

City of Fredericksburg Strategic Technology Plan 2015

V1.0.2 - FINAL

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Introduction

Managing technology growth, minimizing risk of technology and ensuring technology is effectively aligned to support the strategic objectives of the City are all key reasons why Fredericksburg has embraced strategic planning for technology. While technology is very dynamic, this plan is intended to provide a blueprint for technology for the City for the next 3 years. The strategies in this document reflect industry best practices and demonstrate the use of technology as an enabler for today's local governments.



This document is intended to provide a summary snapshot of the Strategic Technology Plan 2015. The full plan goes into the details of the current technology posture of the City along with defining a comprehensive vision for the future which is supported by detailed goals and strategies.

A Vision for the Future

By definition, a “Strategic Plan” represents a “Vision for the Future”. Through the strategic planning process, the City has crafted this vision shaped by input from departments within the City, recognized best practices in local government, and by recognizing the needs of the citizens of the City. In today's society, citizens demand performance from their government. Because performance matters, investment in technology is critical to be able to run an efficient government and to provide the services that citizens are demanding and which they deserve.

The City's “Vision for the Future” will focus on technology investments that we believe will result in a positive return on investment (ROI) and will be represented by these guiding principles and characteristics.

Performance Matters

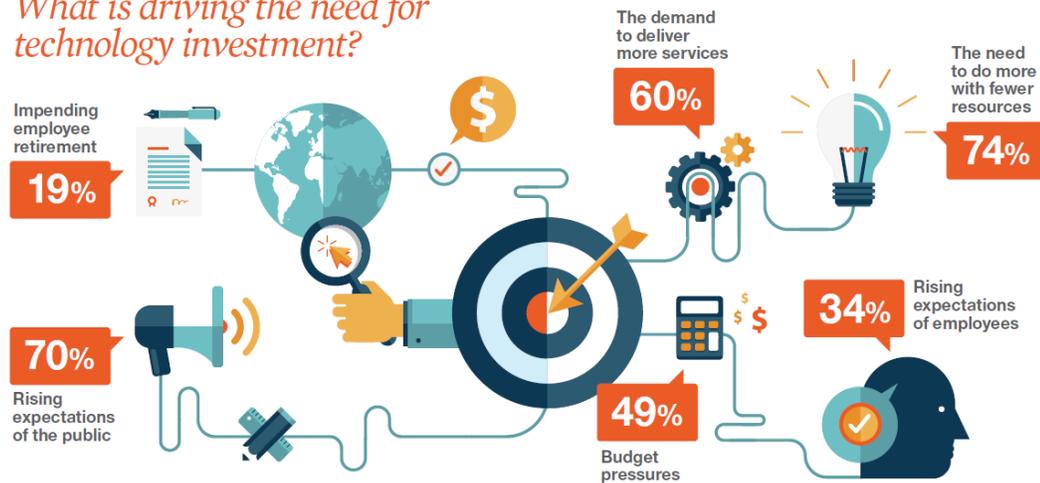
By reshaping business processes and employing new technologies, government can be just as innovative as the private sector. Consider the following:

- ✓ **Electronic content management** can improve data handling and retrieval while helping to reduce costs and eliminate the redundancies common with manual processes.
- ✓ **Platform-, Infrastructure- and Software-as-a-Service** increase government agility and flexibility while lowering operating costs.
- ✓ **Automation of key processes** such as permitting and licensing is enabling governments to work at the speed of a startup company on a limited budget.
- ✓ **Innovative data warehousing** and big data analytics are allowing governments to move on from troublesome legacy systems.
- ✓ **Virtualization and shared services** help agencies save dollars and better deliver services.



So what are the factors which drive the need to invest in technology? It is important we understand this question instead of wandering aimlessly through the strategic planning process. The following figure represents results from a recent survey by the Center for Digital Government.

What is driving the need for technology investment?



Source: CDG Improving Government Performance Research Survey, 2014

The results of this study are consistent with the strategies set forth in this plan. Many of the strategies in the plan were recommended because we either need to meet expectations of the citizens or technology needs to fill the gap as the City is required to do more with less. The only reason to invest in technology not cited in this survey which related to some of the strategies in the plan, is related risk avoidance or minimization, which we can all agree, is very important.

The following guiding principles serve as the foundation for this strategic plan and the goals and strategies which were defined as a part of the strategic planning effort.

- In lieu of increasing head count and personnel, **technology must become a priority** for the City in order to maintain acceptable levels of services to citizens.
- **The user experience for devices** utilized by employees will converge to a common user interface providing users with a consistent experience regardless of whether they are using a desktop computer, laptop computer or tablet device.

For example, Mecklenburg County, N.C., implemented its "1 to 1, One Person, One Device" initiative, which allowed the county to eliminate extra desktops and laptops, instead equipping employees with one device and enabling them to access resources via virtualization.

Center for Digital Government
- **Virtualization** at both the server and desktop will be a critical technology for the City moving forward.
- Recognizing the City is truly a "Digital City" relying heavily on technology, **there will be a focus on disaster resilience** to ensure technology services as well as public safety technology can continue to operate in the event of a disaster.
- **The City will begin the process to prepare for transition** from a legacy ERP suite and platform which is over 27 years old to a contemporary platform to support core local government functions including financial management, tax

assessment and billing, HR and payroll, planning and development, assessment, and other key functions.

- ***The focus of GIS will turn to the user*** placing enabling technology and apps in the hands of the users allowing the users to access GIS through mobile applications and to allow the users to maintain information in GIS at the point of entry.
- ***The City will continue to move toward “Digital Government”*** by utilizing document management and imaging technology.
- It will be important for the City to continue to ***embrace the cloud*** and take advantage of cloud-based services which result in lower operational costs and which do not put confidential information or service levels at risk.
- ***The City’s network*** will continue to be one of the most important assets which will promote “Digital Government” and support the evolution of technology.
- Technology, which has historically been utilized independently by Police and Fire, along with the planning implementation and support of the technology will converge into a ***“Common Public Safety Technology Platform”***.
- ***Consolidation of technology planning, implementation and management will provide significant benefits*** but will require the City ensure the Information Technology Organization is staffed effectively to handle this model.
- ***Improving communication to citizens should be a priority*** and the Media and Communications Specialist will focus on all aspects of public release and communication of information.



Current State of Technology

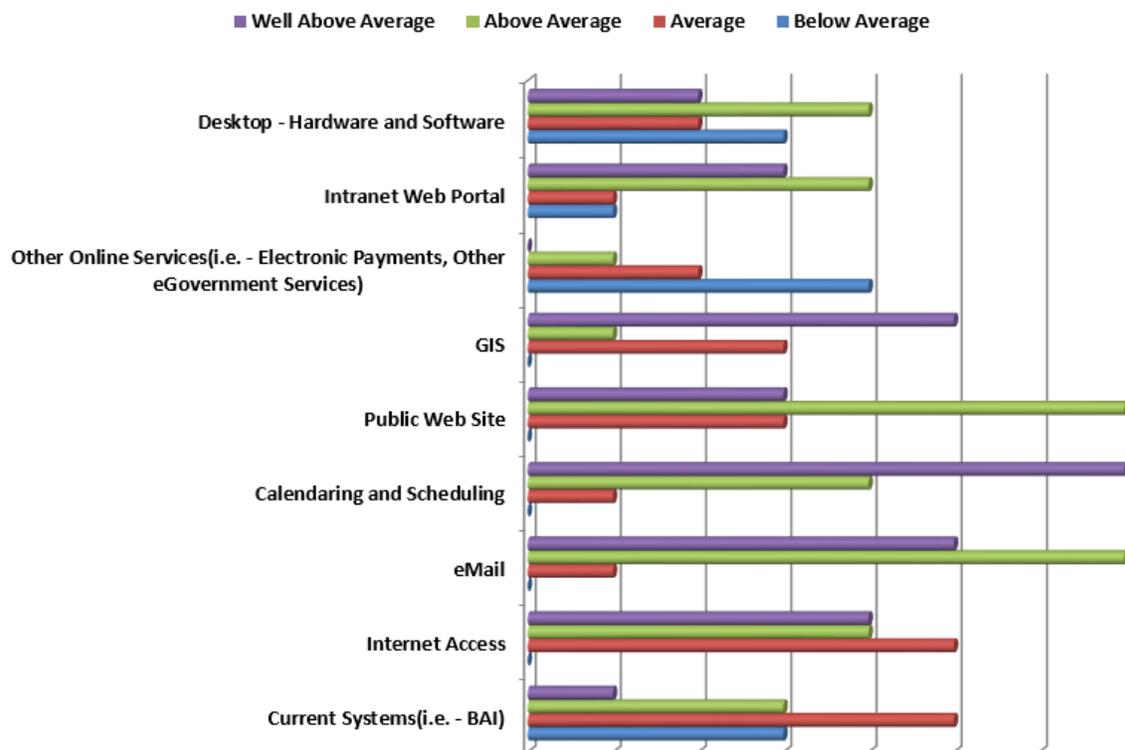


As part of the strategic planning process, the current state of the City’s technology environment was evaluated. This evaluation included departmental surveys and an analysis of the City’s overall technology posture culminating in the SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis which identified current state strengths, weaknesses, opportunities and threats to future success. This

analysis sets forth the current baseline for technology within the City. It was this baseline that served as the starting point for moving forward with planning for the 2015 Strategic Technology Plan

Technology Report Card

As a part of the strategic planning process, departments within the City were surveyed to gain an understanding of how well they felt the existing technology and services were meeting their needs. This information was then utilized during the strategic planning process to focus on addressing specific needs of the departments and to address potential deficiencies in the technology services being provided.



This chart reflects how well departments felt technology services such as eMail and Internet access were meeting their needs. This also reflects how well systems such as BAI, the City’s financial application platform, were meeting the needs of the departments as well.



Summary of the SWOT Analysis

As part of the strategic planning process, the current state of the City's technology environment was assessed identifying strengths, weaknesses, opportunities and potential threats to future success. This section of the plan summary provides an overview of items which were identified as part of the SWOT Analysis.

1. The City's current technology posture including the fiber network, technology project management, and server virtualization provide a sound foundation for future state technology initiatives.
2. One of the City's most valuable technology assets is the public web site.
3. Another valuable asset which is an extension of the public web site is the City's Geographic Information System or GIS.
4. Information Technology works with departments to set measurable goals, objectives and measures to quantify what needs to be completed along with the status of these items from a technology project perspective.
5. The City and Information Technology have become well versed in the Payment Card Industry (PCI) Data Security Standard and have implemented a PCI framework to allow the City to handle credit card transactions.
6. The City relies heavily on Bright and Associates (BAI) and the AS/400, a 27 year old platform, to support the key functions of the City.
7. The City has both on-site and off-site backups for key systems in place but does not have a documented disaster recovery or resilience strategy. The City is working toward developing a comprehensive disaster resilience strategy.
8. The City has multiple connections to the public Internet which are not centrally controlled or monitored from a security perspective which could present a vulnerability.
9. The City experiences challenges in trying to keep up with updates to the desktop computing environment. The City has recently implemented a tool which will aid in pushing updates and software upgrades to the desktops in an effort to improve on the management of the desktop computing environment.
10. The existing network infrastructure does not have adequate connectivity to two remote sites.



11. Departments within the City are ready for change when it comes to the City's primary financial application platform, BAI, and the AS400 hardware platform which runs this application as well as others.
12. Planning, implementation and support for the Fire Department technology is inconsistent with the City's centralized technology management model.
13. Opportunities exist to further expand the use of GIS as a strategic asset for the City.
14. A largely underutilized asset for the City is the intranet platform.
15. The City has an opportunity to implement a document imaging and management system to improve efficiency and reduce overall risk.
16. The City is currently utilizing limited proactive network monitoring.
17. The current pattern of implementing systems and technology within the City will likely present maintainability challenges into the future.



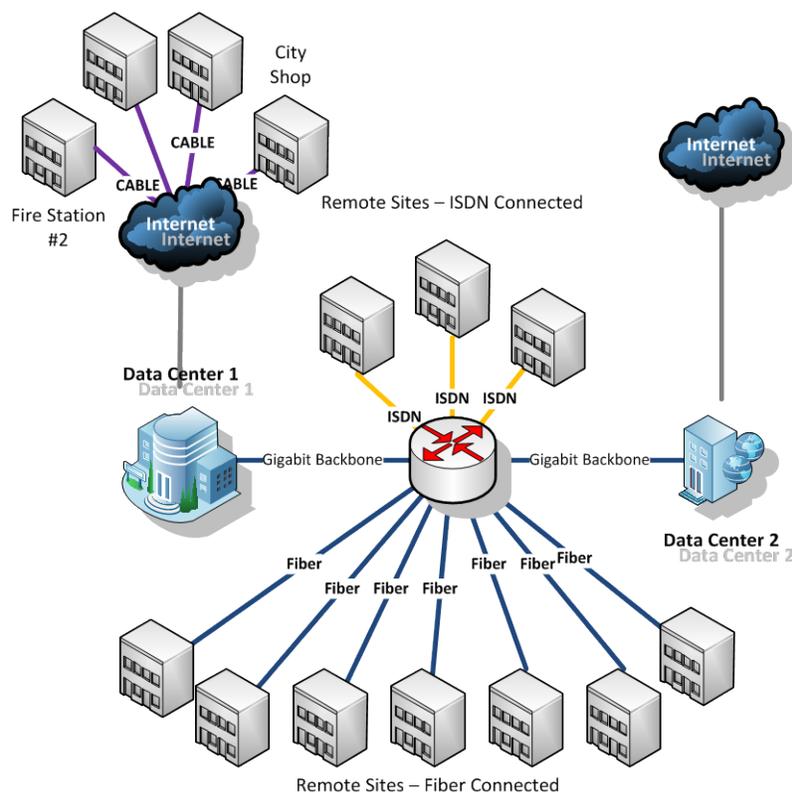
Future State of Technology

This section of the summary outlines the Future State of Technology for the City and is intended to provide a future state reference model which represents a fully implemented strategic plan. This is the target model or the end state goal which this plan is designed to help the City achieve. While this section of the plan is a point in time representation of the target, it should be noted that neither time nor technology stands still. As a result, the strategy surrounding technology is a dynamic process. It will be critical for the City and the City's Information Technology group to continuously monitor changes in technology, vendor software and department needs to adjust the plan and the strategy as needed to meet the goals of the organization.



The Network

The City's current fiber network provides a sound foundation for the future. The network, as with any other technology, evolves and grows over time. As a part of the strategic planning process, opportunities to further progress the network were identified. Network connections to the City Shop and Fire Station #2 are both not part of the fiber network and present challenges in terms of performance. Information Technology will evaluate options for integrating these sites into the fiber network. In order to allow remote sites to reach each the City Hall Data Center or the Public Safety Data Center should either site be lost to a disaster, modifications will be made to the network to support advanced routing and resilience.



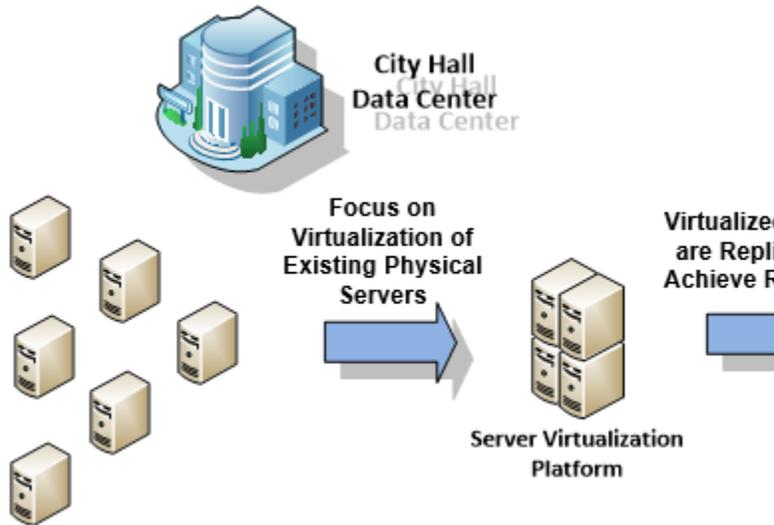
Virtualization is a Foundation

The City had previously implemented server virtualization technology. Server virtualization technology will continue to be a foundational technology for the City. As a part of the 2015 plan, the existing server virtualization platform will be upgraded in terms of hardware, software and capacity. A redundant virtualization platform will be added at the disaster resilience site allowing the City to operate out of the DR site should the primary data center be damaged.

Capitalizing on Savings with Cloud and Virtualization

When asked which technology investments bring the greatest return, private and public sector interviewees resoundingly agreed on the answer: cloud computing and virtualization. There has been a steady uptick of cloud and virtualization technologies in government over the last five years, and when it comes to ROI (in both the hard and soft sense), they can bring similar advantages to IT departments by:

- Reducing upfront capital expenditures as well as investment in hardware
- Adding capacity, including hardware and software, with minimal impact to existing resources
- Increasing the reliability and availability of mission-critical systems
- Allowing scalability on an as-needed basis
- Easing IT management, maintenance and upgrades



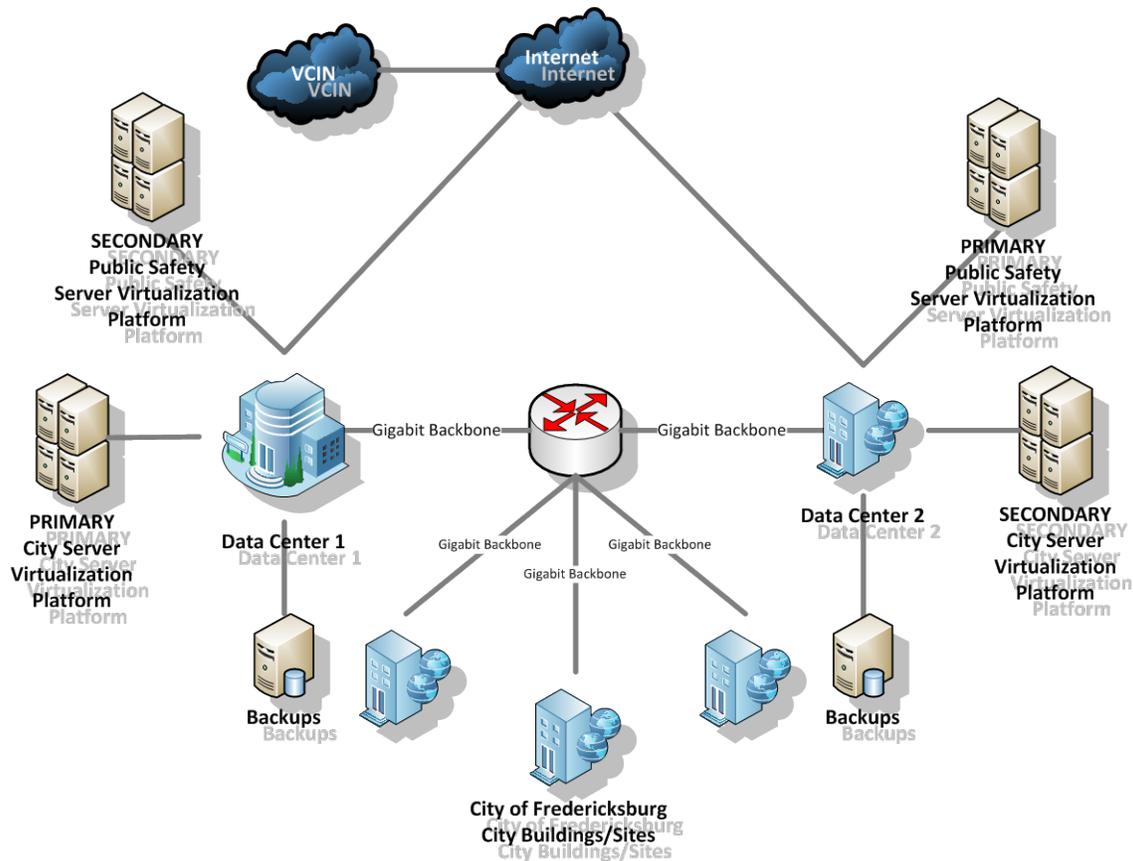
The City will focus on continuing to virtualize existing physical servers with a goal of reducing the physical server footprint by 75%. Along with the reduction in physical servers, this will also allow the City to avoid significant server replacement costs and is estimated to reduce power consumption by 50%.



Focusing on Resilience

Recognizing that Fredericksburg is truly becoming a “Digital City” relying heavily on technology, there will be a Focus on Disaster Resilience for Key Systems and Services. Many localities are taking advantages of lower technology costs, high speed networks and technology which promotes resilience to be able to establish a resilience strategy which they have typically not been able to afford.





The following is a summary of characteristics of the disaster resilience strategy.

- Will utilize a co-location strategy utilizing City Hall and the Public Safety Building as co-location sites which will both house technology. In the event either site is destroyed due to a disaster, the other site would be utilized to run both City applications as well as public safety applications.
- Technology necessary to support key City systems will be co-located at both sites.
- Technology necessary to support public safety will be co-located at both sites.
- Other network related functions such as Active Directory, DNS and DHCP will be diversified with these services running in real-time at both sites to provide for resilience.
- Backups will be replicated between the two sites to provide automatic, off-site rotation of the City's data.
- Will continue to evaluate options for a solution which will provide geographic diversity at a reasonable cost.

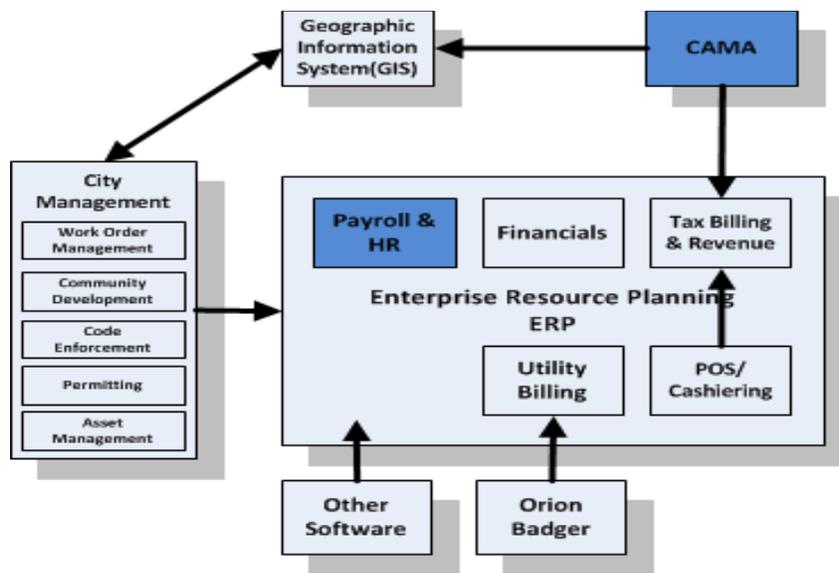
Next Generation ERP

The City will begin the process to prepare to transition from BAI to a contemporary platform to support core local government functions including financial management, tax assessment and billing, Payroll and HR, Community Planning and Development and other functions. This needs to occur because:

- The current BAI system is 27 years old and runs on an antiquated platform.
- Costs to make improvements to the system continue to increase.
- There are limited resources with the necessary skill to maintain the system.
- Many localities are upgrading financial systems making the client group of our existing provider smaller each year which poses a going concern issue with the vendor.
- Elected Officials and key City staff are committed to carrying out the massive project.
- A new system would provide the ability to provide more online services for citizens.
- A new system would help Community Development functions become more efficient, automated and citizen friendly.

The following figure represents a high-level view representing the scope of this project. The core ERP would include:

- Financials
- POS/Cashiering
- Utility Billing
- Personal Property, Real Estate and Miscellaneous Tax Billing
- Payroll and HR

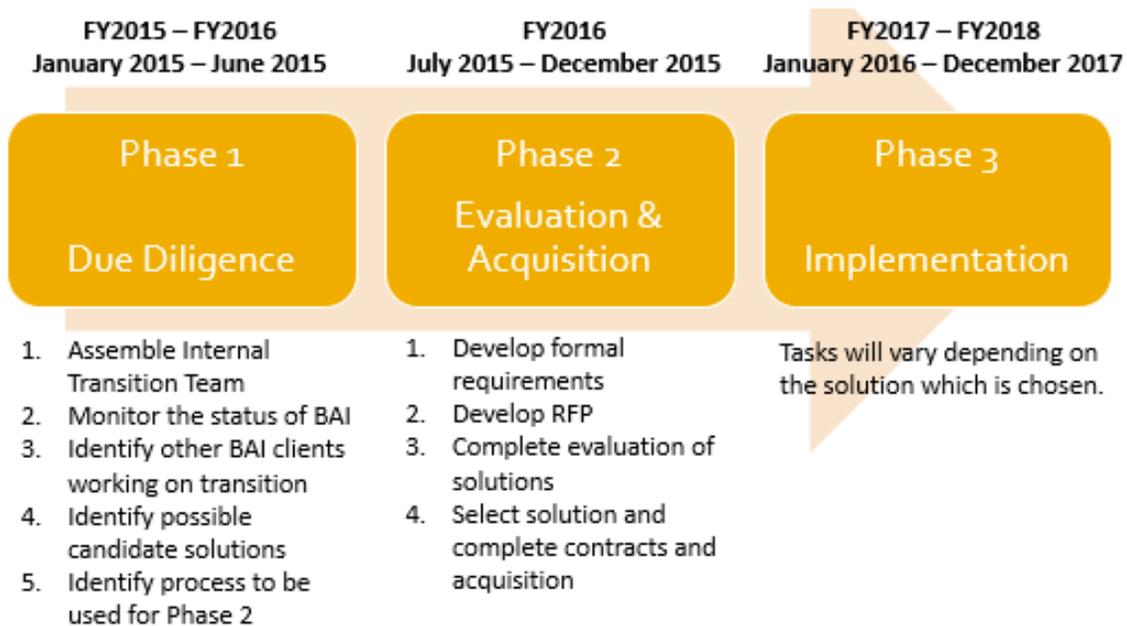


The project will also involve the selection and implementation of an appraisal application (CAMA) as well as a Community Development Suite which encompasses the following functions:

- Permitting and Inspections
- Work Order Management
- Community Development and Plan Review
- Code Enforcement
- Asset Management

There are a number of local governments in Virginia who have transitioned to a hosted solution for Payroll/HR as well as CAMA. As the City goes through the evaluation process, it will be important to evaluate these options.

This transition will be a multi-year process due to the scope of the functions currently handled by BAI. The following figure outlines a three phase process which will guide the City through this transition.

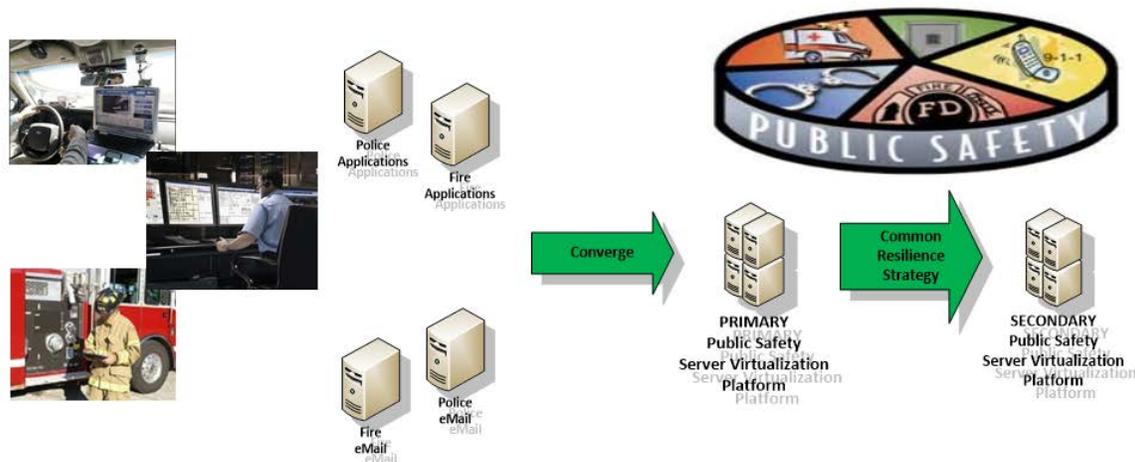


Convergence of Public Safety Technology

Technology, which has historically been utilized independently by Police and Fire, along with the planning implementation and support of the technology will converge into a “Common Public Safety Technology Platform”. This convergence will provide for greater efficiency, improved security, better support, and resilience of the technology which supports key public safety technology.



The future state will see duplication of technology and resources between Police and Fire disappear in favor of integrated, redundant systems which leverage the City's overall strategies for virtualization, storage and disaster resilience.



In addition, as the support of these technologies are fully integrated into the City's centralized technology management model, the support model for these key systems will include both primary and secondary support as well as standard on-call support. The following is a summary of the benefits which will be realized through this consolidation.

- Reduce duplication of technology resources reducing the physical server footprint and reducing overall cost for acquisition, support and equipment replacement costs
- Improving security by removing Internet point of entry that is not centrally managed or maintained
- Leverage other strategies focused on providing high availability for public safety systems
- Utilize established support model for Police to extend to Public Safety as a whole

Putting GIS in the Hands of the Users

The focus of GIS will turn to the user. While the City will continue to advance the foundation of GIS by implementing additional layers in the GIS model, it is time to better utilize what we have with a focus on placing enabling technology in the hands of the users. One of the first steps in this evolution will be to complete an upgrade to the GIS web site and platform which will enable mobilization



of GIS. This will allow departments and users within the City as well as Citizens to utilize existing GIS capabilities on mobile devices including phones and tablets. This will also establish the foundation for the implementation of other user applications which empower the user. Some examples of these applications or “apps” are as follows.

- **Common Operational Picture (COP) App.** Common Operational Picture (COP) offers a standard overview of an incident, providing incident information that enables the Incident Commander and any supporting agencies to make effective decisions.
- **ArcGIS for Water Utilities Hydrant Inspection Solution.** The ArcGIS for Water Utilities hydrant inspection solution modernizes the paper report for hydrant inspections by using a smartphone or tablet device. By using a map view of hydrants, field crews are able to record scheduled or ad hoc hydrant inspections on any mobile device using the hydrant inspection schema. 
- **Pre-Incident Planning App.** Pre-Incident Planning is an editing map and set of editing workflows that can be used by fire and law enforcement personnel to collect hazards, equipment, supplies, and procedures need to deal with an incident.
- **My Hazard Information Map and App.** My Hazard Information helps residents discover hazards that exist in their community and obtain information about evacuation routes and government facilities provided by a government agency.
- **Code Violation for iOS.** Code Violation for iPad allows code enforcement officers, building officials, and zoning administrators to collect violation and related inspection information in the field.



In addition to putting applications like these in the hands of the users, we will also seek to increase GIS internal visibility through a Lunch and Learn series where the GIS Analyst will do a “Show and Tell” for New Maps and Apps as well as demonstrate existing capabilities such as data editing and update using ArcMap.

The User Experience

Historically, some users have utilized desktop computers, some have used laptop computers, some have used a combination of both and some users utilize a desktop or laptop, a touch screen tablet such as an iPad along with a smartphone such as an iPhone or Android device.

For example, Mecklenburg County, N.C., implemented its “1 to 1, One Person, One Device” initiative, which allowed the county to eliminate extra desktops and laptops, instead equipping employees with one device and enabling them to access resources via virtualization.

While it is not the norm for users to have all of these devices, many need multiple devices to do their job. The user interfaces and the method the

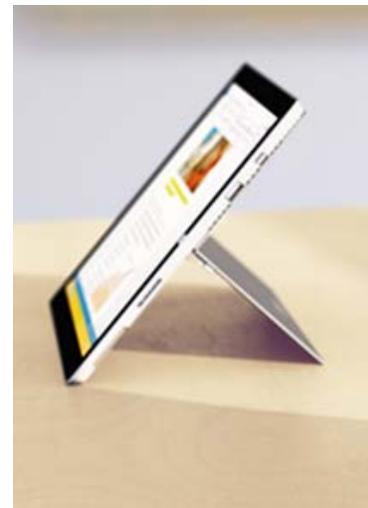
user interacts with these devices vary across the devices. Most of the desktop computers deployed within the City are similar in terms of their performance while the needs of the users may vary greatly with many machines being underutilized.

Looking toward the future, the goal will be to minimize the number of user interfaces along with the method with which the user interacts with the computer to provide a more common experience whether the user is sitting at the desktop, working remotely from home, or working remotely in the field.



For users that have a need for a computer to use in the office as well as out of the office, a strategy to utilize devices which can serve as a desktop, laptop and tablet will be evaluated. Based on current industry best practices, Microsoft's Surface Pro 3 or the Dell Venue Pro tablet can serve this type of multi-function role reducing the overall cost per

user allowing a single device to handle what was being handled by three individual devices. These multi-function devices can be utilized with a docking solution as a desktop. By adding a detachable keyboard, they can transform immediately to a laptop for mobile use. They can also standalone to function as a tablet for applications requiring this type of use model.



In addition, the user will be utilizing a common Windows user interface avoiding having at least two different user interfaces to deal with and learn.

To The Cloud!



34%

of public leaders turned to cloud solutions to improve internal operations and increase efficiencies, while 28 percent plan to invest in cloud technologies in the future.

Source: CDG Improving Government Performance Research Survey, 2014

Without a doubt, services that are provided in "The Cloud" should continue to be considered as part of the City's overall technology portfolio. Already today, the City's public web site and fire records management are examples of applications which are hosted by an external service provider. Does this mean everything should be hosted externally? There should certainly not be a one size fits all mentality. However, as the City embarks upon new projects, solutions that are hosted externally will continue to be evaluated for their viability.

Specifically, external hosting of payroll and HR functions along with CAMA are both possible candidates based upon what is occurring with other localities in Virginia. Another service which would be a possible candidate would be email and Microsoft Office applications. So why not? The City recently invested in an upgrade to the Microsoft Exchange email platform. Moving this service

to the cloud at this point would not result in a positive ROI. This opportunity should be considered again in approximately 3 years which is the typical useful life for software such as Microsoft Exchange.

Other opportunities will present themselves to utilize hosted solutions instead of hosting internally. The City should continue to evaluate these possibilities from a financial, functional and information security perspective to determine which opportunities make sense.

We Must Take Control of Content

“Paper. There is perhaps no other single word in government that creates so much potential for inefficiency.”^{CDG} The City will continue to move toward “Digital Government” by utilizing document management and imaging technology. Not only will this enable departments to achieve greater efficiency and allow the City to reduce overall risk of loss of key information, it will provide a tool which will allow the City to break down barriers in extending services to citizens.

Information Technology completed a study in 2012 detailing the cost of continuing to manage and maintain paper. A document management and imaging solution by far has one of the greatest ROI’s of any project outlined in the strategic plan.

Moving forward with projects such as ERP, document management and imaging will be a key component to bridge the gap between the past and the future as the City’s history, which is maintained in paper, can be joined with the future through a simple document management and imaging solution. Here are just a few of the benefits the City will realize through the implementation of this type of solution.

- Would allow the City to store files and documents electronically reducing costs related to filing and retrieval, on-site document storage and off-site document storage
- Would make the process of searching for information more efficient resulting in improved customer service to citizens
- Departments could find historic information electronically without having to physically go to cold storage and sift through boxes full of dust-riden paper.
- Significantly improve security of documents allowing the City to manage access control to documents electronically



- Improve document security by allowing backups of documents to be moved offsite electronically to enhance overall disaster resilience
- Would serve as a basis for improving workflow and business processes interfacing with new applications and systems as they are implemented resulting in “paperless” processes

While the City’s web site is a strength for the City, content does not update itself and information does not automatically end up on social media channels. However, there are cases



People in Wythe County are angry after getting personal property tax bills for cars they no longer own.



Thousands in Wythe County get tax bills for cars they no longer own
<http://www.wdbj7.com>

The line inside the DMV was steady. Folks were trying to figure out why they were getting tax tickets on cars they hadn't owned in years. Geiger said she wasn't giving money to anyone who she felt didn't deserve it.

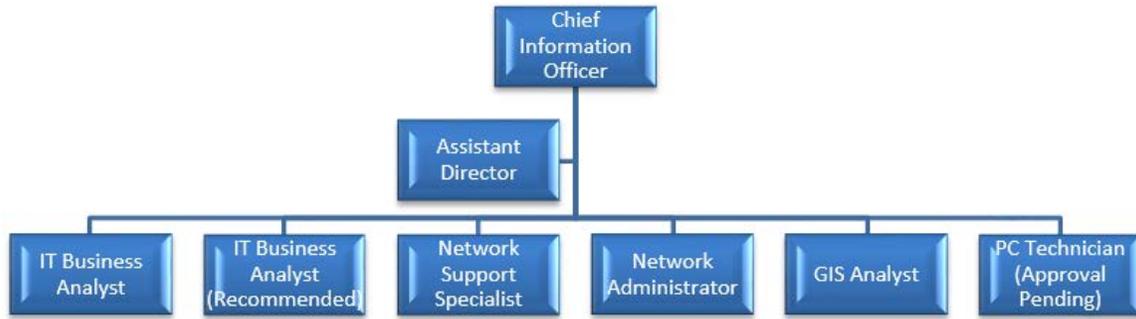
where information does end up in the wrong hands or information that is supposed to convey one thing ends up being construed as something else. Most localities do not want to end up on Facebook like the example on the left.

Improving communication with citizens should be a priority and the Media and Communications Specialist will focus on all aspects of public release and communication of information. This role should be established to provide the City with a conduit through which information can be communicated regardless of the

channel. This role would have the following responsibilities.

- Responsible for working with departments to handle web content updates
- Responsible for working with departments and the public to support Freedom of Information (FOI) Act requests for information
- Responsible for working with City Administration and City Council to establish standards and guidelines for public release of information
- Responsible for working with departments to support release and publication of news, announcements and other types of media communication
- Responsible for working with City Administration and City Council to establish media and communication channels for making information available to citizens
- Responsible for establishing and maintaining social media channels for the City and aiding departments in the utilization of these channels to support the public distribution of information







Transition

This section of the strategic plan sets forth an implementation plan which will be utilized by the City to implement the goals and strategies which were set forth in the previous section. The implementation plan which is set forth in this document is a “point in time” snapshot of the implementation plan. Information Technology will utilize this implementation plan to manage the actual

implementation of the strategies and thus the implementation plan will be a dynamic tool which will be updated on a regular basis to reflect task status and progress of the full implementation of the strategic plan.

Implementation Summary

The following table provides a summary of the defined goals and strategies. The implementation is broken down by phase with phases represented by the calendar year and quarter along with the estimated completion date. The estimated work involved in the item is defined along with the projected capital cost, the cost of implementation support for the strategy and the yearly recurring cost.

WBS	Strategy	Fiscal Year	Phase	Capital Cost	Yearly Recurring Cost
1.00	Implement Disaster Resilience Strategy	2015	2014 Q4	0	0
2.00	Implement Resilient Public Safety Platform	2015	2014 Q4	80,000	5,989
3.00	Backup Server Platform Upgrade	2015	2014 Q4	2,500	500
4.00	Information Technology - PC Technician	2015	2014 Q4	0	56,250
5.00	Change Management Process	2015	2014 Q4	0	0
6.00	Infrastructure and Application Monitoring	2015	2014 Q4	0	0
7.00	ERP Platform - Phase 1 Due Diligence	2015 - 2016	2015 Q1	0	0
8.00	Network Upgrade - Core	2015	2015 Q1	0	0
9.00	GIS App(s) Implementation	2015 - 2018	2015 Q1	0	0
10.00	Evaluate Contemporary Endpoint Computing Strategy	2015	2015 Q2	0	0
TOTAL - FY2015				82,500	62,739
11.00	Electronic Document Management Pilot	2016	2015 Q3	80,000	6,050
12.00	Virtualization Upgrade - Phase 1	2016	2015 Q3	39,964	4,868
13.00	Consolidation of Public Safety Technology Platform	2016	2015 Q3	0	0
14.00	Information Technology - Business Analyst	2016	2015 Q3	0	81,250
15.00	Establish Media and Communications Specialist Role	2016	2015 Q3	0	62,500

WBS	Strategy	Fiscal Year	Phase	Capital Cost	Yearly Recurring Cost
16.00	ERP Platform - Phase 2 Evaluation and Acquisition	2016	2015 Q4	650,000	50,000
17.00	Virtualization Upgrade - Phase 2	2016	2015 Q4	18,934	1,124
TOTAL - FY2016				788,898	205,792
18.00	ERP Platform - Phase 3 Implementation	2017 - 2018	2016 Q1	0	0
19.00	Implementation of Additional GIS Layers	2017 - 2018	2016 Q1	66,500	0
20.00	Network Upgrade - City Shop	2017	2016 Q3	15,000	0
21.00	Information Technology - GIS Analyst	2017	2016 Q3	0	56,250
22.00	Network Upgrade - Fire Station 2	2017	2016 Q4	50,000	0
TOTAL - FY2017				131,500	56,250
23.00	CAMA Implementation	2018	2018 Q1	100,000	20,000
24.00	City Management Suite Implementation	2018	2018 Q2	150,000	30,000
TOTAL - FY2018				250,000	50,000
PLAN TOTAL				1,252,898	374,781

