

Department of Information Technology

Strategic Plan

Revision History

Revision	Date	Reason for Revision	Updated by
3.0	8/8/2009	Update of 2006 Plan Radio System Update Internet/Intranet Update	Lori Pinz Woodie Smith Ed McCandless Bob Cuomo
4.0	3/3/2011	Update of 2009 Plan Internet/Intranet Update and Government Access Channel inclusion Inclusion of Back Up and Disaster Recovery Site Strategic Alignment with City Strategic Plan	Lori Pinz Bob Cuomo Woodie Smith I.T. Team
5.0	9/28/2012	Annual Review and Mission Statement Update	Lori Pinz
6.0	8/27/2013	Annual Review	Lori Pinz Brian Popp Woodie Smith Greg Robison Steve Podszus Bob Cuomo
7.0	10/21/2014	Annual Review and Incorporation of SWOT Analysis	Lori Pinz David Peterson Debra Hill Woodie Smith
8.0	8/17/17	Update	Lori Pinz Helena Smith Todd Mrotek Greg Robison Brian Popp Michael Clark
9.0	11/11/2019	SWOT Analysis Update	I.T. Team

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY	4
2. INFORMATION TECHNOLOGY DEPARTMENT OVERVIEW	4
3. INFORMATION TECHNOLOGY PRODUCT AND SERVICES STRATEGIC FOCUS	5
3.1. I.T. POLICIES AND GOVERNANCE	5
3.2. I.T. SERVICES AND SUPPORT	5
3.3. ENTERPRISE SOFTWARE	6
3.4. PUBLIC SAFETY - POLICE	6
3.5. PUBLIC SAFETY - FIRE	7
3.6. DOCUMENT IMAGING	8
3.7. SPECIALIZED APPLICATIONS	8
3.8. APPLICATION AND REPORT DEVELOPMENT	8
3.9. E-MAIL AND OFFICE APPLICATIONS	9
3.10. SERVER ENVIRONMENT	9
3.11. DESKTOP COMPUTERS AND MOBILE DEVICES	9
3.12. PRINTING STRATEGY	10
3.13. NETWORK AND SECURITY	10
3.14. TELEPHONE SYSTEM	11
3.15. DISASTER RECOVER AND BACK UP SITE	12
3.15.1. <i>Disaster Recovery and Backup System</i>	12
3.16. AUDIO/VIDEO	12
3.16.1. <i>Video Conferencing</i>	12
3.16.2. <i>Electronic Whiteboards</i>	13
3.16.3. <i>Audio/Visual Systems</i>	13
4. RADIO COMMUNICATIONS	13
5. INTERNET OF THINGS AND SMART CITY INITIATIVES	14
6. GIS STRATEGIC PLAN	14
7. INTERNET AND INTRANET	15
7.1. WEB SITE: WWW.PUEBLO.US	16
8. SOCIAL MEDIA	16
9. GOVERNMENT ACCESS CHANNEL AND PUBLIC INFORMATION	17
10. I.T. STAFFING	17
10.1. TECHNICAL SUPPORT	18
10.2. APPLICATION SYSTEMS SUPPORT	19
10.3. RADIO COMMUNICATION SYSTEMS	19
10.4. PROJECT MANAGEMENT AND OTHER SERVICES	19
10.5. MEDIA DEVELOPMENT AND PUBLIC INFORMATION	19
10.6. I.T. ADMINISTRATION	19
11. PLAN REVISION	20

1. Executive Summary

The City of Pueblo strives to implement 21st century technology by utilizing industry standards and best practices for our delivery of services. It is imperative that the City continues to leverage technology investments to improve and deliver services, but only after careful evaluation and analysis of our citizens' and community's needs.

To ensure that the City of Pueblo is successfully in meeting the needs of our community, the Information Technology Department's (I.T.) strategic plan focuses on providing quality network service and robust infrastructure, delivering excellence in our customer service for both internal and external customers, optimizing internal and external partnership opportunities, facilitating innovation and promoting out-of-the-box thinking to capitalize upon our strengths, improve our weaknesses, and reduce costs. Above all, we strive to implement I.T. solutions that are aligned with and meet the City's overall mission and goals:

CITY OF PUEBLO MISSION STATEMENT

We, the City of Pueblo, representing a community of diverse culture, character, and history:

- **Commit to upholding the City Charter, all City Ordinances, and the highest standards of conduct;**
- **Commit to promoting and enhancing the well-being and quality of life for Pueblo's residents, visitors, and businesses by providing excellent services in an efficient, respectful, and courteous manner;**
- **Commit to a model of professionalism that ensures respectful and complete consideration of all decisions and decrees; and**
- **Commit to strategic growth, all facets of economic development, and sustainability.**

This strategic plan will outline the current and future direction of the City of Pueblo's Information Technology Department including the technology direction, strategies, funding and management process requirements, and the technology recommendations for the next three to five years.

2. Information Technology Department Overview

The mission of the Department of Information Technology is to facilitate the seamless integration of technology solutions in a secure and cost-effective manner, provide support and maintain a reliable system and network infrastructure that enables City entities to provide superior customer service to our community and our citizens, and support the City's mission and goals by ensuring I.T. services and technology solutions align with the City's strategic plan. Our goals are:

- Facilitating innovation and promoting out-of-box thinking to capitalize upon our strengths, improve our weaknesses, and reduce costs
- Enhancing both our internal and external customers' support experience to a level of excellence
- Optimizing internal and external partnership opportunities
- Strengthening our network service, infrastructure and analytical capabilities to create the City of the future

To support our mission, we systematically and carefully evaluate, design, acquire, implement and support technology solutions. There are several major technological advancements that have been implemented since the last revision I.T. Strategic Plan in 2017:

They include, but are not limited to:

- Implemented GETAC V110 Mobile Device Terminals for both police and fire, including the implementation of Sierra Wireless modems for in-car wireless connectivity
- Replaced the Fire Department's Record Management system, time-keeping system, and training system with cloud-based products
- Implemented two-factor authentication for all public safety and key personnel
- Implemented new parking ticket system for the Transportation
- Implemented new cloud-based Parks and Recreation system
- Implemented new server and file auditing software including ransomware protection
- Completed the re-design of the City's Internet site

As in all areas of the City, staffing in the I.T. department remains very lean. Cost control and leveraging technology investments are vital to the I.T. departments strategic plan; therefore, we are continuing the trend of selective outsourcing and partnership building to assist in supporting the City employees and Citizen Requirements.

3. Information Technology Product and Services Strategic Focus

3.1. I.T. Policies and Governance

The establishment of I.T. Policies and Training services is to provide employees, third-party contractors, consultants, and temporary employees with the acceptable usage for the City of Pueblo's technology resources. Inappropriate use of resources puts the City's network systems and services at risk from attack and/or exposes the City to legal liabilities.

Recommendations:

- Continue to develop, update and revise I.T. policies and procedures as required and update annually or as appropriate
- Adopt COBIT (Control Objectives for Information and Related Technologies) framework for I.T. management and governance as applicable

3.2. I.T. Services and Support

The I.T. Department is responsible for facilitating the implementation and support of the technology solutions employed by the organization, including maintaining data, voice, video, and network infrastructure that enables City entities to provide superior customer service to our community and our citizens. It is our goal to provide excellent customer service to both our internal and external customers and to continually strive to improve our services.

Recommendations:

- Annually evaluate computer and software replacement policies. Enforcement of policy is contingent upon available budget
- Annually evaluate radio communication equipment replacement policy. Enforcement of policy is contingent upon available budget
- Establish an I.T. Liaison for every City department to improve customer relations and support by 2022
- Modify and align existing project planning and management standards with ITIM (IT Service Management) to assist with procuring, funding, and implementing software solutions by 2023. This would include modification of software and hardware standards to comply with CJIS (Criminal Justice Information Services), PCI (Payment Card Industry), and HIPAA (Health Insurance Portability and Accountability Act) standards as applicable by 2023
- Recommend cost-effective and appropriate technologies solutions to facilitate work activities
- Continue to procure energy efficient data equipment for deployment throughout the City network
- Continually evaluate alternative desktop solutions to improve performance and user satisfaction

- Continually evaluate alternatives for software distribution methods. Wherever possible, move to Windows-based or Cloud-based solutions for the various discrete applications supported throughout the City
- Leverage technology to improve collaboration and improve business workflow
- Implement quick “How to fix” Tips for IT Staff on SharePoint issues by end of 2019
- Centralize and Organize technical documentation for quick and easy access for I.T. Staff by end of 2019
- Improve Internal I.T. Staff Communication for emergency situations by the end of 2019

3.3. Enterprise Software

The City continues to use a hybrid approach to software selections. Cloud-based services are always considered, if available; however, costs, contractual constraints, and adherence to compliance standards may dictate on-premise solutions to be selected. Our server environment is heavily virtualized with only approximately 5% of our servers being stand-alone. We continue to push enterprise wide or multi-departmental software solutions to control operating and support costs.

The City utilizes Tyler Munis as its ERP (Enterprise Resource Planning) system as well as Tyler Incode for the Municipal Court’s case management system. The system has consolidated many of the disparate systems used previously by various departments. The system has improved business efficiencies, reduced data errors, and introduced employee, vendor and employee self-service tools. Potential expansion of our on-line service offerings is now possible. However, Tyler Munis has several areas that need improvement including, but not limited to, custom reporting, time management, work order management, alcohol and marijuana business licenses and permitting, and Community Development. A major upgrade is scheduled for late 2019, which is expected to improve many of these areas. If there is not a realized improvement, the City will need to evaluate other software solutions to meet business requirements.

Recommendations:

- Upgrade Tyler Munis and Incode to the latest versions late 2019
- Replace Tyler ESS, for time keeping, with Kronos citywide including the expansion of Krono’s scheduling and rostering for the Police Department by 2021
- Implement a new Community Development and Planning system to include an online portal for business collaboration by 2021
- Expand or replace the I.T. Department’s work order management and inventory system with Tyler Munis or a new COTS (commercial off-the-shelf) system by 2021
- Continue to expand employee and citizen access applications when available and as applicable
- Continue converting of applicable home-grown Access database systems into Tyler Munis or other COTS systems where applicable
- Expand the use of Microsoft O365 collaborative tools, for example, SharePoint online, Teams and OneNote citywide by 2022
- Continue current software selection and evaluation practices for software selections

3.4. Public Safety - Police

The City of Pueblo Police Department’s (PD) Records Management and Computer Aided Dispatch systems are based upon client-server application architecture as well as accessible via web server architecture. The Records Management System (RMS) collects and stores incident information gathered by law enforcement personnel in a centralized database for tracking cases and suspects. It can support multi-agency and multi-jurisdictional agencies and allows other City departments to stay connected to law enforcement data, as well as other cities, and counties. This functionality is currently shared with the Pueblo County Sheriff’s Department and the Pueblo District Attorney’s office. The Computer-Aided Dispatch system (CAD) handles dispatching and tracking calls for law, fire and medical units including AVL (Automatic Vehicle Locator) systems.

The system provides a mobile application that many of the law enforcement personnel use. This mobile application provides instantaneous information to an officer who is in route or on-scene at an incident. For example, it provides, voiceless dispatch; status updates; car-to-CAD messaging; car-to-car messaging; and queries including local, state, and national warrant checks, stolen vehicle and property information, mug shots, and records management information. Application updates can be done through the wireless connection to the City's network. The PD's RMS and CAD system is reaching its end-of-life in the next five years. A replacement system with the current vendor will need to be considered, or a Request for Proposal will need to be generated to identify a new solution.

The in-car video systems installed in police vehicles are being updated to wireless systems as funding allows; however, there are vehicles with obsolete equipment which need replacement. It is a proven fact that officer accountability and safety are enhanced with video. The new in-car video systems utilize strategically located wireless access points to upload video to City servers and eliminating the need for manual interaction to extract the video. The PD uses a cloud-based body worn camera system. The use of body-worn cameras continues to expand into other areas of the Police Department and have become a vital necessity in police response. However, the explosion of storage requirements and the costs to remain cloud-based continue to rise with each new contract extension. The PD may need to evaluate bringing storage back in-house to control costs.

IoT (Internet of Things) devices, vehicles, and other smart city needs are beginning to emerge with more intensity. These devices are highly unsecure, and the City must develop a strategy surrounding their implementation. As IoT grows and Smart City initiatives thrive, I.T. must be able to support and securely connect and exchange data with the City Public Safety Systems as well as implement and support the network infrastructure. On our horizon and as funding allows, I.T. is preparing to utilize network segregation and shortest-path bridging infrastructure to support these devices. It is expected that by 2025, the City will be using gun-shot locator sensors, monitoring real-time video, using real-time analytics and predictability systems for providing 9-1-1 call response, and exchanging data with other jurisdictions. The Police Department must adhere to CJIS (Criminal Justice Information System) standards. In 2018, CJIS compliance required two-factor authentication for public safety system access. The City completed its implementation of, Identity Automation's two-factor authentication for all public-safety mobile devices in 2019. The PD currently uses GETAC V110's for their MDT's as well as Sierra Modem's for in-car Broadband connectivity. Netmotion's software suite is utilized to proactively manage and encrypt all mobile device connectivity and application issues. Currently, the PD Communications Center provides dispatching services and support the City of Pueblo's Police and Fire Departments. In 2019, the City replaced it's Intrado Viper system Solacom's Guardian Next-Generation VoIP 9-1-1 call handling system for all 9-1-1 calls into dispatch. This system handles all emergency calls and includes such capabilities as capturing and displaying critical call location information directly from an embedded map as well as provides text-to-9-1-1 and text-from 9-1-1 capabilities. The Guardian system is already positioned to handle other multi-media as NENA (National Emergency Number Association) processing and protocol standards are developed without a fork-lift upgrade of the system.

Recommendations:

- Continue expansion of wireless access points throughout the City as funding allows.
- Upgrade remaining in-car video systems as funding allows
- Implement text-to and text-from 9-1-1 by the end of 2019
- Research and evaluate joining State of Colorado E 9-1-1 ESInet by end of 2021
- Expand E 9-1-1 services for other multi-media types as NENA standards are identified.
- Evaluation a new RMS and CAD system for PD by the end of 2021
- Expand the use of in-car modems and wireless infrastructure when applicable

3.5. Public Safety - Fire

The City of Pueblo's Fire Department completed its implementation of three new cloud-based systems in 2018. ImageTrend, a Fire Records Management System, Kronos' Scheduling and Rostering System, and Target Solutions, for fire training. All three systems interface and share data. Image Trend also interfaces with Fire's LifePak defibrillator system for patient vitals.

Currently, the Fire Department has updated their mobile device terminals with GETAC V110's. These MDT's connect via Sierra Modems and Netmotion. Two-factor authentication was implemented for all Fire personnel using the MDT's in 2018.

Recommendations:

- New technology is advancing in the Fire Department's domain. Today, fire staff can use infrared heat-seeking mobile devices that allow them to see through smoke, identify hot spots, and quickly locate victims easily. The I.T. Department would like to work with Fire Admin to fit every firefighter with such a life-saving device.
- Expand the use of in-vehicle modems and wireless infrastructure when applicable.
- Utilize Data Mining tools of Fire, EMS and Inspection data to identify areas of need within the department as well as providing accurate data for the Department's accreditation.

3.6. Document Imaging

The City utilizes three different imaging systems. FileBound is the citywide imaging system deployed across all city departments. FileBound houses documents from the City's retired ERP and court systems as well as documents not kept by other city systems, i.e. maps, memos, letters, etc. The City Clerk's office uses LaserFiche which also has a web-based component allowing online access to City Ordinances and Resolutions.

The City continues to use Agenda Center as its agenda management system. This system allows for departmental collaboration on agenda creation and management without the need for paper. Items are added to the agenda and supporting documentation is directly attached to the agenda in a browser-based system. All forms, staff reports, and back-up materials are now available on-line for anyone to obtain without having to come to the Clerk's office and requesting the material. This ability supports the City's transparency efforts.

Recommendations:

- Continue to expand on-line access to other City documents and services via the City's Internet page
- Complete the migration of Optiview to new FileBound System by end of 2019
- Evaluate the ability to consolidate LaserFiche with FileBound by end of 2022

3.7. Specialized Applications

Just as the City has specialized departments, the City has requirements for several specialized applications. There are several engineering or transportation-related applications that are not "mainstream," but are nonetheless essential to City Staff. Currently, the I.T. Department installs such applications on an ad hoc basis, which does not allow for even cursory testing or comparison with similar products that may be a better fit for the user.

Recommendations:

- Continue to follow formal procedure for evaluating and securing specialized software for inclusion within the City Standards including the end-user responsibilities for installing, testing and securing, and supporting such specialized software.

3.8. Application and Report Development

The City has decreased its use of home-grown applications with the implementation of the City's ERP system. When necessary, the I.T. department can provide application development using Microsoft Access as the front-end to a Microsoft SQL back-end database; however, lack of staffing in this area limits the I.T. Department's ability to be agile in this area. A home-grown system will only be developed if an off-the-shelf solution cannot be found. However, with the explosion of mobile devices, it may be necessary for the City to evaluate its

long-term approach to mobile apps and the development of those apps if they are not readily available via a 3rd party. In the future, it may be necessary to add application development staff to the I.T. department; however, outsourcing this development should be evaluated.

Recommendations:

- Utilize off-the shelf solutions as much as possible
- Monitor the need for application development personnel to be added to the I.T. Department
- Train existing staff in Microsoft Access and Microsoft SQL to develop and support home-grown systems when needed

3.9. E-mail and Office Applications

The City has standardized on Microsoft products and migrated to Microsoft O365, a cloud-based subscription solution for e-mail and other Office products. There are other non-Microsoft products that the City has standardized upon, but generally not in areas where Microsoft offers a good solution. Examples of this include publishing and antivirus software.

City employees, if authorized, can check their e-mail and calendars from any Internet connection (at home, on vacation, etc.). I.T. has installed and currently maintains VPN (virtual private network) access into the City's network allowing employees complete access to City resources outside of O365.

Recommendations:

- Continue current methodology
- Continue to utilize and roll-out new O365 products as they become available and requirements support their use
- Evaluate the feasibility of migrating our Blackberry MDM to a cloud-based infrastructure to ensure phone and email availability during an ISP outage by end of 2020

3.10. Server Environment

The City's datacenter houses much of the City's technology. This data center has surplus power and energy efficient cooling as well as generator back up. The datacenter supports a very strong virtualized server environment. I.T. continues to work automating manual I.T. processes or tasks for user account creation, improve management and system performance monitoring and evaluate and establish I.T. as a service to empower end-user to manage a portion of their I.T. needs.

Recommendations:

- Evaluate the feasibility of migrating from VMware to Hyper-V by mid-2020
- Leverage Defender ATP to achieve immediate alerting of server compromise by end of 2019
- Implement additional production Nimble Hybrid SAN by mid-2019
- Implement site-to-site replication using Nimble resources by mid-2019

3.11. Desktop Computers and Mobile Devices

The City is an HP and Dell and Microsoft Windows shop for all desktop and laptop computers. We utilize GETAC V110s for mobile device terminals for field personnel. The I.T. department uses Netmotion to securely communicate with laptops on the City's network and maintain session persistence.

The City has implemented Blackberry Technology for mobile device management. Although, this system can support BYOD (Bring Your Own Device) capabilities, the City only allows this capability on a very limited basis and only on iOS-devices. We use Blackberry's VPN to control access to City applications securely; however, many of our applications do not have mobile applications developed, which limit some of our

capabilities in this area. It will be necessary in the next couple of years to add staffing to the I.T. Department to develop mobile applications.

Recommendations:

- Implement cloud-based next generation malware protection so non-domain systems can be better protected and monitored
- Expand the use of per app VPN for devices control by Blackberry's MDM in order to provide secure connectivity to City systems by end of 2021
- Implement more stringent policies to secure off network devices by end of 2020 and reevaluate as necessary
- Create policy to mandate current iOS updates to all Apple devices for security compliance by end of 2019
- Implement SCCM to improve deploying and managing Windows by the end of 2020
- Work to establish a 5-year replacement cycle for all desktop and mobile computing as funding allows
- Evaluate the use of VDI (Virtual Desktop Infrastructure) to reduce costs by end of 2021
- Implement a new inventory tracking system by end of 2021

3.12. Printing strategy

The I.T. Departmental standard for printers is:

- HP Lasers (networked)
- Canon multifunctional network copiers
- Printers are assigned via Active Directory organizational units and augmented with specific installations as required

Recommendations:

- Implement Centralized management by end of 2023

3.13. Network and Security

The City's network backbone is comprised of its own fiber optic cable, franchised fiber, and leased CenturyLink services. The City's fiber infrastructure provides connectivity for 98% of the City's departments and provides connectivity to several County offices through joint partnerships. The remaining 2% of the departments are connected to the City's network via leased T-1 lines from CenturyLink. The City owns all the rights-of-way necessary for this campus-like implementation additionally, the City has access to much existing underground conduit for specific City purposes. It also has the rights necessary to use utility poles throughout the City, if the use is for some clearly defined municipal services. The City's fiber backbone has expanded tremendously with over 90 miles of fiber aerially or in the ground. The City's fiber network topology has evolved from a "star" topology and has been positioned to provide a redundant and highly available "ring".

We use network segregation methodology to provide traffic control and optimize performance. As funding allows, the data and voice network will be implemented with SPB (Shortest Path Bridging) and 10GIG topology for voice and data back up and redundancy. The SPB protocol allows for edge programming eliminating cross network administration reducing staff time and provides a robust platform to accommodate transport for today's emerging technologies. As the City has a fully converged network with data, voice, and multimedia traffic being pushed across it, this SPB assists with reducing staff time, simplifies device configurations, and allows the City's small I.T. staff to nonetheless build out the voice and data network within a well-designed architecture. I.T. is in the process of implementing a network access control solution to restrict device access for both our wired and wireless networks.

Extreme (Avaya) equipment is the standard of choice for the City's network infrastructure. This standardization allows for a flexible, responsive and stable network that we can manage and easily modify parameters through

Extreme's (Avaya) embedded tools. Extreme's (Avaya) platform allows the City to utilize software-defined networking to improve the stability, security and reduce infrastructure costs.

The City uses Fortinet WLAN access the City's network. Access to our wireless network is controlled through two wireless controllers through which we provide guest and employee access.

As the demand for online services and mobile access grows, the City's current DMZ infrastructure is being strained. The City needs to stabilize the DMZ and improve its performance of citizen facing applications as well as enhancing internal local area network security.

Event collection has been optimized to ferret out specific threat-types. Threat analysis has been improved. For example, a sandbox was added to analyze the files that enter the network. Scripts were created to examine systems the sandbox listed as having received dangerous files. Next-generation malware detection software is being deployed throughout the City to thwart zero-day threats, crypto-attacks, and to record threat behavior (which processes were used, which other systems were reached out to, what artifacts were created...) should malicious code make it onto a system. Vulnerability scanning, both in terms of patches/updates and in terms of system configuration, has been layered by employing multiple products. The City has employed shortest path bridging as a means of shielding core assets. We are working to shield assets on a need-use-basis. TAA appliances and extensive secured Wi-Fi is being deployed. We adopted an always on/off the LAN policy for City devices. An enforced VPN keeps our other devices LAN-safe wherever they roam. The City continues to harden infrastructure and enforce a "zero-trust" model and to maintain as many layers of defense as possible to mitigate any exposure. Improved auditing remains a key goal. Our current measures are too labor intensive. We are working towards a more universal and administrator friendly approach.

Recommendations:

- Continue to expand the wireless access points to meet the City's needs as funding allows
- Implement Network Access Control by end of 2019
- Establish Phishing Awareness training by end of 2019
- Continue and enhance our city-wide security training for all City personnel. This is on-going
- Continue to expand our Software Defined Networking strategy as an on-going goal and as budget allows
- Improve threat detection and eradication to detect and removed compromised City systems. This is an on-going goal
- Actively keep abreast of the ever-evolving threat landscape
- Continue to expand City fiber and eliminate T-1 lines for remaining City departments
- Evaluate and plan to implement a zero-trust model for network security. This move will be a high priority budget item over the next few years. Full implementation of this model will be based upon available funding and staffing
- Initiate client-based alerting for security events in order to achieve immediate threat detection by mid-2021
- Implement a continuous monitoring program as well as tightening scripting and analysis programs and tools by end of 2020
- Establish network methodology and security protocols for Internet of Things (IOT) by end of 2021
- Create an independent network utilizing fiber and microwave to segregate IOT from the City network by end of 2023

3.14. Telephone System

The City uses Avaya's IP Office as its PBX. This system is fully VoIP; however, digital and analog capabilities are still utilized in some areas due to functional requirements or poor wiring. All City departments are on the telephone system. This system has been very stable. PCI (Payment Card Industry) compliance requires us to implement encryption for all voice traffic. This is scheduled to be completed by January 2020.

Recommendations:

- Encrypt all voice communications for PCI compliance by end of 2019
- Upgrade phone system and management software by end of 2019
- Expand existing platform to enhance unified communication capabilities by end of 2022

3.15. Disaster Recover and Back up Site**3.15.1. Disaster Recovery and Backup System**

The I.T. department uses Veeam and Exagrid as its backup and archiving solution for the City's data. This system utilizes two Exagrid units for back-up and replication of the main City servers and data on a predefined schedule. In the event data on a main server or user needs to be selectively restored due to data corruption or accidental deletion, the appropriate backup data is copied from the Exagrid to the target server or user. In the event of a major server failure, the backup data from the Exagrid can be restored to a replacement server in a matter of a few hours. The Exagrid appliances are located at the City's Data Center and the disaster recovery site that is not likely to be simultaneously subjected to the same perils as the main data center (for example: fire, tornado, flooding, acts of terrorism, etc.).

The goal of this robust backup strategy is for the City to be able to restore business critical data to rebuild or replacement servers in the event of main server failure, which is in line with our Business Continuity goals. This offsite location is home to the City's DR site and houses an Exagrid for replication of the Data Centers Exagrid. The DR site houses many of our redundant mission critical systems; however, additional power improvements are necessary to ensure up-time during an event.

Recommendations:

- Continue to expand and relocate mission critical systems to the City's backup site in the event of a major catastrophe. This is on-going
- Create redundant and geographically dispersed virtual host of select critical systems for immediate failover by end of 2020
- Snapshots of critical systems allowing for quick bare-metal restorations housed off-site by end of 2017
- Create hardware architecture that supports rapid failover and reduces the risk of an individual system causing a catastrophic failure of critical and the public safety systems by end of 2017 or as funding allows
- Install generator power to site by the end of 2022 or as funding allows
- Document and fine-tune DR processes by end of 2019
- Implement 15-minute roll-over by mid-2020
- Update I.T. disaster recovery to reflect 2018 and 2019 changes in infrastructure and procedures by the end of 2020
- Expand and restructure Exagrid system to increase retention capabilities by early 2020
- Evaluate replacement of Exagrid system by end of 2021
- Establish a tertiary back up site using recycled City equipment in mid-2021
- Evaluate Azure Government Cloud as a potential target for tertiary back up site by end of 2020 to eliminate the use of recycled equipment

3.16. Audio/Video**3.16.1. Video Conferencing**

The City uses Life-Size video conferencing units in many of its conference rooms. Recently, we have replaced our multipoint bridging unit with Zoom, a cloud-based hosted solution. This solution has multi-vendor interoperability and allows participants to join a conference through a variety of means, i.e. iPhones, iPads, H.323/Sip room units, desktop systems etc. It eliminates I.T. support and security concerns for

external video conferences and expands face-to-face collaboration abilities. Utilizing this type of architecture will allow the City to expand video conferencing capabilities easily and more cost effectively.

Recommendations:

- Implement desktop to desktop conferencing to those end-users that will benefit from this technology
- Expand videoconferencing to other departments as necessary and as funding allows
- Continue to utilize Zoom as the hosting solution for video conferencing

3.16.2. Electronic Whiteboards

The City uses Hitachi Starboards and Clickshare wireless presentation and collaboration systems in its conference rooms. With the Clickshare system, the City will reduce the use of electronic whiteboards except where necessary. Clickshare also provides a mobile device application which allows anyone to share content from any device.

Recommendations:

- Implement wireless presentation and collaboration systems instead of Starboards

3.16.3. Audio/Visual Systems

The City utilizes high-definition televisions throughout the City controlled using AMX Touch Panel Control Units. The AMX Touch Panels controls system on/off, display content, lightening control, and input selections. The City utilizes a mixture of analog, high-definition and IP cameras for broadcasting council meetings and for building and campus surveillance. The City is centralized on one video management system but is evaluating a replacement system due to poor support, limited functionality and high costs. The real-time analysis of live video including situational notifications, i.e. package left behind, has increased in importance. Our current system provides some video analytics tools, but it is limited in its functionality and accuracy.

Videoconferencing is provided with Lifesize Conferencing equipment using Zoom as our video-conferencing provider; however, as meeting rooms are upgraded, wireless and mobile screen sharing including more cost-effective conferencing equipment is being utilized to control costs while delivering High-Definition video.

City Council uses Shure's voting system including microphones for all City Council meetings. This system works well but has limited audio control on the microphones. It is a relatively old system and needs to be upgraded or replaced due to age and lack of audio control.

Recommendations:

- Replace current video management system and implement video analytics with by the end of 2019
- Replace old analog cameras with IP cameras as funding allows
- Implement video analytics for building and campus surveillance by the end of 2020
- Replace City Council voting system and microphones by the end of 2021
- Expand the use of wireless screensharing city wide as funding allows
- Replace meeting room projectors with High-Definition (HD) displays and wireless screen sharing as funding allows. If a projector is needed, implement only laser projectors

4. Radio Communications

The City cooperates with and utilizes the State of Colorado's Digital Trunked Radio System (DTRS) to provide radio services for all city departments. Over the last couple of years, and in cooperation with Pueblo County and the State of Colorado, the City has connected to the zone controller located in Pueblo County, as well as, assisted with

the creation of a simulcast DTRS system. In 2019, this same partnership implemented a redundant microwave ring improving system resilience and redundancy for all radio communications. The City and Pueblo County partner to provide back-up services to each other for radio traffic and 9-1-1 calls. The DTRS maintenance is performed by Motorola; however, Radio personnel are enhancing their training and knowledge in this area to provide faster support for the system. This will increase the mean-time-to-repair as well as reduce the reliance on Motorola and 3rd party support.

Recommendations:

- Continue to participate in the partnership with Pueblo County and the State of Colorado
- Reduce reliance on 3rd party and vendor support through enhanced training and improving vendor relations by end of 2020
- Decrease repair returns by 3% by end of 2020
- Maintain inventory levels of parts to avoid repair and install delays.
- Continue bi-annual tower site maintenance
- Document and develop network diagram of radio network including integrations with NG9-1-1 equipment mid-2020
- Improve end-user support through scheduled visits and public safety ride-along by end of 2019
- Cross-train personnel in fiber optic installation, repair and maintenance, and design by end of 2020

5. Internet of Things and Smart City Initiatives

The City currently employs IOT devices in the PD Patrol cars, Fire trucks and Waste-Water trucks. The City will continue to deploy IOT devices wherever they enable us to economically improve services to our citizens while maintaining a high level of security. This is a new field so while potential seems limitless the difficulty will be implementing these devices securely and in a responsible manner.

Recommendations:

- Catalog existing IOT devices (such as temperature sensors) by the end of 2020
- Create policy and plan to govern and maintain IOT devices by the end of 2020
- Physically separate IOT devices from the City infrastructure as funding allows
- Develop infrastructure needed for future smart city initiatives and shot locator systems by the end of 2022
- Reimplement predictive policing software once Police staffing and funding allows
- Implement real-time analytics for Police and Fire command staff as funding allows

6. GIS Strategic Plan

GIS services and data resources are managed within the I.T. Department through the GIS Division. The GIS Division currently comprises of two (2) FTEs. GIS staff work closely with every department of the City. Additionally, staff routinely collaborates with several regional partners including Pueblo County, Pueblo Regional Building Department, and the Pueblo Board of Water Works to support the exchange of accurate mutually beneficial information. The GIS Division is responsible for developing and supporting all GIS data vital to maintaining efficient and effective day-to-day business operations. Our goals for the next 1-5 years are as follows:

Recommendations:

- Assist and support map-based software implementation for all City Departments
- Update physical property addressing policies and regulations to adopt new standards and create mechanisms to better monitor and track mixed land-use issue
- Continue to integrate GIS infrastructure with critical business systems of the City including Tyler ERP mapping

- Standardize all mapping systems and data development utilizing ESRI software and data formats to maximize information system interoperability and integration.
- Create a permanent full-time GIS Analyst position to assist with increased mandated authoritative City map records management and regulatory compliance responsibilities by the end of 2021
- Establish process supporting Tyler MUNIS Central Address and Property record maintenance and upkeep.
- Increase 'City of Pueblo' GIS data and map information accessibility on the web
- Improve inter-departmental coordination and collaboration for GIS data
- Establish new memorandums of understanding (MOUs) and or IGAs for GIS 'data sharing' with regional partners including, but not limited to: Pueblo Board of Water Works, Pueblo West Metropolitan District, Pueblo Conservancy District, and the State of Colorado Governor's Office of Information Technology GIS Department, Black Hills Energy Corporation, and Xcel Energy Corporation
- Expand mobile field/data collection applications by developing a new mobile application for many new and existing City projects by 2025
- Improve and increase data sharing by increasing the use of Arc Server and Arc Online to provide better availability of GIS data by the end of 2020
- Expand customer GIS web and data resources by utilizing ArcGIS Enterprise tools that allow for interactive data collection and editing, and will allow for in-office Dashboard apps to show real-time analytics by 2024
- Improve intra and inter-departmental communications by utilizing platforms like Microsoft Team and SharePoint so other employees have greater access to GIS personnel by 2021
- Streamline end-user single-sign-on experience by working with other I.T. personnel to create the required server/network environment to provide this ability by 2022
- Document GIS and Technical workflow processes so anyone can pick up and complete all tasks, and to prevent institutional knowledge from leaving when an employee leaves employment by 2020
- Increase the analytical value of our GIS data so that it can be used to make better informed business decisions. Need to create new ways for City decision makers to have access to data and analytics in a clear and concise format by 2022
- Map Remaining Public Assets utilizing mobile applications via the Public Works ADA compliant Asset Management application, and other mobile products by 2021
- Keep abreast of GIS Trends and Standards to provide guidance and knowledge that will ensure the City of Pueblo moves into the future on top by researching and utilizing web-based training opportunities
- Increase and improve end-user training and knowledge by documenting processes and training resources and creating an innovative way to supply necessary training to all city personnel by 2022
- Increase knowledge of "IoT" and Smart Cities to determine the role GIS will play in creating the City of the Future by 2024

7. Internet and Intranet

There are several e-government models that organizations can measure and align their e-government initiatives. These models can vary in their number of phases; however, each model's final phase is seamless or full integration across all services and functions of the organization. The City follows Gartner's methodology of an agency's progress regarding e-Government. Gartner identifies four phases:

- (1) Presence. Characterized by static content; informational only.
- (2) Interaction. E-mail enabled to allow communication, search engine or other tools imbedded to help users navigate amidst more voluminous information.
- (3) Transaction. Registration, form submission, and/or payments via the Web.
- (4) Transformation. E-government solutions are considered as a facet of every organizational initiative.

The City of Pueblo focus on the transformational phase of e-government. Citizens can interact and communicate with the City of Pueblo which is available on-line and available via mobile applications. The City will continue to increase the interactivity with the public. The speed to which the City will be able to meet this demand will be constrained by budget and staffing.

7.1. Web site: www.pueblo.us

The City website (www.pueblo.us) is hosted by Civic Plus, a 3rd party e-Government Company specializing in website development and content management for local, county and state governments. The web site is Section 508 compliant and is a mobile first design. The content management system allows the City to disperse the ability to manage content of departmental pages to content providers across the organization. This allows I.T. staff to focus on development and outreach efforts. This has been a very economical arrangement since City's I.T. department is understaffed to support a Web server or the accompanying software. Civic Plus specializes in website development for local government and focuses on interactive citizen-focused engagement tools including a solid connection with social media sites.

Recommendations:

- Leave the responsibility for managing all the City's web initiatives within the Information Technology department, to ensure adherence to Section 508 compliance and maintaining a unified look and feel
- Continue with the strategy of making departments responsible for the currency and quality of the material they choose to publish on the City's website
- Continue departmental process to obtain fresh and updated content for the City websites
- Continue to utilize Civic Plus as our hosting and content management system provider
- Support economic and revitalization efforts for the City of Pueblo by depicting the positive, "feel-good" aspects of our local government and community
- Continue to pursue and expand e-Government services focusing on citizen engagement, transparency, open data, and online services and communications as applicable
- Continue to provide 24 x 7 streaming of Government Access Channel
- Improve transparency while maintaining network security by leveraging new technologies and existing web resources
- Design and implement websites specifically focused on drawing visitors and business to the City as funding allows
- Expand and train contributors by establishing quarterly training sessions by the end of 2020
- Expand the website team by 2 FTE's to keep up with the growing demand of online services and information by end of 2021

8. Social Media

The integration of social media tools is a necessity of any good government website. It provides the platform to allow citizens to interact and collaborate with their City government along with the ability to retrieve governmental information and data. Implementing social media gives citizens the ability to engage with their government on a 24x7 basis.

Many of the City departments rely heavily on the use of social media to market services, promote events, publish alerts and engage citizens. For example, the Pueblo Police Department (PPD) uses Facebook and Twitter to post pictures of wanted criminals, to ask for assistance on criminal activity, and to alert citizens to crimes in progress. The City uses YouTube to post training videos for both internal and external employees. Many departments in the City feed a social media site to disseminate information.

Recommendations:

- Facilitate the use of social media to improve citizen engagement through more productive dialogue that is timely, responsive, and relevant
- Create and consolidate all relevant videos to the City's YouTube channel
- Evaluate and utilize "BIG DATA" tools to improve our social media outreach by the end of 2022
- Expand social media and video media options with other entities by collaborating with and encouraging better communication with other entities such as the local Chambers, City/County Health Department and other governmental and quasi-governmental agencies by the end of 2021

- Expand our use of social media platforms to LinkedIn, Snap Chat, Tumblr, etc. by the end of 2024

9. Government Access Channel and Public Information

The Information Technology Department is responsible for managing the City's dissemination of public information on-line, via media outlets, and broadcasted over the Government Access Channel, Pueblo 17. The City partners with Pueblo Community College for all broadcasting needs including City Council meetings and special events. The I.T. Department provides program scheduling and content creation such as public service announcements. The City can broadcast in high-definition; however, we must work with the Public Access Channel provider to move to a high-definition channel.

Recommendations:

- Continue to add fresh content to our government access channels including establishing partnerships with outside entities to help obtain or create content by the end of 2021
- Continue partnership with Pueblo Community College on live broadcasting of City Council meetings, content creation for short public services announcements and other programming content
- Develop a mechanism to obtain community feedback on what type of programming would be valuable for them to watch and create the content to meet these needs by end of 2021
- Produce future content in digital and high-definition format. Expand staffing by 1 FTE to assist with writing and production public affair programming including specialized targets by end of 2021
- Increase video production by establishing an internship program with local colleges and universities as well as School District 60 by 2024
- Expand and train contributors by establishing quarterly training sessions by the end of 2020
- Continue to expand and improve the quantity and quality of public information distribution from the City. This is an on-going goal
- Implement live streaming of boards and commission meeting, special events, press conference, etc. as funding allows by the end of 2024
- Implement post-production closed captioning of the Government Access Channel by the end of 2020 or as funding allows

10. I.T. Staffing

The I.T. Department currently consists of 20 regular employees and 6 temporary employees. Local college interns and temporary employees are sometimes utilized for short duration and special projects assisting regular employees.

All areas of I.T. are understaffed and the I.T. department continues to have 1 vacant position which has been unfunded due to higher priority funding needs. The number of customers utilizing technology continues to grow as well as the extent of and dependence on technology.

Most City I.T. employees occasionally cross over into other areas of expertise, some more often than others. One of the FTEs normally supporting Networks and Servers routinely supports the helpdesk activities, which falls under PC/Network Support. This happens often and the many scenarios of crossover are too numerous to go into detail.

I.T. services fall into 5 major areas:

Technical Support

- Helpdesk Support
- PC Hardware installation and repair
- PC Software installation and support
- Networks – Fiber and copper network infrastructure
- File and Application Server support

- Security and Business Continuation – Perimeter protection, exploit protection, event analysis and access monitoring
- Telephone system support – analog, digital and VoIP
- Video Conferencing and Audio/Visual equipment
- Mobile Device management, support and repair
- Wireless Communication management and support
- Printer Support

Application System Support

- 3rd party application software and hardware systems support
- GIS development, application integration and support
- Web site development and operation
- Limited mobile application development
- In-house application development and ongoing enhancements/maintenance
- Imaging system support

Radio Communications

- Mobile and base radio communications installation and repair
- Radio Tower management
- DTR system management, design, and support
- Fiber optic infrastructure management, implementation and support
- Mobile wireless LAN installation and support
- Mobile device installation and management
- Custom mounting and electrical build and implementation

Project Management and other support

- Project identification used to determine the organizational technological needs of the City
- Management of project implementation, quality standards and budget control

Media Development and Public Information

- Responsible for dissemination of public information including press releases, speech preparation, social media engagement for City Departments
- Responsible for video production, i.e. public service announcements, of Government Access Channel programming

10.1. Technical Support

- I.T. has 6 FTE's and 3 temporary employees assigned in this area. This group supports over 700 desktop computers, 275 notebook computers, 100+ servers (physical and virtual), 250 I-devices and numerous miscellaneous peripheral devices and provides Help Desk support.
- There are 3 FTE and 3 temporary employees assigned to desktop support. Desktop and notebook computers require rebuilding or replacement depending on the severity of the failure. Standard supported software is generally imaged to load a new PC or a PC that has had its hard drive contents compromised. Imaging allows I.T. to return PCs to the customers in less time than loading individual software packages and applying subsequent patches and upgrades. It also allows I.T. to maintain software standards that have been set.
- The Help Desk (3 part-time temporary employee) provides first level contact with internal customers experiencing technical issues. Many problems are resolved at this level. Those that cannot be resolved are

referred to technicians via a Work Order. I.T. utilizes an automated work order system to assign technicians and track the progress of the Work Order from entry to completion.

- 1 FTE in this area is responsible for implementing security policies, protecting computers from malicious cyberspace attacks by keeping antivirus and firewalls up-to-date, and actively monitoring unauthorized attempts to access the City's network. Staff is also responsible for setting up authorized access to the City's network from other agencies and internal customers needing remote access to the network. To assist with security policy, a Security Committee has been established, and committee members include power users throughout the City departments.
- 3 FTEs assigned to this area are responsible for expanding and maintaining the electronic network infrastructure, application software and associated servers. This includes managing the design of the fiber optic network as well as back up installation. The servers include those that support the Public Safety system data and software applications, general and application specific shared folders and email. 1 of the FTEs has the responsibility for maintaining the City's O365 environment.

10.2. Application Systems Support

- I.T. has 4.5 FTE's. These FTEs generally specialize in areas of support such in-house database systems development, GIS system development and support, Web services development, and 3rd party application system acquisition and ongoing support.

10.3. Radio Communication Systems

I.T. has 4 FTEs assigned to Radio Communication Systems. These FTEs are responsible for installing and maintaining the City's mobile radios and associated centralized equipment, antennas and towers that are used by Public Safety and Public Works departments. This includes three Digital Trunked Radio sites, with interconnecting microwave systems that are capable of up to 90 days of self-sustained power, and an emergency Police and Fire Dispatch center with eight dispatch positions. The Radio Communication division is also responsible for the installation and maintenance of the City's fiber network infrastructure, installation and supports the City's AVL systems, wireless modems and all in-car devices including the in-car video systems utilized by the police department, and automated alerting system for the Fire department.

As radio communications continues to converge with I.T. network operations it is necessary to expand the networking knowledge of staff in this area.

10.4. Project Management and Other Services

- 2 FTEs assigned to project management for City technology projects

10.5. Media Development and Public Information

- 1 FTE assigned as Public Information Officer for non-public safety departments
- 1.5 FTE assigned to video development and access channel management

10.6. I.T. Administration

- 1 FTE, the Director, is assigned to the overall management of the department
- 1 FTE is acting as interim Assistant I.T. Director as well as fulfilling the role in project management
- 1 temporary employee is assigned as the I.T. Operations Support Specialist in the department

Recommendations:

- Invest in I.T. resources to sustain and improve upon the excellent customer service that is expected from internal customers

- Invest in on-the-job training for all staff in order to meet the growing and future demands of the I.T. department
- Continue to enforce Hardware and Software standards that will allow limited I.T. resources to perform tasks in an efficient and effective manner as possible
- Expand the area of Internet based services to reduce manpower requirements for Public Services than can be offered via the Internet
- Increase staffing by 2 FTEs in the Media Division
- Increase staffing by 2 FTEs in the GIS Division
- Increase staffing by 1 FTE in Network Administration
- Increase staffing by 1 FTE for Application Development
- Increase staffing by 1 FTE in Operations Support
- Fill open unfunded positions as soon as possible

11. Plan Revision

This plan should be reviewed and updated annually. The City's Information Technology Department should coordinate the process of gathering new requirements and proposing new recommendations, based on the input solicited from the user community.