement System (MILES)

    - National Crime Information Center (NCIC via MILES)
    - National Law Enforcement Telecommunications System (NLETS via MILES)
    - Motor Vehicle Administration (MVA via MILES)
    - State s Arrest Booking System (ABS)
    - E*Justice
- Interface with Panasonic Arbitrator In-Car Video Camera and Electronic Citation printer and scanner

MCFRS MDCs

The MCFRS In-Vehicle Mobile Computers are ruggedized Panasonic laptops that responding units use to communicate with 9-1-1 call center via CAD. The Mobiles are connected to a CDMA network and have access via the IP protocol to various functions. Specifically, MCFRS Mobiles allow personnel to:

- View and respond to CAD event
- Communicate with other units responding to the incident

FIREHOUSE

The FIREHOUSE System supports Montgomery County Fire and Rescue functions. It is a Records Management System designed to support Fire Departments and EMS agencies functions. Its core software contains the following functions/modules:

- Incident Report
- Incident Investigation Report
- Staff Members, Activity and Training
- Staff Training
- Staff Training Programs
- Apparatus, Equipment, and Inventory
- Hydrant management
- Occupancy
- Occupancy Inspection
- Code enforcement inspections (includes billings)

The incident reports gather National Fire Incident Reporting System (NFIRS) mandated operations data. The NFIRS data is sent to the State Fire Marshall every month.

ePCR (Electronic Patient Care Reporting System)

The ePCR system will support Montgomery County Fire and Rescue (MCFRS) functions related to Emergency Medical Services (EMS) operations. It is an electronic patient care reporting system that is necessary to meet state standards for reporting data and patient records established by the Maryland Institute for Emergency Medical Services System (MIEMSS).

The system will be used by MCFRS field providers to document all EMS patient encounters. The system will provide the reporting capabilities to satisfy the MIEMSS reporting standards to the State as well as provide information to MCFRS for determining services needs and improving quality of service.

State / Federal Interfaces

Montgomery County Public Safety Systems receive and exchange information from various federal, state and regional information systems. Links include direct wireline from state agencies and IP based exchanges through data hubs. The data exchanges include first responder and investigative queries, inputs to regional, state and national databases, and links with communication – data exchange sources. Some of these interfaces are:

- Automated Booking System: PacketWriter data provides input data to ABS to populate some of the booking fields prior to the processing of a prisoner at the Central Processing Unit. ABS provides interface to Maryland State Booking System and to the E*Justice Records Management System.
- MILES: Wanted and stolen checks are initiated through the PSDS PacketCluster application via the PSDS interface to the state system. Responses are received from the state and displayed in the PSDS system A second interface exists from the State to the County mainframe for exchange of queries and criminal history data. In 2010 the system will be renamed METERS and become a web based interface/link
- NCIC is the federal National Crime Information Center data base and is linked through the MILES link.
- NLETS is the National Law Enforcement Telecommunications System and is linked through MILES
- MRC is a hardline link to the state law enforcement information system and is maintained at Police headquarters.
- LINX is the regional law enforcement data sharing exchange. There is an outgoing data interface between the RMS and LINX.

IJIS Interfaces

IJIS Inquiry is a web-based Integrated Justice Information System (IJIS). It provides a central query system of the various public safety data sources. IJIS serves as a mission-critical information system that links together and provides access to current and future public safety and criminal justice information systems in the County.

It supports the following queries:

- Wanted Person Checks
- Person Background Checks

Against the following data sources:

- Montgomery County CJIS
- Montgomery County E*Justice
- IJIS Arrest History
- CRIMS (future)

- SAO (future)
- JJIS (future)

Specifically, the IJIS Inquiry Application will allow authorized users the ability to perform automated Wanted Person Checks and Person Background Checks against a wide variety of data sources. Previously, to perform a Wanted Person Check or Person Background Check, an authorized user had to access over ten disparate systems to obtain the necessary information they required. These systems all have different security requirements, query parameters, and query result screens. The user had to then decipher the information from these applications and determine if the resulting information is what they need.

WEBEOC

WebEOC is a web-based emergency management communications system which can link local, state and regional resources to facilitate sound decision making in emergency situations. WebEOC provides secure, real-time information and access to state and national weather trends, satellite images, mapping information, details of operations in other jurisdictions, local, regional and even national resource status and other data vital to the efficient management of any contingency. WebEOC has become the standard used by all levels of government including: the State of Maryland, the National Capital Region (NCR) as well as many federal agencies and healthcare associations. The implementation of WebEOC in Montgomery County will allow for interoperability between multiple agencies in the event of an emergency or disaster.

Montgomery County was able to secure funding for WebEOC through the Urban Area Security Initiative (UASI) for the National Capital Region (NCR) and is currently in the process of implementing this program for use in our Emergency Operations Center.

False Alarm Reporting System

The False Alarm Reduction Section (FARS) of the Montgomery County Department of Police was created to administer the County's alarm law. The FARS's main function is to reduce the number of false alarms to which police respond each year. The FARS licenses alarm companies, registers alarm users, sends notification of false alarms and bills for excessive false alarms to alarm users, ensures that appropriate inspections and upgrades of alarm systems occur, and handles informal appeals regarding the false designation of alarm activations. To carry out their mission, FARS operates a False Alarm Tracking and Billing System (FATB).

FATB and the Computer Aided Dispatch System (CAD) are interfaces in support of this mission. CAD event data related to Alarm calls and events is captured in CAD and uploaded to the FATB system on a daily basis. The FATB system in-turn provides CAD with daily updates of Alarm Business and Alarm User Records that assist and speed of the delivery of police service in response to residential and commercial alarm activations in the county.

Station Alerting

Station alerting is the method by which fire/rescue worksites are alerted to emergency incidents. Currently, in most work sites, when a dispatcher presses the dispatch button an encoded radio

frequency (RF) signal is transmitted using existing county radio infrastructure. This code sets off a series via a Motorola (MOSCAD) box in the worksite, a series of audio and/or visual alarms at fire stations making them aware that they are needed or a call. Motorola no longer supports MOSCAD boxes, there are no replacement parts available, and they have reached end of life such that they are becoming increasingly more difficult to maintain.

Council has already approved and fire/rescue is in the process of upgrading current MOSCAD alerting system with a newer WESTNET system that will also require an interface with CAD. As technology continues to develop and more mobile devices with IP capabilities are added the type and method of station alerting will continue to evolve. For the foreseeable future voice radio will continue to be the primary tool for the dispatch and management of fire/rescues resources, but other tools such as station alerting continue to be critical subparts of the fire/rescue service provision.

Change Management

The PSDS organization change management processes have been developed and followed since 2005. The procedures are updated as needed to address new technologies and user level requirements. There are many key areas of change management that are used daily for the public safety system. These main areas include process control, stakeholder approvals, notifications, software management, version controls and system changes. Described below are a few of the key CM structural examples used in the day to day operations:

Change Control Board (CCB) / Workgroup Committee

- Established to review, approve change requests and to oversee the work related to the Public Safety systems as well as monitors the day to day activities.
- Composed of DTS (Department of Technology Services), Law enforcement and Fire Rescue agency members.

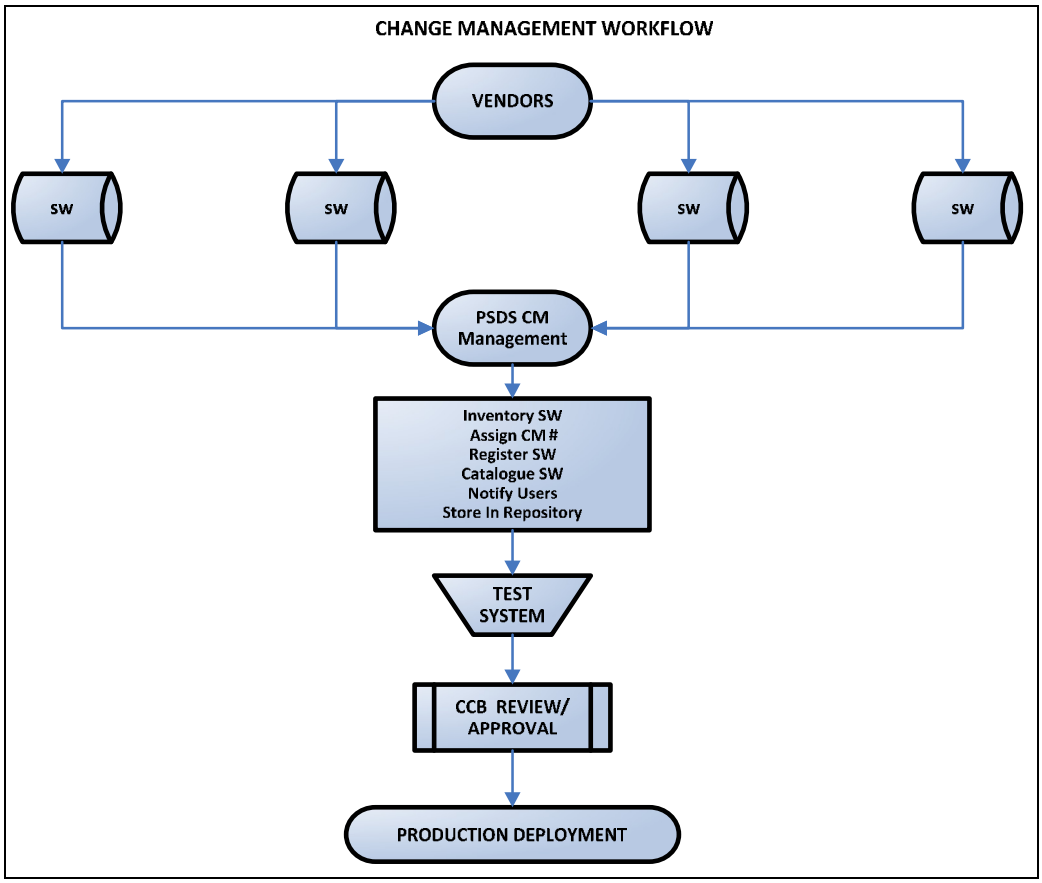

Figure 8- Change Management Workflow

Software Intake Process

1. Software obtained from the designated public safety vendors.
2. The software is catalogued, dependencies and related information are identified, a physical copy of the CD is made (if not already available), registered with a CM #, notifications are sent out to the Stakeholders.
3. The software is posted in the relevant repositories.
4. The software is installed on a test system and tested by the PSDS staff and key agency personnel.
5. The Public Safety CCB workgroup review for approval of the software into production.
6. Deployment of the software in production.

Operational Tasks and Activities

- Change Requests for the public safety system are submitted to the PSDS team.
- The PSDS team obtains the appropriate level of approval for the work.
- Scheduling and tracking of the work tasks are entered into the scheduling database for tracking and notification statuses.

Operational Scheduling

- Urgent fixes or system level activity that are critical to the immediate well being of the system will be planned as an emergency “out of schedule” activity and will be

performed on a case by case basis with agreement of the Police and FRS agency stakeholders.

- Planned changes and system maintenance is performed in specified time windows designed to minimize any potential impact to operations of 9-1-1.

3.3.3 Telecommunications

Montgomery County Government (MCG) is its own telecommunications carrier. In serving a community of over 950,000 residents, the County Government consumes voice/video/data services in extremely large quantities. Ensuring that the telecommunications infrastructure is reliable and available to all County employees and citizens is vital.

9-1-1 PBX

Montgomery County Police, as the County's designated Primary Public Safety Answering Point (PSAP), operates the 9-1-1 Telephone Systems within the ECC and the AECC. Each system runs independent of the other. Additionally, a set of plain old telephone lines (POTS) lines are set up and configured at the PSCC to serve as an operational bridge in the event of an emergency transfer of operations from the ECC to the AECC.

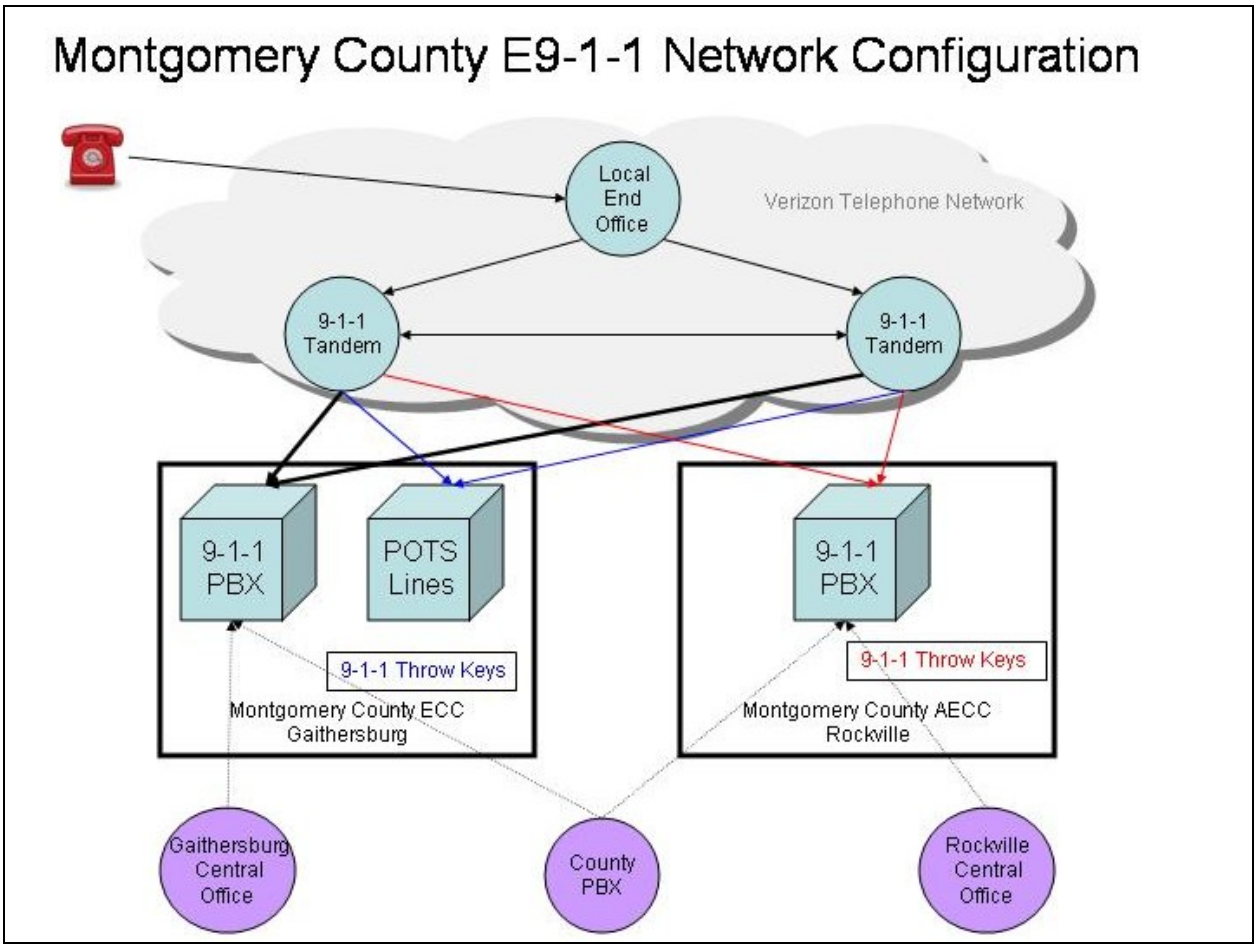

Figure 9- Montgomery County E9-1-1 Network Configuration

Verizon is the County's turnkey Contractor who is solely responsible for every facet of the County's Emergency Communications Centers 9-1-1 Automatic Call Distributor ACD/PBX equipment, software, and other provided services such as ANI/ALI. The Systems were procured in 2001 and became operational in July 2003. Through funding provided by the Maryland Emergency Numbers System Board, the County's 9-1-1 ACD/PBXs are going through full system refreshes in the early fall of 2009. All server and workstation hardware are being replaced and system software is being updated to the latest releases. These upgrades will position the County so that our internal 9-1-1 systems are in alignment with the proposed Next Generation 9-1-1 Network and System standards.

As it currently operates, the 9-1-1 Telephone Systems are on private LANs within the ECC and the AECC. There is a limited one way interface to the County's CAD and Audio Recording Systems that allow for the transfer of ANI/ALI and TDD data.

Montgomery County Network

DTS provides all transport services linking the PSDS applications across Montgomery County, the National Capital Region, State of Maryland and into the Internet. DTS maintains the networking infrastructure making up the PSDS local and wide area networks including reaching into our local municipalities and county neighbors. Most often referred to as FiberNet. FiberNet is an integral component of the County's Public Safety Communications Network. Given this systems critical importance to the County's residents, having the County own and operate the underlying transport infrastructure ensures a higher level of service availability and control than would be achievable in a leased carrier system. Additionally, in the time of a real emergency the County is in a position to regulate network access to make sure that calls go through and applications operate. On an open public network there is no preemption for emergencies.

FiberNet provides transport, security, TDM and IP layer services to the Public Safety Communications Center for all of its applications. These services include:

- Synchronous T1 circuits for the 800 MHz Trunked Radio System;
- Internet access for mobile wireless MDC access to reach into the PSDS network;
- Fixed 802.11 b/g access for MDC software maintenance via secure Wi-Fi hotspots;
- Secure LAN and WAN connectivity supporting all of the PSDS applications;
- Internet access for PSDS applications;
- High availability networking based on a partial-mesh network topology with diversely routed connections for critical nodes.

DTS is currently migrating sites from the original FiberNet ATM network to a new metro-Ethernet infrastructure based on Multi-Protocol Label Switching (MPLS)/ Virtual Private Network (VPN) technology.

Wireless

The Public Safety Telecommunications infrastructure includes both wireless voice and data communications between the dispatchers and first responders and between first responders.

The County implemented the 800 MHz Radio System in 2003 to serve both voice and data needs. The 800 MHz system has proven to be and continues to be very capable and reliable for voice communications. Over time, as the bandwidth requirements for data transmissions increased, the County began implementing other wireless solutions to meet the bandwidth needs, since the 800 MHz bandwidth could not be increased.

The county has deployed 802.11 (Wi-Fi) access points at various facilities throughout the county. These are used primarily to apply patches and push updates out to the MDCs. The 802.11 and the 800MHz infrastructures are dedicated to and maintained by the County.

The county has implemented Code division multiple access (CDMA) (currently EVDO rev a) for the data transmission needs of MDCs in first responder vehicles. The majority of this infrastructure is provided by a commercial service provider, with the County managing the security and connectivity at the termination points in the vehicles and at the Public Safety Communications Center. The CDMA solution has enabled the implementation of field reporting by law enforcement users, provided access to County email from the mobile data computers, as well as access to numerous County and Internet based business systems and reference sites.

The connection of the mobiles is deployed using a Virtual Private Network (VPN) solution. This provides two important benefits. 1) All traffic between the mobile and the PSCC is encrypted, preventing unauthorized access, and 2) the VPN solution senses what type of connection is available and seamlessly switches between the carriers allowing user to have uninterrupted work sessions when they travel from one coverage area to another.

3.3.4 Security

The County has a comprehensive security program to prevent disruptions to the operations of the public safety systems and ensures preserving of County information assets.

All computer systems have inherent risks that cannot be completely eliminated. The goal of the risk-based security program focuses on identifying risks, communicating them to the proper level of management, and maintaining identified risks at an acceptable level. Risk is managed by using the management structure to accept, decline, or transfer identified risk(s). A risk-based approach enables senior management to understand the risks associated with specific business operations and make informed decisions as to how to mitigate and manage such risks. Most importantly, risk assessments and cost-benefit analysis allows a manager to effectively plan and implement a budget that works for the overall County business goals and objectives.

The County employs multiple layers of security measures to safeguard the public safety systems including the following:

- A separate network for public safety servers and computers that is separated from other County traffic and Internet traffic by firewalls.
- Anti-virus / Anti-maleware software on all servers, workstations and mobiles.
- Ongoing server and workstation security patching.
- Periodic network vulnerability scanning.
- Virtual Private Networks to encrypt traffic between mobiles and the PSCC.

- Web filtering to limit connects between mobiles and approved sites
- Lockdown of mobiles and workstations to limit use for authorized functions.

3.4 Architecture

Starting in 2000 the Department of Technology Services initiated an Enterprise Architecture program that began with the creation of an Enterprise Architect position. The newly hired Enterprise Architect sponsored a project which resulted in the official publishing of the Montgomery County Technical Architecture document in 2003. The publication has undergone a number of updates since that time with updates published in 2004, 2005, 2007, and 2008.

In 2008 a Public Safety Enterprise Architecture effort was begun that resulted in the creation of a Public Safety Enterprise Architecture Slice. The Public Safety Enterprise Architecture slice inherits and extends the base County Enterprise Architecture. It covers the Public Safety domain. When discussing the Public Safety Enterprise Architecture by definition it includes the information in the County Enterprise Architecture.

The Public Safety Enterprise Architecture defines the following:

- Business Architecture – defines the business strategy, processes, business domains, and governance
- Technical Architecture – defines the IT infrastructure and standards
- Data Architecture – defines the business physical and logical data structure and its data management policies and governance
- Application Architecture – Application architecture and standards

The purpose for the Public Safety Enterprise Architecture is to communicate:

- the results of county business decisions (related to IT)
- the county Public Safety IT Architecture and infrastructure
- how the county manages its Public Safety data
- how the county builds or acquires Public Safety applications

In general, it communicates how the organization has invested in its Public Safety IT infrastructure. The County continues to make significant investments in Public Safety IT and must communicate to many parties how future investments align or impact the architecture and infrastructure.

The following audiences have need of information:

- Public Safety Departments Administration
- IJIS and PSCS Workgroups
- Public Safety Departmental IT
- County Council Administration
- County Executive Staff
- DTS Employees performing Public Safety duties
- Auditors

Montgomery County takes advantage of mature technologies in areas of data, voice and radio networking, datacenter operations and monitoring, hardware and software systems deployment, and application development. The Public Safety Information Technology Architecture document, prepared by the Department of Technology Services (DTS), is used as a comprehensive reference to the County's public safety information technology architecture.

The Public Safety Information Technology Architecture Document is DTS' and the Public Safety Department's framework for program execution. It is prepared in concert with the Public Safety Strategic Plan and is designed to support the initiatives outlined in the plan.

The County has three essential organizational resources, people, process and technology. People are the County's greatest resource, Process binds them together into a coherent work-force, and Technology is the tool. This document addresses all three elements.

The purpose of this document is to present well-defined, strategic standards adopted for the development and delivery of the County's public safety information systems. It uses and extends the base Montgomery County Government Information Technology architecture.

This architecture provides a cohesive blueprint to optimally design, purchase, develop, deploy and manage public safety information systems for the County.

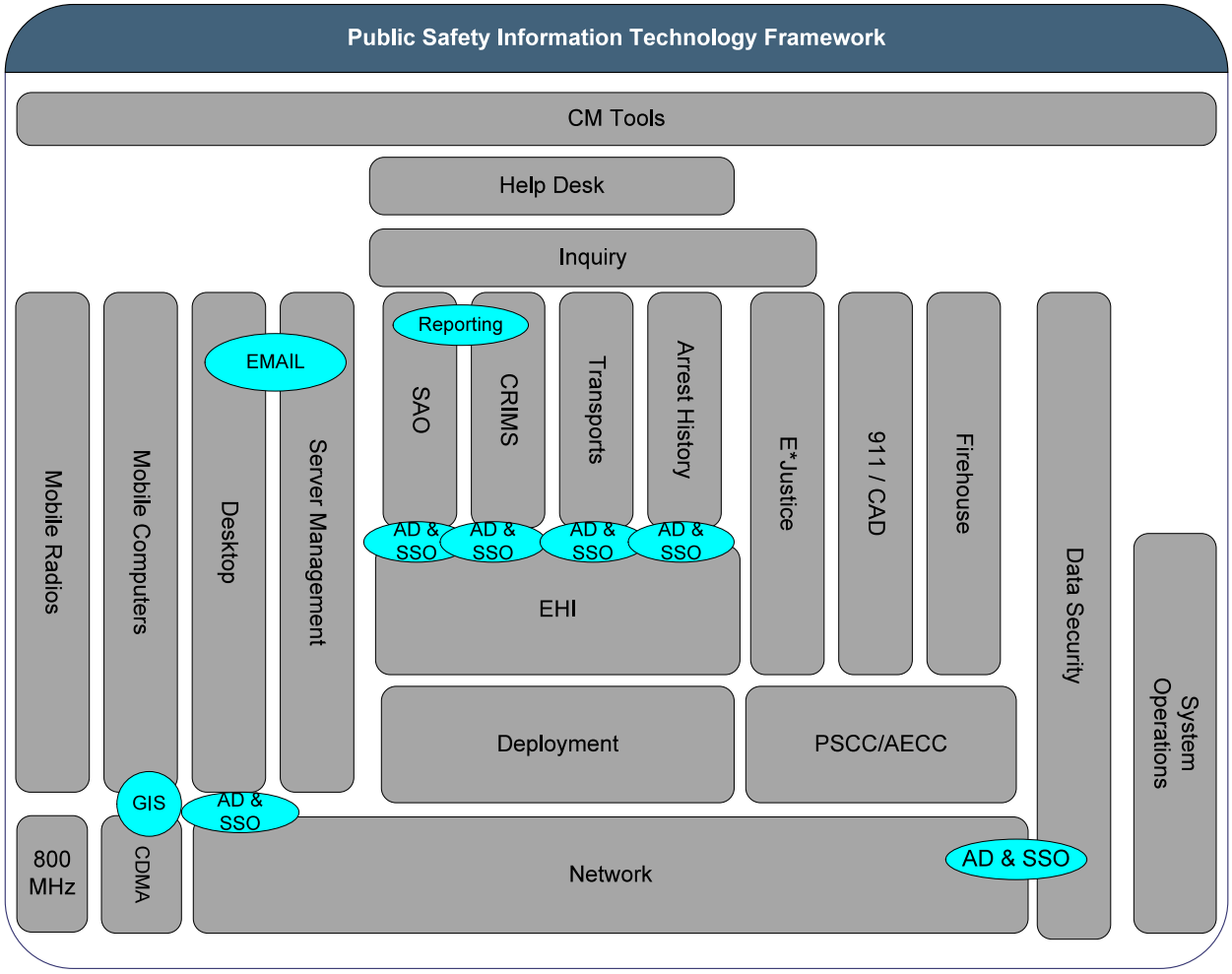

Figure 10- Public Safety Information Technology Framework

This integrated approach to developing complimentary technologies yields a rapid return on investments for new and upcoming programs. In certain areas, the County benefits from consolidating technology, increasing depth of knowledge and skill-set, and lowering the total cost of ownership.

The architecture is designed to achieve efficiencies based on economies of scale. Standardization of technologies encourages the development and purchase of reusable infrastructure and business components. This enhances in-house employee skills in a predictable set of hardware, systems software, COTS packages, and communication and networking platforms. Tiered architecture permits horizontal scaling of solutions by rapid allocation of skills and resources.

This document identifies a framework for the County's Public Safety IT initiatives with a great degree of specificity. It also offers a certain amount of flexibility, permitting Program Managers a list of options for the development of their enterprise software solutions.

Domains

As Figure10 suggests, Montgomery County Public Safety Technical Architecture may be defined as a collection of the following component architectures:

- Active Directory and Single Sign On Services - enabling security
- Data Security Domain - implementing secure access control management
- Desktop Domain - defining desktop computing standards
- Email Domain - increasing operational efficiencies
- Help Desk - providing assistance to the County
- Geographic Information System– delivering cartographic data and location services
- Reporting Domain– optimizing software licenses
- Enterprise Applications Domain - automating business processes
- Web Applications Domain – developing and deploying applications rapidly
- Service Enabled Domain – avoiding stovepipe applications
- Deployment Domain - utilizing resources and sharing costs
- Mainframe Application Services - integrating core business processes
- Network Domain - empowering common infrastructure
- Enterprise Hosting Infrastructure Domain - hosting enterprise applications
- System Operations Domain – Data Center Operations including Backup Services
- Configuration Management (CM) Tools Domain – providing CM Tools Support
- Enterprise Server Management Domain – providing Enterprise Server Management
- SAO - State's Attorneys Office Case Management System
- CRIMS - Correction and Rehabilitation Information Management System
- Inquiry – Providing centralized query services
- Transports - Inmate Transports function
- Arrest History – Arrest History database containing non-Montgomery County Police Department (MCPD) arrests in Montgomery County
- E*Justice – MCPD and MCSO electronic management system
- 9-1-1/CAD – 9-1-1 System
- PSCC/AECC – Public Safety Communications Center (PSCC)/ Alternate Emergency Communications Center (AECC)
- FIREHOUSE – Fire and EMS Records Management System.
- ePCR – Electronic Patient Care Reporting System
- 800 MHz – Montgomery County 800 MHz Network
- Mobile Radios – Digital Mobile Radios
- Mobile Computers – MCPD and MCFRS In-Vehicle Mobile Computers

Each architectural component identified above introduces the following topics:

Principles – explaining the purpose of the component, along with some implementation details.

Owners – identifies both the technical and business owners for the component.

Components – expanding on the operational aspects of the component by identifying preferred implementation products and staff skill-sets.

Standards and Guidelines – identifying standards and guidelines which the County follows so that it can provide quality services.

Users – identifies the users of the component.

Database – identifies the data or database for the component.

The components are all interrelated with the result that the sum of the whole is greater than the parts.

Public Safety Architecture Direction

As a result of work that came out of the creation of this strategic plan it was realized that the published Public Safety Architecture would be better served if it was broken out into two architectural subcomponents. Both would still inherit from the overall County Enterprise Architecture but there would be two slices with one covering the major Criminal Justice Elements (i.e. IJIS, E*Justice, etc) and one covering the Public Safety elements. The Public Safety elements would focus more on the immediate incident response activities that start with a 9-1-1 call.

The new Public Safety IT Framework will cover the following components:

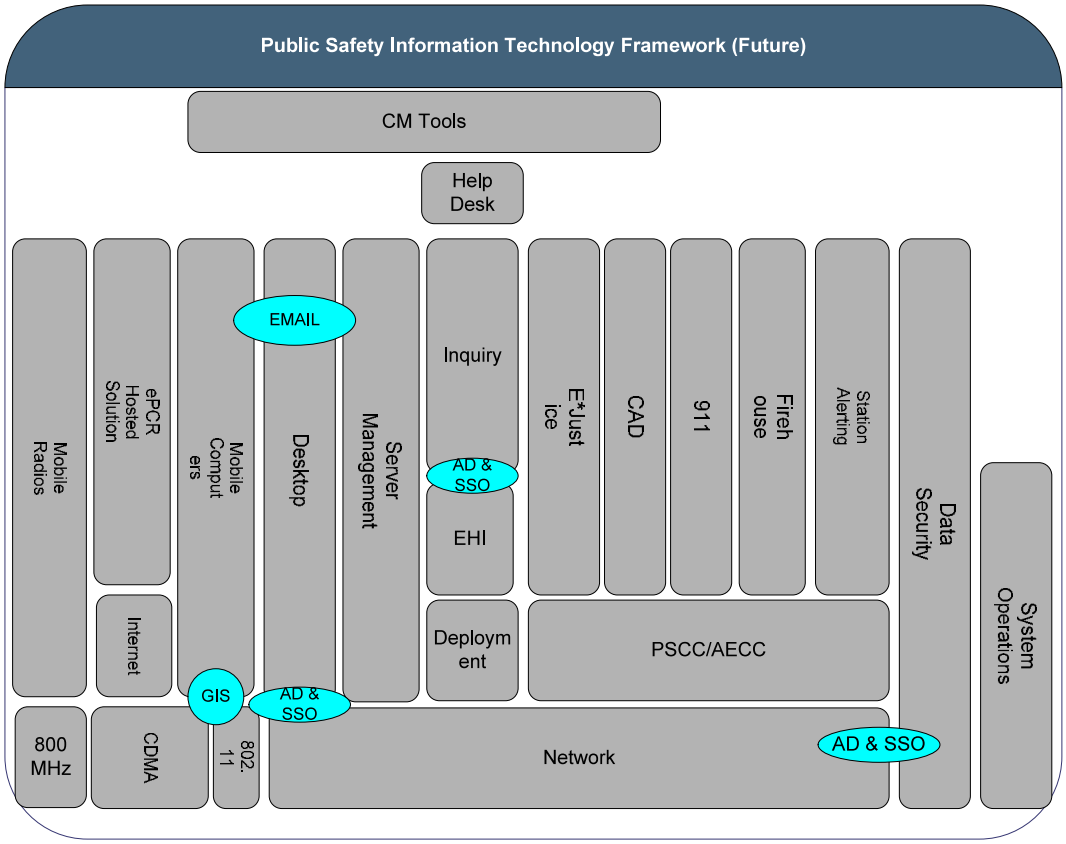

Figure 11- Public Safety Information Technology (Future)

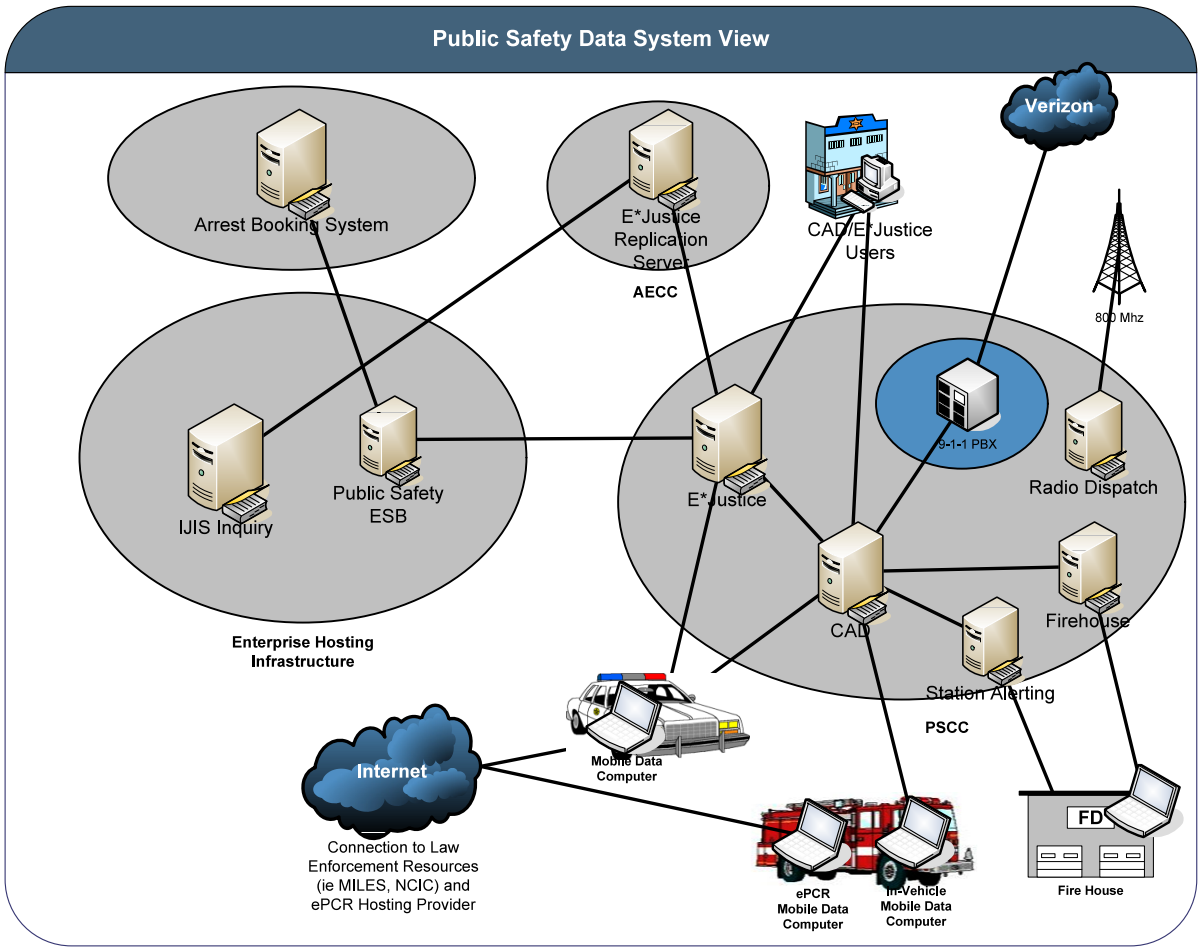

Figure 12- Public Safety Data System View

3.5 Grant Funding Sources

Montgomery County actively seeks grant funding opportunities to support county projects, programs and initiatives. The Office of Emergency Management and Homeland Security has secured grant funding to support the needs and initiatives of the Department of Police, Fire/Rescue Services, Department of Transportation, Department of Technology Services, Health and Human Services and the Office of Emergency Management and Homeland Security (formerly Homeland Security Department).

These grants have provided funding for improved infrastructure for public safety communications; data information sharing technology; increased personal protective equipment and mobile data terminals for first responders; hazmat meters for DFRS; a total containment vehicle for use by the DFRS Bomb Squad, to name a few; as well as, providing funding for many other projects and initiatives within the county government.

Montgomery County and specifically the Office of Emergency Management and Homeland Security continue to seek funding opportunities which will support the various projects and initiatives of various departments. These continued endeavors will ensure the safety of citizens of Montgomery County in the event of an emergency.

4 Innovation

Montgomery County Public Safety has demonstrated leadership in the use of technology. New innovation opportunities have been pursued, as a result of the development of maturing technology, that have clearly shown benefits to business operations. Through these opportunities the County has implemented new solutions that streamline technology or business operations and those that create efficiencies in management as well as cost.

4.1 Existing Strategies

Montgomery County Public Safety has developed numerous innovative solutions which have been integrated into the County's operations. These forward thinking solutions are continually critiqued to ensure that innovation is not taken too far to the "bleeding edge".

4.1.1 Voice over IP

Montgomery County has been a demonstrated leader in the development and implemention of new technologies in many areas. One such area, within the Telecommunications Operation, is the inclusion and rapid deployment of Voice over Internet Protocol (VoIP).

Voice over Internet Protocol (VoIP) is a general term for a family of transmission technologies for delivery of voice communications over IP networks such as the Internet or other packet-switched networks.

Montgomery County's Enterprise Telecommunications Team has numerous VoIP efforts included in the solution portfolio. As a direct result of the County's PBX platform upgrade in early, 2007, as business requirements demonstrate the need for enhanced voice services, these modern voice solutions can be integrated without complex changes to the infrastructure. An example of these service opportunities includes:

- IP Soft phone
- Mobility solutions
- Bluetooth headsets
- Wireless PBX phones
- Conferencing and Collaboration Solutions
- Distance Learning
- Desktop Video Telephony
- Wireless PDA
- Push Alerts and Messaged through VOIP display phone
- Unified Communications

All of the above solutions can be supported on the current platform. At the present time, only the IP Soft phone, which is used at the County's Emergency Operations Center, has been deployed for production use.

The Telecom Division is currently in the process of engaging various departments in developing strategies to leverage the systems capabilities in their business functions. Additionally, many of the above trends are being discussed for use in the planned MC311 contact center.

4.1.2 Heartbeat performance monitoring

The CAD application systems infrastructure is comprised of multiple servers and numerous interfaces to various systems needed to process the CAD and RMS transactions. Operations monitoring is a key operational function needed to provide support and ensure the highest level of service for this critical 24/7 operation.

System monitoring and heartbeat monitoring provides a proactive view of the health of the various systems, enabling real time alerting, summary reporting, and trend analysis, to ensure that the system is operating within the acceptable limits and perform preventive maintenance whenever possible. The systems monitoring function covers a broad range of CAD components including:

- Application
- Database
- Operating System
- Hardware
- Printers

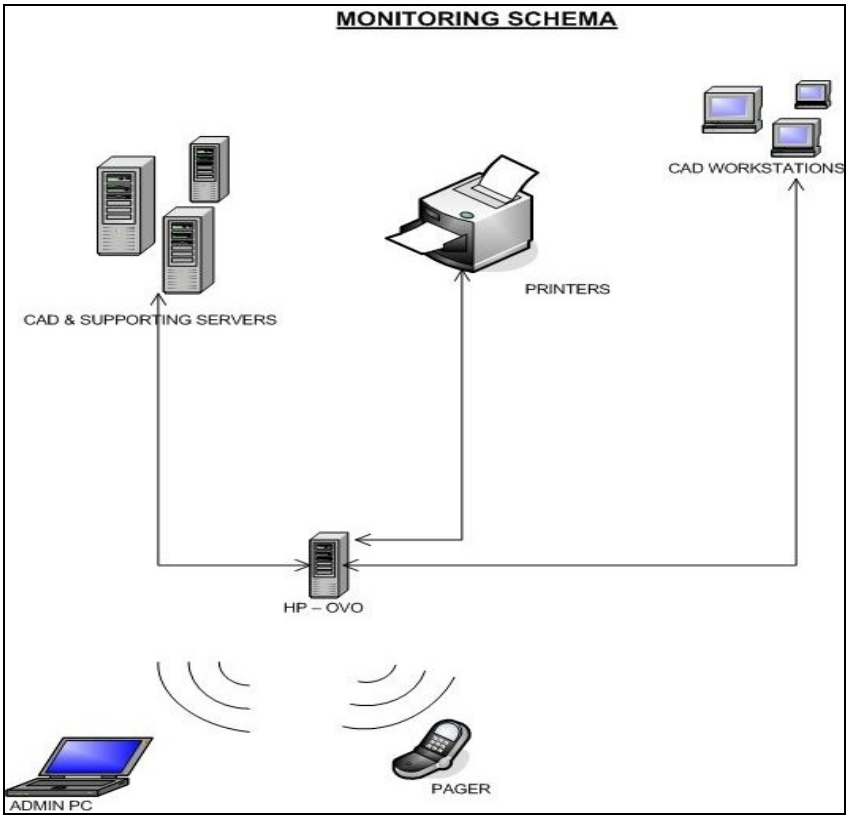

Figure 13- System Monitoring Schema

Monitoring Infrastructure
The PSDS team has developed a comprehensive monitoring system using HP OpenView as the foundation. The tools developed check system status and performance based on thresholds identified to indicate the potential of system performance degradation. The team has integrated various tools with the OpenView base system to enable the monitoring of servers and application components that are not directly compatible with OpenView. All monitoring alert data is captured and stored in a database for reporting and trending analysis.

The system is actively used by the PSDS team, with members reviewing logs and system health reports on a daily and weekly basis. The system sends email and/or paging alerts immediately when a critical triggering event occurs. Various reports are also provided to PSCS using department technical staff for review and input for their operational system planning.

These monitoring techniques have allowed the PSDS team to carry out preventative intervention, and prevent major impacts to the system, greatly improving the observed stability of the system.

4.1.3 Data Exchange Standards

Montgomery County manages its Public Safety data through a combination of methods. The methods include:

- Definition of a Data Architecture
- Use of an Enterprise Service Bus for Information Transfers
- Use of Industry standard data formats such as GJXML or NIEM

Data Architecture
Data Architecture creates a logical data model for the County's Lines of Business (LOB) and is designed to promote common vocabulary and data definition.

The guiding principles for the Data Architecture are:

Data is an asset, accessible and shared for decision support and interoperability
Data is secure, and protected from unauthorized use and disclosure
Data is stored and accessible with technology independent methods
Data has an owner and an established system of record
Data has a data retention policy

The purpose of the Data Architecture is to build a platform which enables rapid development of distributed, multi-tiered applications. It is designed to identify the County's common data structures in XML or database schema definition, and to associate those data structures to their source platforms.

The Public Safety Data Architecture is based on and extends the base county Data Architecture defined in the Montgomery County Government Information Technology Architecture.

Enterprise Service Bus
All Enterprise Data Exchanges are targeted to pass over the Public Safety Enterprise Service Bus. The Public Safety Enterprise Service Bus decouples the source and target systems in the transfer and allows one to many or many to many communications. It provides the ability to decouple the systems taking place in an exchange from each other and allows systems to be less tightly coupled. By moving to a more loosely coupled Data Exchange model it reduces the cost of future system enhancements.

Industry Standard Data Formats
Montgomery County uses standards and guidelines being developed by the Federal Government such as GJXML and NIEM. Where the County can use such data standards it does. Like with the Enterprise Service Bus the use of Industry Data Standards helps decouple the systems taking place in an exchange from each other and allows systems to be more loosely coupled. It brings the ability to upgrade components of a system rather than the whole system and should drive down the cost of ownership.

The Integrated Justice Data Interface promotes enterprise-wide data standardization, reuse, interoperability, and information management across Criminal Justice applications and agencies. This applies to Criminal Justice agencies such as Police, Sheriff, Corrections and Rehabilitations, States Attorney and Circuit Courts. It facilitates common solutions for business processes, enterprise-wide business logic, code reuse, and integration. The common data standard eliminates expensive integration of peer solutions, such as records and case management.

The Integrated Justice Data Architecture aims to model all interactions and exchanges that occur within the County's Criminal Justice Information Systems and cross-jurisdictional business applications. Exchange and sharing of data is vital for timely decision-making.

4.1.4 Wireless Capacity

The PSDS went live in July 2003 with an 800 MHZ data communications system providing patrol MDC units with data service. A smaller number of non-patrol MDCs were provided CDPD commercial wireless connectivity. In June 2004, Northrop Grumman advised that the 800 MHZ data system would not provide bandwidth necessary to support implementation of field reporting. The CDPD service was expanding to cover one police district and the bandwidth and connectivity was sufficient. In 2005 and 2006 this initial effort was expanded for all patrol units and the bandwidth increased with a move to CDMA wireless air cards.

All law enforcement MDCs currently are provided Sprint CDMA, 1xEVDO (G3) level service with 95% plus coverage throughout Montgomery County. Sprint service is comparable with Verizon and ATT in bandwidth and coverage. The Sprint contract provides for free air cards when service levels increase. We are on our third service level increase and monthly costs per unit have dropped by 1/3 over that period. Montgomery County is migrating from the Sprint Data Link service to the Sprint PSC Vision service which reduces backend support costs for the county and potentially allows for multiple vendors to provide broadband service to the existing PSDS network.

In 2010 Sprint is projected to rollout WiMax service in the Montgomery County area. This would potentially increase current broadband speed by 4 times. Strategies are to evaluate cost and

migration plans for WiMax service and evaluate G4 broadband services from other commercial carriers. Farther into the future is a potential for a shared broadband service based on a public private partnership of the auction of the Block D spectrum available to public safety from the 700 MHZ release from television. Initial efforts in establishing this partnership were unsuccessful and future actions are under evaluation by the FCC.

4.1.5 Station Alerting

Implementation of a new station alerting system will modernize the technology. The proposed station alerting setup will use TCP/IP instead of RF (radio frequency). More importantly, the system includes monitoring software for both ECC and the fire stations, so that all personnel will have access to know when and if the system goes down. As a safety net, the software uses both audio and visual cues to notify personnel of network outages with station alerting.

By implementing new station alerting, the county has an opportunity to start on a positive note with new stations as well as keep old stations up and running smoothly. Failure to implement this system leaves MCFRS personnel at a strong disadvantage and risks the lives of the very citizens MCFRS personnel are sworn to assist. Additionally, the new system provides regional interoperability with several surrounding counties, improving communication with neighboring public safety jurisdictions in order to provide improved support for the citizens of included areas.

4.1.6 P25 Radios

The P25 Standard was developed by the Association of Public-Safety Communications Officials (APCO) for a number of reasons, primarily including improvements in interoperability. Other benefits of the standard are that it allows any number of manufacturers to produce compatible equipment, thus increasing competition and potentially lowering prices of equipment. In its second phase, P25 standards will provide improvements in efficiency in usage of the RF spectrum, which will nearly double the number of conversations which can occur in a given spectral bandwidth.

Although P25 is a standard which is still evolving, State, Local, and Federal governments have been deploying P25 systems throughout the United States, Canada, and Latin America since 2001. Today, approximately 120 total P25-compliant state and local systems and at least 50 P25-compliant Federal systems are deployed or are currently being implemented.

The P25 systems that are operational or currently in implementation today in the Mid-Atlantic region are as follows:

- Baltimore Washington International Airport
- Washington County, MD (UHF)
- Arlington County, VA
- Hampton Roads region, VA
- York, James City, and Gloucester Counties, VA
- Prince George’s County, MD

4.2 Existing business strategies

4.2.1 AECC Activation

The Alternate Emergency Communication Center (AECC) is maintained and is capable of being staffed and operational at any time. 9-1-1 PSAP and Dispatch Operations are completely transferred to this center at least quarterly in order to exercise the equipment under live conditions and to exercise the ECC Emergency Action and Evacuation Plan.

The 9-1-1 Telephone System, Public Safety Radio Systems, and CAD clients are maintained in a hot standby mode. The Public Safety Data Systems server sets to include CAD, RMS, and Mobile Switch Servers are in a warm standby mode. Given a catastrophic loss of the PSCC and the technologies that were in place at the time the current systems were architected, dispatch functions would revert to manual operations for a period of time (minimum of 4 hours) until such time as the AECC server sets and databases could be brought online.

4.2.2 GIS Mapping Updates

Firebox (MCFRS)

Firebox areas are defined and modified from time to time by MCFRS. Fire Station Response Areas are the aggregate of these firebox areas. The whole county is divided into 35 response areas correcting to the 35 functioning fire stations. The boundaries for the firebox areas are typically backyard lines of the land parcels. This is to ensure that same first-due fire station will respond to events on both sides of the streets.

An alternative to the backyard line based firebox boundaries is square grids. With square gridding, the county is divided into squares, say half mile by half mile. Densely populated areas can be covered with quarter mile by quarter mile grids. Under this system, the address matching needs to use the buildings file instead of the street centerlines since the latter would not return precise lat/long coordinates and thus could lead to wrong firebox assignment.

DTS GIS has been maintaining an up-to-date buildings file that can support this new firebox system.

Beats (MCPD)

Police Reporting Areas (PRA) and Beats were delineated using the street centerlines. As population growth or shift happens, the PRAs can be subdivided, consolidated, or boundaries shifted. This has been a workable system; no methodology change is needed. The challenges are coding the PRAs for the areas around the highway interchanges.

MD Park & Planning map updates

Many basemap GIS data layers that go into the PSDS are being maintained by the Maryland-National Capital Park and Planning Commission (M-NCPPC). Due to resource limitation, the currency of these basemap layers is not quite up-to-date. Executive Branch supports allocating additional resources so that this situation can be improved.

4.2.3 Emergency medical services

Emergency medical services (EMS) are a subset of the services provided by the Fire/Rescue Service. EMS resources, like most Fire/Rescue operational resources are dispatched from the Emergency Communications Center (ECC) and are referred to as Emergency Medical Dispatch (EMD). The triage of EMS calls is currently accomplished using a proprietary system called PROQA. PROQA is a program that runs on the CAD workstations and has an interface with the CAD system, such that once the PROQA software offers an EMD call type, that call type is automatically entered into the CAD event form. Current State law as outlined in COMAR Title 30 mandates the use of a systematic process for EMS caller interviews that any automated EMD software must comply with.

Patient care reporting (PCR) software must meet local needs for developing quantifiable EMS data. PCR will also require an interface with CAD. This interface will allow for a two-way flow of CAD data. The benefit of a PCR system is that it allows Fire/Rescue to make more accurate determinations of when providers actually arrive at the patient's side, and will allow Fire/Rescue to compare actual patient outcomes to the recommendations generated by EMD system, with the net result of improving patient outcomes and dispatch efficiency.

4.2.4 Emergency Medical Dispatch (EMD)

EMD is one of many products on the markets. Current State law as outlined in COMAR Title 30 mandates the use of a systematic process for EMS caller interviews but does not mandate a particular product.

Where EMD meets the State mandate for a systematic process to dispatch calls, patient care reporting (PCR), meets a local need for developing quantifiable EMS data. The PCR will also require an interface with CAD. This interface will allow for a two-way flow of CAD data. The benefit of the PCR is that it allows Fire/Rescue to make more accurate determinations of when providers actually arrive at the patient's side, and will allow Fire/Rescue to compare actual patient outcomes to the recommendations generated by EMD, with the net result of improving patient outcomes and dispatch efficiency.

4.2.5 Emergency Operations Center (EOC) Activation

The Emergency Operations Center (EOC) may be activated for a variety of reasons such as major snow storms or blizzards, hurricanes, public health incidents, major transportation emergencies or other types of disasters. The EOC can also be activated during significant events which may pose a possible threat to the surrounding communities such as Presidential Elections, etc.

The EOC is the primary emergency support facility where key representatives from County departments and outside agencies respond to support a disaster. The people who respond to the EOC are called Disaster Specialists, and together they comprise the 153 member Emergency Management Group, also referred to as the EMG. The purpose of the EMG is to support the Community in planning and preparing for, responding to and recovering from

disasters. All of the members of the EMG have had training in the functions of EOC operations, and EMG members have the authority to commit the resources of their department or agency to the disaster response.

The EOC is equipped with advanced computer and communications equipment in order for department and agency representatives to be able to obtain information from a variety of sources, analyze the data being received and use that information to coordinate the activities of first responders across all levels of government. The facility is equipped with significant redundant capability to include internal and external power back up and secondary as well a tertiary satellite phone and internet service.

Regardless of activations for real disasters, the EMG must respond to the EOC no less than 4 times a year for exercises. These exercises are intended to train and test EMG representatives in EOC operations and incident response protocol. Past exercises have centered on hurricanes, hazardous materials spills or releases, and potential terrorist incidents.

The EOC uses National Incident Management System structure, which is guided by a Disaster Manager in the EOC. The disaster specialists report to the disaster manager, who in turn reports to county leaders and the state emergency management agency on the event. Should the county expend its resources on an event, additional resources can be requested through mutual aide agreements with surrounding jurisdictions or through state and national emergency management compacts.

4.2.6 Dispatching

The dispatch process is a multi-faceted process that involves first the systematic interview of persons accessing the 9-1-1 system. This initial interview is conducted by an emergency call taker. As the call taker collects information, he/she inputs pertinent data into the CAD using a series of coded entries essentially distilling the interview into a unique response determinate; a call type. Once the interview is complete the encoded information is electronically sent to the dispatcher.

CAD is the decision support scaffolding for the dispatch process. An effective CAD will be able to collate disparate bits of data in multiple formats, including GIS data, call type and response plan data, quickly turning those individual data points into a visually and spatially coherent format that reduces the information processing needs of dispatcher and call takers allowing them to engage in higher order thinking and the exercise of judgment and discretion.

Police 9-1-1 Call Taking and Dispatch operations leverage automated systems (9-1-1 ACD, Public Safety Radio, CAD, Mapping,) and Standard Operating Procedures to enable the delivery of public safety services. Call taking strategies ensure call triaging procedures focus on caller location identification and verification, caller identity and contact information, and that the interview process collects the necessary information to affect the proper level of event response and prioritization while simultaneously gathering information to enhance citizen and officer safety as part of that response.

Dispatch systems and protocols serve as an extension of the call taking process, ensuring that public safety response capabilities are maintained county-wide. A Public Safety field response is affected through the dispatch of pre-determined numbers and types of units by geographical

areas. Paramount among the duties of a dispatcher is the ability to maintain status and positive accountability of units and personnel in the field.

4.3 Future Strategies

4.3.1 State-of-the-Art CAD

Functionality

CAD functionality is a nebulous term, referring primarily to its ability to support the human decision maker by quickly taking disparate series of data points and from them creating information that the human decision maker uses to make resource allocation decisions. What makes the term “functionality” nebulous is that CAD as a stand alone application may be perfectly functional. However, it is the effective interface between the technology and the irreplaceable human actor that is the core requirement.

The basic premise for Calling Taking and Dispatching remains constant. However, modern CAD and ancillary systems that leverage current technologies will allow for ‘plug-and-play’ integration through the application of open standards and interfaces allowing proprietary systems to be interoperable.

Opportunities for the improvement of Call Taking and Dispatching can and should exist in the following area:

1. Incorporation of Next Generation 9-1-1 data types (text, images, video) into the call flow process with the ability to accept, store, incorporate into dispatch recommendations and pass to field units and incident commanders,
2. Full Integration of AVL/AVRR in order to decrease response times.
3. Mapping that enable the incorporation of other Public Safety and non-public safety dynamic geo-layers and third party images (Pictometry oblique’s)
4. Hot Back-up systems with availability in seconds, not minutes or hours.
5. Modern Geographical User Interfaces (GUI) that allow for more robust end user configuration.
6. Support real time CAD-to-CAD information exchange.

CAD Future Technologies and Strategies

As detailed in the CAD Roadmap study report, the next generation CAD system will need to accommodate new interfaces and continue to evolve as the technology and business requirements for CAD and the many inter-related systems continue to change.

The current CAD system is comprised of many functional components tied together with specific interface requirements that bring unique capabilities to each 9-1-1 call and dispatch. This architecture has limited the growth of the system and has built in many interdependencies which have locked the processing of the applications into single threaded synchronous behavior with single points of failure.

The County is looking for an architecture for the next CAD system that is based on the latest standards and best practices used in mission critical production environments. This will include a multi-tier infrastructure that provides a more modular design, allowing for easier

manageability, recoverability and expandability. The databases will be decoupled from the applications and utilize the latest replication protocols. It will have redundancy and site independence designed into the architecture will provide the capability for seamless failover, maintaining continuous uptime to handle critical 9-1-1 calls.

The current CAD system has a proprietary mapping (GIS) subsystem and interface to the County's industry standard ESRI based GIS system is very cumbersome. The County is looking for the next CAD system to use industry standard mapping or have open interface that allows easy data exchanges with the County's GIS system and other mapping platforms. This will greatly enhance the mapping usefulness to first responders.

The current CAD system has separate applications for communications with mobile computers, filed data reporting, and records management, with each requiring a specific interface. The County is looking for a comprehensive solution in the next CAD system, with either a system that provides all functions in a single system, or one that has standard interfaces that allow efficient exchange of data between the systems.

Communications between the various fixed and mobile workstations and servers that comprise the PSCS will continue to leverage the County's network infrastructure (wired and wireless) as well as commercial carriers, and the next CAD system will be required to support all of them. This includes the 800MHz voice radio system, Fibernet for the backbone, and CDMA & 802.11 for mobile data. Future technologies that will also have to be supported are WiMAX and 700MHz.

The new CAD system will also need to be able to interface with the following:

Next Generation 9-1-1 Telephone System - Nationally, Enhanced 9-1-1 (E9-1-1) telephone technology is migrating from analog to Internet Protocol (IP)-based technology. This vision is known as next-generation (NG) 9-1-1.

Regional CAD Systems - The key to regional data sharing is to interface disparate CAD systems. Recognizing this growing trend in 1999 Association of Public-Safety Communications Officials (APCO) began Project 36 to create a standard for CAD to CAD interfaces.

4.3.2 Wireless Systems

The PSDS team plans to continue to employ and support both commercial wireless solutions such as CDMA and the forthcoming WiMAX, along with County provided and maintained 802.11 Wi-Fi solutions. The combination of solutions provides the County with the most flexibility and availability to ongoing bandwidth growth, while balancing the investment between commercial services and building/maintaining in-house infrastructure.

The County plans to adopt the higher bandwidth commercial service when it is offered, the cost (if any) has a demonstrated return on investment, and the service is stable and can be deployed without disruption to the existing mobile infrastructure.

The County is currently operating 802.11 (g) Wi-Fi access points at various facilities throughout the county and is planning to upgrade them the next standard (n), when standard has been

adopted and the cost of the upgrade has a demonstrated return on investment. The County is also planning to expand the coverage of the 802.11 access points to maximize their effectiveness, and add access points at additional locations as business needs are identified.

As with other technologies, both commercial and 802.11 wireless will continue to evolve and the County will keep abreast of the technology direction and potential implications to keep the County aligned with industry standards.

4.3.3 Radio Spectrum (700 MHz)

In June 2009, broadcasting by certain television broadcasters in the upper part of the 700 MHz band ceased. This provides approximately 60 MHz of spectrum to be made available, of which approximately 24 MHz is being allocated by the FCC for public safety operations. A number of public safety providers have been granted licenses to operate in these newly available bands, and others have applied for such licenses. Prince Georges County and the State of Maryland are among those who will have significant operations in the 700 MHz bands. Montgomery County has an applications pending for 3 channels in the 700 MHz band, but will remain primarily a user of 800 MHz channels. The 700 MHz channels currently under application will be used only for specialty mobile repeater operations.

4.3.4 Next Generation Telephone Network

The Nation's current 9-1-1 system is designed around analog telephone technology and cannot handle the text, data, images and video that are increasingly common in personal communications and critical to future transportation, safety, and mobility advances. Next Generation 9-1-1 (NG9-1-1) initiatives are establishing the foundation for public emergency communications services in a wireless mobile society and include; the National Emergency Numbers Association (NENA) Committee work, the US Department of Transportation (DOT) NG9-1-1 Initiative, the Technical Assistance Center of the National 9-1-1 Office, and a variety of standards efforts. Five test sites were set up across the country; data has been collected, and is being analyzed with the results are being used to establish complete system architecture and a nationwide transition plan. At their 2009 Annual Conference in Ft Worth, Texas, the National Emergency Number Association hosted an NG9-1-1 Showcase in which four vendors successfully integrated their NG9-1-1 oriented products with components of a prototype NG9-1-1 core system for the first time.

Montgomery County's 9-1-1 Phone Systems have been positioned to connect to these networks once they are available. The Maryland Emergency Numbers System Board initiated a statewide report with recommendations for moving Maryland's PSAP to the Next Generation 9-1-1 Systems. In line with these recommendations, the County has received funding from the Board and is working with our 9-1-1 service provider to upgrade our Customer Premise Equipment (CPE) consisting of the 9-1-1 Automated Call Distributor (ACD) and end-user workstations. Once that upgrade is complete later this year, our CPE will be Internet Protocol (IP) enabled and capable of receiving traditional 9-1-1 voice calls in addition to the NG9-1-1 data types.

4.3.5 Mobile Devices (Cell phone, PDA, etc.)

New computing platforms and communications devices continue to appear in the consumer and commercial market places. Sometimes these new devices are establishing a new platform, and other times merging platforms. As public safety vendors begin to support the new platforms and the County's public safety providers identify business needs for new platforms, the PSCS workgroups will evaluate the costs, risks and benefits of incorporating the new platforms into the supported architecture.

As the number of platforms and devices increases, it is important that the County keep abreast with industry standards and maintain a unified architecture to avoid supportability issues and premature obsolescence. In addition, careful consideration is required before any consumer products are adopted, because in most cases they are not designed for central or large scale management and support.

The PSCS workgroup anticipates that new devices may increase productivity and/or safety by adding functionality, reducing complexity or increasing redundancy. Although there is a general trend to merge more functionality onto fewer devices, that actual capabilities may be reduced and single points of failure introduced. The workgroups will continue to review new technologies from both a specific requirements and an overall operations perspective to make the best choices in technology adoption.

4.3.6 New data and reporting standards

All jurisdictions are required to report crime data to the FBI for national statistical purposes. The reporting requirements are in transition between the older Uniform Crime Reports (UCR) and the new National Incident Based Reporting System (NIBRS). Maryland requires UCR format reporting but will soon be in transition to NIBRS.

NIBRS is an incident-based reporting system in which agencies collect data on each single crime occurrence. NIBRS collects data on each single incident and arrest within 22 offense categories made up of 46 specific crimes called Group A offenses. For each of the offenses coming to the attention of law enforcement, specified types of facts about each crime are reported. In addition to the Group A offenses, there are 11 Group B offense categories for which only arrest data are reported. Incident-based data provide an extremely large amount of information about crime. The information is also organized in complex ways, reflecting the many different aspects of a crime incident.

The E*Justice RMS is built around NIBRS reporting requirements. Until Maryland transitions to NIBRS, E*Justice will convert report data from NIBRS to UCR format for forwarding to Maryland.

MCFRS is required to report to two systems. They are MIEMSS (Maryland Institute for Emergency Medical Services Systems) for EMS data and NFIRS (National Fire Incident Reporting System) for fire incident data.

5 Governance

To be fully effective, Governance works better when business owns the business process of planning how to meet their needs, and utilizing technology as the tool for the results. The County has established a governance model for public safety that has proven to be successful by having the business drive the use technology and making effective decisions on technology investments.

5.1 PSCS Workgroup

The Governance model for public safety communications system includes a management oversight and steering group, the PSCS management Workgroup that is comprised of management staff from Montgomery County Police Department, Montgomery County Fire and Rescue Service, Montgomery County Sheriff's Office, Office of Emergency Management and Homeland Security and the Department of Technology Services. The PSCS Workgroup meets on a monthly basis and receives input from functional workgroups that meet on a bi-weekly basis. The PSCS management workgroup sets priorities and allocates resources based on overall County policy and business needs.

The functional workgroups focus on specific functional areas and focus on tactical business requirements and technical solutions for business needs. The functional workgroups are:

- Radio Systems workgroup
- Fire and Rescue workgroup
- Law Enforcement workgroup

Each workgroup has functional and technical staff representation from the user departments as well as DTS.

The functional workgroups identify, develop and recommend policies and strategies required to guide the deployment of public safety technology solutions and products. The functional workgroups identify opportunities for improving service delivery and make recommendations to the management workgroup.

The governance structure has been instrumental in the adoption and implementation of new policies and procedures for the public safety information systems. The governance structure will allow the County government to steer a course to introduce and coordinate the best use of IT resources in order to improve the service provided citizens and County employees.

The Public Safety Architecture is covered by the following governance structures:

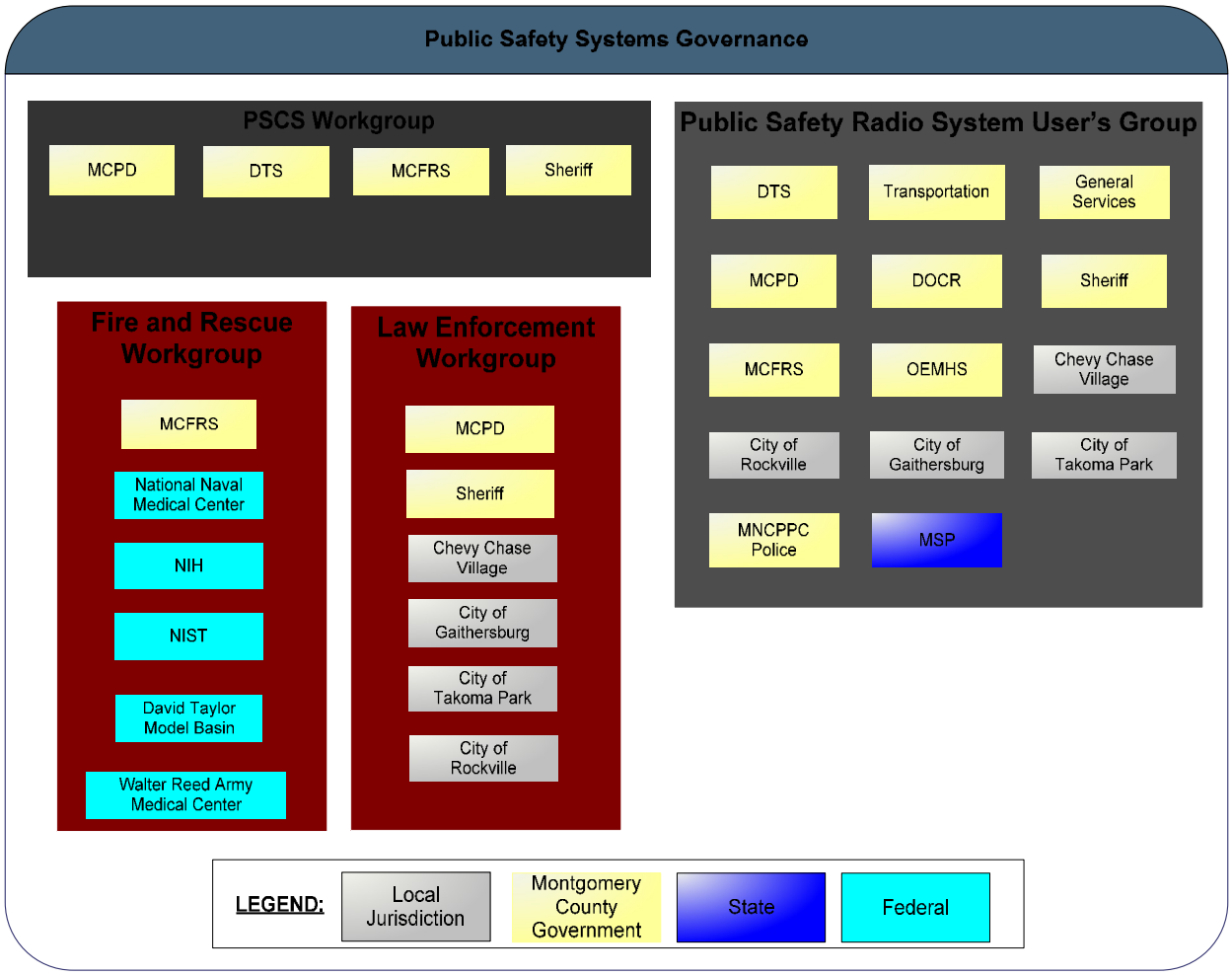

Figure 14- Public Safety System Governance

The Public Safety Architecture would have the following governance relationships with external governance bodies:

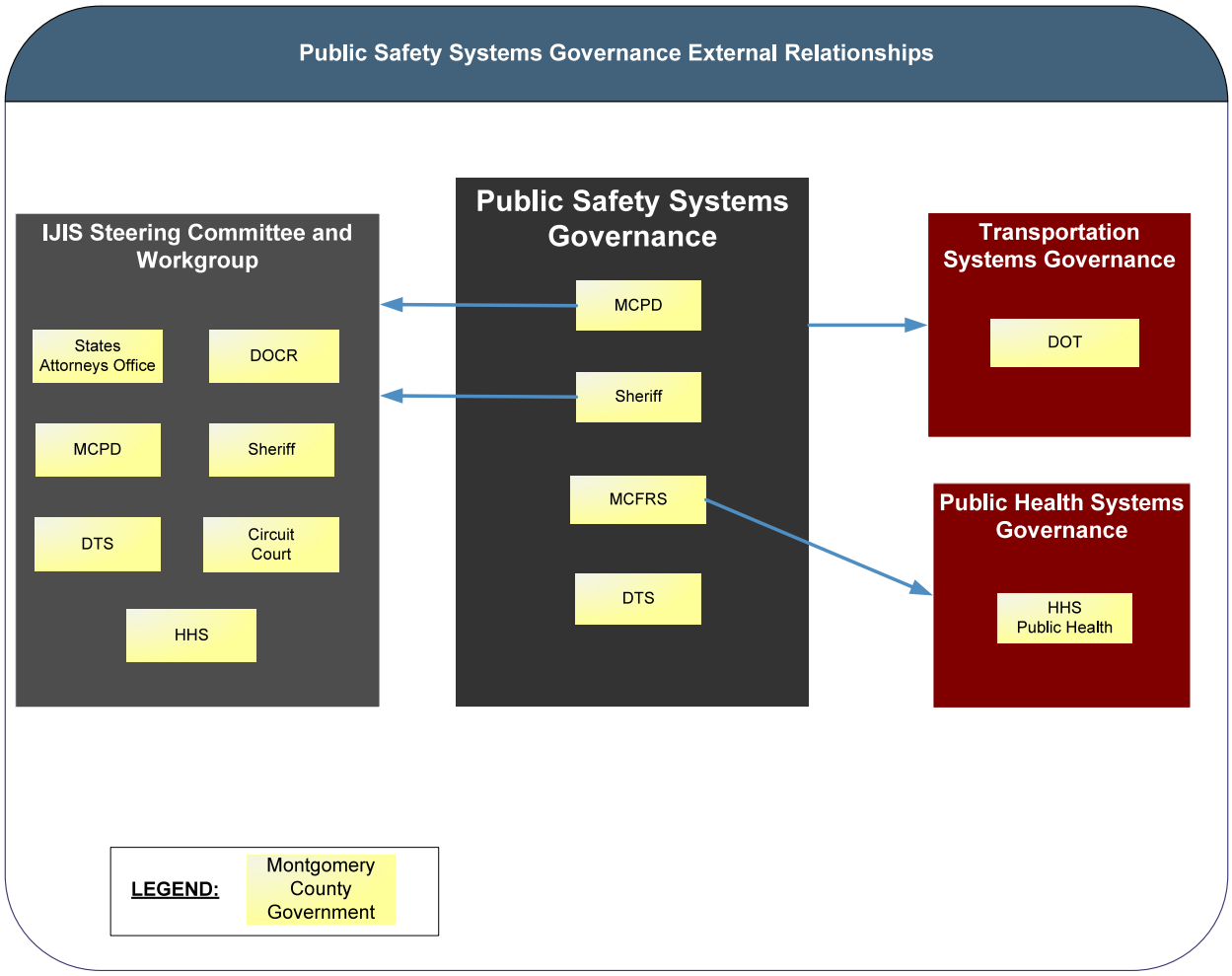

Figure 15- Public Safety Governance External Relationships

5.2 Public Safety Radio Systems Users' Group

There is a Public Safety Radio System Users' Group which meets to review operational issues of the public safety radios and the 800 MHz radio system. Members include representatives of the following Departments and Agencies:

- Montgomery County Police Department (MCPD) *
- Montgomery County Fire and Rescue Service (MCFRS) *
- Montgomery County Sheriff's Office (MCSO)*
- Department of Correction and Rehabilitation (DOCR) *
- Department of Technology Services (DTS) *

- Office of Emergency Management and Homeland Security (OEMHS)
- Chevy Chase Village Police Department
- City of Gaithersburg Police Department
- City of Rockville Police Department
- City of Takoma Park Police Department
- National Naval Medical Center Fire Department
- NIH Fire Department
- NIST Fire Department
- Walter Reed Army Medical Center Fire Department
- David Taylor Model Basin Fire Department
- Maryland State Police (MSP)
- Maryland National Capital Park Police (MNCPPC) *

* **Configuration Control Group** member

A subset of this group includes those members marked with an asterisk (*), above, and comprises the Configuration Control Group for the 800 MHz radio system and its governance and operations.

5.3 Fire and Rescue Workgroup

There is a Fire and Rescue Workgroup meeting held that discusses mostly non-IT Fire and Rescue operations. MCFRS and the mutual aid Fire Departments (NIST, NIH, etc) attend the meeting. In addition, there are also Council of Government meetings held to discussion regional Fire and Rescue operations.

5.4 Law Enforcement Workgroup

Public Safety Communications System User's Group is composed of representatives from Police, Sheriff's office, and police representatives from Rockville City, Takoma Park, Gaithersburg, and Chevy Chase with observer status to National Capital Park Police. The group meets bi-monthly at the call of the MCPD Mobile Data Systems Manager. The group shares the status of the Public Safety Communications System, gathers requirements from municipal agencies and documents problems for the Working Group to address. All these agencies are signatories to the MOU governing the Public Safety Communications System.

5.5 IPAC / TOMG/ ITPCC Interactions

Several members of the public safety communications workgroups also serve on the IPAC and TOMG Enterprise workgroups, and policies adopted for the enterprise are reviewed for incorporation in the public safety domain. Enterprise best practices are also reviewed on an ongoing basis and adopted by the public safety workgroups.

The public safety communications workgroup also interacts with the Interagency Technology Policy and Coordination Committee (ITPCC) in coordinating technology approaches. The strategic roadmap study for CAD systems recently completed was conducted under the auspices of the Interagency Technology Fund (ITF), an example of interagency coordination that have been facilitated by the existence of ITPCC.

6 Resources and People

6.1 Education & Training

Education and training are both ongoing evolutionary processes. The policies, procedures and thought processes of the public safety leadership exist in the realm of perpetual alteration in order that they might be able to react to changes in the operational environment. Any initial training must be supported and/or reinforced by on going training, both formal and informal.

Sufficient evidence exists to support the need for training environments that realistically mirror actual operational environments. Realistic training environments allow the trainees the opportunity to be exposed to stressors, challenges, and work loads similar to what they will face in their respective operational environments, lessening the stress of the daily environment and improving response to critical events.

Further, training and test environments that can replicate the operational environment allow for the testing of new methodologies against realistic scenarios without having a direct impact on the public safety. Being able to operate this way lessens the occurrence of unintended consequences from policy or operational changes.

6.1.1 Multiple Environments

While Production and Backup/COOP instances of our Public Safety Systems meet the 24/7/365 mission critical needs of Public Safety Agencies, they should not and can not be sacrificed to meet our systems testing and training requirements. it is imperative that software releases and builds are put into production only after being fully vetted through both vendor and end-user technical and functional testing. Therefore there must be a Test instances of critical systems complete with actual or simulated interfaces.

Technology and IT systems are tools that help to make our greatest asset; the call takers, dispatchers, clerks, officers, and firefighters that use these systems, more productive. It is imperative that our users are provided extensive and thorough training in a non-threatening non-production environment. Therefore there must also be Training instances of critical systems complete with actual or simulated interfaces that can support the training needs of our Public Safety Training Academy, our 9-1-1 Emergency Communication Center, and our Public Safety Technology Training Center.

6.2 Contractor vs. County Staff

The technology support team for the Public Safety Communications System is comprised of a combination of permanent staff and contract employees.

DTS hires contract versus in-house personnel for a variety of reasons and under different circumstances. Contract personnel are most often hired under one or more of the following scenarios:

- The County has an immediate near-term need for a resource and cannot wait the 3-6 months it takes to hire a new County employee.
- The County has a need for a resource with a specific skill set in a particular technology that is not readily available in the market place or demands a salary above the County's pay scale.
- The County has limited duration needs for a skill set or specialized application, where a long term staffing commitment is not desirable.
- The County has changing needs over time, where it is desirable to have the flexibility of contractor staff that can be adjusted to meet the evolving business needs.

DTS management performs periodic evaluation of potential conversion of contractual positions to County's permanent positions.

This hybrid approach has proven to be very effective and has enabled DTS to build a very strong team, which has significantly enhanced the operational readiness of the PSCS systems and increased the ability of the technical team to provide support to ongoing projects.

6.3 Hosting vs. SaaS

Traditionally, PSCS applications and infrastructure have been hosted by the County exclusively. As Software as a Service (SaaS) has been maturing and more public safety application vendors are offering SaaS solutions, the County has been conducting SaaS vs. in-house solutions analysis as new systems are evaluated. The current implementation of ePCR is being done as a SaaS implementation as it was determined to be the best solution for the business and operational needs.

The PSCS workgroup will continue to perform these evaluations for any new system to make a determination whether a SaaS or in-house system is the appropriate solution.

The County has an established SaaS service offering for Enterprise applications. The standards and protocols can also be applied or adapted to the PSCS for the use of externally hosted applications by Montgomery County. The service provides support that solves the common issues around using an externally hosted application. The common issues that are addressed within the SaaS support are related to:

- Identity
- Security
- Integration

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.

8 Appendix A- Acronym List

Acronym	Title, Subject, or Phrase Usage
ABS	Arrest Booking System
ACD	Automatic call Distributor
AECC	Alternate Emergency Communications Center
ALI	Automatic Location Identification
ANI	Automatic Number Identification
ANSI	American National Standards Institute
APCO	Association of Public-Safety Communications Officials
BDA	Bi-directional Amplifier
CAD	Computer Aided Dispatch
CALEA	Commission on Accreditation for Law Enforcement Agencies
CCB	Change Control Board
CDMA	Code division multiple access
CE	County Executive
CIO	Chief Information Officer
COOP	Continuity of Operations Plan
COTS	Commercial Off- The-Shelf
CPE	Customer Premise Equipment
CRIMS	Correction and Rehabilitation Information Management System
CTO	Chief Technology Officer
DCM	Desktop Computer Modernization
DED	Department of Economic Development
DGS	Department of General Services
DHHS	Department of Health and Human Services
DOCR	Department of Correction and Rehabilitation
DOT	United States Department of Transportation
DR	Disaster Recovery
ECC	Emergency Communications Center
EJB	Enterprise Java Bean
EMG	Emergency Management Group
EOC	Emergency Operations Center
ERP	Enterprise Resource Planning
ESB	Enterprise Service Bus
EVDO	Evolution-Data Optimized
FARS	False Alarm Reduction Section
FATB	False Alarm Tracking and Billing System
FCC	Federal Communications Commission
GIS	Geographic Information Systems
HTML, XHTML	HyperText Markup Language
HTTPS	Secure Hypertext Transfer Protocol
IEPD	Information Exchange Package documents
IJIS	Integrated Justice Information System
I-Net	Institutional Network
IP	Internet Protocol
IPAC	Information Technology Policy Advisory Committee
IT	Information Technology

ITF	Inter-Agency Technology Fund
ITPCC	Interagency Technology Policy Coordination Committee
IVR	Interactive Voice Response Services
JJIS	Juvenile Justice Information System
JMS	Java Messaging Services
LAN	Local Area Network
LDAP	Lightweight Directory Access Protocol
LEITSC	Law Enforcement Information Technology Standards Council
MCCIP	Montgomery County Communications Interoperability Plan
MCFRS	Montgomery County Fire and Rescue Services
MCG	Montgomery County Government
MCPD	Montgomery County Police Department
MCPS	Montgomery County Public Schools
MCSO	Montgomery County Sheriff's Office
MIEMSS	Maryland Institute for Emergency Medical Services System
MILES	Maryland Interagency Law Enforcement System
MNCPPC	Maryland National Capital Park and Planning Commission
MPLS	Multi-Protocol Label Switching
MSP	Maryland State Police
MWAA	Metropolitan Washington Airports Authority
MWCOG	Metropolitan Washington Council of Governments
NCIC	National Crime Information Center
NCR	National Capital Region (Council of Governments – COG)
NENA	National Emergency Numbers Association
NFIRS	National Fire Incident Reporting System
NFPA	National Fire Protection Association
NG	Next-Generation
NIBRS	National Incident Based Reporting Standards
NIEM	National Information Exchange Model
NIH	National Institutes of Health
NIMS	National Incident Management System
NIST	National Institute of Standards and Technology
ODBC	Open DataBase Connectivity
OEMHS	Office of Emergency Management and Homeland Security
PBX	Private Branch Exchange
PDA	Personal Digital Assistant
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute's
POTS	Plain Old Telephone Lines
ProQA	Proactive Quality Assurance
PSAP	Public Safety Answering Points
PSCC	Public Safety Communications Center
PSCS	Public Safety Communications Systems
PSRS	Public Safety Radio Systems
RAD	Rapid Application Development
RMS	Record Management System
RSS	Really Simple Syndication
SaaS	Software as a Service

SCIP	State of Maryland Communications Interoperability Plan
SDLC	System Development Life Cycle
SOA	Service Oriented Architecture
SOAP	Service Oriented Access Protocol
SW	Software
TCP/IP	Transmission Control Protocol
TDD	Telecommunications Device for the Deaf
TDM	Time Division Multiplexing
TMC	Traffic Management Center
UASI	Urban Areas Security Initiative
UCR	Uniform Crime Reports
UDDI	Universal Description Discovery and Integration
VoIP	Voice Over Internet Protocol
VPN	Virtual Private Network
WAN	Wide Area Network
WiMAX	Worldwide Interoperability for Microwave Access
WMATA	Washington Metropolitan Area Transit Authority
WSDL	Web Services Description Language
XML, XSLT	Extensible Markup Language