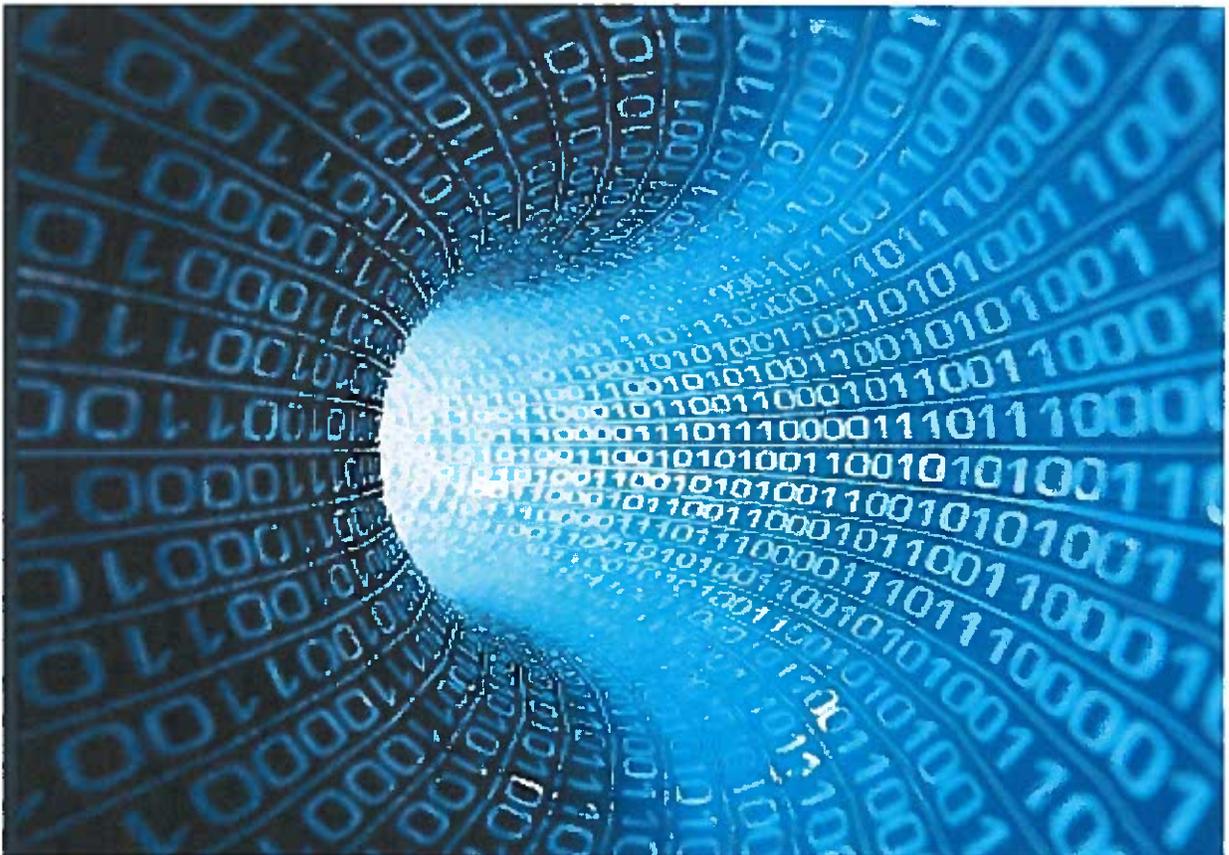




DEPARTMENT OF  
INFORMATION TECHNOLOGY  
PERFORMANCE AUDIT REPORT



6/30/2016

City of Chesapeake Audit Services Department



June 30, 2016

The Honorable Alan P. Krasnoff and  
Members of the City Council  
City of Chesapeake  
City Hall – 6<sup>th</sup> Floor  
Chesapeake, Virginia 23328

Dear Mayor Krasnoff and Members of the City Council:

We have completed our review of the Department of Information Technology for the period July 1, 2015 to June 30, 2016. The purpose of this audit was to evaluate whether the City of Chesapeake's (City) Department of Information Technology (DIT) was providing services in an economical, efficient, and effective manner, whether its goals and objectives are being achieved, and whether they were complying with applicable City procedures. The audit included reviews and evaluations of procedures, practices, and controls of the various divisions of the DIT on a selective basis. All divisions of the DIT, including performance measures for Enterprise Application Services, Administration, Enterprise Software Development, Computer/Network Operations Center, Network Support, Desktop Support, Mainframe Operations, Geographic Information Systems (GIS), Enterprise Financial System, E-Gov, Radio Systems Maintenance and Administration, and Data Security Administration were subject to evaluation. We attempted to identify performance information that appeared to be relevant to the department's operations. We also attempted to identify and address any additional problem areas as requested by DIT or determined from the audit itself.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our finding and conclusions based on our audit objectives.

DIT employed a work force of approximately 55 full-time positions and 1.5 part-time positions for FY2015. Its budget for fiscal 2015 exceeded \$10.6 million dollars, and accounted for approximately 1.1% of the City's budget.



The City budgeted approximately \$381M for multi-year capital projects in FY2016. Those projects included infrastructure for public safety and other City departments, the City's Constitutional Officers, and schools. Of that, approximately \$22.8 million was designated for DIT infrastructure, and systems, and 12 for DIT capital projects scheduled in FY2016. Of these 12 projects, the five projects largest in cost were the Project 25 Radio System (\$9.6 million), Mainframe Migration (\$5.5 million), Electronic Plan & Permit System (\$3.2 million), CAMA implementation (\$1million), and the Enterprise Wide Tech budgeted (\$750,000). The chart below highlights these projects in relation to the 12 DIT projects combined. (Note: The Library and Police Mobile Communication Security DIT projects were excluded from this analysis since DIT was not responsible for those projects.)

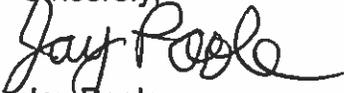
Based on our review, we determined that DIT had accomplished its overall mission of providing centralized and decentralized automated information systems technology services to City departments and the Chesapeake School Administration. However, we did identify several significant issues that needed to be addressed. These issues included the following:

- DIT Governance challenges and legacy system issues
- Access Controls and the Active Directory
- Archiving Processes
- PeopleSoft Financial System Issues
- 911 Statistical Call Data
- Heat Ticketing System
- DIT Staffing Challenges

DIT Officials were fully aware of these issues and addressed them in the Self-Assessment and department responses included with this audit. Police Officials were also aware of the 911 Statistical Call Data issues and addressed them in their responses.

This report, in draft, was provided to DIT and Police officials for their review and responses. Their comments have been considered in the preparation of this report. These comments have been included in the Managerial Summary, the Audit Report, and Appendices A and B. DIT and Police management, supervisors, and staffs were very helpful throughout the course of this audit. We appreciated their courtesy and cooperation on this assignment.

Sincerely,



Jay Poole

City Auditor

City of Chesapeake, Virginia

C: James E. Baker, City Manager  
Peter Wallace, Chief Information Officer



## **Managerial Summary**

### **A. Objective, Scope, and Methodology**

We have completed our review of the Department of Information Technology for the period July 1, 2015 to June 30, 2016. The purpose of this audit was to evaluate whether the City of Chesapeake's (City) Department of Information Technology (DIT) was providing services in an economical, efficient, and effective manner, whether its goals and objectives are being achieved, and whether they were complying with applicable City procedures. The audit included reviews and evaluations of procedures, practices, and controls of the various divisions of the DIT on a selective basis. All divisions of the DIT, including performance measures for Enterprise Application Services, Administration, Enterprise Software Development, Computer/Network Operations Center, Network Support, Desktop Support, Mainframe Operations, Geographic Information Systems (GIS), Enterprise Financial System, E-Gov, Radio Systems Maintenance and Administration, and Data Security Administration were subject to evaluation. We attempted to identify performance information that appeared to be relevant to the department's operations. We also attempted to identify and address any additional problem areas as requested by DIT or determined from the audit itself.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our finding and conclusions based on our audit objectives.

DIT employed a work force of approximately 55 full-time positions and 1.5 part-time positions for FY2015. Its budget for fiscal 2015 exceeded \$10.6 million dollars, and accounted for approximately 1.1% of the City's budget.

The City budgeted approximately \$381M for multi-year capital projects in FY2016. Those projects included infrastructure for public safety and other City departments, the City's Constitutional Officers, and schools. Of that, approximately \$22.8 million was designated for DIT infrastructure, and systems, and 12 for DIT capital projects scheduled in FY2016. Of these 12 projects, the five projects largest in cost were the Project 25 Radio System (\$9.6 million), Mainframe Migration (\$5.5 million), Electronic Plan & Permit System (\$3.2 million), CAMA implementation (\$1million), and the Enterprise Wide Tech budgeted (\$750,000). The chart below highlights these projects in relation to the 12 DIT projects combined. (Note: The Library and Police Mobile Communication Security DIT projects were excluded from this analysis since DIT was not responsible for those projects.)

## **Major Observations and Conclusions**

Based on our review, we determined that DIT had accomplished its overall mission of providing centralized and decentralized automated information systems technology services to City departments and the Chesapeake School Administration. However, we did identify several significant issues that needed to be addressed. These issues included the following:

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This report, in draft, was provided to DIT and Police officials for their review and responses. Their comments have been considered in the preparation of this report. These comments have been included in the Managerial Summary, the Audit Report, and Appendices A and B. DIT and Police management, supervisors, and staffs were very helpful throughout the course of this audit. We appreciated their courtesy and cooperation on this assignment.

## **B. Performance Information**

### **1. Overview**

DIT was one of the City's three internal service funds. Its expenditures were not related to a single department since it also included contingencies and expense provisions that were allocated to individual departments. DIT provided necessary computing resources throughout the City and billed its services to other City departments.

DIT provided centralized and decentralized automated information systems technology services to City departments and the Chesapeake School Administration. In addition, DIT managed radio and telephone systems serving City departments as well as the City's website, internet, and intranet. A brief description of each business unit is provided below:

Over the years DIT had been consistently recognized nationally:



The City of Chesapeake is honored to have been again recognized by the Center for Digital Government as a top-ranked digital City government.



Chesapeake's CIO was featured on the cover of StateTech Magazine for "virtualizing" servers, which saves the City \$203,000 a year in hardware costs and \$2,000 per month in electricity.



IBM recognized Chesapeake as a "Smarter City" for its use of technology to serve citizens.



The [Public Technology Institute](#) recognized Chesapeake for its use of Web 2.0 and social media tools in 2011.

## **2. New Initiatives and Emerging Issues**

### **Modernization Migration Project**

Over the last several years DIT has focused on improving the core infrastructure of the City's network. The next phase of the department's readiness focused on the application portfolio and human capital to not only leverage the investments already implemented, but grow the organization in order to meet the increasing demand of the digital age.

### **Accela Program**

In November 2015, DIT implemented the Accela program for departments with permitting processes. As of July 7, 2016, DIT reported 1,953 individuals who had conducted business online for a total of 5,783 transactions since the Accela program went live in November 2015. This was approximately 12 times higher than the 445 permits that were processed in the mainframe last year. The Accela system had also collected a total of \$2,104,448 as of July 7, 2016.

## **C. Operational Issues**

In reviewing DIT's operational processes, we identified several issues that needed to be addressed. The issues included DIT's Governance challenges, legacy system issues, and the DIT Modernization Project; access control and the Active Directory; the Archiving location; PeopleSoft Financial Issues; Heat Ticketing System; IT Staffing Challenges. As part of this audit, we included DIT's Self-Assessment of its own business processes as well as the status of the Public Safety New World Implementation.

## **1. DIT Governance Challenges, Legacy Systems Issues, and the DIT Modernization Project**

**Finding** - The City did not have an IT Steering Committee and a Citywide IT Governance Policy to ensure cohesive ERP solutions for its financial systems resulting in long-term challenges for DIT.

**Recommendation** – The City should adopt a Citywide Governance Policy.

**Response** - DIT agrees with the audit recommendation that it is in the best interest of the City to reduce the footprint of ERP systems currently in use by the City. Gartner describes this consolidation trend in the industry as a post-modern ERP approach whereby the end result is less complexity regarding interfaces, integrations, and synchronization of data coupling with much more agility and adaptability at a lower cost than it otherwise would be if the City continues along the current path. This also gives the City the opportunity to introduce innovative business processes to take advantage of faster more efficient ways of conducting business in a more transparent, collaborative, and measureable manner going forward.

As for the governance policy, DIT will work along with the City Manager’s office to ensure the key stakeholder enterprise business units such as Real Estate, Planning, Public Utilities, Public Works, Public Safety, and the constitutional officers are on board with the new governance process. In order for the City of Chesapeake to operate at a high level of efficiency and cost effectiveness while being properly aligned with stated City priorities it is necessary to establish a project governance mechanism for approval of all projects greater than \$100,000 or where it is determined the impact of the project has sufficient enterprise impact that it warrants governance review. (Note: The full text of the response is included in the audit report).

## **2. Access Control and the Active Directory**

**Finding** - The City did not have an Administrative Regulation requiring the Human Resources Department (HR) to promptly notify DIT of new hires, and changes in employees’ status. This resulted in DIT’s untimely disabling of active directories for some employees and volunteers who were no longer working for the City.

**Recommendation** - The City should develop an Administrative Regulation requiring HR to promptly notify DIT of new hires, and changes in employees’ status.

**Response** - DIT agrees with the audit findings and will revamp the draft policy attached in the overall audit report to include clear directives for each department working with Human Resources to provide timely and accurate information to address this issue. With the new help desk service desk application being implemented with IT Service Management (ITSM), we will be able to automate

workflows that will help enforce the pending policy. (Note: The full text of the response is included in the audit report).

### **3. Information Technology Aspects of Business Continuity Management and Disaster Recovery**

**Finding** - Backup tapes generated from DIT's private cloud were temporarily stored at the secondary data center. They were then transported based on the application owner's retention requirements to the vault in the City's municipal center, less than 400 feet away from the City's DIT center. Also, the PeopleSoft Financial System had not been archived which caused delays in processing data tables that had been kept open since the system was implemented in 2005.

**Recommendation** – The Finance Department should work with DIT to develop a plan for archiving PeopleSoft financial systems and records.

**Response** - DIT agrees with the audit's recommendation. The new Public Safety Operations Building (PSOB) will become a dual data center with active-active network capability to address disaster recovery and business continuity. In fact, the model is already implemented within a limited scope by utilizing the city's private cloud to capture and store backups that are designed with DIT's active-active network architecture state.

**Finance archiving:** DIT will continue to work with the City's school and the City's Finance department to address this issue. Without a proper archiving agreement and tool in place, PeopleSoft records will continue to grow thus eventually impacting timely access to data and impeding speedy recovery to data within a reasonable window from a disaster.

### **4. PeopleSoft Financial Issues**

**Finding** - The PeopleSoft Financial System was purchased but not fully implemented due to budget constraints, resulting in the City paying maintenance fees for software modules that were not being used. In addition, unused modules were supplemented with additional systems creating a need for integration, which increased complexity and decreased efficiency.

**Recommendation** – DIT should continue to evaluate future enterprise application replacements, and consider whether it is in the City's best interest to continue to expand the City's PeopleSoft ERP footprint, use alternative applications, or consider other technologies such as cloud computing (SaaS).

**Response - DIT agrees with the audit recommendation. In fact, the formal governance adoption as outlined in issue #1 is a forerunner to resolving this issue. The Department of Information Technology (DIT) will be following the Gartner strategic roadmap to address the following:**

- **Enable innovation to take place**
  - **Allow for the exploration and discovery of functions, business processes, and technologies**
  - **Provide innovative solutions with improved, well-defined, and measurable outcomes**
- (Note: The full text of the response is included in the audit report).**

#### **5. Public Safety and the New World System**

**Finding -** For the most part, the Public Safety Departments was satisfied with the state of information technology in the City and progress was being made daily. However, there was a need to replace the Shadow IT staff that supported the Fire Department with DIT personnel.

**Recommendation –** DIT should continue ongoing efforts with the New World Implementation.

**Response -** DIT agrees with the audit recommendation. New World conducted a second round of training for Fire and Police staff that remedied several issues. The new fire alerting system is already included in the future capital request.

#### **6. 911 Statistical Call Data**

**Finding –** Statistical call data from the Aurora Cassidian system showed an increasing trend of unanswered 911 calls in 2015 due to staffing shortages for Emergency Communications Dispatchers.

**Recommendation –** The City should take steps to address Emergency Communications staffing shortages to reduce the number of unanswered calls.

**Response – (from the Chief of Police)** I have reviewed the audit report and concur with the findings. It should be noted that some of the concerns identified by the audit are being addressed through prior, existing, and future budgets. In order of priorities of the items that are left unsettled are: 1.) increased staffing; and 2.) salaries. In addressing staffing, we have expanded our recruiting efforts and are presently exploring additional methods to reach people who desire to and can perform these essential functions, including partnering with Tidewater Community College to develop work-force solutions to help us recruit and retain dispatchers. However, these efforts can prove to be ineffective if we cannot offer competitive salaries; therefore, I will be requesting Human Resources to conduct a pay and compensation study. (Note: The full text of the response is included in the audit report).

## **7. Heat Ticketing System, the Help Desk, and Operations**

**Finding** - DIT was working with a HEAT Ticketing System that no longer served the City's needs.

**Recommendation** – DIT should continue the system update.

**Response** - DIT agrees with the audit recommendation. DIT is in the final stages of selecting the vendor for the new Help Desk service tool. (Note: The full text of the response is included in the audit report).

## **8. DIT Staffing Challenges**

**Finding** - There were City employees performing IT functions (referred to as Shadow IT) that were not a part of DIT. However, DIT did not have sufficient staff to support the all of the City's DIT systems and infrastructure. Thus, the entire comprehensive view of technology support within the City was obscured.

**Recommendation** - The City should consider bringing DIT staff assigned to other departments under the direct supervision of DIT.

**Response** - DIT concurs with the audit findings. DIT is currently in discussion with the Fire Administration staff to determine the duplicate IT efforts. DIT has an extremely successful enterprise IT agreement with Public Safety and will continue to evaluate and make recommendation for technical resources as needed. (Note: The full text of the response is included in the audit report).

## **9. DIT Self-Assessment Using COBIT 5 Model**

**Finding** – In 2015 DIT completed a COBIT<sup>1</sup> 5.0 self-assessment. This self-assessment found that the DIT was, on average, an “immature” department and that their systems and processes needed substantial growth to reach what would be considered an optimal level of performance.

**Recommendation** - DIT should continue to improve its' process and procedures in order to move from its' immature state to that of full innovation and optimization. We also recommend that DIT continue to perform its Self-Assessment annually to monitor the maturity levels of DIT processes overall.

**Response** - We will begin with the ITIL structure to address many of these issues addressed in this audit.



Department of Information Technology

PERFORMANCE AUDIT

July 1, 2015 to June 30, 2016

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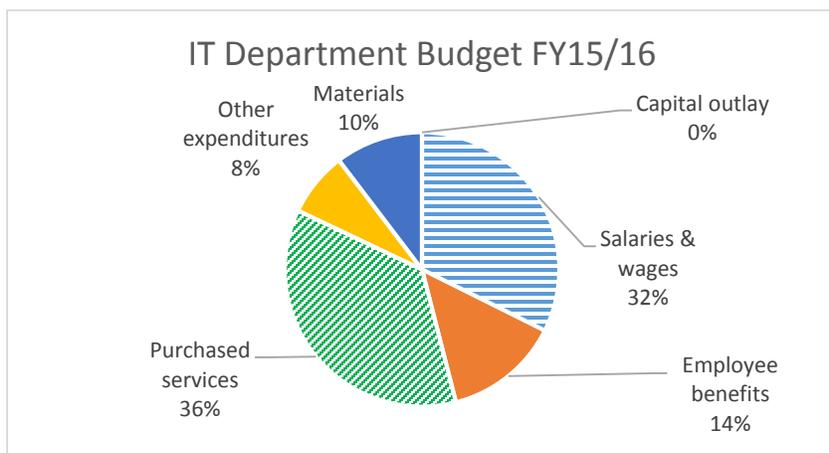
## Information Technology Department Performance Audit

### A. Objective, Scope, and Methodology

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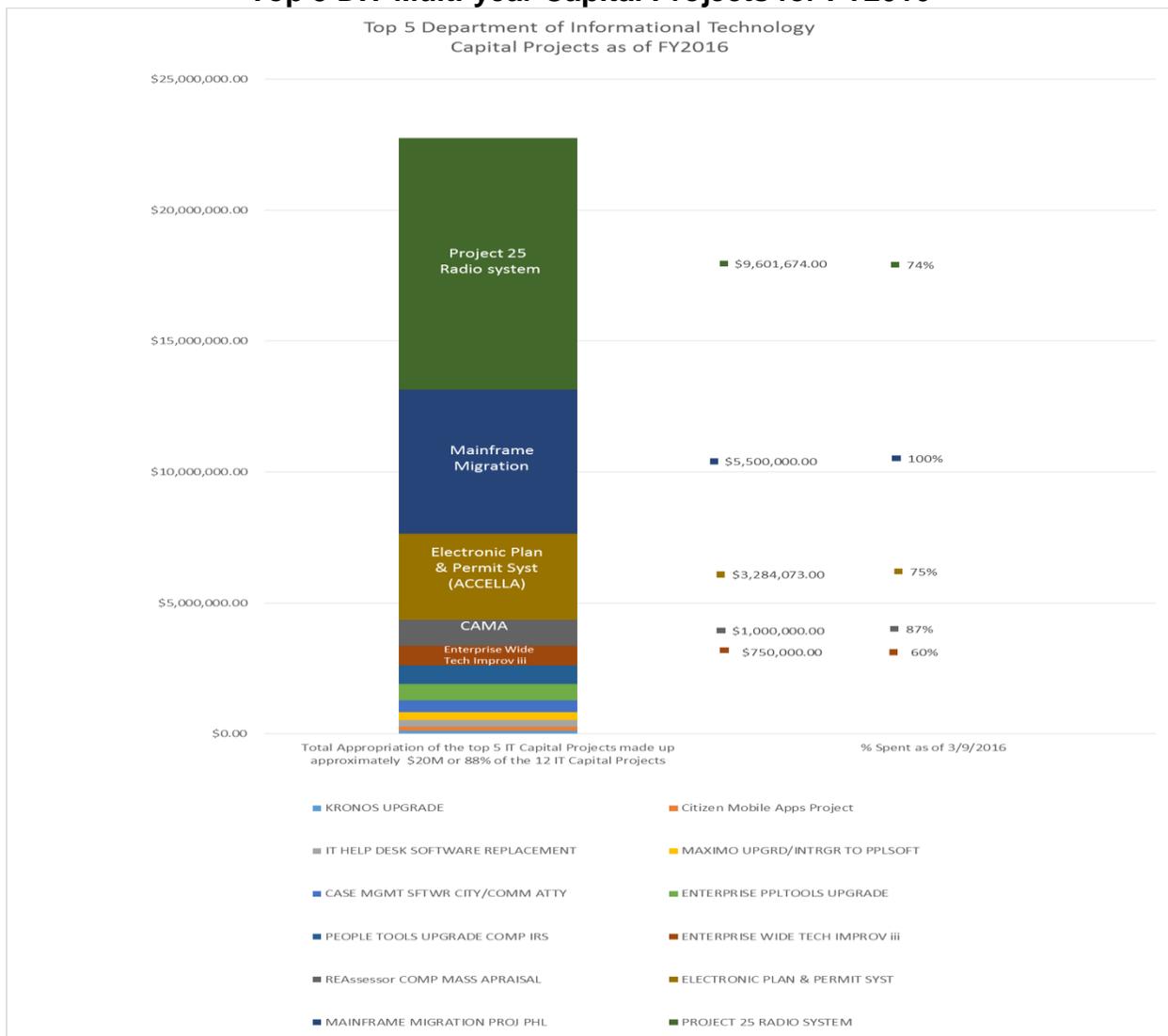
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## IT Capital Spending

The City budgeted approximately \$381M for multi-year capital projects in FY2016. Those projects included infrastructure for public safety and other City departments, the City's Constitutional Officers, and schools. Of that, approximately \$22.8 million was designated for DIT infrastructure, and systems, and 12 for DIT capital projects scheduled in FY2016. Of these 12 projects, the five projects largest in cost were the Project 25 Radio System (\$9.6 million), Mainframe Migration (\$5.5 million), Electronic Plan & Permit System (\$3.2 million), CAMA implementation (\$1million), and the Enterprise Wide Tech budgeted (\$750,000). The chart below highlights these projects in relation to the 12 DIT projects combined. (Note: The Library and Police Mobile Communication Security DIT projects were excluded from this analysis since DIT was not responsible for those projects.)

### Top 5 DIT Multi-year Capital Projects for FY2016



Source: Department of Information Technology

## **Major Observations and Conclusions**

Based on our review, we determined that DIT had accomplished its overall mission of providing centralized and decentralized automated information systems technology services to City departments and the Chesapeake School Administration. However, we did identify several significant issues that needed to be addressed. These issues included the following:

- DIT Governance challenges and legacy system issues
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DIT Officials were fully aware of these issues and addressed them in the Self-Assessment and department responses included with this audit. Police Officials were also aware of the 911 Statistical Call Data issues and addressed them in their responses.

This report, in draft, was provided to DIT and Police officials for their review and responses. Their comments have been considered in the preparation of this report. These comments have been included in the Managerial Summary, the Audit Report, and Appendices A and B. DIT and Police management, supervisors, and staffs were very helpful throughout the course of this audit. We appreciated their courtesy and cooperation on this assignment.

## **Methodology**

To conduct this audit, we reviewed and evaluated City and Department policies and procedures, operational documents, and reports, both internal and external. We evaluated personnel data related to staffing. We accessed PeopleSoft expenditures and conducted site visits of the Operations Data Centers, both central operations and remote locations. We conducted in-depth interviews with the managers, supervisors, and staff of the various DIT business units. Audit Services:

- Reviewed the City's Operating Budget and Capital Budget for FY2016, listings of financial applications used throughout the City, the City's draft IT governance policy and other City IT policies.
- Compared on a sample basis, Human Resources employee data to DIT's active directory in order to determine the timeliness of disabled active directories.
- Toured the DIT data center, the City's secondary data center, and the City's vault.
- Interviewed the DIT staff extensively to gain an understanding of the Computer User Access Request Form (CUARF) and Heat Ticketing processing and reporting.
- Interviewed DIT staff to gain an understanding of the backup and archiving processes.
- Documented the PeopleSoft System implementation issues.

- Interviewed Public Safety departments to determine the level of satisfaction with the t state of information technology within the City.
- Analyzed MUNIS HR data to determine the percentage of IT personnel eligible to retire as of June 16, 2016.
- Reviewed DIT's self-assessment regarding the maturity levels of DIT management processes.

## **B. Performance Information**

### **1. Overview**

DIT was one of the City's three internal service funds. Its expenditures were not related to a single department since it also included contingencies and expense provisions that were allocated to individual departments. DIT provided necessary computing resources throughout the City and billed its services to other City departments.

DIT provided centralized and decentralized automated information systems technology services to City departments and the Chesapeake School Administration. In addition, DIT managed radio and telephone systems serving City departments as well as the City's website, internet, and intranet. A brief description of each business unit is provided below:

**Administration.** Provided leadership, policy direction, planning, governance, coordination, and oversight.

**Enterprise Application Services.** Managed the City's Commercial Off-the-Shelf (COTS) software applications. Examples of software included Maximo, Fleet Anywhere, and Kronos.

**Enterprise Software Development.** Automated business processes through the development and implementation of software solutions to facilitate the successful delivery of business value-added services to departments and citizens.

**Computer/Network Operations Center.** Focal point for network and computer related troubleshooting.

- Processed production batch applications
- Monitored the day-to-day activities of the City's network
- Monitored systems availability, integrity, and performance
- Provided online data communications and job scheduling
- Provided Help Desk support
- Served as the main point of contact for problem resolution and escalation

**Network Support, Desktop Support.** Managed the hardware and software infrastructure which included:

- Network connectivity
- Voice, data, and internet access
- Security
- Backups and disaster recovery
- Database support
- Operating system maintenance.

**Desktop Support.** Managed and supported all client desktop environments along with their associated software and the PC replacement plan.

**Mainframe Operations.** Provided high speed computing and reliability to perform large computing jobs

- Performed daily and nightly batch job processing and enterprise backup of critical applications, bank/positive pay processing, and check processing

**Geographic Information Systems (GIS).** Provided mapping and geospatial technology support

- Administered the central repository for all geospatial data
- Maintained applications and software integrations that utilized this data

**Enterprise Financial Systems** Maintained and supported the official record of financial transactions for the City and Chesapeake Public Schools.

#### **E-Gov**

- Managed the City's internet website, CityofChesapeake.net
- Managed the City's primary social media sites
- Oversaw the Social Media Steering Committee, which sets policy for social media use within the City.

**Radio Systems Maintenance an Administration** Provided maintenance support for the Public Safety and operational services departments' radio system.

#### **Data Security Administration**

- Protected data and systems vital to the operation of the City from loss or damage due to security threats, inadvertent disclosure, or unintended actions by establishing security policies and protective measures, system and network monitoring, and reviewing system security designs.
- Ensured compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and the Health Information Technology for Economic and Clinical Health Act of 2009 (HITECH).

## Accomplishments

Over the years DIT had been consistently recognized nationwide:

	The City of Chesapeake is honored to have been again recognized by the Center for Digital Government as a top-ranked digital City government.
	Chesapeake's CIO was featured on the cover of StateTech Magazine for "virtualizing" servers, which saves the City \$203,000 a year in hardware costs and \$2,000 per month in electricity.
	IBM recognized Chesapeake as a "Smarter City" for its use of technology to serve citizens.
	The <a href="#">Public Technology Institute</a> recognized Chesapeake for its use of Web 2.0 and social media tools in 2011.

## 2. New Initiatives and Emerging Issues

### Modernization Migration Project

Over the last several years DIT has focused on improving the core infrastructure of the City's network. The next phase of the department's readiness focused on the application portfolio and human capital to not only leverage the investments already implemented, but grow the organization in order to meet the increasing demand of the digital age.

The DIT Mainframe Modernization project was also implemented to address system requirements for the Constitutional Offices. The objective was to reduce the risk of disruption, security vulnerabilities, and system failures due to an aging unsupportable legacy system. Phase I of the DIT Mainframe Modernization project was implemented to address the issues by first securing a vendor, contractors, and in-house developers, to convert COBOL programs, previously written by in-house programmers, to the C+ programming language using an Agile methodology<sup>1</sup> and second, migrating those custom programs from the mainframe to the virtual Windows.net environment.

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<sup>1</sup> **Agile Methodology, also referred to as Iterative agile development process**, is a process where software is built incrementally from the start of the project instead of trying to deliver it all at once near the end of the project. A large project is broken down by user functionality called "user stories." The smaller projects are then prioritized, and then continuously delivered in cycles called *iterations*. Agile is a highly structured development process which includes (1) Technology & Architecture, (2) Delivery Models, (3) Roles & Workforce, (4) DIT Organization, (5) Capacities, (6) Sourcing & Partnering. (Source: Digital communities for City and County Leaders)

The decision to convert the software to a newer C# programming language not only addressed the issue of the obsolete COBOL programming language, it also opened up some employment opportunities to attract others with this skillset, including graduates from colleges, universities, and specialized trade schools, to work for DIT. Phase I of the project was scheduled for completion in June 2016. Until that time, DIT planned to keep the mainframe operating until the new systems in the virtual environment had been tested and accepted by user departments and constitutional offices.

When the virtual systems went live in 2016, DIT planned to keep the mainframe running for read-only purposes for the departments' and Constitutional Officer's historical reference. DIT planned to continue to retain in-house developers and contract workers to maintain the legacy programs and interfaces for the purpose of maintaining both the mainframe and those converted to the Windows.net environment. Additionally, DIT planned to reduce costs by discontinuing patches and updates to the mainframe system which was last updated in 2014. Beginning in FY2017, DIT planned to perform a cost analysis to determine the feasibility of maintaining these programs or replacing them with an ERP solution.

In addition to the DIT Modernization project, DIT was also in the process of transforming its own processes through a new DIT Service management (ITSM) system. Once implemented, this software would incorporate an IT Infrastructure Library (ITIL) which included a framework of best practices designed to provide guidance on developing a systematic approach to the provisioning<sup>2</sup> and management of DIT services. This Service Management system was expected to be tested and implemented in FY 2017.

## **Accela Program**

In November 2015, DIT implemented the Accela program for departments with permitting processes. As of July 7, 2016, DIT reported 1,953 individuals who had conducted business online for a total of 5,783 transactions since the Accela program went live in November 2015. This was approximately 12 times higher than the 445 permits that were processed in the mainframe last year. The Accela system had also collected a total of \$2,104,448 as of July 7, 2016.

## **Security Enhancements**

DIT recognized that IT systems had been compromised by hackers in a variety of public and private organizations outside of the City. More policies were being developed to reflect best practices in the area of cybersecurity. DIT also planned to scale back the number of employees who had local administrator access to protect the integrity of City's

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<sup>2</sup> **Provisioning** The process of providing users with access to data and technology resources. The term typically is used in reference to [enterprise](#)-level resource management. Provisioning can be thought of as a combination of the duties of the human resources and [IT](#) departments in an enterprise, where (1) users are given access to data repositories or granted authorization to systems, [applications](#) and [databases](#) based on a unique user [identity](#), and (2) users are appropriated [hardware](#) resources, such as computers, mobile phones and pagers. The process implies that the [access](#) rights and privileges are monitored and tracked to ensure the security of an enterprise's resources. (Source: <http://www.webopedia.com/>)

systems and data. As DIT continued to evolve more information would be provided regarding this issue.

### **Virtual Desk Infrastructure (VDI) Initiative**

DIT was working toward replacing personal desktop computers (PCs) and transitioning to a virtual entity which allowed employees to access work from anywhere. Gray terminals were the VDI access. In addition to these terminals, an employee could also access the VDI through the internet which could be accessed remotely. An employee could log in by typing <https://VDI.cityofchesapeake.net>. The workstation gave access to an employee's files in the shared drive within the city as well as web based applications such as PeopleSoft and Kronos. The objective was to replace the PCs with a smaller more economical footprint. The PCs had a 5-year replacement cycle. The new VDI devices had a 17-year replacement cycle. These devices were also more secure because since the data did not have to leave the data center, there was minimal chance of data corruption between data transferring from work to home. Also, the VDI infrastructure was highly available in the private cloud. In this particular application, there was minimal risk of data loss.

### **Help Desk Changes**

DIT was also transitioning from a Help Desk to a Service Management Desk. The goal was to improve the service that DIT was providing to its customers. DIT's first task was to replace the software application. The new software was scheduled for implementation around July 1, 2016 and would help DIT to better align its services with the business needs of each department. The new Service Management application would be Information Technology Infrastructure Library (ITIL) compliant that focused on aligning DIT services with the needs of the business efficiently and effectively. DIT would be better equipped to serve the users, and provide its users with tools that would enable them to help themselves such as "Self Service." An employee would be able to check the status of his or her help tickets, how many had been completed, and where they were in the queue. Employees would be able to re-set their Active Directory passwords in more than one application including KRONOS, as well as other application passwords as DIT evolved.

The new Service Catalog would allow users one stop shopping. At a click of a button, users would be able to see the various DIT services available. DIT planned to provide screenshots to share at a future User quarterly meeting in the Spring of 2016.

### **The New Public Safety Operations Building (PSOP Building)**

The PSOP Building was being built next to Animal Services on Battlefield and Military Highway. This building was scheduled to house the City's 911 Dispatch previously located in the Public Safety Building, the City's Emergency Operations Center, Emergency Management Administrative Offices, the Call Center (382-CITY), and had a 190-foot monopole communication tower to assist with the radio system. The three story building included 50,000 square feet, was hurricane, flood, and earthquake resistant, and

had a structural steel frame with specialized concrete footing. It also included two generators, designed using LEED Standards (Leadership, Energy, and Environmental Design) and was designed to be environmentally friendly. The building was scheduled for completion in April 2017, with occupancy four months later, giving DIT dual data centers for redundancy.

### **Update on Public Safety**

The P25 radio project and the new CAD system (New World) was slated for location in the new PSOP building. The new CAD system went live September 2015. In that time, Public Safety transitioned from a Tiburon system, which was the core functionality and the systems they used every day, to the New World information management system. The vendor returned as scheduled, and performed a business practice review.

DIT was also in the process of working on developing interfaces with many of the other Public Safety systems. The initial interface was with CrimeMapping.com. The citizen's portal was running and citizens could see where crimes were occurring in their neighborhoods. Getting timely information to citizens was one of the main goals.

### **Sendit.cityofchesapeake.net**

The City initiated **sendit.cityofchesapeake.net**, a web portal where employees could log in with an Active Directory account credential, upload a confidential document, share it, and send it. The document was secure using encryption in transit. Employees could also choose to encrypt the data at rest. This was a person-to-person solution where the receiver got an email with a link specific to him or her. Additional passwords could also be required to access the file. "Sendit.cityofchesapeake.net would not save the document. Files were deleted 10 days after upload. Links were only active for 7 days for security reasons. Information on this portal would be available in the DIT SharePoint website. The file size limitation was 4 gigs.

## **C. Operational Issues**

In reviewing DIT's operational processes, we identified several issues that needed to be addressed. The issues included DIT's Governance challenges, legacy system issues, and the DIT Modernization Project; access control and the Active Directory; the Archiving location; PeopleSoft Financial Issues; Heat Ticketing System; IT Staffing Challenges. As part of this audit, we included DIT's Self-Assessment of its own business processes as well as the status of the Public Safety New World Implementation.

### **1. DIT Governance Challenges, Legacy Systems Issues, and the DIT Modernization Project**

**Finding - The City did not have an IT Steering Committee and a Citywide IT Governance Policy to ensure cohesive ERP solutions for its financial systems resulting in long-term challenges for DIT.**

According to the *IT Governance Institute (COBIT Framework)*:

**"IT Governance** is the responsibility of executives and the board of directors, and consists of the leadership, organizational structures, and processes that ensure that the enterprise's IT sustains and extends the organization's strategies and objectives."

The purpose of an IT Governance Policy was to create a framework to ensure that the City's leadership was appropriately involved in the governance of the organization's IT. The framework should set out guiding principles for directors on how to ensure the effective, efficient and acceptable use of IT within the organization.

The City did not have an IT Steering Committee to adopt and enforce an IT Governance Policy regulating the City's IT protocols. DIT addressed the IT Governance issue in its 2015 prepared responses to the external auditors:

*"Governance can be considered as being comprised of two components (1) a decision-making mechanism, and (2) the assignment of decision-making authority and accountability both of which drive decisions regarding IT strategy, IT project investments, and IT architecture.*

*...The governance process has four steps of approvals: 1 – Architectural Design Team (ADT), 2 – IT Steering Committee, 3 – Investment Committee, and 4 – City Manager. To date, no projects have gone beyond step two. The CIO has reviewed the data available and made the determination that, since the IT Steering and Investment Committees are yet to be formally convened and the pressing time table vis-à-vis budgetary constraints for the respective departments involved, a full review of the request as submitted did not warrant the delay necessarily imposed by the full governance scenario".*

**DIT Management**

In the absence of a formal IT Governance Policy, DIT stated:

*“The City’s [DIT] existing Architectural Design Team (ADT) will continue to be the necessary first step in a four step process that will include two additional committees comprised of executive management in the form of a IT Steering Committee, Investment Committee [for financial and budgetary considerations], and concluding with the City Manager’s review with the goal of insuring that ... new projects are compliant with IT Standards ...”*

## **DIT Management**

DIT was successful in the implementation of the City’s Library System using DIT’s ADT and the methods described above. DIT was also successful in replacing the legacy Tiburon CAD system for all of the City’s Public Safety Departments with the New World System. The department was in the process of launching the CAMA Real Estate system. DIT also implemented the Accela program for departments with permitting processes. As of July 7, 2016, DIT reported 1,953 individuals who had conducted business online for a total of 5,783 transactions since the Accela program went live in November 2015. This was approximately 12 times higher than the 445 permits that were processed in the mainframe last year. The Accela system had also collected a total of \$2,104,448 as of July 7, 2016.

However, as of FY2015, the City had four financial systems which DIT had already started to review.

1. **Windows Servers** which housed:
  - PeopleSoft Applications, Web, and Database Servers for Risk Management, Accounts Payable (AP), Asset Management, General Ledger (GL), and Purchasing transaction classes.
  - MUNIS Human Resources system that processed Payroll. Journal entries transferred nightly to PeopleSoft for GL processing.
  - Utility Billing CIS System for Billing and Receipts
  - Effective July 1, 2016, COBOL programs for Billing, Accounts Receivable (AR), and Receipts in the z/OS Mainframe were converted and will be implemented in the Windows.Net environment.
2. **z/OS Mainframe for Billing, AR, Receipts.** Journal entries were transferred to PeopleSoft nightly for GL processing through June 30, 2016. The z/OS was scheduled to be available only for historical reference after July 1, 2017.
3. **Client-Server with Windows based cash registers and z/OS Mainframe for Cash Receipt processing.** This utilized the IBM Websphere MQ message queuing infrastructure for the client-server interfacing.

The exhibit below shows the City's various financial applications.

### FY2016 City of Chesapeake Financial Applications

Application	Platform & Operating System	Integrated or Related Database	Transaction Classes Impacted*	Number of End Users	Number of Admins	Service Organization Name (if applicable)**	Internally Developed?	Externally Developed		
								Vendor/Brand Name & Version	Custom Features (if any)	Access to Source Code?
PeopleSoft	MS Windows Server 2012	MS SQL Server 2012SP2	Risk Management, AP, Asset Mgmt, GL, Purchasing	832	4		N	Oracle/PeopleSoft Financials 9.2	Many	Yes
Utility Billing CIS System	Windows Server 2008 R2	SQL Server 2008 R2	Billing, Receipts	109	4	HRUBS for bill mailing and fee collection	N	Cogsdale Corp CSM 11.9 and Microsoft Corp Great Plains 2010 SP3	Some. Including interfaces to PeopleSoft, Mainframe Cash processing, and HRUBS	No
Cash Processing	Windows based cash registers, z/OS mainframe	DB2	Receipts	30	6		Y			
Munis HR/Payroll	Windows Server 2102R2	SQL Server 2012SP2	Payroll (City)	182	4		N	Tyler Munis 10.5	Interfaces to Kronos and PeopleSoft, Laserfiche Connector	No
Miscellaneous invoices	z/OS mainframe	DB2	Receipts	63	4		Y			
Real Estate Billing	z/OS mainframe	DB2	Billing, AR	83	3		Y			
Storm Water billing	z/OS mainframe	DB2	Billing, AR	100	3		Y			
Business Tax	z/OS mainframe	DB2	Billing, AR	127	5	Preferred Direct for mass mailing of renewal notices	Y			
Personal Property	z/OS mainframe	VSAM	Billing, AR	20	4		Y			
Animal License	z/OS mainframe	VSAM	Billing, AR	8	2		Y			
State Tax	z/OS mainframe	DB2	AR	10	3		Y			
Lockbox	z/OS mainframe	File-based				Wells Fargo is a collection point. They produce payment file	Y			
Official Pay credit card payment	z/OS mainframe	File-based					Y			
Rapid Pay – taxpayer online banking service	z/OS mainframe	File-based					Y			
Solid Waste tipping fee	z/OS mainframe	DB2		10	3		Y			
Parking Tickets (an existing system that has been accidentally omitted from past audits)	z/OS mainframe	VSAM	Billing, AR	8	2		Y			

\* Examples of "transaction classes" include GL, AP, AR, Inventory, etc.

\*\* Service Organization refers to whether or not a third party provider is used to administer or house the system.

Please note that in August 2016 the COBOL programs in the z/OS will be available for historical reference only, and the converted programs in the Windows.Net will be implemented. The timeline was adjusted to align the Vision CAMA system implementation with the implementation of the newly converted Windows.Net systems.

## Legacy Systems and the Need for Modernization

Because the City had not adopted an IT Governance Policy regulating the City's IT protocols, DIT was required to maintain antiquated z/OS Mainframe legacy systems for City affiliated entities serviced by IT<sup>3</sup> that had not modernized their business systems. However, the decision to maintain the legacy systems was creating a growing expense for the City. Since the inception of the DIT Modernization Project in February 2013, the City had spent approximately \$5.5 million by June 2015 on legacy systems. To limit costs during this transition, DIT decided to keep only the core licenses to continue running batch reports until the mainframe legacy programs had been completely converted, rewritten, and transferred to a virtual Windows.net environment. This decision decreased mainframe licensing expenses, resulting in cost savings of \$522,204 to the City. DIT anticipated saving an additional \$300,000 in the FY 2017 fiscal year.

The DIT Modernization Project was designed to address the legacy system issues, which had reached a breaking point for the following reasons:

1. Vendor support was no longer economically feasible and in some cases available to service the aging hardware and software. DIT was dedicating a significant portion of internal resources and hiring consultants to address legacy system repairs and failures.
2. The legacy system created security vulnerabilities as the security measures were older technology and no longer adequate.
3. The COBOL programmers needed to maintain the systems were beginning to retire making them difficult to replace. DIT had to retain this outdated programming knowledge and expertise to keep legacy systems running.
4. DIT staff had less available time to develop new services because their time was being spent keeping older applications running.

This situation occurred because the City lacked a citywide IT Governance Policy and service level agreements between the Constitutional Offices regarding IT requirements. The City had begun adopting an IT Governance Policy in the 2011-2012 timeframe but never formally approved an Administrative Regulation covering it.

In the absence of this policy, it became standard practice for individual departments to make decisions about their own IT systems without regard to a homogenous enterprise resource DIT solution resulting in systems that, in some cases, were not compatible with one another. Individual departments made decisions based upon the departmental budget process without consideration to the overall strategic direction of the City, resulting in departments purchasing software and then (in some cases), automating manual processes verses reengineering the workflow to take full advantage of the software capabilities. Departmental funding for DIT projects, as well as staffing shortages, was also a factor in deciding which software upgrades were implemented. This piecemeal approach to deploying DIT projects, departmental priorities,

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<sup>3</sup> City Treasurer and Commissioner of Revenue Offices

and staffing shortages all impacted the outcome of DIT project implementation. The lack of a comprehensive, and funded DIT Governance Policy created long-term challenges for the DIT. The City may experience significant opportunity costs attributable to a lack of a Citywide IT Governance Policy, personnel challenges, and retaining contractors to maintain customized system requirements for the City's Constitutional Offices.

### **Recommendation – The City should adopt a Citywide Governance Policy**

In order to appropriately address these urgent issues, the City should consider the following measures for adoption:

- Work with executive management to adopt a comprehensively funded City-wide IT Governance Policy to set the direction for the future DIT architectural framework. The Governance Policy should also address departmental security responsibilities to ensure there is adequate monitoring of system access as well as adequate segregation of duties to detect or prevent employees from compromising systems of the City, especially financial.
- Work with the Constitutional Officers to discuss ERP business solutions that will interface effectively with other City systems. Additionally, work with the Public Procurement Office to make reference to both the departments' and DIT's responsibilities in the RFP process when making technology purchases. Those references should be formally addressed in the Purchasing Policies and Procedures.

In addition, DIT should

- Continue plans to perform an analysis to determine the feasibility of maintaining these programs or replacing them with an ERP solution in Phase 2 of the Modernization Project.
- Continue to evaluate future enterprise application replacements, and consider whether it is in the City's best interest to continue to expand the City's PeopleSoft ERP footprint, use alternative applications, or consider other technologies such as cloud computing (SaaS).

### **Management Response**

#### **Item # 1: DIT Governance Challenges and the legacy system issues**

**DIT Response - DIT agrees with the audit recommendation that it is in the best interest of the City to reduce the footprint of ERP systems currently in use by the City. Gartner describes this consolidation trend in the industry as a post-modern ERP approach whereby the end result is less complexity regarding interfaces, integrations, and synchronization of data coupling with much more agility and adaptability at a lower cost than it otherwise would be if the City continues along the current path. This also gives the City the opportunity to introduce innovative business processes to take advantage of faster more efficient ways of conducting**

**business in a more transparent, collaborative, and measureable manner going forward.**

**As for the governance policy, DIT will work along with the City Manager's office to ensure the key stakeholder enterprise business units such as Real Estate, Planning, Public Utilities, Public Works, Public Safety, and the constitutional officers are on board with the new governance process. In order for the City of Chesapeake to operate at a high level of efficiency and cost effectiveness while being properly aligned with stated City priorities it is necessary to establish a project governance mechanism for approval of all projects greater than \$100,000 or where it is determined the impact of the project has sufficient enterprise impact that it warrants governance review.**

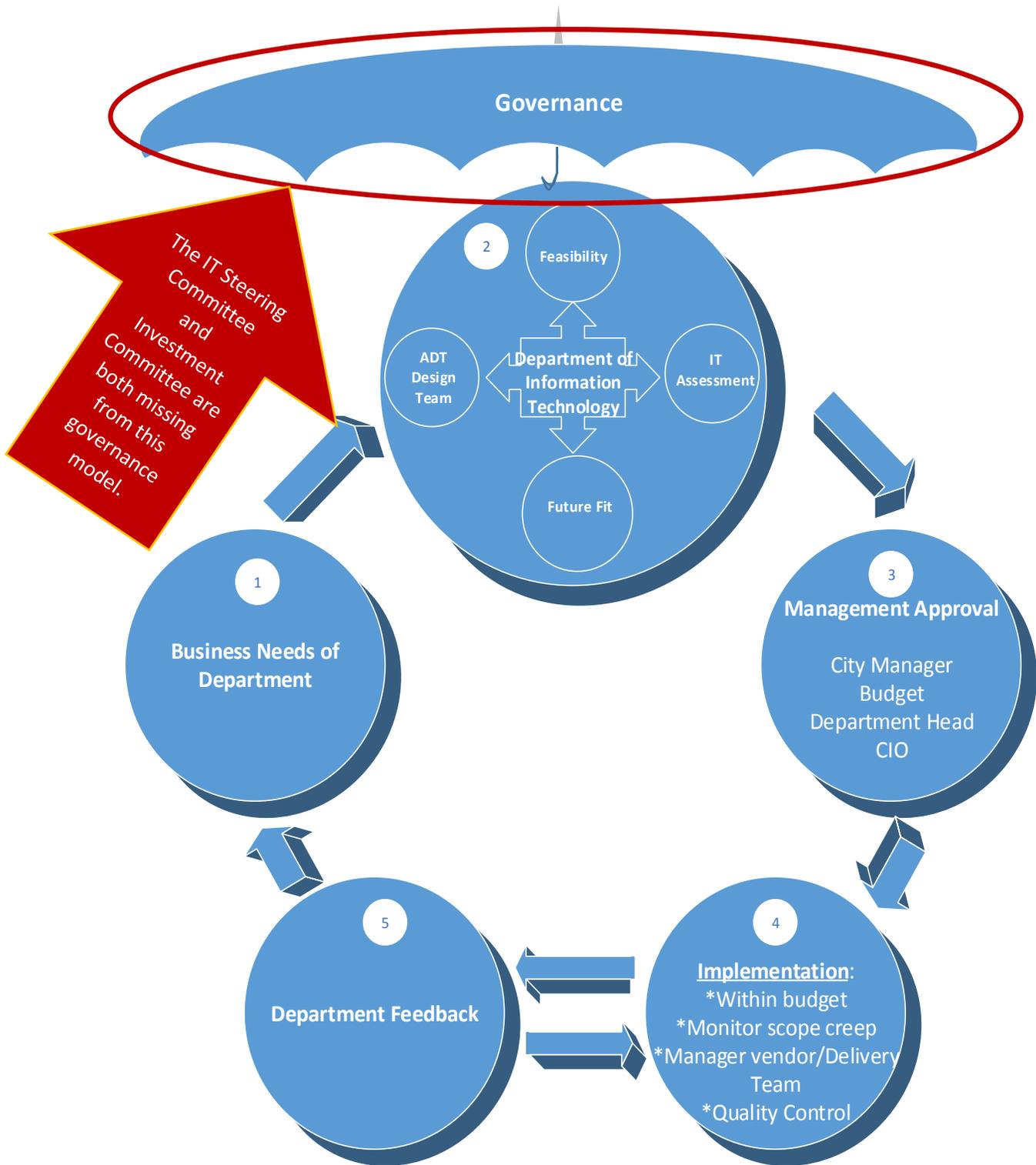
## **DIT's Systems Development Life Cycle (SDLC) used for major system implementations**

Before a major project enters the development cycle (or purchasing cycle for a vendor supplied solution), a business case must be documented, funds must be identified, and potential IT resources must be identified. The proposed project must then be reviewed and approved by the DIT Architectural Design Team (ADT).

1. The ADT is tasked with reviewing the technical aspects of the proposal, ensuring that: the design is supportable by existing resources and technical expertise of the IT staff; that the proposed technical architecture complies with architecture standards that have been developed by DIT; that the proposal meets stated business needs; and that security, records management, and other 'standard' requirements have been addressed.
2. If approved by the CIO upon recommendation of the ADT, the proposal is embodied in a formal project plan that includes a project manager, major implementation task steps, schedules, resources required, outstanding issues, and budget amounts available and spent.
3. Formal design (or vendor proposal) is then completed, and the normal development process starts. Peer review of detail designs are performed, stakeholder review of functional implementation is performed, test plans are identified, and testing environments are established. Approval to move to production status is required from both IT management and stakeholders and incorporated into the Quality Assurance (QA) and change management process.
4. End-user education is identified and scheduled prior to implementation. If there has been significant vendor involvement, skills transfer activity to IT staff from the vendor will be identified in the formal project plan. IT staff may be scheduled for additional training and education as required by the nature of the project.

The diagram on page 18 highlights the City's basic SDLC processes.

# City-Wide DIT Processes



## **2. Access Control and the Active Directory**

**Finding - The City did not have an Administrative Regulation requiring the Human Resources Department (HR) to promptly notify DIT of new hires, and changes in employees' status. This resulted in DIT's untimely disabling of active directories for some employees and volunteers who were no longer working for the City.**

According to the *ISO/IEC 27002 Code of Practice*

### **“Business requirements of access control**

The organization's requirements to control access to information assets should be clearly documented in an access control policy and procedures. Network access and connections should be restricted.

### **User access management**

The allocation of access rights to users should be controlled from initial user registration through to removal of access rights when no longer required, including special restrictions for privileged access rights and the management of passwords plus regular reviews and updates of access rights.”

DIT had an internal procedure for creating Active Directory (AD) accounts for employees. DIT also had created an electronic document called a Computer User Access Request Form (CUARF) that departments could access when requesting system access for new hires, or changes for existing employees, volunteers, contractors, and others doing business with the City. This electronic document passed through an automatic workflow designed in SharePoint to move from the department head (for authorization), to HR (for the purpose of assigning employee ID#s for new hires), and finally to DIT (to create a HEAT ticket). This HEAT ticket would automatically generate automatic assignments through the SharePoint system to DIT staff responsible for granting access to various systems such as Microsoft exchange for email setup, Active Directory setup, SharePoint access, PeopleSoft access, etc. Once the last DIT staff completed the final system access, the HEAT ticket would be closed and automatically notify the department that all system accesses had been granted.

The City also had a DIT Acceptable Users Policy ([AR 1.13](#)) effective 12/14/14) which defined the user's responsibilities to the systems as well as password requirements, and application access controls. However, there was no policy with regard to the process of DIT User Account Creation and Modification.

In order to gain a comprehensive understanding of the CUARF process, Audit Services created a flowchart to show the workflow of how a new active directory was created for a new user. (See flowchart on the following page.) The work flow was the same, for the most part, when a department was notifying DIT when an existing user AD account needed to be modified or disabled. We also interviewed DIT help desk staff and observed the process to gain a more comprehensive understanding of how a user active

directory account was created, disabled, and deleted. Based on our observations, the following issues were discovered:

1. HR required departments to process Personnel Action (PA) forms for new hires or changes in employee status. This was a manual process, and separate from the CUARF process for creating new active directory accounts or modifying accounts for existing employees, volunteers, and contractors. Departments were responsible for completing both the manual PA form and the electronic CUARF forms. There was no policy which required HR to promptly notify DIT of changes in an employee's status.
2. Although department payroll clerks were trained to complete PA forms, DIT were limited in staff which prevented them from providing regular training on the CUARF process. As a result, departments did not always remember to notify DIT through the CUARF process when an employee terminated, transferred to another department, or a volunteer ended their work with the City.
3. At times, consultants and contractors were authorized system access by their department heads. In these cases, it was DIT's standard practice to grant them a 30-day system access. The system would automatically disable their access once the 30 days had expired.
4. The list of system selections available on the CUARF form were not up-to date and needed to include the newer systems such as New World, Accela, and CAMA.
5. Unique identifying numbers were given to City employees by Human Resources. Unique identifying numbers were not given to consultants and contractors, department service accounts, State paid/Schools/Human Services employees, and volunteers (i.e., consultants and contractors were assigned ID#'s 999999. Department service accounts were assigned ID#'s 888888, and State paid/Schools/Human Services employees were all assigned ID#'s 555555.)
6. The creation and modification of User Active Directory Accounts was spread among the responsibilities of the Help Desk, Operations Staff, and their Supervisor (4 people), and the Network staff who was responsible for deleting disabled accounts after 6 months.

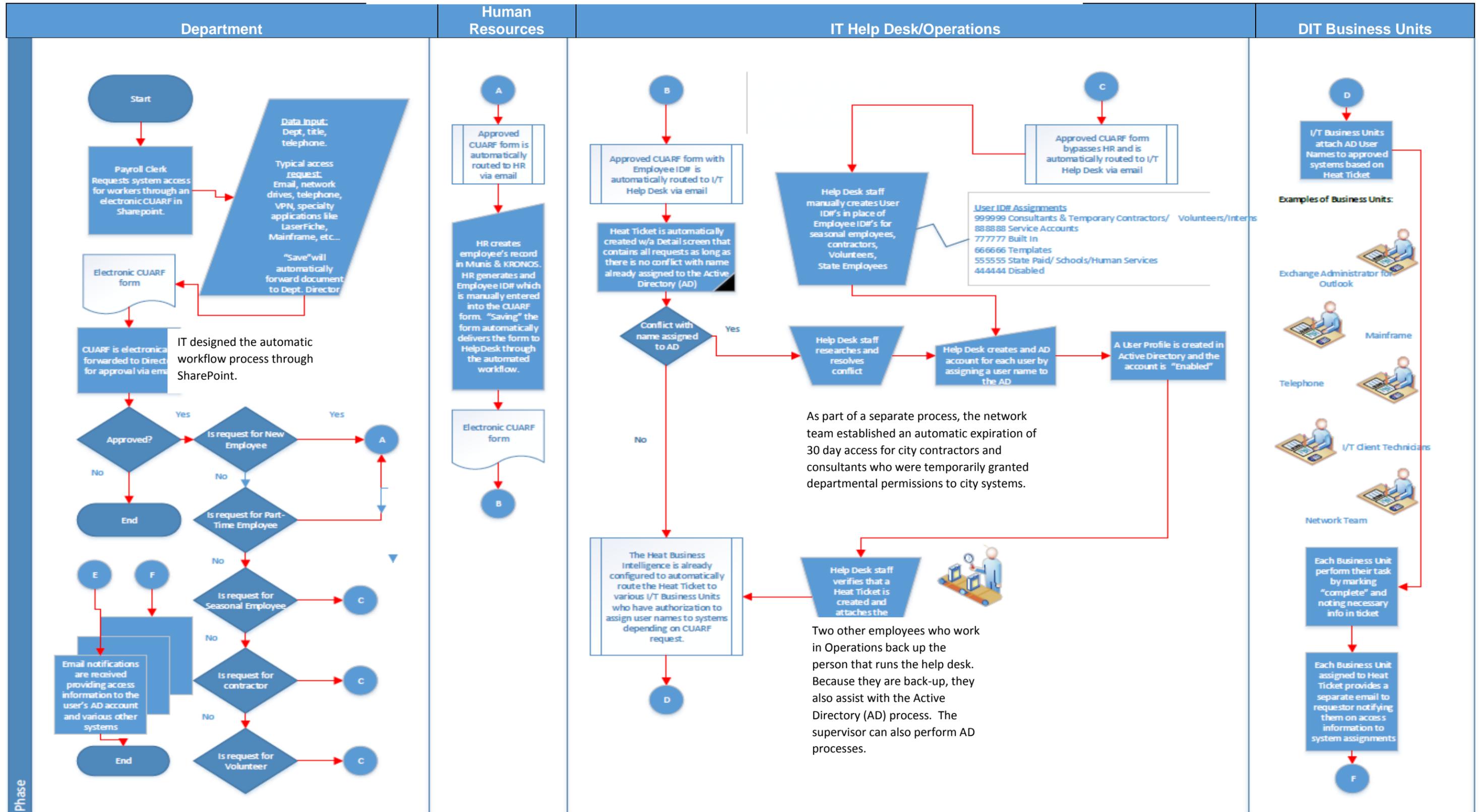
This situation had several causes:

- The City did not have an Administrative Regulation or Policy that required HR to promptly notify DIT of changes in employees' and volunteer status' to ensure DIT's ability to modify, or disable, active directories for the purpose of restricting access to City systems timely.
- The PA process was separate from the CUARF work flow process causing department heads to process two different forms for every employee instead of combining the two processes into one. Training was only given for the PA process, but not as frequently for the CUARF process due to staff time constraints.
- There was no system in place for the assignment of unique identifying numbers for consultants, contractors, volunteers, department service accounts, or State paid/Schools/Human Services employees accessing the City systems.

- DIT had did not have the staff to focus attention to the creation and modification of user active directory accounts.

As a result, DIT was not able to disable active directories for employees, and others, who no longer needed systems accesses in a timely manner due to untimely notification from departments.

# Computer User Access Request Form (CUARF) Work Flow Process



Phase

**Recommendation - The City should develop an Administrative Regulation requiring HR to promptly notify DIT of new hires, and changes in employees' status.**

DIT should consider the following measures:

Work with executive management to formalize a standard City-wide Administrative Regulation or operating policy which requires HR's prompt notification of new hires and changes in employee, or volunteer status. The policy should also call for the timely addition, adjustment, disabling (to eventually deleting) of AD<sup>4</sup> accounts. Then restructure the operational processes for more *timely* processing of AD accounts for new hires, transfers, and terminated full-time and part-time employees, seasonal employees, and other non-city employees (such as volunteers, contractors, and state employees.) By automating the Human Resources Personnel Action (PA) notification process, through electronic work flow, with the computer user requirements up front, there will be less confusion communicating pertinent employee statuses between the city departments, HR, and DIT. The following should also be considered:

- Revise and automate the workflow of the Human Resources Personnel Action (PA) form to include all instructions requested by departments from Computer User Access Requests form (CUARF). Note: Since city systems have changed, the Computer User Access Request forms should be updated with newer departmental system requirements.
- Revise the PA policy to include the timely reporting of active and inactive employees between HR and DIT. The policy should include SLA agreements between departments, HR, and DIT with regard to the assignment of non-employee ID numbers for volunteers, contractors, state workers, and other non-city employees. The policy should also define the timely processing of adding, disabling, and deleting AD accounts. Additionally, for security reasons, DIT should be required to provide a list of active AD accounts, and names associated with those accounts, to department heads no less than quarterly. The department heads should then be responsible for reviewing the list and provide positive, timely confirmation to DIT that the AD accesses are still current or need to be disabled. However, for departments that are impacted by a higher attrition rate, those departments should be required to report more frequently.
- Minimize human error by allowing the system to automatically update each employee IDs, and other IDs assigned to non-city employees, from HR's data field captured in the PA process to the AD data field in DIT. Once AD accounts have been updated, a separate review, and approval, should provide the necessary checks and balances to ensure the accuracy of the data.
- Assign unique identifying ID numbers to each employee, and non-employee, for AD accounts to more easily track those accessing city systems. By implementing

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<sup>4</sup> **Active Directory (AD)** is a directory service that Microsoft developed for Windows domain networks. When a user logs into a computer that is part of a Windows domain, the Active Directory checks the submitted password and determines whether the user is a system administrator or normal user. A server that runs Active Directory Domain Services authenticates and authorizes all users and computers in a Windows domain network.

this tracking method, DIT can more easily manage, identify, and disable AD accounts of terminated employees, and non-employees, who no longer are doing business with the city. It also decreases the city's risk of unauthorized access to city systems and confidential data.

- Automatically disable AD accounts for employees who have not accessed systems over 60 days. This will also decrease the city's risk of unauthorized access when employees are on temporary leave. The policy should also require that non-City employees are granted temporary access to city systems by automatically expiring their AD accounts after 30 days or less.

## **Management Response**

### **Item #2: Access Control and the Active Directory**

**DIT Response - DIT agrees with the audit findings and will revamp the draft policy attached in the overall audit report to include clear directives for each department working with Human Resources to provide timely and accurate information to address this issue. With the new help desk service desk application being implemented with IT Service Management (ITSM), we will be able to automate workflows that will help enforce the pending policy.**

## **Department of Information Technology**

**Subject: Acceptable Account Usage and Management**

**Effective Date: XXXXX**

### **I. PURPOSE**

To establish a policy for the creation, modification, management, and access of accounts.

### **II. DEFINITIONS**

Account – An electronic object that allows access to the City’s infrastructure such as networks, devices, servers, applications, or services such as Exchange Email, a PC work station, telecommunications services, or wireless networks. This object will be associated with a single person.

Standard Account – An account that gives a minimal level of access to City infrastructure and systems. This account does not have the ability to make any system wide changes to any server, directory, domain, or network.

Service Account – An electronic object that is created and exclusively associated with an application under which an application process is run with. This account is not associated with any physical user.

Administrative Account – A level of access higher than a standard account which includes the ability to make system wide changes to either a workstation, server, directory, domain, or network resource.

Account Owner – This is the defined person that is ultimately responsible for the management and usage of the account. The owner is associated with a single Active Directory account linked to person employed by the City.

### **III RESPONSIBILITIES**

- A. Department of Information Technology will be responsible for the initial creation and setup of the account in accordance with departmental requests.
- B. The account owner is responsible for the operation, management, usage, and confidentiality of that account.
- C. The department head, or their designee, of the department in which the defined account owner is a member is responsible for requesting the disposition of an account.

- D. IT system owners and/or security administrators shall activate any necessary technical controls governing the policy statements herein.

## **IV POLICY**

### **1. Account Creation and/or Modification**

- A. Any account or modification of an existing account, excluding access to wireless networks, will be requested through the submission of a work request ticket utilizing the City's central request tracking software.
- B. Any submission for the creation of an account or modification of an existing account shall include a Computer User Request form. The Computer User Request form will detail the account owner, what person is associated with the account, and what level of access should be granted to the requested account.
- C. A standard user account will be created in a manner so that the first letter of the first name is adjoined with the full last name of the person associated with the account. In the event an account is pre-existing with the same name as outlined the format will then be first letter of the first name adjoined with the first letter of the middle name adjoined with the full last name. In the event both outlined names are pre-existing the format will be first letter of the first name adjoined with the first letter of the middle name adjoined with the full last name adjoined with a number.

Example users: John Bark Doe, Joe Bravo Doe, and Jack Bravado Doe:

JDoe (John Bark Doe) – Normal account name

JBDoe (Joe Bravo Doe) – Used when JDoe is pre-existing

JBDoe1 (Jack Bravado Doe) – Used when both JDoe and JBDoe are pre-existing

- D. User accounts shall be made up of the user's full legal name. Legal name changes, such as ones due to marriage, shall be requested via a Computer User Request Form. Their AD account name shall be changed to their full legal name. Nicknames can be put into their AD account as well if desired.
- E. The created account will be given access to the systems and networks in accordance with the Computer User Request form submitted in conjunction with the work request ticket. The IT Dept. reserves the right to modify or deny an access request if the access is not deemed necessary based on least privilege criteria or potentially being a security risk.
- F. An account will only be created or modified with both the service request ticket and the accompanying Computer User Request form.

## **2. Password Requirements**

- A. The password for the account must meet the following requirements.
- Must be a minimum of eight (8) characters
  - Must minimally contain a combination of three (3) of the following: (1) capital letter, one (1) lowercase letter, one (1) number, one (1) special character.
  - Must not include the account ID.
  - Must not be any one of the previously used (10) passwords.
  - The minimum password age will be set to 1 day (24 hours).
- B. Passwords shall be set to expire every ninety (90) days. Users will be prompted to change their password prior to expiration. Service accounts are exempt from this requirement.
- C. Account Lockout Settings:
- Account Lockout Threshold: 10 attempts
  - Account Lockout Duration: 15 minutes
  - Reset account lockout counter after: 16 minutes

## **3. Account Usage**

- A. All users shall be granted a standard user account which allows them access to the necessary systems required for their job function. This account shall have no administrative access.
- B. An exception to policy section IV, subsection three (3), item A can be made on a case by case basis and administrative access limited to the user's specific workstation for the purpose of operating or accessing required departmental software necessary for the successful completion of job duties.
- C. Any user requiring administrative access to any domain, directory, server, or system will be granted a secondary account for which necessary administrative functions can be performed. All requests for secondary administrative accounts must be approved by IT Technical Support and the IT Systems Security Analyst.
- D. City workstation PCs will only allow logons utilizing a user's standard account. Logon by any administrative account shall not be permitted.
- E. Access to production systems other than a workstation PC will be granted through a user's associated administrative account. Any user not defined as a "Domain Administrator" as part of their defined job classification shall be granted access to production systems only during the execution of a previously approved change. This change shall be submitted utilizing the City's official change management system and procedure. The system access will then be revoked upon completion of the change.

- F. Only standard user accounts will be granted a mailbox. No administrative account shall be configured for, have access to, or be granted an email address or mailbox.
- G. Only standard user accounts will be granted internet access. No internet access will be configured for or granted to any administrative or service accounts.
- H. Logon to any workstation or server by utilizing service account credentials shall be prohibited.
- I. Logon to any system by a universal, generic, or shared account credentials shall be prohibited except for the expressed purpose of initial configuration.

#### **4. Account Disposition**

- A. In the event the defined account owner is no longer employed by the City, the defined account owner will revert to the head of the department, or their designee, in which the original account owner was a member.
- B. Any request for account disposition will be requested through the submission of a work request ticket utilizing the City's central request tracking software.
- C. Any request for account disposition shall include a Computer User Account Request Form. The Computer User Account Request form will detail the effective disposition date and any data retention needs associated with the account.
- D. Upon request of the disposition of the account, the account will be disabled and moved to an area of the City's Active Directory domain that prevents account access to City resources. The account will be retained for a minimum of thirty (30) days. At the end of thirty (30) days the Active Directory account will be permanently deleted.
- E. If an Exchange email account was associated with the disposed account it will be retained, modified, or permanently deleted in accordance with the official City email and archiving policy.
- F. An automated process shall be implemented to locate and disable user accounts that have been inactive for a minimum of ninety (90) days. Any accounts found not to have been utilized during that time period will automatically be disabled preventing access. A Computer User Request form submission will be needed to reactivate the account.
- G. An automated process shall be implemented to locate and delete user accounts that have previously been disabled and been inactive for a minimum of one hundred and twenty (120) days.

### **3. Information Technology Aspects of Business Continuity Management and Disaster Recovery**

**Finding - Backup tapes generated from DIT’s private cloud were temporarily stored at the secondary data center. They were then transported based on the application owner’s retention requirements to the vault in the City’s municipal center, less than 400 feet away from the City’s DIT center. Also, the PeopleSoft Financial System had not been archived which caused delays in processing data tables that had been kept open since the system was implemented in 2005.**

According to the *ISO/IEC 27002 Code of Practice*

**“IT Business Continuity Plan**

The continuity of information systems should be planned, implemented, and reviewed as an integral part of the organization’s business continuity management system.

**Redundancies**

IT facilities should have sufficient redundancy to satisfy availability requirements.”

DIT had an internal **Server and Database Backup Policy** (Topic 513-102) which described its backup processes. The objective of this policy was to define the system backups to protect the city from data loss or corruption.

The table on the next page shows the locations of where the major DIT systems are housed and backed up. It should be noted that most of the major DIT systems were backed up on tapes at DIT’s secondary data center, and then removed and transported to the City’s vault and archived based on predefined retention scheduling requirements. This off-site storage was approximately 400 feet away from DIT’s Data Center. The Tyler/Munis Payroll backups were located in the vendor’s DR Public Cloud.

#### **Major DIT Projects and status of Backups**

Major City Programs	Where Live Programs and Data Exist			Backed Up?	Where Backup Processing Occurs	
	IT Data Center	Public Cloud	City’s 2 <sup>nd</sup> Data Center		Private Cloud	Public Cloud*
Microsoft Products	X			Yes	X	
PeopleSoft	X			Yes		
Tyler/Munis		X		Yes		X
Kronos	X			Yes	X	
CIS	X			Yes	X	
ACCELA	X			Yes	X	X
CAMA	X			Yes	X	
New World			X	Yes	X**	
Maximo	X***			Yes	X***	

\*Backed up and archived in the disaster recovery public cloud. \*\*DIT is looking to have a second backup solution to prevent the CAD from any downtime. \*\*\*As of May 2015, Maximo exists in the IT Data Center. DIT is currently looking to place the program and database in the public cloud.

**IT Business Continuity Plan.** The DIT had a continuous IT business strategy. As part of this strategy, DIT produced a Disaster Recovery Software Criticality Chart dated December 8, 2014. DIT also contracted with Electronic System (ESi) to develop and test a disaster recovery plan for the City. On March 13, 2015, ESI published the CoC Disaster Recovery Analysis. The document included interviews with key City departments to develop a Business Impact Analysis for each department. Additionally, ESI reviewed the IT assets for the City and then developed a report with a summary of interviews, IT readiness, and items necessary to prepare and test a disaster recovery plan.

**Redundancies.** DIT used a Point of Presence and their wide area network to replicate data between the virtual servers located in the DIT Data Center and the City's second data center. The data is encrypted at both sites throughout the transmission process. The data's end-point backup times are every hour, and then collectively every 24 hours for a full backup. The ongoing differentials are maintained by the Microsoft DPM (Data Protection Manager). The off-site backups are maintained at the city's second data center. After seven days, the backup data, collected on disc, is transferred to electronic tape for archiving purposes. The tape is then transferred by car to the central DIT Operations center. A heat ticket is created to document the transfer of tape to the vault where the tapes are held for historical purposes. Once the tape is transferred, the heat ticket is closed.

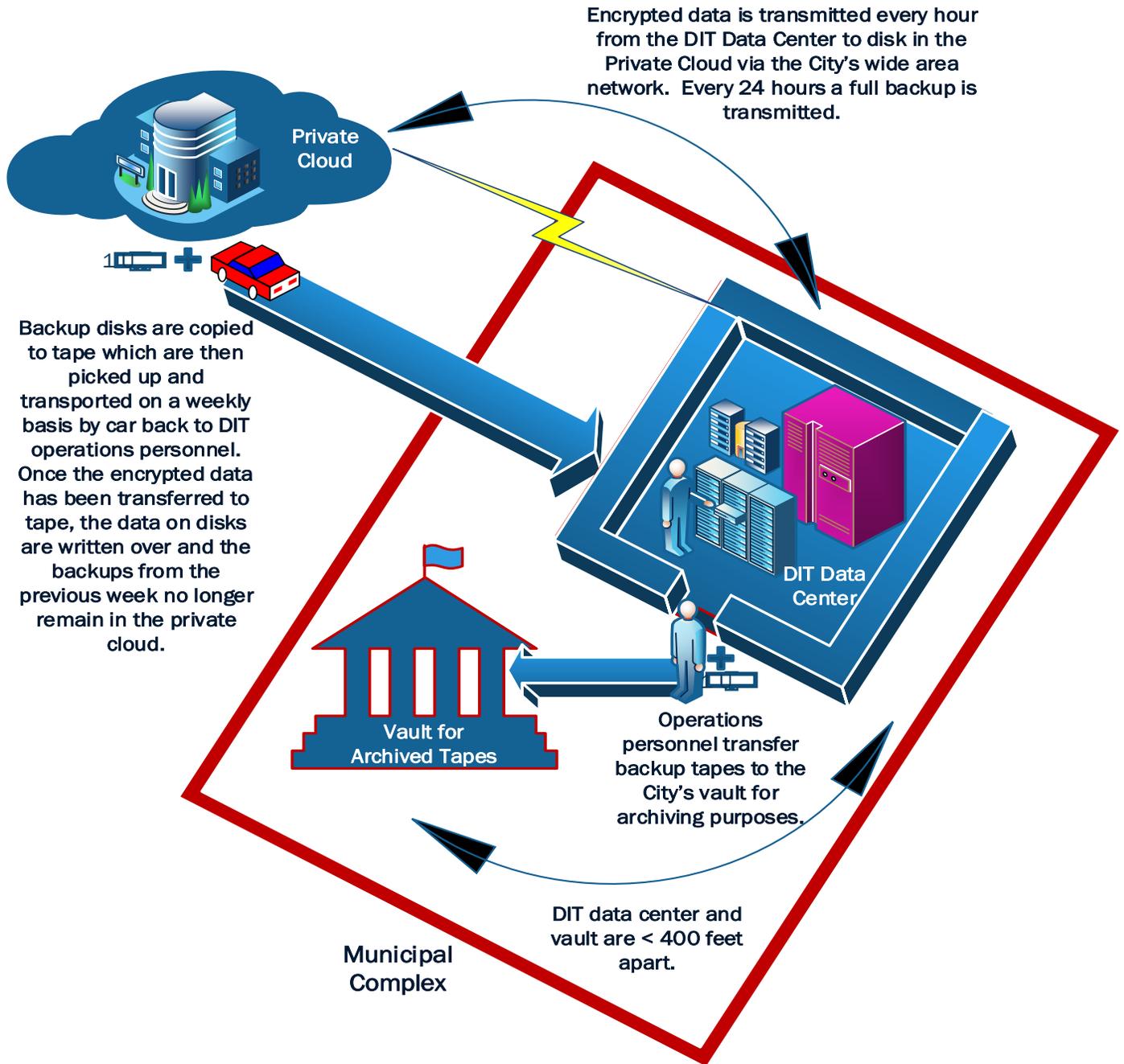
According to the DIT:

*“Proximity of the tapes from the data center to City Hall as it stands today is definitely a concern. With the new PSOB building, we will have a hardened secure data center with a large footprint to not only replicate systems but will also provide secondary site storage for tapes. The new PSOB building is on track for IT to start implementing the infrastructure in May 2017.”*

**DIT Management**

The following chart shows the data backup and archiving process.

## Data Backup and Archiving Process



This situation occurred because the City did not have a vault remotely located away from the Municipal Complex to store archived DIT tapes. The City made a decision not to compress and archive the City's financial data because of the multiyear programs, contracts, and bond data that needed to be tracked.

As a result, the City may experience system failures and the inability to process financial, and other business activities in a timely manner in the event of a catastrophic disaster since both the DIT and archived tapes are located in the Municipal Complex. Employees responsible for processing and querying financial data may experience time delays when performing batch processing and data queries.

**Recommendation – The Finance Department should work with DIT to develop a plan for archiving PeopleSoft financial systems and records.**

DIT should work with City finance staff to develop an archiving plan that balances the need to maintain the accuracy of the financials with the need to process the financial information as quickly and effectively as possible, to help ensure more timely processing of City financial data. Since the City is addressing the need for a second secure IT data center and secondary site storage, we have no further recommendations on this issue.

**Management Response**

**Item #3: Archiving Processes**

**DIT Response - DIT agrees with the audit's recommendation. The new Public Safety Operations Building (PSOB) will become a dual data center with active-active network capability to address disaster recovery and business continuity. In fact, the model is already implemented within a limited scope by utilizing the city's private cloud to capture and store backups that are designed with DIT's active-active network architecture state.**

**Finance archiving: DIT will continue to work with the City's school and the City's Finance department to address this issue. Without a proper archiving agreement and tool in place, PeopleSoft records will continue to grow thus eventually impacting timely access to data and impeding speedy recovery to data within a reasonable window from a disaster.**

#### 4. PeopleSoft Financial Issues

**Finding - The PeopleSoft Financial System was purchased but not fully implemented due to budget constraints resulting in the City paying maintenance fees for software modules that were not being used. In addition, unused modules were supplemented with additional systems creating a need for integration, which increased complexity and decreased efficiency.**

Audit Services inquired about the PeopleSoft Modules that were implemented. Their status is depicted by the checkmarks in the table below.

#### **PeopleSoft Systems Purchased and Implemented In the City of Chesapeake**

PeopleSoft Products		
<input type="checkbox"/> ALM Portal Pack	<input checked="" type="checkbox"/> General Ledger	<input type="checkbox"/> Project Discovery
<input checked="" type="checkbox"/> Asset Management	<input type="checkbox"/> Grants	<input type="checkbox"/> Proposal Management
<input checked="" type="checkbox"/> Billing	<input type="checkbox"/> Human Capital Management	<input checked="" type="checkbox"/> Purchasing
<input type="checkbox"/> Cash Management	<input type="checkbox"/> Implementation Toolkit	<input type="checkbox"/> Quality
<input type="checkbox"/> Catalog Management	<input type="checkbox"/> In-Memory ADB Analyzer	<input type="checkbox"/> Real Estate Management
<input checked="" type="checkbox"/> Contracts	<input type="checkbox"/> In-Memory Allocations Analyzer	<input checked="" type="checkbox"/> Receivables
<input type="checkbox"/> Currency Conversion Utility	<input type="checkbox"/> In-Memory Close Analyzer	<input type="checkbox"/> Resource Management
<input type="checkbox"/> Deal Management	<input type="checkbox"/> In-Memory Fin Pos Analyzer	<input type="checkbox"/> Risk Management
<input type="checkbox"/> Demantra	<input type="checkbox"/> Inventory	<input type="checkbox"/> Services Procurement
<input type="checkbox"/> Engineering	<input type="checkbox"/> Maintenance Management	<input type="checkbox"/> Staffing Front Office
<input type="checkbox"/> ESA Portal Pack	<input type="checkbox"/> Manufacturing	<input checked="" type="checkbox"/> Strategic Sourcing
<input type="checkbox"/> Expenses	<input type="checkbox"/> Mobile Inventory	<input checked="" type="checkbox"/> Supplier Contract Management
<input type="checkbox"/> eBill Payment	<input type="checkbox"/> Order Management	<input checked="" type="checkbox"/> Supply Chain Portal Pack
<input checked="" type="checkbox"/> eProcurement	<input checked="" type="checkbox"/> Payables	<input type="checkbox"/> Supply Planning
<input type="checkbox"/> eSettlements	<input type="checkbox"/> Pay/Bill Management	<input type="checkbox"/> Trading Partner Management
<input checked="" type="checkbox"/> eSupplier Connection	<input type="checkbox"/> Program Management	<input type="checkbox"/> Transaction Billing Processor
<input checked="" type="checkbox"/> Financials Portal Pack	<input checked="" type="checkbox"/> Project Costing	
Enable Commitment Control		
<input type="checkbox"/> Billing	<input type="checkbox"/> Inventory	<input checked="" type="checkbox"/> Purchasing
<input type="checkbox"/> Expenses	<input checked="" type="checkbox"/> Payables	<input type="checkbox"/> Receivables
<input checked="" type="checkbox"/> General Ledger	<input type="checkbox"/> Procurement Card	
<input type="checkbox"/> Grants	<input checked="" type="checkbox"/> Project Costing	

As of November 20, 2015, under Installation Options in Set Up Financials for PeopleSoft, the modules installed were listed in the table below. It should be noted that the implementation ranged from Implemented and fully used to not implemented at all.

PeopleSoft Financial System Modules	Implemented and Fully Used	Implemented and Moderately Used	Implemented	Not Implemented	Additional DIT Information
Asset Management	X				
General Ledger	X				
Payables	X				
Project Costing		X			
Receivables				X	
eProcurement	X				
Purchasing	X				
Strategic Sourcing				X	Considered during Supplier Contracts implementation; no development work performed.
Supply Chain Portal Pack				X	
Contracts			X		Used minimally or not at all. In the past, this module was used regularly, but Purchasing stopped using it when they lost staff. The Supplier Contracts module pulls existing data from this module but offers much more functionality.
Billing				X	
eSupplier Connection				X	Considered during Supplier Contracts implementation; some development work performed in test environments
Financials Portal Pack				X	Does not appear to be implemented. It is basically a collection of pagelets.
Commitment Control	X				Technically, this is a feature, not a module.
Supplier Contract Management			X		Purchased and developed by Purchasing alone. However, due to a lack of financial resources, implementation didn't quite make it over the finish line. In 2013, it had fallen a PeopleTools version behind, meaning this module wouldn't have been rolled out into the new PeopleSoft version upgrade in April 2015. IT and Finance worked with Purchasing to successfully move it into the current (at the time) Tools version, so this module would be (and was) included with the upgrade. This module is used minimally or not at all.
Planning and Budgeting				X	This was a separate application which is not part of the PeopleSoft install options. At the time it was purchased, Budget Office tried the product and was displeased with it. Budget resumed its old process.

According to DIT's Enterprise Applications Business Unit:

- “Fully used” does not mean there is no functionality left to explore. There are so many possibilities, I don't think that you could ever say that. It just means that the module is used robustly by many users on a daily basis.
- Almost all of these modules came as a package, meaning the City didn't have the option to pick and choose most modules individually. Oracle/PeopleSoft didn't offer individual pricing per module at the time of the original purchase.
- According to the license verification forms the Financials Portal Pack was purchased in 2004, a year after the package purchase.
- The Supplier Contract module was purchased separately and directly by Purchasing 2011 with no participation by other departments. The implementation for that started in February 2012. There were also discussions about implementing eSupplier and Strategic Sourcing during the Supplier Contracts implementation. There appeared to be some development work on eSupplier in test environments but that effort was never finalized. It also appeared that nothing was done with Strategic Sourcing other than consider it.”

This situation occurred because the PeopleSoft Financial System was purchased, but not fully implemented due to budget constraints. As a result, the City was paying maintenance fees for each year to maintain PeopleSoft modules that were not being used. In addition, the modules that were not implemented caused overall compatibility

issues with several other systems, resulting in the need for “workarounds”, and other uneven training.

Also, in our 2010 Audit of Public Procurement, Audit Services cited the inadequate implementation of the Purchasing components of the PeopleSoft system which adversely impacted the City’s Public Procurement operations. Specifically, we identified system issues that affected training, which resulted in manual bid/quote processes, and system issues involving: commodity codes, system performance and contingency back up plans, vendor management, access to purchasing information, and the decision to not install strategic procurement and contracts administration modules. These issues had not been resolved.

**Recommendation – DIT should continue to evaluate future enterprise application replacements, and consider whether it is in the City’s best interest to continue to expand the City’s PeopleSoft ERP footprint, use alternative applications, or consider other technologies such as cloud computing (SaaS).**

Since DIT Management was working toward a plan to perform an analysis to determine the feasibility of maintaining existing financial system or replacing them with another ERP solution, we recommend that DIT continue on this path.

## **Management Response**

### **Item #4: PeopleSoft Financial Systems Issues**

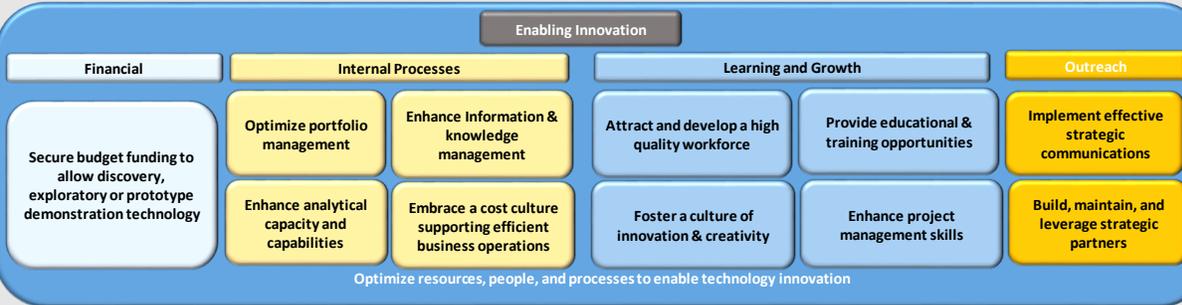
**DIT response - DIT agrees with the audit recommendation. In fact, the formal governance adoption as outlined in issue #1 is a forerunner to resolving this issue. The Department of Information Technology (DIT) will be following the Gartner strategic roadmap to address the following:**

- **Enable innovation to take place**
- **Allow for the exploration and discovery of functions, business processes, and technologies**
- **Provide innovative solutions with improved, well-defined, and measurable outcomes**

**DIT has already begun to identify duplications of systems that are already purchased and operational in the city’s application system portfolio. As part of the governance policy adoption, and steering committee, IT will be reporting the findings of these multiple systems and complex interfaces to the key stakeholders. It is imperative that the city adopts a postmodern ERP strategy to avoid further reliance on costly legacy systems while increasing the footprint of standalone systems. DIT is working under the strategic technology roadmap. See following Department of Information Technology Map 2017 and Beyond below.**

## Department of Information Technology Strategy Map 2017 and Beyond

**Vision: To be the Technology Innovation Partner to City Departments Moving toward A Post-modern ERP Structure**



**Mission: To provide innovative solutions for improved business outcomes through technology**

## 5. Public Safety and the New World System

**Finding - For the most part, the Public Safety Departments were satisfied with the state of information technology in the City and progress was being made daily. However, there was a need to replace the Shadow IT staff that supported the Fire Department with DIT personnel.**

The New World CAD system was implemented in September 2015. As of May 13, 2016, the interfaces between the New World Interfaces and other Public Safety systems were mostly complete.

New World Interfaces			
<i>Standard Interfaces</i>	Status	Notes	Propose
CAD Pre-Arrival Instructions	Completed	n/a	To provide medical triage and dispatch the correct equipment and personnel
Enhanced 911	Completed		To provide location data when someone dials 911
Fire Station Alerting	In-Progress	Need to figure correct zoning for multiple functioning stations	To alert the fire station by speaker and lighting when dispatched.
State/NCIC NLETS	Completed		To provide access to the state and national criminal databases and DMV
Coplogic	Completed	Interface is being tested at this time.	To provide a method to citizen to self-report crime offenses
Pictometry	Completed	Should be completed once version 11.4 is implemented	To provide ariel photograph while using New World's mapping features
Telestaff	Completed		To provide New World CAD the personnel rosters for the Fire Units
VA-Treds	Not Started	Police Department has not instituted Accidents through New World	To provide DMV accident information occurring in the City using New World's Accident Module
<i>Custom Interfaces</i>			
NCR/Linx	In-Progress	New World side is complete. LINX has started their side of the interface.	To provide the Law Enforcement Incident Data Exchange (LINX) the incident data occurring in the City. LINX is hosted by the Naval Criminal Investigative Service (NCIS)
ImageTrend ePCR	Completed	n/a	To provide the fire department the incident data in CAD for their medical reporting program (ImageTrend)

As of May 13, 2015 the status of the CrimeView interface was as follows:

*“The public CrimeView portion is completed and can be accessed from <http://www.crimemapping.com/> . I am working with Trittech on two sides of the Internal CrimeView Interface between New World and TriTech. We need to rebuild the CrimeView Desktop and the CrimeView Dashboard functionality. New World paperwork has been completed, [and are] working on getting the TriTech side at this time.”*

### **Public Safety Network Services Coordinator**

Audit Services asked the following two questions to the heads of each Public Safety Department:

- Is the current state of information technology meeting your needs?
- If not, what areas need to be improved and reviewed?

The largest stakeholder in this transition from the legacy CAD system to the New World System was the Police Department (PD). The PD’s response is provided below:

*“IT has performed an amazing job. Clearly, migrating to a new CAD & RMS was a major undertaking, which is not commonly done. Both internally and externally, IT has worked diligently to streamline process, train users and working with the vendor to fix problems or obtain clarification with regard to product performance. All of this on top of maintaining existing systems and providing services where needed.”*

### **Chief of Police**

The Sheriff’s Department was also satisfied with the current state of information technology within their department.

The CFD had no major concerns and was working with DIT to transfer IT assignments to DIT personnel in an effort to address its staffing shortages. The CFD and DIT both identified a need for an automated station alerting process.

*“For clarity, before, New World, the alerting process was manual. We contracted with New World for an automated process. New World reached out to WestNet (the current provider) to complete the interface. We [DIT] were able to complete the interface without zoning-the process of alerting one part of the station and not the whole station. The fire department wants zoning. Therefore, they [the CFD] kept the process manual until we get a new solution. WestNet stated they are now updating their software or stations to handle zoning through an automated process. We will revisit the WestNet solution as part of the overall evaluation moving forward.”*

*“The Fire Department already requested \$1.2 million for the new fire system in the 2020 capital budget.”*

**DIT CIO**

**Recommendation – DIT should continue ongoing efforts with the New World Implementation.**

Also, the City should continue its efforts to fund the capital budget request for the new fire alerting system. Additionally, DIT should continue working with the city in its continued efforts to replace the Fire Department’s shadow IT staff with DIT personnel.

**Management Response**

**Item #5: Public Safety and the New World System**

**DIT Response - DIT agrees with the audit recommendation. New World conducted a second round of training for Fire and Police staff that remedied several issues. The new fire alerting system is already included in the future capital request.**

## 6. 911 Statistical Call Data

**Finding – Statistical call data from the Aurora Cassidian system showed an increasing trend of unanswered 911 calls in 2015 due to staffing shortages for Emergency Communications Dispatchers.**

According to criteria provided by Chesapeake PD for our 2007 *Emergency Communications Audit*:

“The minimum staffing requirement is 27 persons per day composed of 10 each for day and evening shifts and 7 for midnight shift. While the minimum staffing level is 27, a staffing level of 30 is suggested to allow personnel to take meal breaks, restroom breaks and perform necessary administrative duties (i.e., cycle sheets, training evaluations, etc.)”

The Aurora Cassidian system report provided below showed a total of 9,894 unanswered 911 calls for calendar year 2015. Unanswered 911 call statistics were as low as 613 in February 2015 to a high of 1,153 calls in October 2015. The primary reason for unanswered 911 calls was directly related to ongoing staffing shortage within the Emergency Communications Center. This issue was identified in a 2007 special audit which, at the time, showed a 35% turnover rate in dispatcher trainees, and addressed poor working conditions.

ECC Call Count Comparison by Month													CASSIDIAN
For (Call Type)													AN EARLE-NORTH AMERICA COMPANY
Creation Date: 01/27/2016 09:49:04 AM						Grouping: Call Type							
Date Range: 01/01/2014 12:00:00 AM - 12/31/2015 11:59:59 PM						Filter Criteria:							
Detail Information (year 2015 data)													
Call Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Abandoned	1,617	1,574	1,814	1,792	2,048	2,379	2,458	2,241	2,753	2,860	2,602	2,898	27,036
Answered	18,636	17,673	19,258	19,185	21,419	21,565	21,815	21,473	20,280	19,957	18,181	19,263	238,705
Callback	1,144	1,080	1,279	1,274	1,473	1,636	1,712	1,431	1,818	1,804	1,582	1,834	18,067
Internal	9	13	22	19	14	13	26	19	17	19	12	21	204
Outgoing	6,374	6,503	6,491	6,864	7,567	8,010	7,900	7,818	7,372	6,911	6,437	6,854	85,101
Unanswered	774	613	678	688	649	868	767	651	1,050	1,153	947	1,056	9,894
None	10	13	13	1	5	2	1	3	6	11	8	3	76
<b>Total</b>	<b>28,564</b>	<b>27,469</b>	<b>29,555</b>	<b>29,823</b>	<b>33,175</b>	<b>34,473</b>	<b>34,679</b>	<b>33,636</b>	<b>33,296</b>	<b>32,715</b>	<b>29,769</b>	<b>31,929</b>	<b>379,083</b>

PD officials explained the situation as follows:

## “ECC staffing and challenges

The current allotment of personnel for the Emergency Communications Center is sixty-six employees. Presently the Center has eleven vacancies. In an effort to improve the hiring process Human Resources has reduced the marijuana drug use disqualifier from 3 years to 1 year. The Department has also begun working with the Chesapeake Public school administration and local colleges to recruit applicants.

Chesapeake ranks third in the region when comparing salaries. The proposed naval regional dispatch center ranks at the top of the list with a beginning salary of \$35,906. Second is Virginia Beach at \$33,858, then Chesapeake at \$31,568.

Currently the Emergency Communications Center is tasked with numerous activities that effect its ability to function efficiently such as monitoring municipal alarms, VCIN entries, Emergency Medical Dispatching, bait car monitoring, as well as added agency participation/monitoring on the system such as the Sheriff’s department, parks and recreation (Park rangers), Fire Tactical position, etc. All the above added tasks along with call volume vs. staffing and 4 hours of mandatory overtime per employee has overwhelmed the Center causing telephone wait times to escalate.

Future challenges for the center include text to 9-1-1 and Next Generation 9-1-1 which will boost the centers workload requiring an increase in personnel to monitor additional consoles that would receive image texting, text messages, and videos.

### CURRENT STAFFING

	Allotted Personnel	Filled	Needs
Dispatch Call Taker	8	5	3
Dispatcher Trainee & Dispatcher I	31	27	4
Dispatcher II	13	9	4
Senior Dispatcher	6	6	0
Dispatch Supervisor	8	8	0
<b>Total</b>	<b>66</b>	<b>55</b>	<b>11</b>

### NUMBER OF PERSONNEL REQUIRED BY HOUR

Position	0600 - 0800	0800 - 1800	1800 - 2000	2000 - 0000	0000 - 0600
Dispatch Supervisor or Senior Dispatcher	1	1	1	1	1
Dispatcher I or Dispatcher II	7 (1 Relief Clerk)	8 (1 Relief Clerk)	7 (1 Relief Clerk)	8 (1 Relief Clerk)	6 (1 Relief Clerk)
Call Taker	1	1	1	1	1
<b>Total</b>	<b>9</b>	<b>10</b>	<b>9</b>	<b>10</b>	<b>8</b>

❖ The ECC works in 12 hour shifts. Shift hours are 6am-6pm & 6pm-6am.

## **TRAINING**

A trainee spends 10 weeks in the Academy then sits with a trainer and trains on each radio/phone position.

### **NUMBER OF HOURS PER POSITION:**

- Fire Tac – 160-320 hours
- Fire dispatch – 240-480 hours
- Call taker – 160-320 hours
- Investigations – 200-400 hours
- Records – 160-320 hours
- East/West – 400-720 hours

### **TOTAL OVERTIME HOURS BY MONTH**

- March – 289 hours
  - Average per employee – 6 hours
- April – 633 hours
  - Average per employee – 14 hours
- May – 447 hours
  - Average per employee – 10 hours
- June – 830 hours
  - Average per employee – 18 hours”

*Police Department Officials*

The City planned to transfer the Emergency Communications Center to the new Public Safety Operations Building to address poor working conditions for this division.

If the City does not address the salary and working condition issues, it will likely continue to experience staffing below the minimum functional levels. If staffing levels continue to fall below established minimums, more unanswered 911 calls will likely result. In addition, the City will incur additional costs related to staff turnover/training, and the remaining Emergency Communications personnel will not be able to provide adequate emergency services endangering Police, Fire, EMS personnel, citizens and potentially increasing liability for the City

**Recommendation – The City should take steps to address Emergency Communications staffing shortages to reduce the number of unanswered calls.**

The City should reevaluate compensation levels for Emergency Communications staffs to minimize staff turnover and minimize the high cost of training new employees. Relative to poor working conditions, since the City was erecting already the new Public Safety Operations Building, it should ensure that the working conditions for 911 Emergency Communication personnel are mitigated until construction is complete and enhanced in the new PSOP building.

## **Management Response**

### **Item #6: 911 Statistical Call Data**

**Chief of Police Response - I have reviewed the audit report and concur with the findings.**

**It should be noted that some of the concerns identified by the audit are being addressed through prior, existing, and future budgets. In order of priorities of the items that are left unsettled are: 1.) increased staffing; and 2.) salaries. In addressing staffing, we have expanded our recruiting efforts and are presently exploring additional methods to reach people who desire to and can perform these essential functions, including partnering with Tidewater Community College to develop work-force solutions to help us recruit and retain dispatchers. However, these efforts can prove to be ineffective if we cannot offer competitive salaries; therefore, I will be requesting Human Resources to conduct a pay and compensation study.**

**The physical work environment will see radical improvement when the new Public Safety Operations Building opens. It was carefully crafted with specific designs to be “employee” friendly, easy to maintain, and provide space for future expansion.**

**We also are reevaluating the task and functions of the Emergency Communications Center so that the appropriate amount of employees’ time is devoted to the primary functions of the call center. This involves determining which functions/services can be discontinued, placed with some other entity, or redesigned to gain greater efficiencies.**

## **7. Heat Ticketing System, the Help Desk, and Operations**

### **Finding - DIT was working with a HEAT Ticketing System that no longer served the City's needs.**

According to the IT Governance Institute (from the COBIT Framework)

“Implement a service desk/support function with quick response, clear escalation procedure, and resolution and trend analysis.”

According to IT representatives, the DIT operated differently a decade ago since the City's major programs were run mostly on the IT mainframe. Approximately 10 to 12 years ago, the HEAT Ticketing System table structures were also altered to adjust to the DIT business practices at that time. Over the years, the DIT business model had evolved and the HEAT system, purchased years ago, no longer was sufficient to meet the IT needs of their changing environment, especially because of the customizations made to the software several years ago.

DIT recognized this issue, and in 2013 identified new software and vendors to address this issue; however, funding was not available. Funding finally became available in 2016. DIT was reviewing IT Service Management Systems (ITSM) with ITIL. Ultimately, the ITSM system, once selected would take all services that IT offers and align them with the City's business strategy. It would also have a variety of reports that could be used by the business unit managers as well as executive management. IT anticipated that the implementation of this new software system would dramatically change DIT's standard business processes, and the “out of the box” reports would be more geared to business strategy.

Although the HEAT Ticketing System had limitations, DIT did not have much choice but to continue to use the system that they had in order to track calls. BPAM was DIT's Business Process Automation Manager, a service within HEAT that waited for an email. If there was no conflict in the profile table, a ticket was generated. However, the BPAM did not always generate a ticket assignment.

A volunteer assisted the QA Coordinator by checking the deficiencies in the HEAT system. She had been assigned to:

- Ensure that HEAT ticket assignments are made.
- Categorize the tickets.
- Check that there is a profile in the ticket for CUARF forms.
- Follow up on print service calls.

The Help Desk put a service call into ESI for printer issues. The ticket stayed open until someone could review ESI's portal to make sure the ticket had been addressed. The

volunteer reviewed ESI's portal to check for open tickets. Also, in order for the various business units to keep up with their own tickets, IT had assigned groups, so that each business unit manager of those units could monitor their open assignments.

Examples of some of the standard reports from the ITSM would include, but were not limited to:

- Departments who called the most
- Departments who called the least
- Departments with the most IT time spent – This was important because the QA coordinator billed departments based on IT time tracked for each. A time tracker that monitored how long a ticket was outstanding was turned off by previous staff that implemented the Heat system. Thus, IT staff were required to manually track and input their time worked on tickets creating a possibility for errors. The new system should have an automatic stop watch, with the ability to pause when IT is waiting, for example, on equipment parts.
- A list of reopened calls
- All calls received by hour

The newer package should have more features because of ITIL. The system should take all services that IT offers and align them with the City's business strategy.

This situation occurred because the former DIT system implementers had highly customized the old HEAT ticketing system as there was an old Help Desk mentality which was different from the Service Management format that was being implemented in DIT. As a result, the HEAT ticketing system did not produce a work product to sufficiently track and report the status of opened and closed HEAT tickets for management purposes.

### **Recommendation – DIT should continue the system update.**

DIT should continue to work toward efforts in securing a new DIT Services Management System in the new fiscal year. Also, DIT should explore all the software capabilities, including ITIL best practices, for use as much as possible.

### **Management Response**

**Item # 7:** Heat Ticketing System, the Help Desk, and Operations

**DIT Response - DIT agrees with the audit recommendation. DIT is in the final stages of selecting the vendor for the new Help Desk service tool. The new service management system will have the following features below:**

### **Capabilities:**

- **Equipping staff to support end user requirements in order to avoid lost productivity**
- **Implementing modules:**
  - **Incident Management & Service Request Fulfillment**
  - **SLA's for Incident & Service Request**
  - **Knowledge Management**
  - **Improving Change Management**
  - **Problem Management**
  - **Service Catalog**
  - **Self Service**
  - **Transparency via Dashboards & Reporting**
  - **Improve external & internal communications**
  - **Customer satisfaction surveys**
  - **Project management**

### **Performance:**

- **Improve timelines in resolving incidents**
- **Allowing user to submit their request with easier to understand processes**
- **Establish work flow policies, processes and procedures to improve accuracy and responsiveness**
- **Better defined roles**
- **Hosted environment**

### **Timeline:**

- **Modules will be implemented in phase**
  - **Phase I – Incident & Service Request w/OOB Dashboards to be implemented by Dec 31, 2016**
  - **Phase II – SLA's, Knowledge Management, Self Service & Service Catalog by April 1, 2017**
  - **Phase III – Improved Change Management, & Problem Management by June 30, 2017**
  - **Additional modules and improvements to those implemented will be part of Continuous Service Improvement**

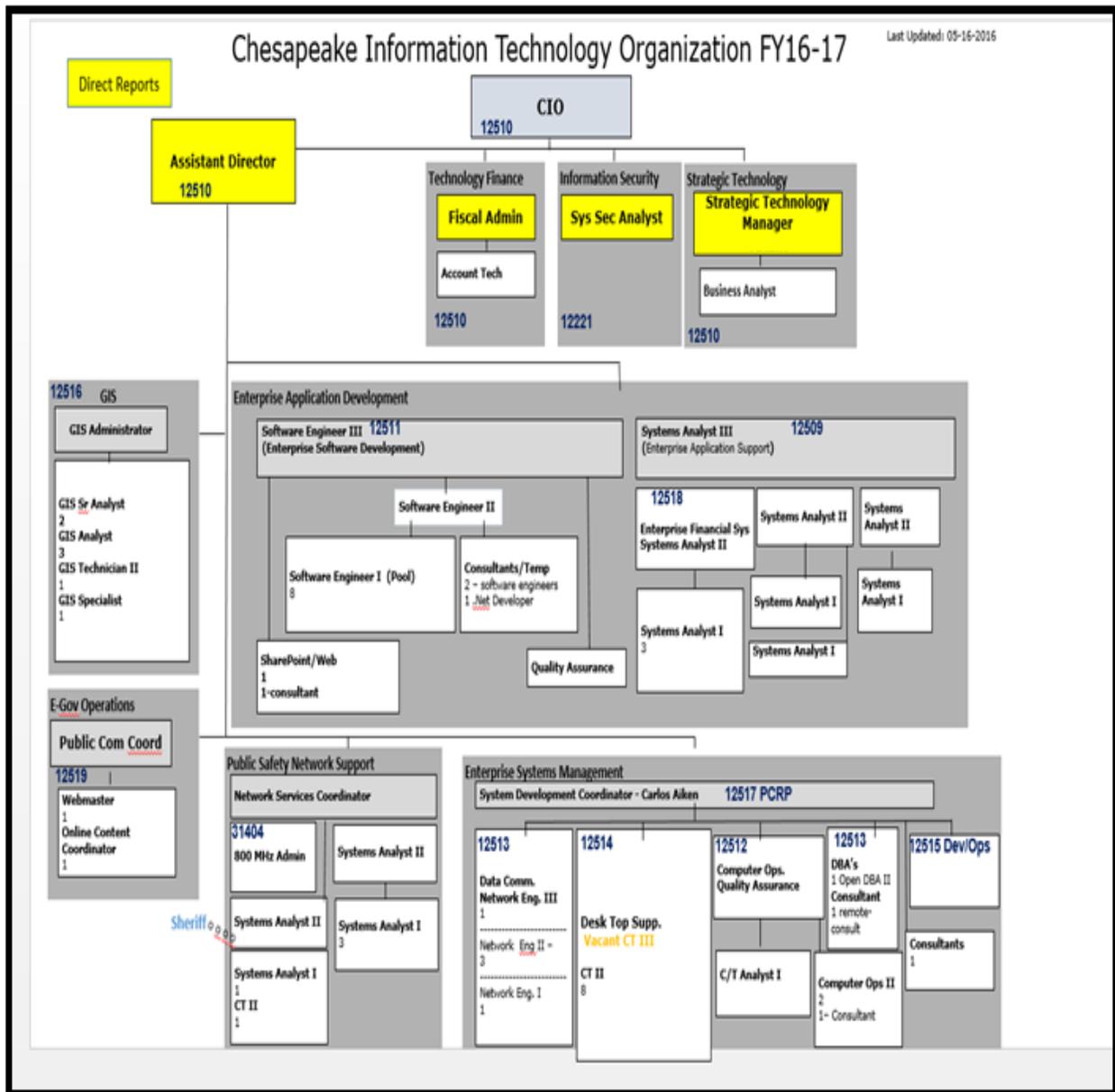
## **8. DIT Staffing Challenges**

**Finding - There were City employees performing IT functions (referred to as Shadow IT) that were not a part of DIT. However, DIT did not have sufficient staff to support the City's DIT systems and infrastructure. Thus, the entire comprehensive view of technology support within the City was obscured.**

At the time of this report, DIT was operating with continued budget and staffing constraints while attempting to meet additional demands for more efficient applications, more data handling and processing capabilities, and new DIT services. DIT's Enterprise Application Development Business Unit contracted for two Software Engineers, one .Net Developer, and one Quality Assurance as consultants/temporary workers. These positions were needed for the Mainframe Modernization Project. Additionally, the SharePoint/Web Administrator was working with two consultants, and the Enterprise Systems Management Business Unit contracted with one DBA consultant and one Computer Ops II consultant.

DIT hired an Assistant Director in 2015 to assist the CIO in overseeing all DIT functions including Information Security. However, DIT had only one Systems Security Analyst to focus on system security. The Enterprise Systems Management Business Unit included four Network Engineers whose primary responsibilities included maintaining system upgrades, patches, and fixes to the various systems. However, they also assisted with system security by deleting the active directories for inactive user accounts and terminated employees. As mentioned earlier, the Help Desk and Operations staff also assisted with the management of the active directory of user accounts.

Audit Services performed an analysis to determine the number of FTEs eligible to retire. As of June 16, 2016, 25 of 51 FTEs (49%) actively working with DIT had the ability to retire from the City. Thirteen of 31 (or 42%) of City IT personnel funded by other City department outside of DIT had the ability to retire as well. It should be noted that in 2017, employees holding two critical positions (DIT's Systems Security Analyst and one of the four DIT Network Engineers) will be eligible to retire, which could potentially place City information systems at risk of system security issues.



According to the City's FY2015 Operating Budget, DIT was funded for a total of 55 full-time positions and 1.5 part-time positions. However, there were 31 FTEs which were funded directly by other departments and not the DIT. Client Technologies Analysts positions located throughout the City reported to DIT. All of the positions were required to work closely with the DIT staff. The table below highlights those positions and the respective departments for which they worked.

## City IT Positions Funded by Departments Outside of DIT

Title	Annual Salaries	Department Funding Source	Location of Employee	Group/BU	FT or PT
MIS Administrator		Community SVCS Board 113074 5100-52100 CIBH Administration	CIBH Administration	General Employees (SEMI)	FT
Business Systems Analyst		Community SVCS Board 113074 5100-52100 CIBH Administration	CIBH Administration	General Employees (SEMI)	FT
Network Specialist		Community SVCS Board 113074 5100-52100 CIBH Administration	CIBH Administration	General Employees (SEMI)	FT
<b>Sum of Annual Salaries Funded by CSB</b>	<b>\$201,652</b>				
Financial Systems Analyst	\$57,000	Finance Department 111020	Finance Department	General Employees (SEMI)	FT
Sum of Annual Salaries Funded by Finance					
Systems Analyst I		Treasurer 220000 2000-12410 Treasurer	City Treasurer's Office	General Employees (SEMI)	FT
<b>Sum of Annual Salaries Funded by Treasurer</b>	<b>\$79,291</b>				
Network Engineer I		Chesapeake Library System 113090 7300-73100 Libraries Administration	Chesapeake Library	General Employees (SEMI)	FT
Systems Analyst I		Chesapeake Library System 113090 7300-73100 Libraries Administration	Chesapeake Library	General Employees (SEMI)	FT
Systems Analyst II		Chesapeake Library System 113090 7300-73100 Libraries Administration	Chesapeake Library	General Employees (SEMI)	FT
Systems Analyst III		Chesapeake Library System 113090 7300-73100 Libraries Administration	Chesapeake Library	General Employees (SEMI)	FT
Client Technologies Analyst I		Chesapeake Library System 113090 7300-73100 Libraries Administration	Chesapeake Library	General Employees (SEMI)	FT
<b>Sum of Annual Salaries Funded by the Library</b>	<b>\$342,468</b>				
Systems Analyst II		Real Estate Assessor 140000 1900-12320 Real Estate Assessor	Real Estate Office	SPPW-Special Project (WEEKLY)	PT
Systems Analyst I		Real Estate Assessor 140000 1900-12320 Real Estate Assessor	Real Estate Office	General Employees (SEMI)	FT
GIS Specialist		Real Estate Assessor 140000 1900-12320 Real Estate Assessor	Real Estate Office	General Employees (SEMI)	FT
<b>Sum of Annual Salaries Funded by Real Estate Assessor's Office</b>	<b>\$161,511</b>				
Systems Analyst II		Public Utilities 112030 6000-60032 Pub Utilities Admin	Public Utilities	General Employees (SEMI)	FT
System Analyst I		Public Utilities 112030 6500-60033 Pub Util Bill/Cust SVC	Public Utilities	General Employees (SEMI)	FT
GIS Analyst		Public Utilities 112030 6007-60052 Pub Util Technical	Public Utilities	General Employees (SEMI)	FT
<b>Sum of Annual Salaries Funded by Public Utilities Department</b>	<b>\$199,933</b>				
Client Technologies Analyst II		Parks, Recreation, and Tourism 112020 7100-72101 PR&T Admin	Parks and Rec	General Employees (SEMI)	FT
<b>Sum of Annual Salaries Funded by Parks, Recreation, and Tourism Department</b>	<b>\$54,124</b>				
Client Technologies Analyst I		Human SVCS 113073 5300-53110 HS-SS Joint Staff/OPS	Human Services	General Employees (SEMI)	FT
Systems Analyst		Human SVCS 113073 5300-53110 HS-SS Joint Staff/OPS	Human Services	General Employees (SEMI)	FT
<b>Sum of Annual Salaries Funded by Human Services</b>	<b>\$116,160</b>				
Senior GIS Analyst		Public Works 112040 4112-61000 Pub Works Stormwater	Public Works	General Employees (SEMI)	FT
GIS Specialist		Public Works 112040 4102-41110 Public works Engineering	Public Works	General Employees (SEMI)	FT
<b>Sum of Annual Salaries Funded by Public Works</b>	<b>\$108,405</b>				
GIS Technician II		Planning 111050 7500-81000 Planning	Planning	General Employees (SEMI)	FT
<b>Sum of Annual Salaries Funded by the Planning Department</b>	<b>\$42,244</b>				

Note Chesapeake Public Schools and the Health Department were excluded from this analysis

## City Employees Who Support the Public Safety IT, Mobile Systems, and Radios as of 6/13/2016

Title	Annual Salaries	Department Funding Source	Location of Employee	Group/BU	FT or PT
Network Services Coordinator		Police 113030 3000- 31100 Police Division	Police Department	General Employee (SEMI)	FT
Systems Analyst II		Police 113030 3011-31110 Police Admin	Police Department	General Employee (SEMI)	FT
Systems Analyst I		Police 113030 3011-31110 Police Admin	Police Department	General Employee (SEMI)	FT
Systems Analyst I		Police 113030 3011-31110 Police Admin	Police Department	General Employee (SEMI)	FT
Systems Analyst I – Web EOC Fire		Police 113030 3000-31100 Police Division	Police Department	General Employee (SEMI)	FT
Client Technology Analyst II		Police 113030 3000-31100 Police Division	Police Department	General Employee (SEMI)	FT
Client Technologies Analyst II		Police 113030 3001-31402 Police EOC	Police Department	General Employee (SEMI)	FT
<b>Sum of Annual Salaries Funded by the Police Department*</b>		<b>\$448,228</b>			
800 MHz Administrator (Supports radios for entire city)		DIT 111040 2708 – 31404 IT 800 MHZ Maint	Police Department	General Employee (SEMI)	FT
Network Engineer I (This position rotates responsibilities with other network engineers. Also, this position supports all Public Safety Departments.)		DIT 111040 12513 IT Tech Support	DIT Department	General Employee (SEMI)	FT
Client Technology Analyst II		DIT 111040 12514 IT Micro Support	Fire Department	General Employee (SEMI)	FT
<b>Sum of Annual Salaries Funded by the DIT*</b>		<b>\$198,160</b>			
Fire Lieutenant		Fire 113020 3200-32100 Fire Suppression/Admin	Fire Department	FFNM – Fire Field Non Management	FT
Firefighter/Paramedic		Fire 113020 3200-32100 Fire Suppression/Admin	Fire Department	FANM-Fire Admin Non Management	FT
<b>Sum of Annual Salaries Funded by the CFD*</b>	<b>\$140,167</b>				
Systems Analyst II		Sheriff 210000 3406-33103 Sheriff Admin	Sheriff Department	General Employee (SEMI)	FT
Systems Analyst I		Sheriff 210000 3406-33103 Sheriff Admin	Sheriff Department	General Employee (SEMI)	FT
Client Technology Analyst II		Sheriff 210000 3406-33103 Sheriff Admin	Sheriff Department	General Employee (SEMI)	FT
<b>Sum of Annual Salaries Funded by the Sheriff Department*</b>		<b>\$171,172</b>			

Source: Munis Payroll Database

\*Sum of Annual Salaries does not include city benefits.

Legend	
	Police Department
	Department of Information Technology
	Fire Department
	Sheriff Department

The table above shows three positions funded by DIT and two positions funded by the Fire Department with employees who did not possess an IT background. DIT was in the process of assessing IT support needs of the CFD.

This situation occurred because departments were authorized through the City's budget process to hire their own IT staff without consideration to the overall strategic IT direction of the City. This resulted in disorganized IT human resources and the potential for security vulnerabilities caused by inconsistent supervision, training, and understanding of systems. If the City does not address these needs, then the City may begin to experience system failures and increased costs due to inefficient and ineffective DIT system interface issues, disruptions to and failure of business operations, system breaches, and security vulnerabilities.

**Recommendation - The City should consider bringing DIT staff assigned to other departments under the direct supervision of DIT.**

The City should also consider revisiting the salary structure to ensure salaries are competitive in order to attract and retain IT professionals and prioritize creating more DIT professional positions to address the IT staffing shortages. Also, allow for cross-training so the institutional knowledge is transferred to the staff when there is staff turnover.

The City should also consider addressing other significant issues such as the need to fund additional support positions for the Security, Network Support, Operations, Help Desk, Client Technology Analyst, and staff to focus attention on IT management services and information security.

## **Management Response**

### **Item #8: DIT Staffing Challenges**

**DIT Response - DIT concurs with the audit findings. DIT is currently in discussion with the Fire Administration staff to determine the duplicate IT efforts. DIT has an extremely successful enterprise IT agreement with Public Safety and will continue to evaluate and make recommendation for technical resources as needed.**

**Shadow IT drains valuable resources away from supporting the city's core functions, creating an inaccurate cost of support for the respective city functions and services. As a result, Shadow IT support for critical business functions for which DIT lacks the knowledge and/or awareness to support in a timely manner can lead to confusion for end users, and ultimately our citizens.**

**DIT, working with Human Resources and some key enterprise units such as Public Utilities and Public Works, has had success in addressing shadow IT in the area of Geographic Information Systems (GIS). The city was able to gather synergy with a cohesive group of GIS specialist that operates within the confinement of their operations business units under the strategic directive of the GIS**

**Administrator in the DIT organization. That model should be further explored to evaluate other shadow technical duties across the enterprise.**

## 9. DIT Self-Assessment using COBIT 5 Model

**Finding – In 2015 DIT completed a COBIT<sup>5</sup> 5.0 self-assessment. This self-assessment found that the DIT was, on average, an “immature” department and that their systems and processes needed substantial growth to reach what would be considered an optimal level of performance.**

A self-assessment can help an organization achieve high performance by identifying areas of strengths, and weakness, while laying out a plan to move toward performance excellence. A self-assessment can also help identify successes and opportunities for improvement, jump-start a change initiative, energize current initiatives, energize the workforce, focus the organization on common goals, assess the organization’s performance against the competition, align resources with strategic objectives, and help deliver world-class results.

The COBIT assessment program was designed to provide enterprises with a repeatable, reliable, and robust methodology for assessing the capability of their IT processes. This assessment would normally be used as part of an enterprise’s process improvement program and can be used to report internally to executive management on the current capability of IT processes against a target for improvement based on business requirements. Such assessments were used as part of the initiation of a program of process improvement or to assess progress after a period of process improvement. The COBIT assessment models are based on ISO/IEC<sup>6</sup> 15504.

DIT performed its own self-assessment in order to provide a clear and objective understanding of the strengths and weakness of its own IT processes against its business needs. DIT officials were not surprised with the outcome as they were already aware of system deficiencies brought out in the self-assessment. The department planned to use the results for process improvement and to define a baseline to measure whether process improvement had been successful. DIT had already been prioritizing and implementing corrective action (as discussed throughout this report) based on the enterprise’s business goals. DIT planned to continue to focus on areas with gaps between the ‘current’ and ‘target’ process capability levels.

DIT Management provided a summary of the results of its self-assessment:

- *“The overall analysis shows that there are expected process, procedures, tasks, and oversight that the teams are aware of within the organization but there is room for improvement,*

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<sup>5</sup> COBIT or Control Objectives for Information and Related Technology is a framework created by ISACA (Information Systems Audit and Control Association) for Information technology (IT) management and IT governance. It is a supporting toolset that allows manager to bridge the gap between control requirements, technical issues, and business risks.

<sup>6</sup> ISO/IEC stands for the International Organization for Standards (ISO)/International Electrotechnical Commission (IEC). The ISO/IEC model is the basis for the COBIT Process Assessment Model (PAM) used to assess the maturity of an enterprise’s IT processes.

- *The highlighted row 7 Ensure Risk Optimization, [DIT believes] is a result of the city's own limited risk analysis*
  - *The only risk I have seen related to projects within the city is will it be on time and on budget*
  - *There has not been too much if any deep dive into what could impact those two criteria which seem to concern the city, and this is not just on DIT projects*
- *Row 12 Manage Strategy [DIT] will work to make sure the teams are more informed of the city's directives or strategies*
  - *The new Clusters may help enable that throughout the City of Chesapeake*
- *Row 14 Manage Innovation is of no surprise and an underlying issue that is hindering the city as a whole*
  - *We are a conservative city but unfortunately to our detriment*
  - *We allow departments to hold us back and not allow change*
  - *This leads to DIT being forced to have one foot in the 21<sup>st</sup> Century and another in the 20<sup>th</sup> Century*
  - *On a side note related to security, this could expose us to greater vulnerabilities the longer we hold off and are forced to keep older systems on line*
- *The topics under Build, Acquire and Implement are related to project planning and requirements*
  - *We need to be able to more effectively engage our user base for better use cases, requirements, and specs*
    - *This is just starting to take place with the .Net teams and their Agile approach*
    - *ALL city employees, elected officials, and DIT need to understand that the true end user is the citizen; it is not anyone on this campus or on the city payroll, that is who we all need to answer to related to usability and responsiveness*
    - *As we implement our new Service Management System and get away from the old Help Desk mentality [DIT] expects our change management process will be greatly improved by its internal managed process flows and authorization capabilities*
    - *The new Service Management System will also greatly improve our knowledge management capabilities for quicker resolutions or self-help capabilities*
- *The outlier to this is our Development team that support the mainframe, [the lead DIT developer] was critically honest in his assessment which accounted for the majority of the "N" "Not Achieved" and are at Level 0*
  - *They operate in mostly firefighter mode*
  - *The work on break fixes as they come in from production*
  - *They handle requests from different departments within the city without inclusion or consideration of the impact it may have on other departments or the end users*

- *[The developer] has begun working to correct this as we migrate off the mainframe*
  - *The plan consist of the teams current efforts to use Microsoft Team Foundation Server for their code repository*
  - *They have begun using Agile methodologies*
  - *They have also standardized their coding practices following Microsoft's Best Practices Coding Standards in their .Net Toolkit*
  - *They have begun tiered releases*
  - *And most recently have begun building the underlying architecture to allow for automated testing and release management*
  - *The final challenge is to make sure that ALL city departments realize the .Net environment is a city resource, not any ONE department's resource*
- *The last outlier was [the DIT Data Architect's] review of the Library modernization which should be a viewed as model for future projects throughout the city; you will notice those are the only two Level 5s noted"*

## **DIT Management**

**Recommendation - DIT should continue to improve its' process and procedures in order to move from its' immature state to that of full innovation and optimization. We also recommend that DIT continue to perform its Self-Assessment annually to monitor the maturity levels of DIT processes overall.**

Additionally, DIT should:

1. Consider working with a data architect to restructure the data systems to identify and flag HIPPA, PII and other compliance requirements in the systems. This action will help employees to identify private information to prevent unauthorized access. It will also reduce the likelihood of legal liability.
2. Strengthen DIT security access controls by considering two factor or multifactor authentication instead of the single sign-on.
3. Continue efforts toward addressing system security issues identified during the system penetration testing and annual external audit.
4. Continue to work toward a modern, secure platform for delivering DIT services.
5. Continuously ensure that security vulnerabilities are being monitored with existing vendors who operate the city's software applications and/or data within the City's internal systems as well as those housed in proprietary clouds. (i.e. Tyler/MUNIS)
6. Continue to explore SaaS Cloud services to monitor security 24/7 for city systems to keeping system vulnerabilities of cyberattacks, both external and internal, to a minimum.
7. Ensure that the governance policy requires Department heads, who are responsible for authorizing and assigning system accesses, to design automated business processes with proper segregation of duties and security measures to prevent any one person from compromising the systems.

## **Management Response**

### **Item #9: DIT Self – Assessment Using COBIT 5 Model**

**DIT Response - We will begin with the ITIL structure to address many of these issues addressed in this audit.**

# **APPENDIX A**

## **RESPONSE FROM**

### **DEPARTMENT OF INFORMATION TECHNOLOGY**

#### **OFFICIALS**

## MEMORANDUM

**TO:** Jay Poole, City Auditor  
**FROM:** Peter R. Wallace, Chief Information Officer  
**DATE:** July 12, 2016  
**RE:** DIT response to Audit findings

The Department of Information Technology (DIT) appreciates the opportunity to respond to the Auditor's findings. The audit of DIT is extremely timely. As the city migrates off the 35 year old legacy systems that use the programming language COBOL, to the object-oriented C# language on the windows .Net platform, this migration becomes the bridge to fostering agility and innovation that is currently lacking within the in-house software programming development life cycle. Government must transform IT organizations from simply service delivery into organizations that assist their enterprises in optimizing business processes, mastering information management, and exploiting relationships to fuel collaboration and innovation. Changing the shape of IT will spawn new disciplines that fuse business and technology to create new value.

It is urgent and essential to create an enterprise that is more efficient and more agile, and better able to cope with sustaining the city's services through constantly changing and unpredictable financial times, while increasing the capability to innovate, continuously improve, and grow as circumstances permit. The Internet of Things (IoT) and "big data" will be important components of this transformation as intelligent adaptive highways, lamp posts, and signs with dynamic instructions to the public take on machine learning capabilities in the future thus impacting our day-to-day lives in ways unimaginable only a short time ago. Additionally, the City needs to reduce its in-house developed applications, and reduce the number of Enterprise Resource Planning (ERP) footprints in order to reduce system complexity, bring more effective governance to system interfaces, integrations, coupling, and synchronization, and improve the efficiency of IT support for the affected solutions.

As IT evolves, and with the migration off the mainframe, the department will become more business centric by adopting the agile software development method. Enhancing technical and business skillsets to support newer initiatives such as the ERP footprint reduction, web facing applications, and mobile apps will be paramount. Embracing the digital economy must be a core priority.

DIT response to Audit's findings:

**Item # 1:** DIT Governance Challenges and the legacy system issues

**DIT Response:** DIT agrees with the audit recommendation that it is in the best interest of the City to reduce the footprint of ERP systems currently in use by the City. Gartner describes this consolidation trend in the industry as a post-modern ERP approach whereby the end result is less complexity regarding interfaces, integrations, and synchronization of data coupling with much more agility and adaptability at a lower cost than it otherwise would be if the City continues along the current path. This also gives the City the opportunity to introduce innovative business processes to take advantage of faster more efficient ways of conducting business in a more transparent, collaborative, and measureable manner going forward.

As for the governance policy, DIT will work along with the City Manager's office to ensure the key stakeholder enterprise business units such as Real Estate, Planning, Public Utilities, Public Works, Public Safety, and the constitutional officers are on board with the new governance process. In order for the City of Chesapeake to operate at a high level of efficiency and cost effectiveness while being properly aligned with stated City priorities it is necessary to establish a project governance mechanism for approval of all projects greater than \$100,000 or where it is determined the impact of the project has sufficient enterprise impact that it warrants governance review.

**Item #2:** Access Control and the Active Directory

**DIT Response:** DIT agrees with the audit findings and will revamp the draft policy attached in the overall audit report to include clear directives for each department working with Human Resources to provide timely and accurate information to address this issue. With the new help desk service desk application being implemented with IT Service Management (ITSM), we will be able to automate workflows that will help enforce the pending policy.

**Item #3:** Archiving Processes

**DIT Response:** DIT agrees with the audit's recommendation. The new Public Safety Operations Building (PSOB) will become a dual data center with active-active network capability to address disaster recovery and business continuity. In fact, the model is already implemented within a limited scope by utilizing the city's private cloud to capture and store backups that are designed with DIT's active-active network architecture state.

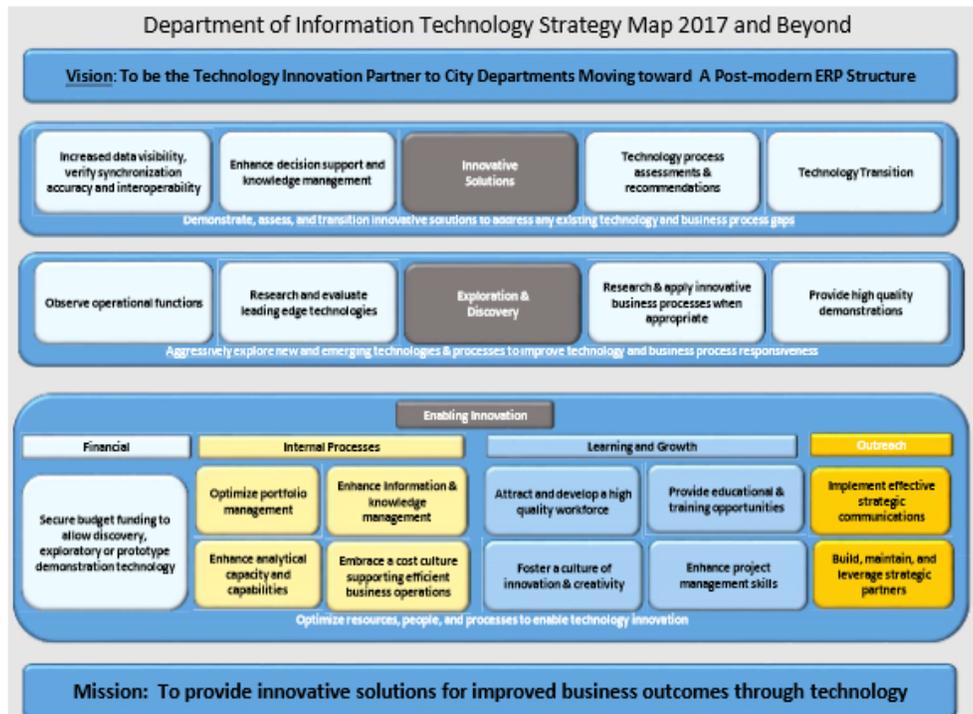
Finance archiving: DIT will continue to work with the City's school and the City's Finance department to address this issue. Without a proper archiving agreement and tool in place, PeopleSoft records will continue to grow thus eventually impacting timely access to data and impeding speedy recovery to data within a reasonable window from a disaster.

**Item #4: PeopleSoft Financial Systems Issues**

**DIT response:** DIT agrees with the audit recommendation. In fact, the formal governance adoption as outlined in issue #1 is a forerunner to resolving this issue. The Department of Information Technology (DIT) will be following the Gartner strategic roadmap to address the following:

- Enable innovation to take place
- Allow for the exploration and discovery of functions, business processes, and technologies
- Provide innovative solutions with improved, well-defined, and measurable outcomes

DIT has already begun to identify duplications of systems that are already purchased and operational in the city's application system portfolio. As part of the governance policy adoption, and steering committee, IT will be reporting the findings of these multiple systems and complex interfaces to the key stakeholders. It is imperative that the city adopts a postmodern ERP strategy to avoid further reliance on costly legacy systems while increasing the footprint of standalone systems. DIT is working under the strategic technology roadmap. See following Department of Information Technology Map 2017 and Beyond below.



**Item #5: Public Safety and the New World System**

**DIT Response:** DIT agrees with the audit recommendation. New World conducted a second round of training for Fire and Police staff that remedied several issues. The new fire alerting system is already included in the future capital request.

**Item #6: 911 Statistical Call Data**

**DIT Response:** N/A – Left blank intentionally. The Police Chief will respond to Item #6.

**Item # 7: Heat Ticketing System, the Help Desk, and Operations**

**DIT Response:** DIT agrees with the audit recommendation. DIT is in the final stages of selecting the vendor for the new Help Desk service tool. The new service management system will have the following features below:

**Capabilities:**

- Equipping staff to support end user requirements in order to avoid lost productivity
- Implementing modules:
  - Incident Management & Service Request Fulfillment
  - SLA's for Incident & Service Request
  - Knowledge Management
  - Improving Change Management
  - Problem Management
  - Service Catalog

- Self Service
- Transparency via Dashboards & Reporting
- Improve external & internal communications
- Customer satisfaction surveys
- Project management

Performance:

- Improve timelines in resolving incidents
- Allowing user to submit their request with easier to understand processes
- Establish work flow policies, processes and procedures to improve accuracy and responsiveness
- Better defined roles
- Hosted environment

Timeline:

- Modules will be implemented in phases
  - Phase I – Incident & Service Request w/OOB Dashboards to be implemented by Dec 31, 2016
  - Phase II – SLA's, Knowledge Management, Self Service & Service Catalog by April 1, 2017
  - Phase III – Improved Change Management, & Problem Management by June 30, 2017
  - Additional modules and improvements to those implemented will be part of Continuous Service Improvement

**Item #8:** DIT staffing Challenges

**DIT Response:** DIT concurs with the audit findings. DIT is currently in discussion with the Fire Administration staff to determine the duplicate IT efforts. DIT has an extremely successful enterprise IT agreement with Public Safety and will continue to evaluate and make recommendation for technical resources as needed.

Shadow IT drains valuable resources away from supporting the city's core functions, creating an inaccurate cost of support for the respective city functions and services. As a result, Shadow IT support for critical business functions for which DIT lacks the knowledge and/or awareness to support in a timely manner can lead to confusion for end users, and ultimately our citizens.

DIT, working with Human Resources and some key enterprise units such as Public Utilities and Public Works, has had success in addressing shadow IT in the area of Geographic Information Systems (GIS). The city was able to gather synergy with a cohesive group of GIS specialist that operates within the confinement of their operations business units under the strategic directive of the GIS Administrator in the DIT organization. That model should be further explored to evaluate other shadow technical duties across the enterprise.

**Item #9:** DIT Self – Assessment Using COBIT 5 Model

**DIT Response:** We will begin with the ITIL structure to address many of these issues addressed in this audit.

cc: James E. Baker, City Manager

**APPENDIX B**

**POLICE COMMENTS**

**ON**

**EMERGENCY COMMUNICATIONS**

**MEMORANDUM**

**TO:** Jay Poole, City Auditor  
**FROM:** K. L. Wright, Chief of Police   
**DATE:** July 13, 2016  
**SUBJECT:** 911 Statistical Call Data

**Finding – Statistical call data from the Aurora Cassidian system showed an increasing trend of unanswered 911 calls in 2015 due to staffing shortages for Emergency Communications Dispatchers.**

I have reviewed the audit report and concur with the findings.

It should be noted that some of the concerns identified by the audit are being addressed through prior, existing, and future budgets. In order of priorities of the items that are left unsettled are: 1.) increased staffing; and 2.) salaries. In addressing staffing, we have expanded our recruiting efforts and are presently exploring additional methods to reach people who desire to and can perform these essential functions, including partnering with Tidewater Community College to develop work-force solutions to help us recruit and retain dispatchers. However, these efforts can prove to be ineffective if we cannot offer competitive salaries; therefore, I will be requesting Human Resources conduct a pay and compensation study.

The physical work environment will see radical improvement when the new Public Safety Operations Building opens. It was carefully crafted with specific designs to be “employee” friendly, easy to maintain, and provide space for future expansion.

We also are reevaluating the task and functions of the Emergency Communications Center so that the appropriate amount of employees’ time is devoted to the primary functions of the call center. This involves determining which functions/services can be discontinued, placed with some other entity, or redesigned to gain greater efficiencies.

kgb