



## 4 Focus on Enterprise

MCG leadership has been strategic and forward thinking with regards to the investment in technology. A challenge that has come to the forefront of key leadership has been the decentralized nature of IT. This renewed emphasis on the overall enterprise is not an attempt to validate or justify the decisions that lead to the current state of the organization, but focus more on how Technology Services can support a reasonable transition to enterprise technologies and drive this methodology to manage future expectations for both technology and support.

Prior technology strategic plans focused primarily on the work activities and accomplishments within the DTS organization. While successes are clear through the numerous awards and accomplishments that have been recognized in national venues, there was a limited focus on the outreach of DTS in support of larger, multi-departmental efforts. The primary focus was on technology operations and internal improvements.

The early efforts in the development of this plan were centered on a comprehensive assessment of the business units to gain a different perspective on support. The assessment would validate the energies on technology improvement by substantiating the direction through the communicated desires and needs of the business departments. While decentralization of IT functionality was a potential obstacle, through the IT Policy Advisory Committee (IPAC), there was a countywide agreement that there were benefits to the departments as well as DTS to ensure that the strategic vision for technology innovation

required a joint approach. However, a comprehensive approach is a time consuming and very detailed effort that is normally supported by auxiliary resources. Given the fiscal constraints and a need to expedite a plan, a hybrid approach has been developed and is embodied in this plan.

The hybrid approach will outline the significant technological successes that are an outcome of DTS process improvements as well as those that have evolved from DTS' support of departmental challenges. In addition to exemplifying the current direction, this strategic plan will be fully validated by continuing the detailed departmental assessments as part of the next update of this plan. While it is not anticipated that any single discovery will significantly alter the direction of technology implementations, the plan will be tested through the major enterprise initiatives like the Enterprise Resource Planning (ERP), the Constituent Relationship Management (MC311) as well as agency specific or service efforts like the Health and Human Services modernization, the Integrated Justice Information Systems (IJIS) implementation and Public Safety Systems upgrades (PSCS).

DTS has embarked on this hybrid view through the exemplification of the strides made in supporting County needs with technology, streamlining services, streamlining cost components to service and delivery and improved information collection by working with the organization to begin the "Enterprise Think" model. This has been achieved through our assessment as well as the fast paced efforts of our enterprise programs. Enterprise Think is the process of looking at solutions, both business and technology, at a holistic level which guides decision making to the multi-departmental level. This methodology introduces the dynamic of making decisions that benefit multiple venues, which is the core expectation of enterprise applications and accumulated benefits.

#### **4.1 Developing the Business Strategy**

As the various departments within MCG grow and expand so do their technology needs. In concert with the County's efforts to improve and modernize through an enterprise approach, there is a definitive need to develop a business methodology that will build "Enterprise" views and visions by and for the departments. The goal of this approach will be to transition the individual department direction model within the organization through the adoption of a "theme" approach to assist with technology alignments and provide results that support economies of scale. Like many other organizations who have adopted a "theme" approach to develop excellence synergies within their organizations, MCG will also include this strategy as a foundation to the technology strategic planning process.

The purpose of "business theming" in building technology strategies is that there are typical commonalities between the different business groups. ***The goal of this model is to ensure that technology's solutions benefits are maximized, systems and enhancements are sized, reviewed, and presented to support an enterprise deployment, whenever feasible.***

Research of other similar organizations that have successfully created "business theme" models use a minimum of three (3) to a maximum of eight (8) business themes. We have reviewed the various departments within MCG, and have recommended groupings

according to their business missions. Consequently, we have identified five business themes and they are as follows:

- Public Safety
- Administration (Back/Office Support)
- Retailing/Direct Consumer Services
- Program Services
- Legislative/Outreach

As with other components of the enterprise strategic planning process, changes to the organization, redefinition of the business mission and other factors may likely warrant reviews of the business theme model and result in appropriate recommendations for changes as required.

Taking this first step at a department synergistic level, the views and recommendations begin to take shape toward the enterprise model and it begins to create a stronger model for technology review, business process similarities, and technology dependencies between the theme participants and provides for the culture change that presents the most impact in “Enterprise Think”.

Coupled to the theming process, a new structure of the governance model is created. While programs and larger projects may have cross departmental participation by senior leadership for direction, planning and outcomes of a specific effort, the thematic oversight from this new approach continues the relationship. It provides insights on project efforts, daily operations as well as business challenges that can potentially be resolved and serve multiple entities. These “Theme Teams” can have multiple positive outcomes, including avoiding multiple solutions for problems that have fiscal and human support elements.

### **Collaboration Imperative**

For an IT organization to have any success in an enterprise approach to any aspect of technology with respect to innovation and common successes, collaboration is a key element of the overarching strategy. In Montgomery County, where large, decentralized components of IT exist in parallel with centralized IT functions and responsibilities, the challenge of organized strategy, management of customer expectation and definitive measures of success requires proactive focus. This focus is essential at all levels of IT to affect the support of vision, change and prudence in innovation adoption.

Montgomery County’s leadership has welcomed and embraced the collaboration process. This is clearly evident by senior leaderships embrace and actions relative to numerous enterprise wide initiatives. Without this single, supported vision within the mission of leadership, adoption of modernization principles and enterprise direction, efforts of these magnitudes are doomed to failure.

Collaborative energies are a focus of more than the business leadership. Elected officials in the County are champions of information, common practice and enterprise solution recommendations. In this combined venue, the recommendations of common modernization efforts have fewer challenges from a governance perspective and are most

common at the business production level. It is in this area that Montgomery County has begun a significant emphasis on Enterprise Change Management, with a proactive focus on the human element of change to encourage, promote and achieve a more accepting pace for business as well as technology change.

## 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), described in more detail in this plan, is the method by which elected governance ensure that common technology strategies are vetted for cross agency benefit and standardization.

**Figure 3 - ITPCC**

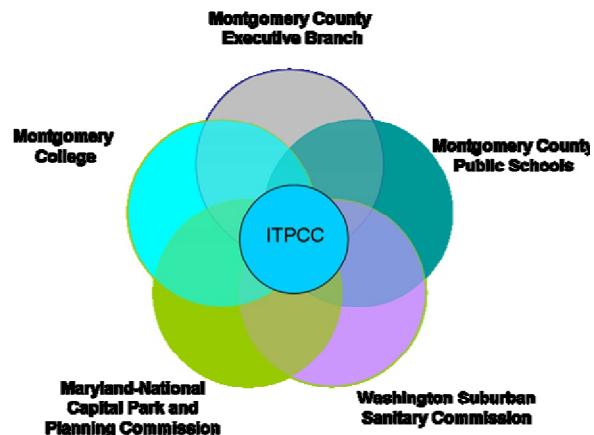
With the advent of a separate funding, the Inter-Agency Technology Fund (ITF), solely for the facilitation of cross agency initiatives, each County agency has an opportunity to contribute to the development, assessment and evaluation of common technology programs. These initiatives provide the basis 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.

## **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.

In addition to local jurisdiction cooperatives, the County has utilized collaborative mechanisms to States, Federal and other National Governmental organizations. These efforts and exchanges are most typically demonstrated by Montgomery County's continued presence in multi-level recognitions for innovative technical solutions and best practice implementations.

## **Summary**

Collaboration and information exchange will be a key component to the ability of the Technology Services organization to effectively promote an Enterprise Technology Strategic Plan. The benefits, demonstrated by prior successes and current modernization efforts can easily be measured as the County embraces and readies for a combined business / technology transformation over the next five years.

**Goal:**

***Identify and document collaboration opportunities including the anticipated outcomes, actual outcomes as well as long term benefits through return on investment and business improvement***

## 4.2 Application Strategy

The embrace and proliferation of technology to solve business challenges requires a strategy to manage the many solutions that can be accumulated. This management process is an application strategy that organizes the myriad of programs that for many organizations grew from a haphazard and often disorganized fashion over many years.

Successful organizations have become savvier in the management of business solutions to ensure that older, obsolete applications are retired, similar applications are merged and newer applications truly solve business information needs, provide for organized delivery and are long-term cost effective solutions.

A mature application strategy is in proper alignment with enterprise business strategies. The overall strategy follows strategic sourcing, the direction of the architecture, business governance and proactive management of adoption and migration through business and human change management.

Montgomery County has embraced best practices in the management of its application inventory, techniques and the delivery of key enterprise applications. DTS has a committed focus on improving delivery and effectiveness through proactive portfolio management, managing applications following lifecycle practices and the delivery and management of an enterprise solution, Graphic Information Systems (GIS).

### Application Portfolio

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.

DTS began the effort to identify all applications currently in use supporting the business functions of the MCG. 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 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. MCG 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 MCG. 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)

**Goal:**

***With the assistance of the business leadership, continue the evaluation and detailed documentation of the Enterprise Portfolio and determine the current and future value of business solutions and potential Integration and retirement objectives.***

## **Systems Development Life Cycle (SDLC)**

MCG'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 high quality systems that will meet or exceed customer expectations, reach completion within time and budget projections, provide 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.

MCG 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.

**Goal:**

***Develop, communicate and support the innovation path for business solutions lifecycle in concert with the County's capability to adopt innovation and system change***

### **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 more quickly?
- 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.

**Goal:**

***Formalize the “build vs. buy” analysis as part of the new application project lifecycle.***

### **Geographic Information Systems**

The overall goals of the enterprise GIS programs for Montgomery County are:

1. Setting GIS technology standards for the County by constantly reviewing and adopting the best solutions for the County as a whole. Facilitate the using departments in obtaining the technology and related services.
2. Constructing and maintaining central (common) GIS databases for the open access of all County employees. The central repository is composed of data from the collaborating agencies, state and federal sources, in-house created and maintained datasets, and those obtained through contracted professional services. The whole County is using the same set of core GIS data.

3. Providing GIS services to departments and offices needing and requesting such services.
4. Developing and deploying Web based GIS services for County employees as well as citizens.
5. Participating and promoting collaboration among County agencies and with regional, state, federal and private entities.

Geographic Information System (GIS) technology is ingrained in County business processes. DTS partners with numerous County departments and offices to provide a comprehensive set of GIS services, including, but not limited to, data management, mapping, analysis, and database and web development.

This section describes the various Geographic Information System (GIS) initiatives needed to further expand the GIS program in support of the County's desire to leverage GIS as an anchoring element of business applications.

### **Migrating ArcInfo Workstation to ArcGIS Desktop/Server**

The existing ArcInfo Workstation software has been in use since the late 1980s. It is a single user editing and visualization environment. The 'coverage' data format utilizes the 'INFO' database management system with limited functions. This must be migrated to the ArcGIS desktop/server environment supporting multiple user editing. The backend database management system makes use of an industry standard relational database management system.

To facilitate the migration, DTS must design an ArcGIS data model that would support the maintenance of both the street centerlines and the various DISTRICTS that were built using (mostly) the centerlines. Districts such as Election Precincts and Districts, Elementary School Service Areas, High School Clusters, Police Reporting Areas, Beats, and Districts, Fireboxes and Responding Areas, etc. must be maintained along with the centerlines. In addition, the data extraction applications for supporting Elections, Schools, and State Highway Administration need must also be migrated to the new environment.

Due to limited in-house expertise and experience with the new ArcGIS platform, DTS may require vendor assistance to support the migration initiative. Vendor training for the staff working on Centerline and Districts maintenance must be provided as well. DTS intends to request additional funding during the FY11 budget process to begin the migration and training efforts.

### **Adding Extensions to the ArcGIS Server Suite**

Once County GIS users become familiar with the ArcGIS Server technology, DTS expects an increase in interest / demand for additional functionalities. These additional functionalities are not present in the ArcGIS Server package, but in a series of extensions. The following is a list of the currently available extensions: 3D, Image, Network, Spatial, Data Interoperability, Geostatistical, Job Tracking, and Schematics. These extensions are described below.

### **3D Extension**

This extension provides advanced three-dimensional modeling capabilities such as cut-fill, line-of-sight, and terrain modeling.

### **Data Interoperability Extension**

This extension provides direct access to hundreds of data formats via data translation tools for spatial extraction, transformation, and loading (ETL) capabilities.

### **Geostatistical Extension**

This extension permits users to take geostatistical layers created in ArcGIS Desktop and publish them as Web services, giving Web application users powerful tools for data and surface exploration (e.g., interpolating the possible flow and direction of radiation, air pollution, or biohazard release or predicting optimal conditions for reliable crop production).

### **Image Extension**

This extension makes it possible to take raw or preprocessed imagery and immediately deliver it as a Web service.

Data access and processing is highly optimized, making the time from request to image display nearly instantaneous. These capabilities dramatically shorten the time between image capture and making imagery available to end users in an effective image management system.

### **Network Extension**

This extension provides network-based analysis capabilities for routing, travel directions, closest facility, and service area analysis.

### **Schematics Extension**

This extension allows the consolidation of numerous diagrams of varying styles and extents into a single Web service, eliminating the need to publish each diagram as a separate service. End users can filter the service for specific diagrams, as well as generate and update diagrams.

### **Spatial Extension**

This extension delivers spatial modeling and analysis by analyzing raster data, performing integrated vector-raster analysis, and deriving new information.

As demand for these extensions arises, DTS will request additional funding to acquire the needed software licenses and any associated training services.

## **Developing new ArcGIS Server Based Applications**

Web based ArcGIS Server applications relieve the need for users to learn GIS software. Instead, knowledge of familiar browser operations are all that are needed to take advantage of the GIS applications.

To date, DTS has developed several applications on behalf of County departments and offices. Among these are:

[Snow Operations Map Viewer](#) – The application queries the relational database at prescribed intervals, retrieves snow clearing status codes (cleared, in progress, not yet worked on) associated with the snow routes and neighborhood streets, and displays the roadways in color codes corresponding to the status codes. With this map service, County citizens get frequent updates of the snow clearing progress.

**Police Response Event Map Viewer** – With this map service, Police event type and spatial distribution can be clearly communicated to the officers for more effective crime fighting and personnel deployment.

**Council District Map Viewer** – This is the ‘live map’ variation of the recently deployed Council District Multi-layer PDF Map Viewer. The selected map layers displayed always reflect the latest in the relational spatial database server. DTS recognizes the need to improve cartographic quality before the application can be deployed to the public.

DTS plans to expand the number of map viewers available in response to Customer demands.

### **Leveraging ‘Free’ Web Map Viewer Technologies**

DTS has deployed several new online map services leveraging industry standards and leading technologies that are now ubiquitous on the Web. Web users have become familiar with the look and feel of online map viewers through the use of travel directions and location maps. Recently, DTS developed online map viewers for the Montgomery County Public Libraries (MCPL), Department of Transportation (DOT) roadway improvement projects map viewer and water main break map viewer, and the MyMontgomery map viewer.

DTS will develop additional map viewers leveraging these same or other emerging technologies as user departments request their development and deployment.

### **Developing Mobile GIS Applications and Services**

GIS for handheld units is gaining popularity. The typical mode of operation is downloading a portion of a geographic database, working (collecting attributes and/or adding/editing spatial locations) in the field and uploading the database back to the relational database.

DTS anticipates increasing interest in mobile GIS applications, and must gear up to support users that intend to adopt this new GIS technology. As demand increases, DTS will request additional funding to acquire the needed software, hardware and any associated training and implementation support services.

## **4.3 Operations and Infrastructure Management Strategies**

### **Technical Operations Strategic Principles**

In an effort to fulfill the goals created to support Montgomery County’s business missions and objectives, DTS recognized that “best practice” operational principles would be required to meet and maintain technology solutions. As a result, DTS has developed strategic operational principles to support solution development, administrative actions and has identified key components that will allow for the transition from theory and design to robust production solutions with best practices for support, including resource management,

The following table depicts the identified strategic operational initiatives to support both short-term and long-term strategies. In short, these are key objectives on how technology is

delivered and maintained. They are leading indicators for the development of new programs and include required considerations before moving into production status.

## DTS Operational Strategic Principles

**Figure 4 - DTS Operation Strategic Initiatives**

<b>Department of Technology Services Operational Strategic Initiatives</b>
■ Define and implement an Enterprise Architecture across the MCG
■ Implement Enterprise Information Management
■ Implement IT Investment Management, including Enterprise Project Management Office capabilities
■ Implement an IT Communications Strategy
■ Enhance Application Portfolio Management
■ Improve Disaster Recovery/Business Continuity for Critical IT Systems
■ Develop and Implement Staffing Plan
■ Plan and Implement Infrastructure Consolidation/Optimization/Modernization
■ Establish an Effective Service-Based IT Operations Architecture
■ Establish MCG Data Warehouse and Business Intelligence
■ Enhance and Progress Information Security

## **Business Automation Framework (Enterprise Architecture-EA)**

The purpose of the Business Automation Framework (BAF) is the process for developing a set of strategic definitions and models that depict the business model, the information to operate the business model, the technologies to support the identified business outcomes, their interrelationships, and the standards, principles and guidelines governing their design and evolution over time.

DTS has for the past few years supported a strong architectural methodology as described in our Enterprise focus within this strategic plan. The challenge for any IT organization is ensuring that the efforts from the development of this important program are continually reviewed and adopted by agencies participating in the enterprise schema.

While there are definitive benefits, risks that need to be considered include the need for strong change management (human) and change control (system) as well as mechanisms that can monitor compliance. Without attention in these areas, the framework is at risk for providing inaccurate expectations for new or modified business solutions.

**Goal:**

***Establish a process to develop, monitor and communicate the County's framework and assess effectiveness through business review and effectiveness in supporting new business deliverables.***

## **Enterprise Information Management (EIM)**

Implementation of an Enterprise Information Management (EIM) solution provides an architecture with the management processes and governance to support:

- information use across Montgomery County
- structure of the information to be managed
- the distribution of information across applications
- the movement information across systems
- the methods by which information is accessed by users and other systems.

The result of building an EIM methodology is a documented definition of the structure of information to be managed and the roadmap for the distribution of information across applications.

Currently Montgomery County does not have a formal discipline in this area. The information is redundant in many systems and information access is complex, inconsistent, lacking enterprise wide data standards, well defined information distribution and providing limited knowledge management. A key component to changing this dynamic in the County will be the design and implementation of both the ERP and the MC311 solutions. Due to the data sharing dependencies for both of these enterprise solutions, EIM will have a new foundation to build upon with future assets.

***Goal:***

***Develop a process for the documentation and tracking of business data to correlate and map information to serve as the basis for an enterprise data warehouse roadmap.***

## **IT Communications Strategy**

An IT Communications Strategy outlines the activities required to ensure stakeholders are informed and educated about IT strategies, plans and the value they bring when aligned with the business. Effective communication strategies and plans help build relationships of trust, manage expectations, encourage commitment, and minimize resistance to change.

With the emergence of a formal Change Management program for current enterprise efforts, the County is beginning to implement a well established outreach program. Through this outreach program, DTS can develop a standard mechanism to communicate operating procedures and processes. While there is no dedicated resource in DTS to support consistent, timely technology communications with business departments or other County agencies, as a part of a business assessment, DTS will be looking for existing opportunities and venues to promote enterprise and evolving strategies.

The benefits of an effective IT Communications Strategy are clear. It ensures that there is a repeatable, consistent communication process and methodology. It also provides for proactive communications with employees, leadership, executive management, external County agencies, internal customers and County residents.

**Goal:**

***Develop a communications strategy that provides periodic, emerging technologies, and support services updates to the County's business departments.***

## **Perform Application Portfolio Management**

Application Portfolio Assessment strategies enable determination of proper application investments and improve overall solution efficiency. A targeted and comprehensive assessment of current business systems has been performed in order to track current investment benefits, assess solutions that provide organizational effectiveness as well as those solutions for potential retirement with the new enterprise programs underway.

The benefits are obtained when an organization establishes a formalized Application Portfolio Assessment that incorporates the following:

- The study identifies the current IT applications and identifies each application's user base, infrastructure and investments
- Identify assets for decommission in both the short-term and long-term
- Conduct a risk assessment of the current key systems
- Includes a study on collaboration tools to optimize enterprise-wide solution investment and facilitate communications

**Goal:**

***Consolidate and maintain the County's application portfolio to allow for tracking and monitoring of County applications and the development of a predictable application life cycle***

## **Plan and Implement Disaster Recovery/Business Continuity for Critical IT Systems**

It is essential to keep a consistent focus on the County's Disaster Recovery Plan and implement solution for the re-establishment of IT services in the event of a disaster. Any new or proposed solutions will need to have a continuity plan as part of the development and ensure finalization prior to a production implementation.

The Disaster Recovery Plan must:

- Identify and categorize critical systems, personnel, system interrelationships and minimum operating environment.
- Plan and implement redundancy at the various technology levels (sub component, component and application level),
- Establish a remote facility with space, network support, storage and a server infrastructure sufficient to support the restoration of IT services, and identify staffing matrix to maintain operations during the disaster event.

- Implement the plan / Test the Plan

Montgomery County systems need to be fully prepared for a systems disaster event and maintain compliance to government regulations for disaster recovery and COOP requirements. As a government agency, as a goal set by our Executive, must be functional in a time of disaster.

**Goal:**

***Perform an assessment of current and proposed business systems that includes a business information analysis that identifies recovery needs to assist in the establishment of the systems recovery plan.***

### **Develop and Implement a Staffing Plan**

A comprehensive staffing plan is essential for the entire DTS organization as well as departmental IT staff. A staffing capabilities evaluation needs to be planned and implemented to ensure that current support needs can be met and future skills be predictable.

DTS currently has a limited staffing plan to accurately predict the demand vs. supply of staff functions and needs for long-term staffing. As an example, there are functions such as Business Automation Framework, database management; CRM etc. that need to be proactively staffed. Montgomery County also has other departments doing IT systems development and implementation, which further complicates cross skills complexity and long term competency needs.

**Goal:**

***Develop a strategy for the evaluation of current staff capabilities, depth of resources for current and immediate support efforts to create a roadmap for skills development, near and future training needs and succession planning.***

### **Plan and Implement Infrastructure Consolidation / Optimization**

Montgomery County has recently developed a focus on technology consolidation and optimization. However, DTS should conduct an independent benchmarking study on its distributed computing, server infrastructure, datacenter, LAN/WAN, centralized services (e.g. DCM) and Help Desk to assess requirements, current technologies being used, and the processes serving the user base. This information should be compared against industry best practices to identify opportunities for consolidation and harmonization.

DTS has already demonstrated a significant vision on infrastructure optimization. With the use of condensed hardware solutions as well as its leadership in the area of virtualization, DTS has considerably moved forward in this area.

**Goal:**

***Begin a benchmarking planning effort that will provide a baseline for the current level of optimization and identify strategic opportunities for inter-Departmental Consolidation/Optimization.***

## **Technology Investment Management**

As a part of DTS's implementation strategy, it is clear that investments in projects demonstrate clear ROI expectations and determine enablers to track their health on a regular basis.

Technology investments need to be prioritized based on the business goals and needs and budgeted accordingly. IT benchmarking should be done on a regular basis to compare costs with similar organizations.

At Montgomery County, there is an IT project request intake, qualification, validation process. Montgomery County has begun to develop a score carding process to aid in enterprise prioritization by establishing metrics for new project recommendations. However, it is not clear how the ROI is tracked for all technology across the enterprise regularly and what in-process validation actions are taken as project development details are assembled.

**Goal:**

***Establish, with the Assistance of Financial Leadership, a Documented Process for the Fiscal Evaluation of Technology Investments that will Demonstrate Return on Investment that is in Alignment with Industry Best Practices.***

## **Establish an Effective Service-Based IT Operations Architecture**

Enterprises that systematically manage the life cycle of their IT assets can reduce the cost per asset by as much as 30 percent in the first year, and between 3 percent and 8 percent annually during the initial four to five years (Source: Gartner Study of SDLC, 2007).

Introduction or use of tactical outsourcing will cause significant degradation of productivity, impede staff retention and will typically have a higher than anticipated fiscal impact. The agile organizations of the future will skill up to the challenge of strategic IT sourcing. By leveraging the central IT buying power, Montgomery County can improve its IT costs by negotiating deeper discounts from its vendors.

Montgomery County does not have an enterprise wide asset management system to track and manage resources for planning, forecasting and acquisition purposes. Montgomery County does have an enterprise wide technology professional services procurement solution to manage strategic resourcing. Formalizing the solution for ad-hoc needs, tracking, documentation of departmental needs and long-term usage will generate necessary improvements for future fiscal outcomes, controlled management and assist in the creation of an automated approval process.

**Goal:**

***Establish a direction for the implementation of an asset management solution to support the control, reporting and overall management of physical and resource assets that support County technology investments.***

## **Enterprise Data Warehouse and Business Intelligence**

The Data Warehouse (DW) is a central component of an organization's business intelligence program and is becoming the mission-critical heart of decision-making. Business Intelligence (BI) is the use of skills, knowledge, technologies, applications, quality, risks in the manipulation of a consolidated Data Warehouse that allows for a business to have a better understanding of business opportunities and enhance decision making. As a result, an organization's data warehousing initiative requires deep and broad skills across technologies and subject areas, sufficient funding and continuous quality assurance from experienced practitioners to avoid the numerous pitfalls.

The County's ERP and CRM initiatives will mandate the development of the first consolidated DW as a direct result of the architecture of the two, enterprise initiatives. All future Technology Modernization initiatives will be required to leverage the single, enterprise DW and BI models.

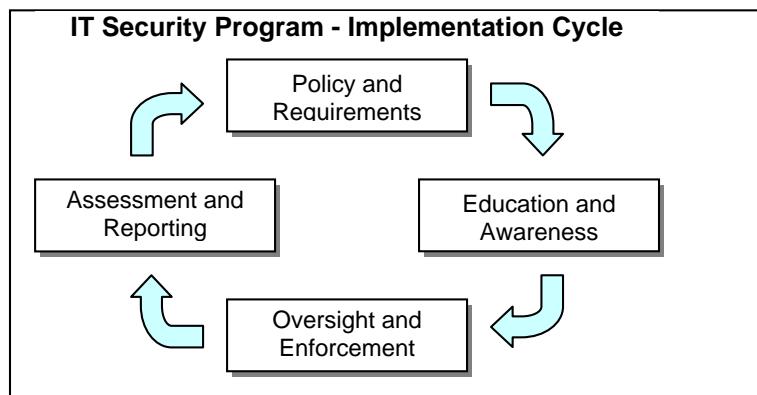
**Goal:**

***Identify existing information stores as well as planned, new solution information repositories that will need to be structured or modified and merged into an enterprise information/data portfolio***

## **Enterprise Security Management**

Development of an IT Security Program is an ongoing venture that follows a cyclical process. The implementation phases (see below) are not cleanly separated processes, but instead represent a flow of activities that yield an ever maturing Program. The implementation cycle involves establishing information security requirements, educating people about their responsibilities under those requirements, building governance structures to ensure Program compliance, and monitoring and reporting of progress.

**Figure 5 - IT Security Program Implementation Cycle**



The statement above makes a crucial point about information security. Information security is an ongoing effort that is the shared responsibility of the entire organization. It is a continuous opportunity to advance executive awareness regarding what it means for an organization to manage information security effectively. It is also a key component of most technology business solutions to ensure that information management and access controls are routinely reviewed as a part of a solution implementation.

Montgomery County includes security considerations in all aspects of technical advances. It will become significantly more visible as the County undertakes enterprise based solutions that will share information resources, dynamically link applications and data and further blend the ability for interdepartmental exchanges as well as information delivery to citizens.

**Goal:**

***Establish a process for regular technical solutions assessment and progress on operational tactics, gap analysis through testing and deployment as well as validation through the integration and support of business objective deliverables.***

## Voice Communications

MCG maintains a modern voice communications platform (Private Branch Exchange - PBX) that leverages the Network domain to provide the following capabilities and services:

- Legacy Voice Services
- VOIP Services
- Voicemail Services
- Interactive Voice Response Services (IVR)
- 311 contact center Services
- Enhanced 911
- Unified Communications
- Mobility Solutions

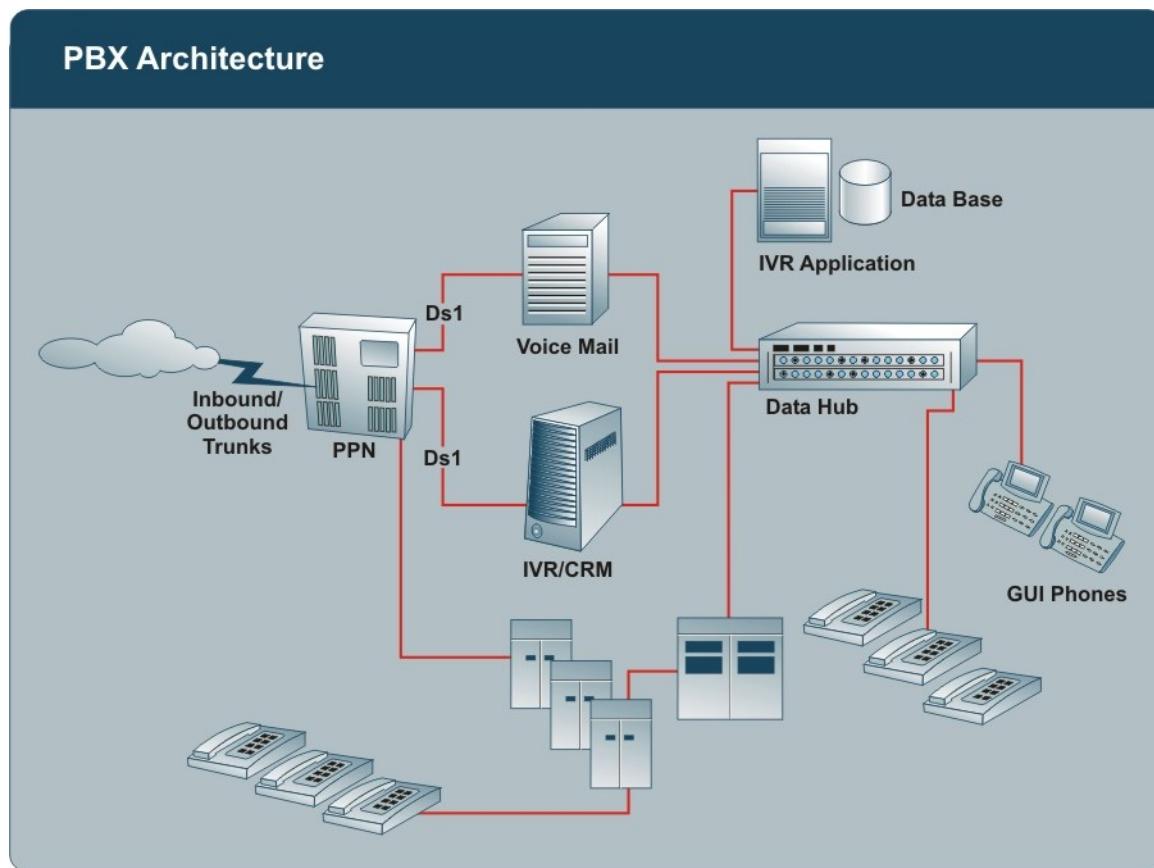
- Conferencing and Collaboration Solutions

The PBX is a highly reliable and scalable system that supports a Flatten Consolidate and Extend (FCE) approach characteristic of Enterprise Architectures found in large organizations. The platform provides access between voice and data endpoints as well as many enterprise services required by the County to perform its mission.

At a time when local governments everywhere, but especially within the Washington, DC Metro area are focused on their ability to provide Continuity of Government when a disaster strikes, maximizing the survivability, availability and uniformity of communications infrastructure is critical. The PBX platform provides the County with significant business continuity and survivability capabilities, which provides highly flexible, scalable, and standards based building blocks that can be mixed and matched to create customized solutions. The PBX server provides a robust application platform based on industry standard operating systems to support distributed IP networking and centralized call processing across multi-protocol networks. The platform includes the following key features:

- Interoperable with standards based data networks to provided maximum flexibility and reduced cost of ownership.
- Survivable features and options that allow endpoints to continue operating even if the primary PBX server fails or in the event a Wide Area Network (WAN) failure affects communications between the gateway and the server.
- Support multi-protocol environments, maximizing investment protection for enterprises that require concurrent support of Time Data Multiplexing (TDM) and Internet Protocol (IP) based telephony
- Redundant system and network options that support high availability configuration for both TDM and IP based solutions.
- Connectivity across any public or private network using a variety of interface options over TDM, Asynchronous Transfer Mode (ATM), Ethernet, Frame Relay or Point-to-Point Protocol (PPP).

**Figure 6 - PBX Architecture**



The current PBX telecommunications infrastructure is critical to the day-to-day operation of the County. County employees depend on the ability to quickly and efficiently communicate to obtain information that is essential to the performance of their jobs. Similarly, County citizens depend on the same infrastructure and telephony applications to access County employees and/or systems for information necessary to meet their needs. Therefore, ensuring that the telecommunications infrastructure is reliable and available to all County employees and citizens is vital. The PBX system is designed to be a “Five-Nine” reliable system which means that it is available, 99.999% of the time.

Additionally, traffic congestion, high fuel cost, and Business Continuity of Operations (COOP) requirements have driven the need to explore new capabilities to support effective means of Telecommuting. The PBX platform provides the ability for workers to have the same capabilities as work, at home, or on the road. For example, workers are able to use PC's, laptops, or even PDA's over the internet to take their phone and all their capabilities with them wherever they go.

Importantly, this communication capability is also available to the County's Emergency Operations Center staff creating the ability to provide critical coordination and communications efforts.

**Goal:**

***Continue to pursue innovative ways to enhance the PBX platform in a healthy evolutionary mode, which will prevent the need for an expensive replacement in the future.***

## FiberNet Strategic Plan

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. In 1995 the County determined that cost savings could be realized and a future-proof network could be created by building its own facilities based fiber optic network. Leveraging work that the Department of Transportation (DoT) had already begun in building a fiber optic network for the Advanced Traffic Management System, The Department of Technology Services (DTS) was given the mission of building an electro-optical network on top of the fiber plant that DoT had already placed. FiberNet was born.

Today, FiberNet is the electro-optical backbone for MCG. FiberNet provides communications services for all County agencies including the Government (MCG), Public Schools (MCPS), Montgomery College, Maryland National Park and Planning Commission (MNCPPC), Washington Suburban Sanitary Commission (WSSC) and the Housing Opportunities Commission (HOC). FiberNet has become a big success and every agency wants to participate to the fullest extent possible. Governance is vested in the Information Technology Policy Coordinating Committee (ITPCC) with technical approval delegated to its CIO Subcommittee. DTS provides technical leadership and is operationally responsible for FiberNet.

The alternative to FiberNet would have been and continued to be the purchasing of telecommunications services from the local commercial market. Many state, county and municipal governments operate in this mode. These other agencies are discovering that as applications become more information rich, initiatives to improve services may be frustrated easily by the high cost of carrier leased lines or other tariffed offerings including special pricing agreements. Montgomery County Public Schools (MCPS) is currently seeing the bandwidth requirements for applications growing and the inability of sites, not on FiberNet, to deliver services.

In several cases the carriers are not maintaining their physical plants (underground and overhead wiring, old copper capabilities, etc.) making even simple connections unreliable and data services, problematic. MCPS has this problem with many elementary schools as does the County Government with several small offices. In a recent conversation with representatives from a commercial service provider, prices were quoted several thousand of dollars per month for a 10 MegaBit/second link. MCPS has over one hundred sites still to be added to FiberNet. Although a long term contract would bring this price down, it is possible to see the order of magnitude associated with providing such services through a local exchange carrier still costing hundreds of thousand dollars per month. MCPS and the

FiberNet Team are looking for alternatives and near term solutions have already been identified.

FiberNet is an integral component of the County's Public Safety Communications Network. Given these 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 or commercial network, there is no pre-emption or prioritization for emergencies.

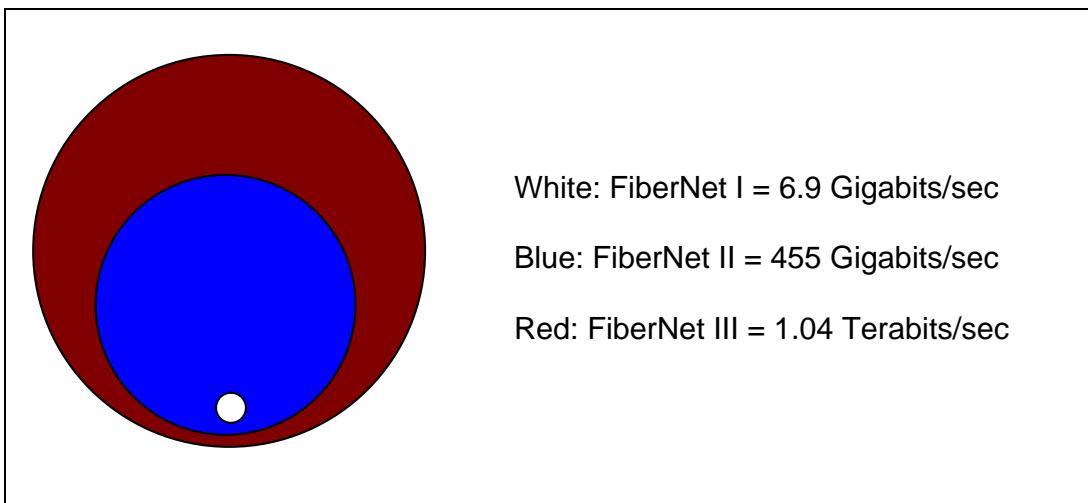
Strategically, FiberNet is working to leverage its resources, increase its footprint, improve security and provide voice/video/data services at lower cost. Tactical successes include:

- Leveraging the County's telephony platform by delivering dial tone to Housing Opportunities Commission (HOC);
- Becoming the Internet Service Provider for Maryland National Capital Park and Planning Commission (M-NCPPC) and HOC, providing Internet Service Provider (ISP) carrier services for the City of Gaithersburg and the American Film Institute;
- Replacing the County's legacy ATM network (FiberNet I) with a state-of-the-art Metro-Ethernet network (FiberNet II);
- Re-architecting the FiberNet core so that no or minimal equipment needs to be purchased to add a new site. Only the cost of fiber or other transport media needs to be considered when adding the location;
- Creating MCG WiFi Hotspots in Silver Spring, Bethesda, recreation centers and County cafeterias;
- Connecting to State of Maryland networks directly;
- Connecting to local government networks directly without going via the Internet;
- Adding a backup Internet Service Provider for the County.

Current initiatives include migrating all County departments onto FiberNet II; other participating agencies are already on the next generation solution. A major effort continues to be increasing FiberNet's footprint by adding MCPS elementary schools and County Government sites including the Smart Growth initiative. DTS is always looking for economically justifiable alternatives to the high cost of fiber. FiberNet has engaged the Washington Metropolitan Area Transit Authority (WMATA) to consider sharing assets and facility access to improve network reliability and availability for the County's Public Safety Radio System (PSRS). It is expected that this effort will produce positive results and increase the availability of this extremely important system.

FiberNet will be an integral part of the next generation Public Safety Radio System (PSRS). FiberNet has started a proof of concept trial to determine the feasibility of using cable modems to create a virtual private network to replace services leased from Verizon by MCPS and MCG. This is a recent initiative. If successful, it will permit high speed connections to elementary schools and leased County facilities at a fraction of the cost available from commercial carriers. MCPS is excited at the prospect and so is the FiberNet team.

**Figure 7 - Raw Aggregate Backbone Bandwidth**



FiberNet is built for the future. Raw bandwidth coupled with an intelligent network infrastructure is the hallmark of FiberNet II and the keys to future proofing the County's IT information transport requirements. A simple graphic captures the past, present and future of FiberNet. The figure above captures the raw aggregate bandwidth across all the FiberNet I backbone links. A second image encapsulates FiberNet I and is a proportionate analog for FiberNet II's aggregate backbone bandwidth today when compared to FiberNet I. Finally, the larger image is a graphical analog for FiberNet III's backbone capacity after a nominal capital improvement to FiberNet II.

FiberNet II is an ***intelligent network*** capable of making routing decisions in the network core. The Internet is designed based on this principle; FiberNet I model, is not. FiberNet II exists, is in use and is based on technologies that are being used by large service commercial providers. Funds are currently being accumulated in a capital reserve to move to FiberNet III when the time arrives.

FiberNet is an integrative system that makes inter and intra governmental IT services and communications easier to implement and most of all easier to secure. Ultimately, FiberNet's strategic goal is to deliver mission critical applications over a reliable and robust communications infrastructure at lower prices than those achievable in the open market. The current configuration of FiberNet II is designed to sustain the County's bandwidth requirements for the next ten years.

**Goal:**

***Continue to migrate to the next generation of FiberNet,  
Communicate and integrate FiberNet advantages within all new  
and enhanced programs requiring inter-department, inter-  
agency and inter-jurisdictional voice and data transmission  
needs***

## **4.4 Enterprise Architecture**

In 2000, DTS initiated an Enterprise Architecture program that began with the creation of an Enterprise Architect position. The 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.

The County's Enterprise Architecture effort is based on defining the following:

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

The purpose of the Enterprise Architecture is to communicate:

- the results of County business decisions (related to IT);
- the County IT Architecture and infrastructure;
- how the County manages its data; and
- how the County builds or acquires applications.

In general, it communicates how the organization has invested in its IT infrastructure (including hardware, software, processes and people). The County continues to make significant investments in IT and must communicate to many parties, how future investments align or impact the architecture and infrastructure.

The Enterprise Architecture is targeted to the following audiences:

- General public
- County employees, including the following subsets of County employees:
  - Technical Operational Management Group (TOMG) members
  - Information Technology Policy Advisory Committee (IPAC) members
  - County Departmental IT Staff
  - County Council Administration
  - County Executive Staff
  - DTS Employees
- Vendors responding to RFPs and Contracts
- Auditors

A reduced version of the document is published on the County Internet portal. The full version is published on the County Intranet portal and is attached to large IT projects RFPs and contracts.

### **Background**

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 Enterprise Architecture document, prepared by the DTS, is used as a comprehensive reference to the County's information technology architecture.

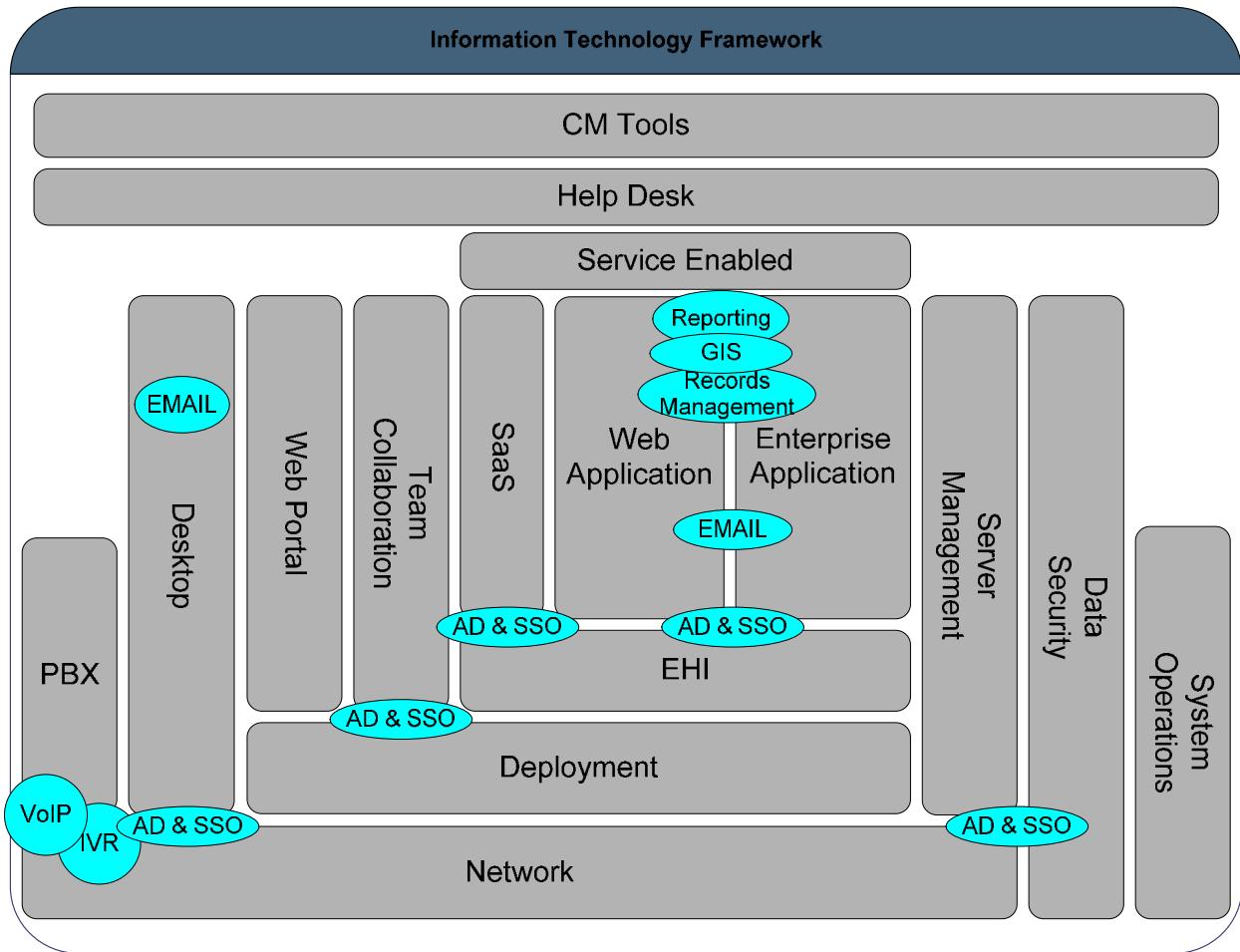
The Enterprise Architecture Document is DTS' framework for program execution. It is prepared in concert with the Enterprise Technology Strategic Plan and is designed to support the initiatives outlined in the plan.

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 workforce, and technology is the tool. This document is a blueprint as to how DTS is aligned and is used with business support to make business, technical, application, and data decisions.

### **Purpose**

The purpose of the Enterprise Architecture is to present well-defined, strategic standards adopted for the development and delivery of the County's information systems. It provides a cohesive blueprint to optimally design, purchase, develop, deploy and manage information systems for the County. The components of the overall infrastructure are shown in Figure 8 – Information Technology Framework.

**Figure 8 - 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.

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

## Domains

As the Figure 8 suggests, Montgomery County Technical Architecture may be defined as a collection of component architectures or domains. Each architectural domain 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.

The components are all interrelated with the result that the sum of the whole is greater than the parts. As one example, the Active Directory domain is the County technical directory service. It is leveraged by other services to improve their functionality. It is used to:

- Improve the Web Applications and Enterprise Applications Domains by having a single identity source for applications
- Improve the usability of the Web Applications and Enterprise Applications Domains through a single sign on
- Improve the Security Domain by providing a single identity source for network and wireless login

## Benefits of a Defined Architecture

The Architecture communicates how the resources of DTS in particular and the County in general are aligned with regards to Enterprise Services. It serves to publish the availability of Enterprise Services that departments can take advantage of in their projects.

The Enterprise Architecture document is included in many MCG IT RFPs and contracts and serves to inform vendors about the County Infrastructure and how they can best take advantage of current County processes within their proposals. Additionally, the Enterprise Architecture document is attached to many contracts to hold vendors accountable to aligning to it.

**Goal:**

*The goal for the MCG Enterprise Architecture is to marry the business and technical fields into one discipline.*

## 4.5 Project Management

Enterprise Project Management (EPM) is a business strategy using technologies and tactical processes that enables organizations to assess, deploy and manage what might otherwise be unstructured efforts. EPM can be the key to strategic investments for organizations to compete and survive in an uncertain economy. EPM can also drive process efficiencies and compliance efforts, as well as collaborative information management needs.

Montgomery County has developed a comprehensive strategy that includes best practices for program level governance, reporting and metrics. As DTS deploys its strategy with the department, adoption by other business areas can also enable the larger organization's ability to optimize costs, remove redundancies from overlapping efforts and save on ongoing maintenance costs, storage and infrastructure costs, and operational support for systems.

Figure 9 - Main Deliverables of the Project Management Process



The Project Life Cycle contains 4 major phases: Initiate, Plan, Execute & Control, Deploy & Transition. Each phase contains multiple steps. Each step defines one or more outputs designed to support the primary goals in each phase.

The Initiation Phase establishes the business case for the project request. The enterprise evaluates the costs, benefits and risks of proceeding with the project. If the project is approved, resources will be assigned for the Plan Phase of the project.

The Plan Phase establishes the framework for which the project will be evaluated and governed. On medium or large sized projects, a project will be assigned to coordinate the various activities in this phase. A Project Management Plan will be developed to define project governance, communications, scope management, quality management,

configuration management, schedule, budget and spending plans, risk and issues management. Requirements Analysis and Systems Design will also commence during this phase.

The Execute & Control Phase defines the period of time where the project team executes the plans developed during the Plan phase. The systems developers may be building the system using any of the selected SDLC methods during this phase. The project manager will be monitoring and reporting progress, risks and issues to the project stakeholders. This phase is usually concluded with the successful completion of systems acceptance testing activities.

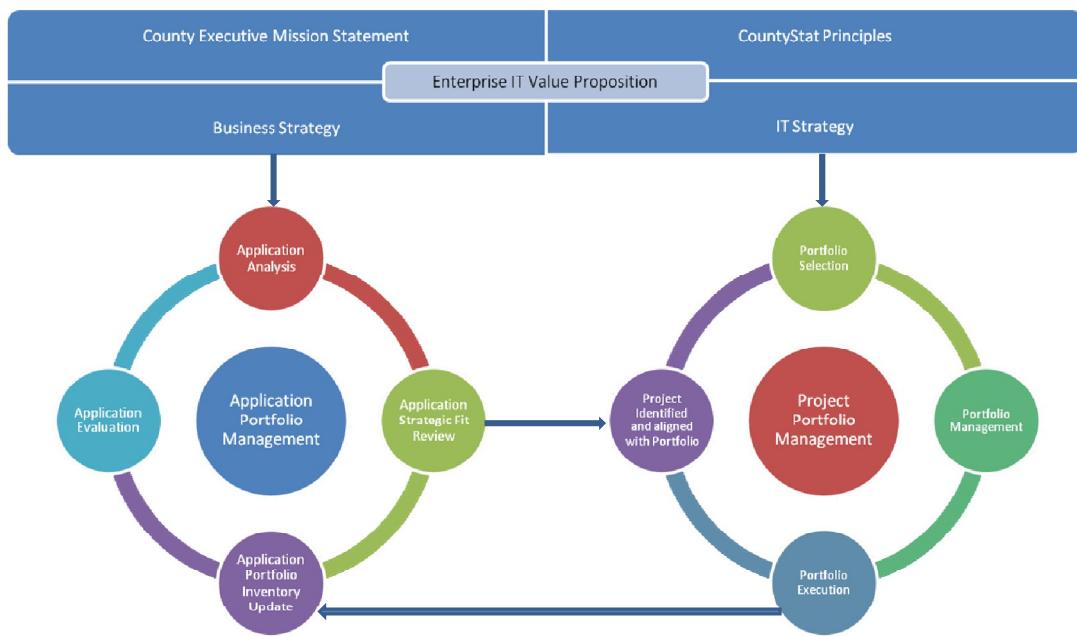
The Deploy & Transition Phase defines the activities required to transition a high quality system from acceptance testing to a working system that fulfills its intended mission. Systems documentation and training are delivered during this phase. Knowledge is transferred from the project development team to the team responsible for application operations. Lessons learned sessions are conducted to identify areas of improvement that can be applied to future projects.

## **Enterprise Project Management**

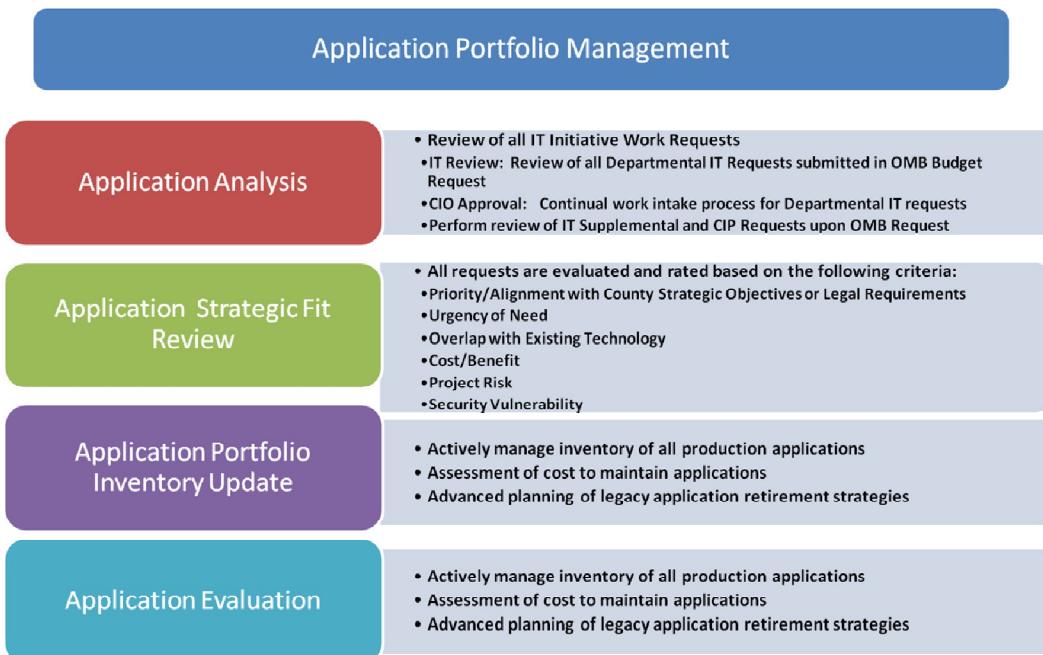
MCG's Enterprise Project Management model is based on the recognition that the IT value proposition is an enterprise business concern, not just a technology concern. Each single project co-exists with many other projects in the enterprise or may be part of a larger program. In order to use the County's technology resources most efficiently, the business must establish an enterprise view of how projects are evaluated and prioritized within the context of existing project requests and existing applications.

It has become essential to be able to manage, monitor and assess the status of all projects in the enterprise through a set of uniform project management processes. DTS' Project Management Office (PMO) facilitates the effective implementation of strategic County objectives by identifying and focusing on a portfolio of projects with the highest value and maintaining standard processes and practices that lead to improved project and program outcomes.

**Figure 10 - Enterprise IT Value Proposition**



**Figure 11 - Application Portfolio Management**



**Figure 12 - Project Portfolio Management**



MCG's Enterprise Project Management approach is focused on monitoring the application and project portfolios to maintain the "right mix" of projects in an ever changing environment with finite resources. New project requests must demonstrate the value to the enterprise as well as support the enterprise architecture and security constraints.

**Goal:**

***Continue the enhancement of the current enterprise project management strategy, including the communication and implementation in other business areas while identifying measures that demonstrate the successes for an optimized PM process.***

## 4.6 Information Security

In 2002, DTS created the Data Security team with a team of two full-time employees and very limited resources. The ever changing information security landscape proliferated by viruses, identify thefts, sensitive data leakages denial of service attacks, and other cyber

threats resulted in the need to allocate more resources to securing County information assets.

Since 2006, the 5-member Security Team has provided technical expertise and services to ensure the confidentiality, integrity and availability of County information assets by establishing and implementing enforceable rules regarding access to and acceptable use of County information resources; conducting risk assessment and analysis; establishing reasonable security guidelines and controls to protect County data; monitoring and management of systems security vulnerabilities; coordinating information security audits to achieve regulatory compliance; and assisting with forensic investigations and resolution of problems and/or alleged violations of County information security policies.

## **Business/Administrative Services**

The team has recommended a comprehensive security program that will provide services for both the Information Technology staff and County end-users to ensure the preserving of County information assets. The services include:

- Risk Assessment/Management

All computer systems have inherent risks that can not 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.

- Compliance: County compliance efforts performed/coordinated by the Security Team have included:

- HIPAA (Health Insurance Portability and Accountability Act) Compliance

In 2007, the security team coordinated with BAE Systems to perform an independent risk assessment of County HIPAA-covered systems. The assessments provided system owners with evidence documenting the capability of the system to operate with an acceptable level of risk to their information technology resources; data processed, stored, and transmitted within specific applications, and their connections to other information systems. These systems included four shared services systems and 15 Major Applications (MA).

Currently, the team is involved on a regular basis with the Executive-led HIPAA Committee to build compliance strategies and monitor progress.

- PCI (Payment Card Industry) Compliance

Montgomery County contracted an industry security assessment organization to perform a Payment Card Industry (PCI) – Self Assessment Questionnaire, in accordance with the requirements of the PCI Data Security Standard (PCI-DSS).

The assessment was performed from a project management approach. Information was collected through batteries of qualitative interviews to identify the various locations and processes that touch cardholder data in the various business units. This project was initiated in January, 2007.

There has been an ongoing effort throughout FY08 and FY09 with 19 departments and the Department of Finance to move towards compliance and remain compliant. This effort will continue as the regulations are updated and new credit card services are brought online.

- Security Awareness and Training Program

In recognition that people are in most cases the first line of defense against security threats, such as malicious viruses, disgruntled employees, and other ill-intended third parties, the County deployed its first ever computer-based Security Awareness and Training Program (ISATP) in June 2007. The ISATP training objective is to heighten County employees' information security consciousness by providing relevant information that will help protect the confidentiality, integrity and availability of County information system resources. Employee training on this important topic is critical and is mandated by several different laws and regulations that require the County compliance. Within the first three months, an unprecedented number of County employees (4,500 plus) enrolled and successfully completed the training.

**Figure 13 - Staff Completion of Security Awareness Training**



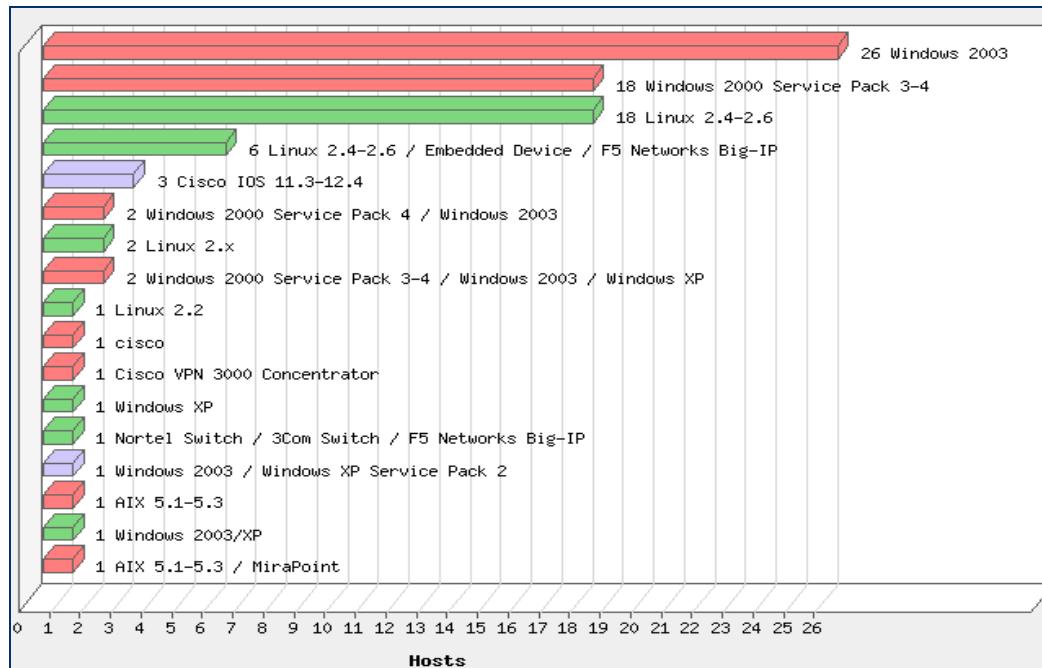
## Technical Services

The Security Team utilizes a myriad of high-tech tools to provide secure remote access to County employees, perform network scanning for vulnerabilities, Internet content filtering, intrusion detection and prevention, security logging, analysis and reporting. The Security Team also provides technical expertise on email SPAM, spyware, virus and other research associated with vulnerabilities. Other technical services include:

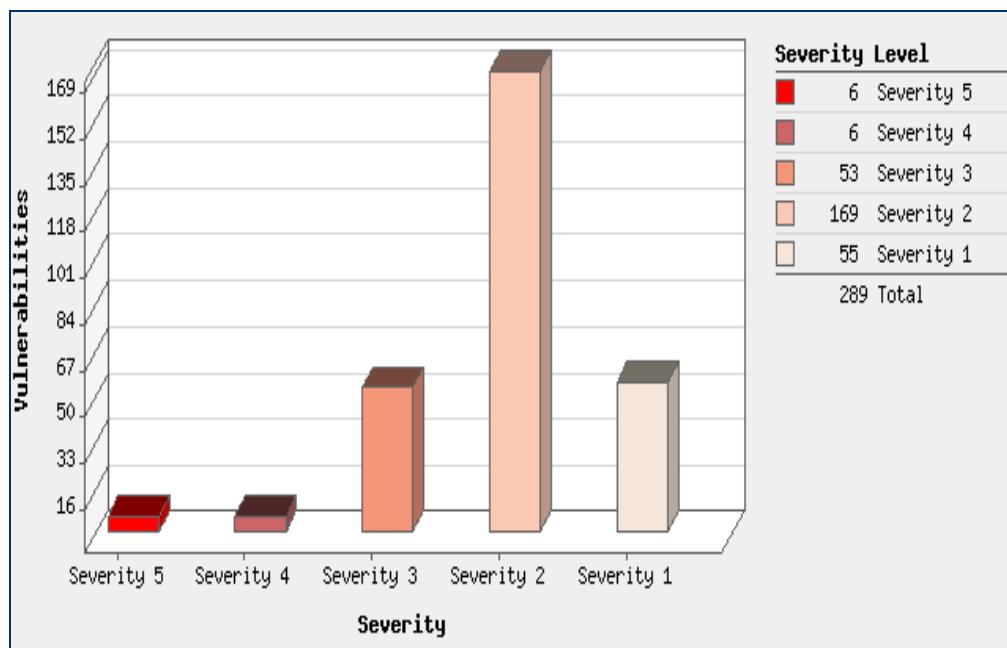
- Incident Response
- Computer Forensics
- Log Correlation and Management
- Remote access

These high-tech tools enable the team to produce ad-hoc or periodic reports using real-time data. See sample reports below:

**Figure 14 - Sample Web Filtering Report**



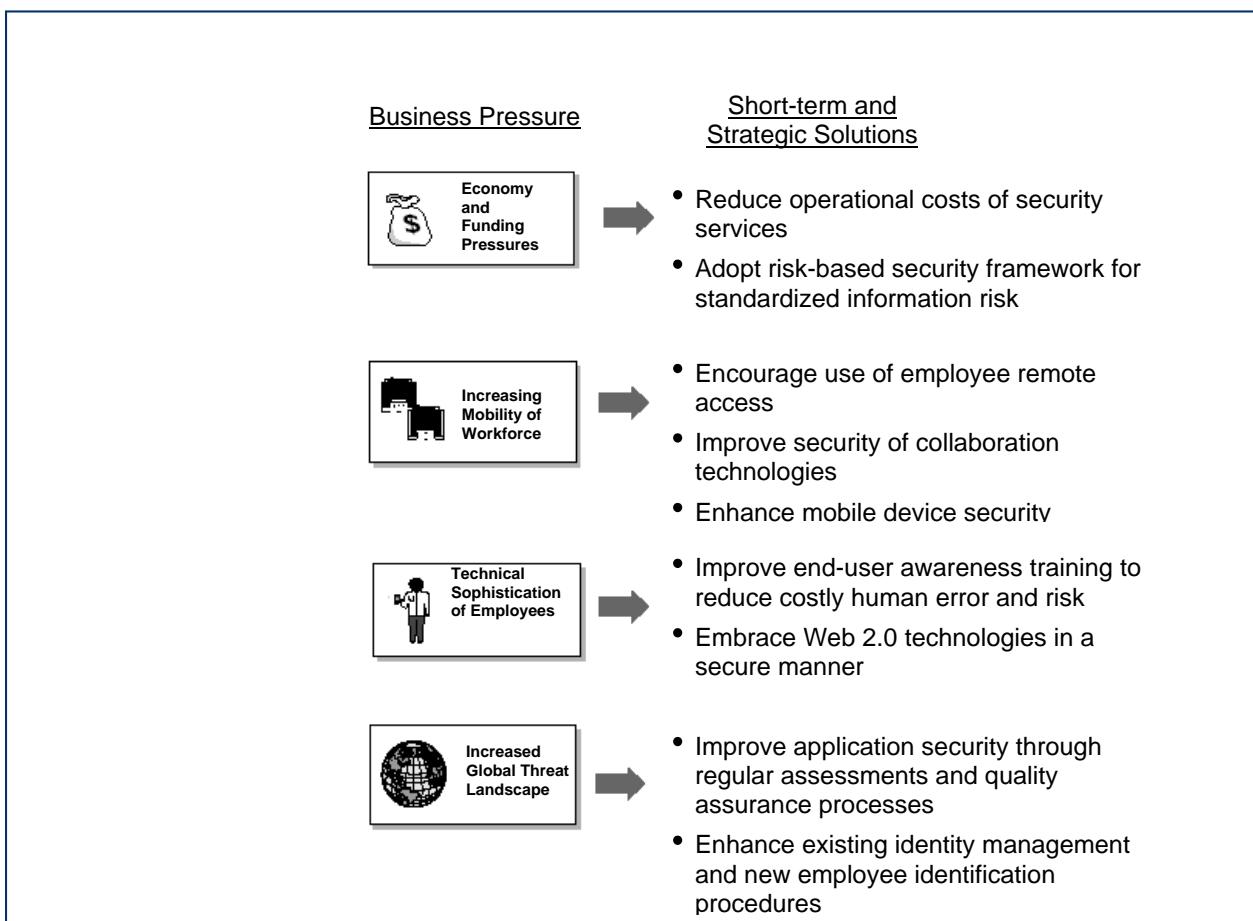
**Figure 15 - Sample Vulnerability Scan Report**



## Security Strategies

As threats and challenges continue to evolve, both tactical and strategic mitigation plans must be adapted to handle these transformations.

**Figure 16 - Information Risk Solutions of Current Montgomery County Pressures**



- New Enterprise Security Implementation

The Security Team completed a draft of a National Institutes of Standards and Technology (NIST) risk-based Enterprise Security Policy Implementation Program. This risk-based policy when approved will replace the existing rule-based security program. This policy will permit differing levels of security depending on business need and appropriate risk-level acceptance. It is currently undergoing the review and approval process for implementation.

- Enhanced Security Awareness and Training Program

Recently, the County participated in a multi-departmental research effort to improve our information security end-user awareness and general employee communication

channels. Based on the survey results, an area noted for improvement included the area of communicating and raising user awareness on policy and compliance requirements. As a consequence, the Compliance & Policy Resource Central (CPR-Central) on the Employee Communications intranet page was created to heighten employee awareness of critical policies and compliance requirements, as they relate to job functions. The CPR-Central will serve as a centralized repository for easy access to Countywide Administrative Policies (APs), County Codes, Federal, State and Local laws, standards, and industry best practices pertinent to information security, privacy and other regulatory compliance requirements. Efforts are underway to create a more interactive and visually-enhanced refresher awareness training and implementation of a Security Message Bulletin Board for alerts, tips, and security notifications.

***Goal:***

***Continue to evolve, both tactical and strategic mitigation plans to adapt to information threat and vulnerability transformations.***