WESTMINSTER
COLORADO

Information Technology Department State of Affairs and Strategic Plan March 2019

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PLAN PURPOSE AND INTRODUCTION

The purpose of the City of Westminster Information Technology Department Strategic Plan is to provide a clear, comprehensive document to effectively communicate the City's technology mission, vision, strategic pillars, priorities, and practices. Furthermore, this plan serves to recognize and demonstrate the connection between the City's Mission Statement, City Council goals and Information Technology strategies.

The Information Technology Department strategic plan identifies eight strategic pillars that provide support for the mission and vision of the department and the City. In various locations throughout this document, these pillars will be included to help the reader understand how specific guiding principles, IT governance practices, current year objectives and standards relate to and support these strategic pillars. And the foundation of the department's success in these strategic pillars and mission clearly lies in recognition and support of the organization core SPIRIT values of Service, Pride, Integrity, Responsibility, Innovation and Teamwork.

The success that the Information Technology Department has achieved since 1985 is closely coupled to the emphasis the department has placed on hiring, training and retaining the highest quality, dedicated technical staff. This plan includes best practices used in hiring and retaining human resources.

Also included in this strategic plan are vital IT governance practices such as technology acquisition and approval process and major system prioritizing.

CITY MISSION, STRATEGIC PLAN AND CITY COUNCIL GOALS

The Information Technology Department Strategic Plan is established with a clear understanding of the City Mission and strategic goals established by the City Council. Each year, City Council conducts an annual strategic planning session to review its vision for the future and update the City's Strategic Plan and supporting objectives to achieve that vision.

The City's Strategic Plan is developed to reinforce long-term planning for both operating (day-to-day operations and services) and capital (long-term investment projects such as road construction, water distribution and sewer maintenance) programs. City Council enlists staff's assistance, via the City department heads, in developing the Strategic Plan. This team approach is critical to success, as it allows City Leadership to better understand City Council's goals and vision for the City. In turn, City Leadership can more successfully plan City projects and budgets to achieve the shared vision. Information Technology Leadership uses the knowledge gained through the City Council strategic planning session to update and align the Information Technology Department strategic plan and objectives to best support City Council vision and goals.

Vision:
Westminster is the next Urban Center of the Colorado Front Range. It is a vibrant inclusive, creative, and well-connected City. People choose Westminster because it is a dynamic community with distinct neighborhoods, quality educational opportunities and a resilient local economy that includes: a spectrum of jobs; diverse, integrated housing; shopping, cultural, entertainment, and restaurant options. It embraces the outdoors and is one of the most sustainable cities in America.

Mission:
Our job is to deliver exceptional value and quality of life through S-P-I-R-I-T (Service, Pride, Integrity, Responsibility, Innovation, Teamwork).

Visionary Leadership, Effective Governance and Proactive Regional Collaboration
The City of Westminster has articulated a clear vision for the future of the community. The vision is implemented through collaborative and transparent decision making. Westminster is proactively engaged with our partners to advance the common interests of the region.

- o Develop communication, management and planning tools that move the City toward its vision while providing excellent government.
- o Collaborate with state agencies, counties, school districts, neighboring cities and other governmental and nongovernmental entities.

Vibrant, Inclusive and Engaged Community

Westminster provides options for an inclusive, demographically diverse citizenry in unique settings with community identity, ownership and sense of place, with easy access to amenities, shopping, employment and diverse integrated housing options. Members of the community are empowered to address community needs and important community issues through active involvement with City cultural, business and nonprofit groups.

- o Advance strategies that demonstrate Westminster is a regional leader in providing affordable/workforce housing.
- o Develop programs and strategies that build a unique sense of community in Westminster.
- o Lead the development of cultural opportunities in Westminster.
- o Identify the distinct neighborhoods of Westminster and help them begin to work together.

Beautiful, Desirable, Safe, and Environmentally Responsible City

Westminster thoughtfully creates special places and settings. The City is an active steward, protecting and enhancing natural resources and environmental assets. The City promotes and fosters safe and healthy communities.

- o Make a Citywide commitment to sustainability.
- o Promote ongoing excellent management and maintenance of the City's parks and open space system.
- o Provide opportunities for residents, visitors and employees to improve their personal wellness – physically, emotionally and intellectually.

Dynamic, Diverse Economy

Westminster is a local government that fosters social, economic, and environmental vitality and cultivates and strengthens a wide array of economic opportunities.

- o Develop an economic development strategy that contributes to City vision attainment and is executed through collaborative work between the City of Westminster, the business community, residents and other partners of Westminster.

<u>Financially Sustainable Government Providing Excellence in City Services</u>
Westminster leads the region in a culture of innovation that exceeds expectations in providing value in all city services – the city shall be known for "the Westy Way."

- o Develop and maintain comprehensive municipal capital infrastructure master plan and financing strategy.
- o Promote the organizational culture of Service, Pride, Integrity, Responsibility, Innovation and Teamwork (SPIRIT).
- o City Manager will develop an annual program of specific department business process improvement reviews.

<u>Ease of Mobility</u>
Westminster pursues multi-modal transportation options to ensure the community is convenient, accessible and connected by local and regional transportation options through planning, collaboration, advocacy and execution. Transportation objectives include walkability, bike friendly, drivability, and mass-transit options.

- o Improve the walkability and bikeability of Westminster.
- o Improve mass-transit options throughout Westminster.

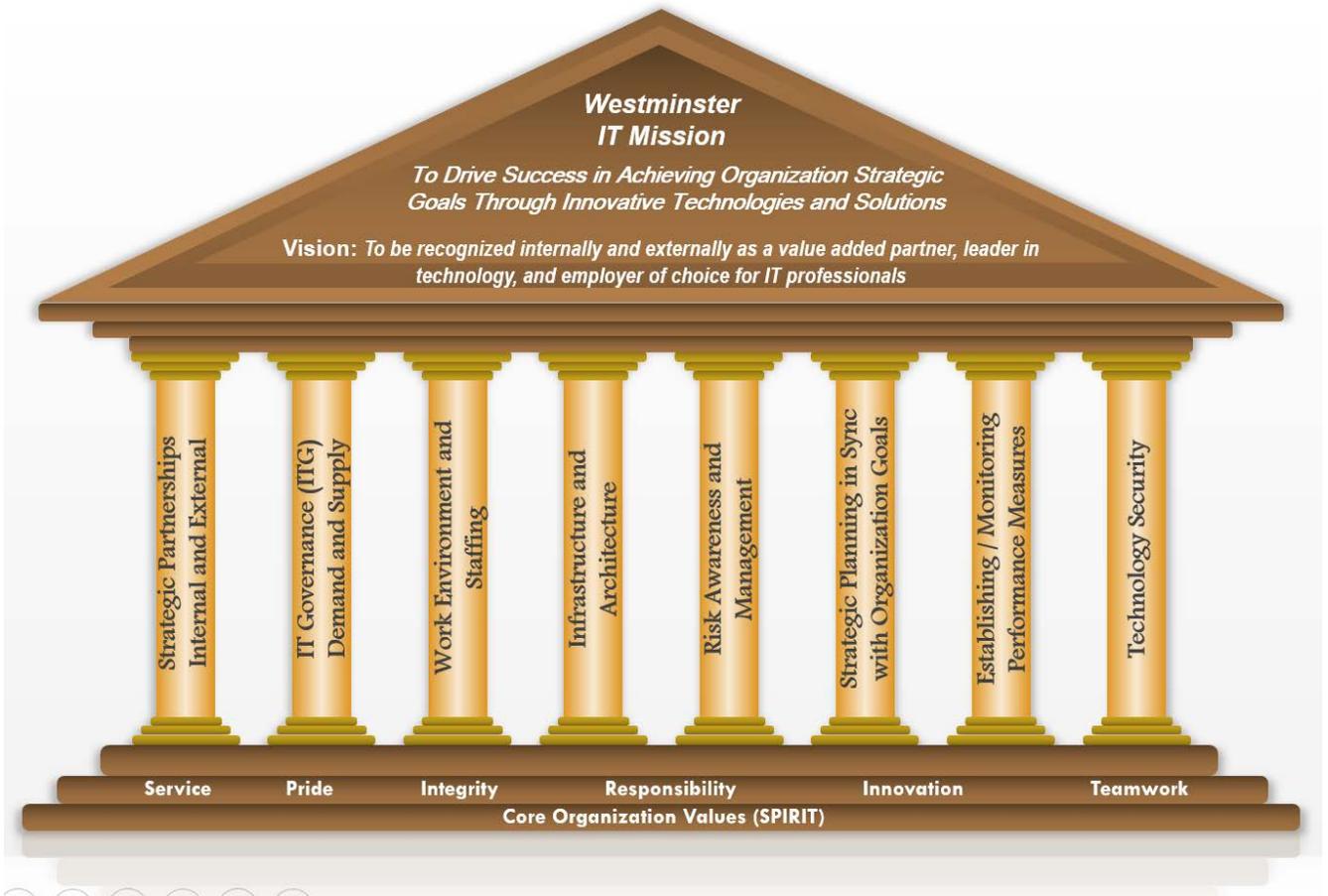**INFORMATION TECHNOLOGY MISSION, VISION, STRATEGIC PILLARS**

In 1998, the City of Westminster recognized that Information Technology was serving an increasingly important role in the efficient and quality delivery of information and services to businesses and citizens. As a result, a change in the organization structure was made to further promote strategic technology planning to support organizational objectives and expanded technology use. Effective January 1999, the Data Processing Division (a division of the Finance Department) was strategically repositioned as the Department of Information Technology reporting to the City Manager. This change successfully achieved a more strategic and balanced use of technology resources throughout all departments within the City and provided opportunity for the IT Director to participate in short and long-range planning with the City's Executive Team. In 2017, the Department revised the mission statement to read

"To Drive Success in Achieving Organizational Strategic Goals through Innovative Technologies and Solutions"

Supporting that mission are eight strategic pillars, including

1) Strategic Partnerships – Internal and External
2) IT Governance – both Demand (ITDG) and Supply (ITSG)
3) Work Environment and Staffing
4) Infrastructure and Architecture
5) Risk Awareness and Management
6) Strategic Planning in Sync with Organizational Goals
7) Establishing and Monitoring Performance Measures
8) Technology Security

The graphic representation below provides the reader with an image of how this strategic plan ties together:

The Westminster IT Mission pillars diagram showing:

Westminster IT Mission
To Drive Success in Achieving Organization Strategic Goals Through Innovative Technologies and Solutions

Vision: To be recognized internally and externally as a value added partner, leader in technology, and employer of choice for IT professionals

Pillars:
- Strategic Partnerships Internal and External
- IT Governance (ITG) Demand and Supply
- Work Environment and Staffing
- Infrastructure and Architecture
- Risk Awareness and Management
- Strategic Planning in Sync with Organization Goals
- Establishing / Monitoring Performance Measures
- Technology Security

Core Organization Values (SPIRIT): Service, Pride, Integrity, Responsibility, Innovation, Teamwork

GUIDING PRINCIPLES

Work Environment and Staffing

- We will achieve success through hiring, mentoring, growing and retaining IT professionals committed to their career and organization

- We will embrace organization core values in our daily work and interactions

- We will provide an environment that promotes innovation and creativity

IT Governance (ITG) Demand and Supply
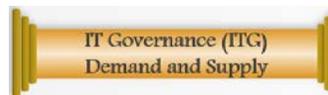
- We will prevent technology obsolescence and reduced organization efficiencies by adhering to a standard hardware and software refresh program

- We will use the IT Executive Steering Committee to approve and prioritize major IT software initiatives when organization demands exceed available resources

- We will maintain a centralized IT support and oversight model to insure efficiency, consistency with technology standards, and integration capabilities between systems

- We will maintain the goal of selecting the best approach to meet new application requirements, including build, buy or cloud

- We will continue to provide clear budget justification to secure approval of funding for technology initiatives

- We will maintain current knowledge and implement best practices in the areas of business management and technology, including software development, systems analysis, project management, database management, network design, technology procurement, and service management

Risk Awareness and Management

- We will evaluate the risk/value relationship of new technology solutions and initiatives in advance of procurement, and identify strategies to mitigate risk prior to implementation

- We will carefully review and negotiate technology and service contracts with the goal of achieving the highest level service, protection for City data, and vendor accountability

Technology Security

- We will implement and maintain best practices and policies to secure City networks, systems and data

- We will pursue third party services and grants to advance cybersecurity initiatives in Westminster

Establishing / Monitoring Performance Measures

- We will provide exceptional customer service and use evaluation and reporting tools to gauge success in achieving performance measures

- We will provide 99.5%+ systems availability for customers during normal business hours

- We will maintain a comprehensive set of performance measures and dashboard to gauge and communicate IT performance in operations, organizational, cybersecurity, financial, and service categories

Strategic Partnerships Internal and External

- We will maintain mutually beneficial relationships with technology service providers

- We will continually assess opportunities to collaborate with state agencies, counties, school districts, neighboring cities and non-government entities in an effort to achieve cost containment or reduction, increase efficiencies and share expertise

- We will serve as a value added partner by providing project management, implementation, system analysis, hardware support and software support services to all departments

Strategic Planning in Sync with Organization Goals

- We will maintain a current IT Department Strategic Plan and update that plan on an annual basis

Infrastructure and Architecture
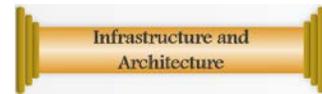
- We will evaluate emerging technologies and continually identify opportunities to enhance delivery of core services, increase organizational efficiencies, decrease cost, and support new City Council priorities

- We will develop and adhere to technology standards

- We will prevent technology obsolescence and reduced organization efficiency by adhering to a standard technology refresh program

- We will adhere to best practices in the design and support of technology infrastructure

- We will build and update technology disaster recovery infrastructure to assure continuation of services in the event of a disaster

CITY OF WESTMINSTER INFORMATION TECHNOLOGY AWARDS AND RECOGNITIONS

The City of Westminster is honored to be recognized by leading state and national organizations for success in planning, selection, deployment and support for innovative technologies used to enhance services and efficiencies within the City. These awards demonstrate progress in achieving the department's vision.

Digital Cities Survey Awards:
The Center for Digital Government conducts a nationwide annual survey of cities to examine how local governments are utilizing digital technology to better serve their citizens and streamline operations. The City of Westminster has placed in the top ten cities in the nation within the population category of 75,000-125,000 for the last 15 out of 16 years. Westminster's ranking for each year are:

2002 – 5th place	2008 – 7th place	2015 – 5th place
2003 – 7th place	2009 – 7th place	2016 – 4th place
2004 – 7th place	2011 – 8th place	2017 – 6th place
2005 – 6th place	2012 – 6th place	**2018 – 1st place**
2006 – 5th place	2013 – 4th place	
2007 – 4th place	2014 – 4th place	

Colorado Information Management Association "2007 IT Infrastructure":
The Colorado Information Management Association (CIMA) conducts an awards program to recognize governmental agencies who have demonstrated significant accomplishments in several categories. In 2007, the City of Westminster was selected as the winner in the IT Infrastructure category, recognizing the City for its proactive efforts in technology risk assessment and security enhancements.

Colorado Information Management Association "2009 IT Team of the Year":
In 2009, the City of Westminster's Information Technology Department was selected as the winner of the "2009 IT Team of the Year" by the Colorado Information Management Association. This award recognized the City for the innovative, low cost and secure strategy the City used to deploy and provide wireless services to employees, visitors, and contractors across 30 City facilities.

International City Managers Association (ICMA):
In 2008, the ICMA highlighted the City of Westminster's Information Technology Department in their national "What Works" publication to share the City's success in IT Customer Service. ICMA reported that 90% of Westminster's IT Department customers reported receiving excellent services, as compared to a national average of 49%. Westminster IT customer satisfaction is measured on a monthly basis through customer surveys. Reasons for the City success include careful IT staff recruitment, monthly surveys; including survey results in employee recognition and appraisals, and reporting of results to City officials were included in the ICMA publication.

Colorado Government Association for Information Technology (CGAIT):
In 2013, the City of Westminster was selected as the winner of the CGAIT 2013 Customer Service Award recognizing the Information Technology Department for the vision and development of an in-house technology forum. This new tool enables employees from across the organization to connect with and learn from one another when technology questions arise.

In 2018, the City was the sole recipient of the CGAIT Excellence Award, presented to the City for the innovative custom designed mobile application created to enhance customer services and efficiencies for all park rangers at the Standley Lake Regional Park.

ESRI Special Achievement Award:
In 2013, the Information Technology, Community Development and Public Works and Utilities Departments were awarded the distinguished Special Achievement in GIS (SAG) Award from ESRI and were recognized for their outstanding work with Geographic Information Systems (GIS) technology. The City stood out from more than 100,000 others during the selection process and illustrates some of the tremendous accomplishments the City has had with GIS over the years. The award focuses on specific successes achieved by using ArcGIS Online when in the field. This allows field crews to gain efficiencies by always being connected to mapping data even when outside of the office.

National Association of Government Websites 2018 Pinnacle Award:
In 2018, the Information Technology, Parks Recreation and Libraries Departments and City Manager's Office were awarded the medium size city top place Pinnacle Award for website redesign from the National Association of Government Web Professionals.

Internal Awards and Recognition:

The Information Technology Department has also been formally recognized by other departments within the City for outstanding commitment to service, teamwork and success of technology projects. Some of these awards and recognitions include:

Website Redevelopment Team
City Council audio broadcast project
Content Management selection and implementation project
Accela Automation Team
Court system implementation project
Computer Disaster Recovery/Business Continuity Team
Unified voice message system implementation project
Electronic Timesheet and Employee/Manager Self Service Implementation Team
Electronic Appraisal Team

ILeads/RMS/Computer Aided Dispatch Upgrade Team
Emergency Response Time Improvement Team
ERP (JD Edwards) System Upgrade and Enhancement Team
Zebra Mussel Team
2009/2010 Budget Team
Intergraph Project Team
GIS Upgrade Team
Fire Station Remodel Team
Westminster Sports Center Renovations Team
2009 Grant Administration Policy Project Team
Wireless Network Planning & Deployment Team
Code Enforcement Automation Process Team
Rerouting of 3200 Commercial Water Accounts
MSC Facility Renovation Project Team
Performance Measures Team
Development & Implementation of NEOGOV Integrated Recruitment Tracking Software
Electronic Pay Stub Team
Backup Replacement Evaluation and Implementation Team
System Wide SCADA Enhancements Project Team
2011/2012 Budget Team
Apply Yourself Recruitment Slide Show Team
Westminster Public Library Online Access Expansion Grant Team
Web Content Management System Technical Evaluation and Implementation Team
Westminster Mall Demolition
IT Service Center / IT Service Request System Team
City of Westminster Centennial Legacy Award Winner – Westminster Website
Full Court Enterprise System Upgrade
2012 Golf Expo Team
Accela Maintenance Management System Upgrade Team
Centralized Phone System Replacement Team
Fire Station 1 Broadband Enhancement Team
WPLin Touch Mobile Application Team
2012 Bank Conversion Team
Ambulance Billing and Collection Team
Disaster Recovery Facility Construction and Relocation Team
Office 2013 Team
Comprehensive Plan Update Team
Payroll Team
Online Subscription Manager Development Team
FD / IT "Connectivity" Team
Intergraph CAD and Mobile Software Upgrade Team
Quality Assurance Team for Emergency Medical Services & Fire Inspections
2013 Business Retention Visit Program Partnership
JDE 9.1 Tools Release Upgrade Team
Remote Time Entry Task Force

COWnet Design Team
Automated Business Licensing Team
Water Plant Wireless Infrastructure Upgrade Project
JDE Training Module Team
Land Development Application Review Team
Denver Golf Expo Team
Website Upgrade Team
COWnet Contributors Team
JDE Experience Team
Partnership between Adams County Fire Rescue Station 12 & Westminster Fire Station 1
2016 Healthcare Task Force
Westminster Station Team
School Emergency Planning Team
The Utility Billing Scramble (Fin)
Electronic W-2 Team
TRAKiT Implementation Team
Golf Expo Team (PRL)
Council Chambers Renovation Project Team
MARS Team is Out of This World
Website Redesign Team (CMO)
Utility Meter Installation Process Review Team (Fin)
JDE CIP Process Improvements Team
Westbury Victims' Assistance Team (Fire)
Water Sewer Rate Proposal Webpage Work (PWU)
eDiscovery Law Enforcement Electronic Filing System (Police)
Citywide Safety Committee (HR)
COW Toastmasters Club (HR)

DEPARTMENT GOALS:

- Provide the technology tools and databases needed to the City's Strategic Plan goal of having a "V*ibrant, Inclusive and Engaged Community*".
- Maintain an effective City web site to provide activity information to members of the community and tools for residents to engage with the City and to support the City Council's strategic plan goal of *"Providing a welcoming and service oriented government for all citizenry*".
- Continue to provide exceptional hardware support services for employees using laptop, desktop and mobile computers through a highly skilled, trained and responsive systems support staff, supporting the City Council goal of "*Financially Sustainable Government Providing Excellence in City Services"*.
- Maintain high availability and security for all computer servers and network resources.
- Continue to implement and execute best practices and tools to prevent Cyber-attacks aimed at City computing resources.

- Continue to evaluate and assess opportunities to leverage new technology to support department goals and organization strategic objectives.
- Provide technology support for continuation of City services during a disaster through a well-planned and tested disaster recovery facility.
- Expand and enhance excellence in City services through the deployment and support of custom and third party software applications, supporting the City Council goal of *Financially Sustainable Government Providing Excellence in City Services"*.
- Maintain and enhance the City-wide network infrastructure to provide secure, fast and reliable connectivity within and between City facilities.
- Implement mobile applications designed to serve employees, citizens, business owners and visitors, supporting the City Council objective's goal of *"Providing Excellence in City Services"*.

INFORMATION TECHNOLOGY DEPARTMENT CUSTOMERS

Until 1996, the Information Technology Department provided services for internal customers only. In March 1996, the City's customer base expanded rapidly as the City unveiled the Westminster City Web site. Businesses and citizens frequently choose and depend on the web site as an alternate avenue to gain access to information and services, as well as to become more involved in their local government.

Information Technology Department internal customers include:

City Council – responsible for serving as the legislative and governing body of the City. City Council appoints the City Manager, City Attorney, and Municipal Judge; adopts laws, ordinances, and resolutions instituting City policy; provides policy direction and guidance through adoption of a strategic plan; holds public meetings on a variety of community issues, meets with groups and businesses, and attends local, county, regional, state and national meetings on issues that have municipal impact.

City Manager's Office – responsible for supporting the Westminster City Council, helping them achieve the City's strategic goals through progressive management, effective communication, and creation and maintenance of a vital local economy. Included in this office are the communications and outreach and City Clerk's office operations.

City Attorney's Office - responsible for the general legal affairs of the City. This office provides legal representation and counsel, and prepares contracts, ordinances, and other legal documents. The office also prosecutes all City Code violations.

Community Development Department – responsible for planning, actively promoting and sustaining an attractive, high quality living and working environment, facilitating appropriate land use decisions, and ensuring that the community is safely built and well maintained.

Economic Development Department – responsible for overseeing all aspects of business recruitment and retention in the City; marketing the City and its assets to potential employers, developers and retailers; working with internal and external staff to oversee and guide major redevelopment and reinvestment projects around the City; developing and implementing strategy related to the provision of workforce and affordable housing; and overseeing the inventory of city-owned developable properties.

Finance Department - responsible for the financial activities of the City, including administration of sales tax and all account functions such as payroll, accounts payable, accounts receivable and financial reporting. The Department also manages the City's debt issuance, investment portfolios and pension plans, procurement process, and utility billing operations.

Fire Department – responsible for timely emergency and response to all hazards and emergency medical calls. The Fire Department strives to ensure the safety of the Fire

Department personnel, citizens, and visitors to the community through utilizing extensive firefighter training and by educating residents, business owners, and visitors on fire safety, health, fire prevention and emergency preparedness.

General Services Department - responsible for providing internal services and serving as a strategic partner with all City Departments in providing municipal court operations, facilities maintenance services and fleet management services for the City.

Human Resources Department - responsible for providing internal and external services and serving as a strategic partner with all City Departments in providing employee recruiting and retention, benefits and compensation analysis, wellness program coordination, volunteer and intern program coordination, risk management and safety, employee development and training, and organizational effectiveness initiatives.

Parks, Recreation and Libraries Department - responsible for providing the physical, social and cultural needs of the community, including park services, library services, Standley Lake operational services, recreation facilities and programs, and design and development of new parks, open space and trails.

Police Department – responsible for enforcing all State laws and Westminster Municipal Ordinances through patrol operations, code enforcement activities, crime investigations and crime prevention. The Department also educates the community about drugs, traffic safety, graffiti and pet ownership.

Public Works and Utilities – responsible for maintaining and enhancing the safety and well-being of the community by providing exceptional water and wastewater service and maintaining the City's extensive network of street infrastructure.

TRENDS IN INFORMATION TECHNOLOGY

The Director of Information Technology and staff monitor trends in the technology field and purchase, evaluate and implement new technologies that have potential to enhance services to internal or external customers or improve organization efficiency. This document does not describe all trends and emerging technologies, but does highlight several key trends that may provide opportunities to improve services and efficiency within the City of Westminster. Reports from Gartner, eRepublic Government Technologies site and publications, technical white papers, technical conferences such as CES, and online reports are just some of the sources the City uses to monitor major trends and advances within the Information Technology field. Some of those trends include:

- Information Technology Department Roles

  The role of Information Technology Departments will likely be changing over the next ten years to what Gartner refers to as Hybrid IT, in which IT acts as: 1) an Advisor; 2) a Service Broker; and 3) a Service Provider. Hybrid IT will change the overall roles and services provided by Information Technology in the following ways:

  Advisor: As a user facing advisor, IT will help facilitate business decisions, provide front end mobile app stores and services, deliver enterprise mobile apps and cloud services, provide internal portals and service catalogs and more.

  Broker: As service facing broker, IT will emphasize its role as a broker and integrator. The broker role will assess private cloud services, public cloud services and traditional services to determine best source of services to meet future needs of the organization.

  Provider: As a provider of service, IT may offer private cloud services or traditional services including data centers and custom on premise software applications.

- The Device Mesh

  Devices such as cars, cameras, appliances and more are connected in an expanding set of endpoints people use to access applications and information, or interact with people, social communities, governments and businesses. As the device mesh evolves, Gartner expects connection models to expand and greater cooperative interaction between devices to emerge. A significant development in wearables and augmented reality, especially virtual reality will potentially provide new opportunities for operational efficiencies and citizen engagement in future years.

- Augmented Reality

  Augmented reality (AR) is a live direct or indirect view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. Example of augmented reality are Google Glasses, Microsoft HoloLens or Smart Hard Hats.

- Advanced Machine Learning

  In advanced machine learning, deep neural nets (DNNs) move beyond classic computing and information management to create systems that can autonomously learn to perceive the world, on their own. The explosion of data sources and complexity of information makes manual classification and analysis infeasible and uneconomic. DNNs automate these tasks and make it possible to address key challenges related to the information of everything trend.

  DNNs (an advanced form of machine learning particularly applicable to large, complex datasets) is what makes smart machines appear "intelligent." DNNs enable hardware or software-based machines to learn for themselves all the features in their environment, from the finest details to broad sweeping abstract classes of content. This area is evolving quickly, and in the future the City will assess how they can apply these technologies to meet City Council objectives, expand services and contain costs of operations and service delivery.

- Autonomous Agents and Things

  Machine learning gives rise to a spectrum of smart machine implementations — including robots, autonomous vehicles, virtual personal assistants (VPAs) and smart advisors — that act in an autonomous (or at least semiautonomous) manner. While advances in physical smart machines such as robots get a great deal of attention, the software-based smart machines have a more near-term and broader impact. Virtual personal assistants (VPAs) such as Google Now, Microsoft's Cortana, Amazon Echo, and Apple's Siri are becoming smarter and are precursors to autonomous agents. The emerging notion of assistance feeds into the ambient user experience in which an autonomous agent becomes the main user interface. Instead of interacting with menus, forms and buttons on a smartphone, the user speaks to an app, which is really an intelligent agent.

  The Information Technology Department will monitor advances in autonomous agents and things over the next 5-10 years to look for ways in which such technology might contribute to cost containment, augment human activity and free people from work that today only people can do.

- Cloud Computing

  As mobile computing meets cloud computing, centrally coordinated applications that can be delivered to any device will continue to grow. Apps that can use intelligence and storage effectively will see lower bandwidth cost. Cloud computing models fall into three categories as listed below. The City of Westminster is using cloud computing today for rapid application deployment and cost containment, and anticipates significant growth in cloud computing to meet City Council and Department technology needs and objectives over the next five years.

  Public Cloud: A public cloud computing platform is one in which a service provider makes resources such as applications, storage and servers available to the general public or businesses over the Internet. Cloud computing benefits include easy and inexpensive setup and scalability to address future needs, and a model that reduces wasted resources since computing expenses are tied to service utilization.

  Public Cloud computing includes:
    o **SaaS (Software as a Service)** delivers a single application through the browser to thousands of customers using a multitenant architecture. On the City side, it means no upfront investment in servers or software licensing; on the provider side, with just one app to maintain, costs for some apps may be lower compared to City hosting.
    o **Utility computing** provides virtual data centers that IT can access on demand. With the ability to provision servers in a matter of minutes, and the ability to distribute resources to workloads, this trend may potentially replace parts of the existing Westminster datacenter over the next 5 years.
    o **Web services** in the cloud offer interfaces that enable developers to exploit functionality over the Internet, rather than delivering full-blown applications, such as APIs offered by Google Maps, ADP payroll processing, the U.S. Postal Service, Bloomberg and even conventional credit card processing services.
    o **Platform as a service** – In the future, the City may build custom applications that run on the provider's infrastructure and are delivered to City employees via the Internet from the provider's servers.
    o **MSP (Managed Service Providers)** such as a virus and spam scanning service for e-mail (Postini). Westminster uses managed service providers to a limited extent today.

  Private Cloud: A cloud computing environment that is implemented within the corporate firewall under the control of the IT Department. Private cloud is designed to offer some of the same features and benefits of the public cloud systems, but can benefit organizations that desire to maintain full control of security, accessibility, and regulatory compliance.

Hybrid Cloud: A hybrid cloud is a cloud computing environment in which an organization provides and manages some resources in-house and has others provided externally. For example, an organization might use a public cloud service, such as Amazon Simple Storage Service (Amazon S3) for archived data but continue to maintain in-house storage for operational customer data.

The hybrid approach allows a business to take advantage of the scalability and cost-effectiveness that a public cloud computing environment offers without exposing mission-critical applications and data to third-party vulnerabilities.

- Mobile Technology and Applications

  As mobile devices continue to proliferate, Gartner predicts an increased emphasis on serving the needs of the mobile user in diverse contexts and environments, as opposed to focusing on devices alone. In 2014, the Information Technology Department created a next generation mobile strategy to identify needs, prioritize, define integration requirements and formulate a comprehensive approach for City-wide mobile application development, deployment, management, security and support. This plan established a foundation on which the City can strategically pursue City-wide efforts to deploy mobile technology to meet City Council and departmental goals. Funding for a 1.0 FTE Mobile Software Engineer, a 1.0 FTE Technical Support Specialist and $190,000 in capital funds for hardware and software were approved as part of the 2015 and 2016 Information Technology budget. Significant progress was achieved in meeting the 2017 and 2018 goals and objectives defined in the Mobile Strategic Plan, published as a separate document.

- Application Virtualization and System Management Appliances

  Application virtualization includes software technologies that improve portability, manageability and compatibility of applications by encapsulating them from the underlying operating system on which they are executed. A fully virtualized application is not installed in the traditional sense although it is still executed as if it were. While not new technologies, recent and developing advances in application virtualization and system management appliances may help the City to streamline deployment and management while reducing support costs associated with the more than 1,000 computers used for City operations.

- Software Defined Networks

  A software defined network provides a new way to operate networks, in which control of the networks moves into an OS. It moves control from individual devices to a central controller and allows configuration of the network from one place. The City will assess software defined networks in future years as network upgrades are scheduled.

- Internet of "Things"

   The Internet of Things (IoT) is a scenario in which objects, animals or people are provided with unique identifiers and the ability to automatically transfer data over a network without requiring human-to-human or human-to-computer interaction. IoT has evolved from the convergence of wireless technologies, micro-electromechanical systems (MEMS) and the Internet.

   A thing, in the Internet of Things, can be a person with a heart monitor implant, a farm animal with a biochip transponder, an automobile that has built-in sensors to alert the driver when tire pressure is low -- or any other natural or man-made object that can be assigned an IP address and provided with the ability to transfer data over a network. So far, the Internet of Things has been most closely associated with machine-to-machine (M2M) communication in manufacturing and power, oil and gas utilities. Products built with M2M communication capabilities are often referred to as being smart.   According to Gartner, there will be nearly 26 billion devices on the internet of things by 2020.

   The combination of data streams and services created by digitizing everything creates four basic usage models — manage, monetize, operate and extend. These four basic models can be applied to any of the four "Internets." Enterprises should not limit themselves to thinking that only the Internet of Things (IoT) (assets and machines) has the potential to leverage these four models. For example, the pay-per-use model can be applied to assets (such as industrial equipment), services (such as pay-as-you-drive insurance), people (such as movers), places (such as parking spots) and systems (such as cloud services). Enterprises from all industries can leverage these four models. IoT opportunities will be assessed and leveraged as appropriate to continue to advance services and efficiencies within the City organization.

- IT Demands

   Gartner research projects that enterprises will see server workload demand increases of 10%, network bandwidth demand increases of 35%, and storage capacity requirements will grow by 50%. The City of Westminster anticipates similar increases. The Information Technology Department is continuing to evaluate options and technologies to optimize capacity through virtualization and cloud services.

- 3D Printing/Copying

   Additive manufacturing or 3D printing is a process of making three dimensional solid objects from a digital model. 3D printing is achieved using additive processes, where an object is created by laying down successive layers of material. 3D printing is considered distinct from traditional machining techniques (subtractive processes)

which mostly rely on the removal of material by drilling, cutting etc. Advances in 3D printing have already enabled 3D printing to use a wide range of materials, including advanced nickel alloys, carbon fiber, glass, conductive ink, electronics, pharmaceuticals and biological materials. These innovations are driving user demand, as the practical applications for 3D printers expand to more sectors, including aerospace, medical, automotive, energy and the military. The growing range of 3D-printable materials will drive a compound annual growth rate of 64.1 percent for enterprise 3D-printer shipments through 2019.

The technology is used in the fields of jewelry, footwear, industrial design, architecture, engineering and construction (AEC), automotive, aerospace, dental and medical industries, education, geographic information systems, civil engineering, and many others.

3D printing will reach a tipping point over the next three years as the market for relatively low-cost 3D printing devices continues to grow rapidly and industrial use expands significantly. New industrial, biomedical and consumer applications will continue to demonstrate that 3D printing is a real, viable and cost-effective means to reduce costs through improved designs, streamlined prototyping and short-run manufacturing

In 2014, the Information Technology Department purchased a 3D printer to begin assessing the potential use and benefit for the City. As 3D printing prices decline and capabilities expand, more applications for the City may become feasible.

- 5G Wireless Network

  5G is the next generation of wireless technology. It will provide a more reliable, faster connection and about four times the speed of current 4G technology by leveraging a higher density of smaller towers. This zero-lag connection will be key to connecting autonomous cars, virtual reality, smart cities, and has the possibility to replace traditional internet service providers with wireless connectivity.

- Data Analytics

  An overflow of data exists within enterprise information systems today. Gartner, one of the leading research and analysis firms in technology, emphasizes that analytics must be infused in every role, business process, decision and action. Based on Gartner's 2018 survey from their Chief Data Officer, "Poor Data Literacy" is the second biggest internal roadblock to success by respondents.

  Data Driven Decision Management has become a buzzword in the industry for an approach to decision making based on verifiable data. A study from the MIT Center for Digital Business found that organizations driven most by data-based decision making had 4% higher productivity rates resulting in 6% higher profits.

This approach requires a standard comprehensive framework for data gathering and analytics.

To address the challenge of data overflow and the need for improved analytics, the Information Technology Department led the City in a search for an enterprise data analytics solution. This search led to the selection of the City's first data warehouse solution focused on financial data, and the use of Microsoft Power BI as the City's standard analytics tool. This tool will be implemented in 2019 to support data-based decision making across the organization.

PERFORMANCE MEASURES

The Information Technology Department established performance measures in 1989, and has made minor updates and additions to the measures over the years. In 2018, the department developed a more comprehensive set of performance measures and created a performance metrics dashboard to help the department track and communicate performance in the areas of organizational, financial, security, operational, and services. Those performance measures include:

Organizational
- Voluntary Attrition Rate
- Ratio of IT Staff per 100 City employees

Financial
- Cost of IT service delivery per employee (IT operating budget/employees)
- Average cost of IT service per end user supported device (IT operating budget/devices)
- IT operating budget as a percent of the total City operating budget
- YTD Dollars Saved Due to New and Upgraded Technology
- YTD FTE Saved Due to New and Upgraded Technology
- Number of IT staff added by year

Security
- YTD Intrusion Attempts Blocked at the Perimeter
- YTD security incidents
- Prior Month Count of Potential Malware Blocked On Devices
- YTD Percent of Employees Who Have Completed Cyber Security Training
- YTD Cybersecurity Training Completed

Operational
- YTD Core network service availability
- Service Requests created by month
- Service Requests closed by month
- Customer satisfaction survey results (more information below)
- YTD completed and scheduled workstation replacement

The online performance metrics dashboard can be viewed at https://itscreports.cityofwestminster.us/. Previously tracked performance measures are included and described below.

Services

In 1989, the Information Technology Department implemented an ongoing service evaluation system to provide all internal IT customers with the ability to provide specific project-related feedback on the quality of services received from department staff. This evaluation system has evolved to: 1) encourage customers to provide formal feedback on services received; 2) promote the guiding principle of exceptional customer service; 3) identify opportunities for continued improvement of IT delivered services by meeting with customers when service levels are rated average or below and; 4) to monitor trends in service levels. The Information Technology Department has enhanced the feedback process on several occasions and now uses an electronic form to collect and maintain user evaluations. Evaluations from customers are recorded and monthly reports are run to determine if customer service standards are met or exceeded.

Customers rate the department, after completion of service requests, on a scale of 1-5 with 1 representing POOR and 5 representing EXCELLENT in the categories of Technical Knowledge, Communication, Cooperation, Responsiveness and Overall Satisfaction with services. The department typically achieves ratings exceeding 4.6 overall in all categories. These high ratings are accomplished through IT staff's commitment to build personal relationships and to provide service in a timely, professional fashion. Follow-up with customers after completion of projects or resolution of problems is also a key component of the outstanding service provided by Information Technology. Individual and overall customer service evaluations will continue to be reviewed and monitored to ensure that the minimal performance standards of 4.1 are exceeded.

While the majority of customer ratings are excellent, the department occasionally receives ratings that are fair or poor. IT uses these opportunities to meet with customers to evaluate and improve service strategies and processes. These meetings were conducted on several occasions during 2016. This process has helped the department increase the overall ratings as shown in the historical trend graph below.

Relationship to Westminster Strategic Goals/Objectives:
o *Financially Sustainable Government Providing Excellence in City Services*

The performance measure is crucial to those employees who depend on such exceptional technical services to successfully accomplish City strategic goals and objectives.

GOAL – To provide exceptional internal customer services to those employees served by the Information Technology Department
- Supports City Council Objectives: Financially Sustainable Government Providing Excellence in City Services
- Quantitative Measure: Ongoing customer survey ratings in the categories of technical knowledge, communications, cooperation, responsiveness, and overall satisfaction with services
- How will IT use the data: To monitor customer service trends by individual/division/department, allocate staff resources, determine training needs, staff recognition, address employee performance deficiencies, performance appraisals, budget requests for new staff or tools, etc.

Historical Trend Data
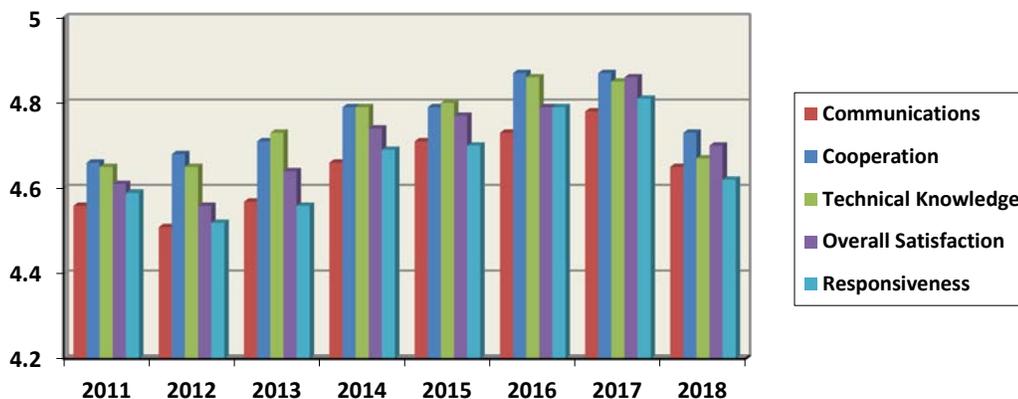
SYSTEM AVAILABILITY PERFORMANCE MEASURE

The Information Technology Department supports numerous computer servers hosting applications for all City employees as well as external customers. The availability of networks and servers is crucial to these customers in accomplishing their goals and is a high priority for the Information Technology Department. The department has implemented several policies and procedures to help ensure maximum system availability for its customers. Performance standards measuring system availability were established in 1992 and continue to be monitored and reported on a quarterly basis. Developing, monitoring and reporting of system availability statistical data has been key to maintaining a focus on developing and supporting procedures to minimize down time.

System availability performance measure standards are as follows:

- Telephone and voice mail system availability – 99% uptime

- Windows based systems (Police/Fire Computer Aided Dispatch, Utility Billing, Sales Tax administration and collection, Recreation Point of Sale and Registration, Enterprise Resource Planning (ERP), Geographic Information (GIS), Office Automation, Finance) - 99%
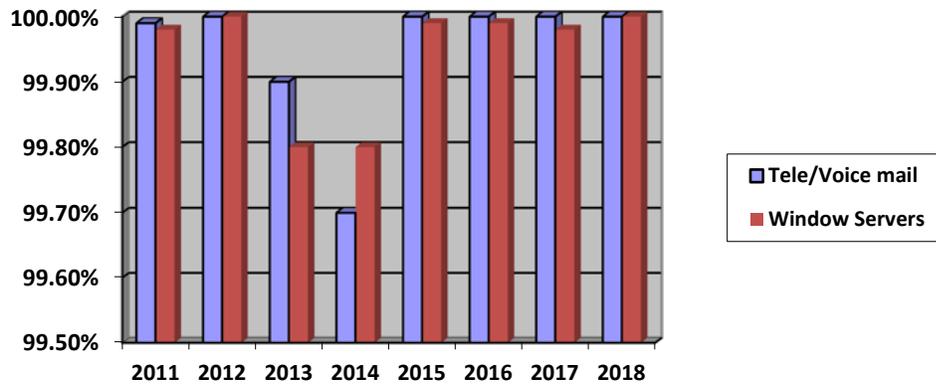
The Information Technology Department always exceeds these performance standards and typically achieves system availability between 99.1% – 99.9%.

<u>Relationship to Westminster Strategic Goals/Objectives</u>:
  o *Financially Sustainable Government Providing Excellence in City Services*

Through an ongoing commitment to high availability standards for all systems, including Public Safety/Computer Aided Dispatch systems, the City is better positioned to provide excellence in City services.

When computer and phone systems are not available, employee productivity suffers and costs to provide services increase. Additionally, the ability to collect, record and track City revenues from Sales Tax and Utilities is difficult without availability of computer systems.

Provide exceptional internal customer services to those employees served by the Information Technology Department
- Supports City Council Objectives: Financially Sustainable Government Providing Excellence in City Services
- Quantitative Measure: Ongoing customer survey ratings in the categories of technical knowledge, communications, cooperation, responsiveness, and overall satisfaction with services
- How will IT use the data: To monitor customer service trends by individual/division/department, allocate staff resources, determine training needs, staff recognition, address employee performance deficiencies, performance appraisals, budget requests for new staff or tools, etc.

TECHNOLOGY STANDARDS

Technology standards are critical in order for the City to achieve high productivity in the use of technology and for the Information Technology Department to provide a high level of customer service with a reasonable level of technical support staff. The IT Department implemented technology standards in 1986 and updates those standards annually to adjust for new technologies, needs and strategies. Deviation from standards may be approved by the Information Technology Department to meet a selected vendor requirement or when a department's need clearly demonstrates that conformance to technology standards will negatively impact their goals. Policies and technology purchase approval processes have been established to ensure compliance with standards. Attachment A details the current year architecture, standards and security in the areas of server hardware, operating system software, database software, office productivity software and network hardware.

INFORMATION TECHNOLOGY DEPARTMENT STRUCTURE AND SERVICES

The Information Technology Department is comprised of two divisions and two functional areas responsible for support of City technology and IT services. Attachment C provides more specific detail on current systems supported and the scope of division and functional area responsibilities. The divisions and functional areas include:

Software & Web Engineering Team

The Software & Web Engineering Team (SWET) provides technology solutions to customers within the City of Westminster to enhance their performance and productivity. Activities range from the simple task of directing an employee to appropriate tools, all the way through researching, developing, implementing and maintaining major applications. The Team is prepared with the technical expertise and tools to provide technological assistance to give Westminster an edge in delivering exceptional services to its citizens.

This Team works specifically on Web development (Internet and Intranet (COWnet)), major system applications (Utility Maintenance Management, Land Management, Sales Tax, JDE EnterpriseOne ERP, Utility Billing, Police/Fire CAD, GIS, Police and Fire Records Management, Court Systems, Mobile apps), and many standalone databases. The Team also develops interfaces to enable data sharing between applications, provide single data entry points to reduce errors and save staff time. The Internet-based applications, developed by this Team, focus on empowering internal and external customers to complete transactions independently without employee interaction. The power of the Internet and the development

of online solutions provide customers with the ability to access information and conduct business with the city 24 hours a day, 365 days a year.

Systems Management Team

The Systems Management Team is responsible for the administration, security and data integrity of centralized Windows servers. These servers are home to applications that support the City's Emergency Services, Municipal Court, ERP, Document Management, Utilities, Library, Parks and Recreation, Community Development, Office Automation, Internet, Intranet (COWnet) and Geographic Information Systems. This Team also provides installation, configuration and troubleshooting services for all desktops, laptops and mobile devices at more than 40 City facilities. Furthermore, this Team provides hardware, software and consulting services for all departments on existing technologies and provides strategic direction for the acquisition and use of new technologies. This Team also operates a Service Center that provides troubleshooting services to departments for the efficient utilization of computerized systems.

As part of the Systems Management Team, the ***Telecommunications / Networking Team*** is responsible for managing all City-owned and leased voice and data communications equipment and networks within and between more than 40 City locations. This Team handles maintenance, upgrades, configuration and support of data communications and telephone hardware and software. Network monitoring and security, capacity planning and network expansion, including new City fiber networks, all fall under this Team's responsibilities.

IT Services Team

The IT Services Team is responsible for professional services related to technology throughout all departments. This team oversees technology budgeting (operational and CIP) and procurement, review of technology documents including contracts, council agenda items, RFPs, state and federal legislation, and other documents related to the City's technology infrastructure.

The team is also responsible for developing and maintaining relationships with all departments, understanding their initiatives as it relates to technology needs, offering IT services where needed, and tracking major technology projects through to successful completion. Some of the services provided specifically by this team are project management, business analysis, and process improvement facilitation. These services are also used internally in the Information Technology Department to create an atmosphere of innovation and continuous improvement.

The IT Services Team actively looks for ways to promote and validate the City's information technology accomplishments outside the city through coordinating surveys and awards submittals and using other techniques for communicating those accomplishments to the public.

HUMAN RESOURCES FOR INFORMATION TECHNOLOGY

Work Environment and Staffing

Successful technology staff recruitment, selection, training and retention are vital to advance the use of technology and achieve long-range strategic plans within the City of Westminster.

Recruitment of Technology Staff – The City of Westminster uses a recruitment and selection process for technology staff that includes application screening, comprehensive job-specific testing, experience verification and situational interview process that assist management in selecting the most qualified, best fit candidate for technology positions. Past employer references and full criminal background checks are completed and considered prior to extending an offer for a technical position. Newly hired technology staff is given specific 30, 60 and 90-day objectives to provide employee direction and serves as an assessment tool for management to determine additional training needs.

Internships – In an effort to maintain a full complement of highly skilled staff, in 2012 the Information Technology Department initiated an Internship program which provides opportunities for three year paid internships in the area of software development/support and desktop/systems support. The purpose of this program is threefold; 1) to enhance Information Technology operational effectiveness by offloading less complex technical tasks from System Administrators and Software Engineers; 2) to provide individuals possessing the right education and aptitude with an opportunity to grow and succeed in the field of information technology; and 3) to cultivate future permanent employees for potential Westminster Software Engineer and Systems Administrator positions. To date, the highly successful program has resulted in promotion and permanent placement of four Interns within the Westminster Information Technology Department.

Training – Technology training helps employees to maintain and increase productivity and serves as a motivator and retention tool for those who strongly desire to advance their knowledge and skills. To the extent possible, on-line training provides a means to maximize training opportunities and reduce the expense associated with training. Full-time employees are required, at a minimum, to complete 10 hours of City general training and 30 hours of job-specific technical training per calendar year. Part-time employees complete a prorated amount of training. Furthermore, the Information Technology Department provides additional IT staff training and educational opportunities through technical conferences, job related college education reimbursement and technical certifications. Significant annual funding for technical training, conferences and certifications is included as an important part of the budget.

Retention – Low staff turnover reduces training expense, helps retain organization specific knowledge and helps the Information Technology Department maintain a high level of productivity and output. The Information Technology Department provides an environment that promotes competitive wages and benefits, cross-training opportunities, professional growth, empowerment, recognition, work-life balance, teamwork, and special staff events. The department has strived for and achieved a non-retirement annual turnover rate of less than 5% per year for the last 33 years. Voluntary attrition is tracked as one of the IT Department's performance measures.

A five-year technology staff review is conducted annually to determine staffing levels required to maintain support for current systems and to support future growth and systems. More information may be viewed in Attachment B. Current organization staffing and structure is shown in Attachment D.

SYSTEM SECURITY

Increased reliance on computer technology to support mission critical services, along with an escalating risk of computer infiltration and corruption by outside individuals, has necessitated a heightened focus on securing computer resources. A broad, multi-facility network and Internet connectivity have amplified security risk. The Information Technology Department has been proactive in implementing multiple layers of protection for IT supported technologies. Without a comprehensive security plan and industry best practices in place, even the best systems can be compromised.

All City servers, located at City Hall, are physically secured in an environmentally controlled fire-suppression equipped computer room with controlled access. Access is limited to IT staff and a limited number of other employees who require access to the room to perform their jobs. Individual access cards are assigned and access date and time is recorded for each access. Video surveillance and environmental controls are also in place for protection.

Multiple security tools, practices and procedures have been implemented during the last several years to protect the systems against unauthorized access and viruses. Some of these include:

Security Patches – Security patches for operating systems, applications and databases are reviewed, tested and installed on an ongoing and timely basis.

Third Party Patch Management – In 2011, the City purchased LANDesk Management Suite to help automate patch management for third party applications such as Adobe, Java, etc.

Security Policies - Complete user and technical security policies are reviewed, updated and distributed on an annual basis.

Application Whitelist - In 2014, the City implemented the practice of whitelisting installed applications. When new applications are requested, they must be evaluated and whitelisted prior to installation. This prevents unknown dangerous applications, especially malware, trojans and crypto applications from being inadvertently installed.

Principle of Least Privileged (POLP) – The City strives for best practices in the area of privileges and permissions. Users and technology staff are granted the minimal access rights needed to get their jobs done efficiently.

Cyber Security - Information Technology staff regularly reviews the US-CERT, SANS, Wired Threat Level, Dark Reading, Dell SecureWorks, Internet Storm Center web sites and other resources to maintain current knowledge of cyber security alerts and product

vulnerabilities. This information is used to fortify City systems against threats. In 2019, all existing cybersecurity policies are being updated and expanded to comply with the National Standards and Technology (NIST) Cybersecurity Framework.

Firewalls - The City uses six firewalls to provide enterprise-class integrated network security services and to establish multi-layered defense for all City computer servers. The main firewall is placed between the internal network and the Internet. A second firewall is in place to secure a data line that allows the Police Department to access the Colorado Bureau of Investigations. The main firewall interacts with content filtering software. In 2009, a new firewall was installed to separate the City Enterprise Network from the SCADA network, which supports critical utilities infrastructure. This firewall prevents PC's and network devices on the SCADA network from connecting to the internet. This security enhancement helps to reduce the risk of unauthorized access and control of the SCADA system.

Internet Content Filtering – The City uses an integrated comprehensive content filtering system to enhance security and support appropriate Internet use policies. The master database of restricted web sites is automatically updated daily.

Intrusion Prevention System - A feature-rich intrusion detection system is used to detect inappropriate, incorrect or anomalous external activity or internal misuse. The system is necessary to detect and stop potential intruders and to eliminate the exploit from use by future intruders.

Telephone System - All telephone systems are housed in locked rooms within each City facility and all maintenance ports are physically disconnected from the outside network. All maintenance is performed on site and access to outside trunks is restricted from callers outside of the system.

Virus Protection and Detection - The Information Technology Department has multiple levels of virus protection for internal systems. Electronic mail is initially screened and filtered for viruses through an outside service. Second, it is scanned through an anti-virus, malware and content filtering utility when it enters the City's gateway. When the email is routed from the email gateway to the Microsoft Exchange Server mailboxes, it is again scanned with anti-virus and malware detection software. At each workstation, locally installed anti-virus software scans local files and removable media for viruses. Virus definition files are automatically updated continuously on the server and workstations. The City also deploys file and web reputation cloud services to enhance protection and greatly reduce the time required to protect city computers against new virus threats.

Online Transaction Security for Citizens and Businesses – The City subscribes to Verisign's service to guarantee on-line customers that the website legitimately runs under the auspices of the City of Westminster, and that all information sent to the site under an SSL session is encrypted, protecting against disclosure to third parties.

Wireless Data Encryption - All wireless networks are authorized and installed by Information Technology staff to ensure that the most recent and secure wireless network encryption standards are in place. AES, WPA2 and/or 802.1x for data encryption are required on wireless installations.

802.1x Network Security (wired and wireless) - Using this protocol we are able to automatically determine if a device belongs to the City and regardless of what wall-jack it plugs into it will be granted full access to the inside network. Vendors and other foreign hosts can also plug into any wall-jack and gain Internet access without being allowed to the sensitive inside network that is for City employees only.

Virtual Local Area Networks - VLANs are used to increase network performance, improve manageability, ease network tuning and increase security.

Network Virtualization - The City implemented virtual networks to allow logical isolated network segments the ability to share the same physical infrastructure. Each segment operates independently and is logically separate from the other segments.

VRF Virtual routing and forwarding - In 2014, the City implemented VRF in addition to network virtualization which creates multiple logical Layer 3 routing and forwarding instances (route tables) that can function on the same physical router. Essentially, VRF is another way of making a single physical router appear and perform as multiple virtual routers. In much the same way VMWare virtualized the server environment, VRF is used to virtualize the network infrastructure.

Password Controls - City employee's access to the various software packages is controlled by the use of passwords and specific login menus that provide access only to the applications and services an employee is authorized to use. Access is controlled and audited though a change management tool.

Ongoing Security Reviews – Using tools such as Nessus and Microsoft's Baseline Security Analyzer, the City conducts ongoing internal and external security reviews to identify and correct any issues that may result in a security breach.

Annual Comprehensive Security Assessment – The City secures the expertise of an outside security firm bi-annually to assist in conducting internal and external system exploitation testing and to assist the City with fine-tuning security policies and fortifying systems.

Social Engineering Training and Annual Awareness Exercise – The City conducts annual social engineering training and awareness exercises to reduce the risk of successful social engineering attacks. In 2014, the City purchased and has since updated a computer security training program from SANS and required all City staff to complete 4 modules, including social engineering, email and message security, password, data security, insider threats, physical security, mobile device security and several others. In 2019, the IT Department will be evaluating and purchasing a more comprehensive training program for all employees.

RSA Two Factor Authentication – RSA two factor authentication is deployed for all IT staff members to eliminate the risk of compromised administrator passwords.

Windows Security on PCs – Windows security features are used to prevent non-administration staff from installing new programs on desktop computers.

Local and Remote Access – Access control is established and maintained by the Information Technology Department. Remote access is provided only through secured, encrypted sessions, using one-time passwords to eliminate the potential risks associated with access by computers with Trojan keystroke loggers.

Email Spam Filtering – All email is screened for spam and viruses prior to delivery to the City network. Questionable mail is quarantined by the service.

Protection of Mobile Data – All laptop computers are deployed with full disk encryption to protect data from unauthorized access.

Automated Email Protection – The City has implemented an industry leading tool to enforce best practices in email content security. This tool provides for outbound content compliance, stopping viruses and other malware and ensuring that all inbound, outbound and internal email traffic complies with policy and external regulations.

Automated Email Archiving – In 2010, the City implemented a cloud based email archiving service. This service provides email archiving for inbound and outbound email as well as internal email for a retention period of three years.

Change Management – All changes to the domain and email environment are proactively tracked, audited and real-time alerts of configuration changes are sent to key staff.

Disaster Recovery/Business Continuity – The City has a dedicated warm facility for disaster recovery. Critical applications and virtual servers are replicated to this facility on a daily basis.

As dependence on technology for service delivery and internal operations has expanded, so has the need for a comprehensive disaster recovery/business continuity plan. Recovery plans are fully documented and updated each year. Comprehensive testing is conducted annually. In 2003, uninterrupted power supplies, network hardware and servers were set up at a City-owned disaster recovery/business continuity site to provide for rapid recovery following a disaster or damage to the computer facility and equipment at City Hall. In 2007, the disaster recovery equipment and servers were relocated to a safer and more appropriate location providing the physical space, environmental controls and security needed for the future. Additional internet access is also provided to the disaster recovery data facility to provide redundant access for basic inbound and outbound web traffic. In 2012, the City constructed a new disaster recovery site at another City facility to expand data center size, enhance physical security, and provide for emergency generator power. The high speed connection

between the City's data center and the disaster recovery data center allow for rapid recovery of critical system in the event of a disaster. Virtual copies of critical servers are copied to the disaster recovery data center and can be powered on to quickly restore access to systems. Applications available for rapid recovery at the new disaster recovery location include Sales Tax System, Utility Billing, Accela maintenance management, JDE ERP and Courts JSI System. In 2016, a 40 Mbps broadband connection was installed to the disaster recovery data center, which provides both expanded capacity for on-going inbound and outbound Internet traffic through load balancing with existing services, as well as adequate and ongoing Internet connectivity in the event that production computer operations need to be moved to the disaster recovery location.

## TECHNOLOGY ACQUISITION PROCESS
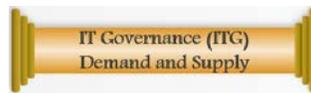
In its objective to develop and maintain a highly robust, sustainable, and reliable technology infrastructure capable of meeting current and future needs, the City has established a governance process in which the Information Technology Department is actively engaged in all technology projects throughout departments. In 2002, a technology budget form was created to be used by departments considering new technology projects. In 2008, that form was combined with the general capital improvement project budget request form which is used in all budget preparation packets. The form requires departments, in collaboration with the Information Technology Department, to consider and document several important aspects of a proposed technical project including: project scope, business need/justification for the project, project team members, on-going user and technical staff support requirements, training requirements and cost.

In order to assist departments in learning how technology can support their goals, the Information Technology Department offers services in needs assessment, process mapping, and business analysis. IT also offers project management services to assist departments in planning and deploying new technology projects. The IT Services Team was established in 2017 to work with departments assessing technology opportunities and educating those departments on how IT services can assist in meeting their needs.

To effectively address the growth in City technology procurement, City Council approved a new position of Technology Procurement Specialist for the IT Department. As a result, the IT Department has been able to establish a more streamlined technology acquisition process, and has integrated that process into the department's service request system.

NEW SYSTEMS STRATEGIC IMPLEMENTATION PLANNING AND PRIORITIZING
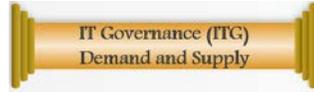
In 2019, the IT governance process will be further enhanced to include an ongoing IT Executive Steering Committee and formal business case studies for major software technology project requests and investments.

DIGITAL DIVIDE AND OPPORTUNITIES

Strategic Partnerships
Internal and External

The City of Westminster participates in providing training, Internet access and computer hardware for citizens who may otherwise lack such opportunity. This is accomplished through several direct and indirect channels.

The City provides 36 desktops and 7 laptop public access computers with broadband Internet access at College Hill Library and Irving Street Library. Nine additional computers provide direct access to the library catalog. The computers are available to citizens and other library patrons during all normal hours of operation.

The City has also partnered with the local 7:10 Rotary Club to support the "Computers 4 Kids" (C4K) program. The purpose of this Rotary sponsored program is to refurbish and prepare used computer equipment for distribution to nonprofit agencies and eligible students for use in their homes or schools. Since 2006, the City has contributed 2516 decommissioned desktop and laptop computers to the program for distribution to students in Westminster and surrounding communities.

Citizens wishing to further advance their computer skills have access to convenient fee based classes available through the City of Westminster, Front Range Community College and local businesses.

ENVIRONMENTAL SENSITIVITY AND SUSTAINABILITY
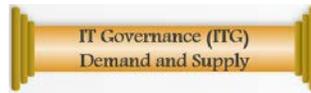
The City of Westminster City Council has defined one of the City's goals as being a "Beautiful and Environmentally Sensitive City" that has energy efficient, environmentally sensitive City operations. The Information Technology Department has established the following specific objectives, standards and practices to support environmental sensitivity and sustainability.

Energy Conservation in Information Technology

Reducing energy requirements and carbon footprint

- Computer monitors used on networked PCs throughout the City are set to enter sleep mode after a period of 15 minutes.
- In 2009, the City replaced all CRT monitors with energy efficient LCD monitors to reduce energy consumption required for monitor operation by more than 50%. Since July 2009, all purchased LCD monitors are Energy Star 5 rated.
- During product evaluation, the City will use EPEAT (www.epeat.net) to assist in identifying and evaluating electronic products based on their environmental and energy star attributes.
- Through server virtualization technology, the City has reduced server energy requirements by 50% by reducing the number of physical servers from 82 to 43. The City will evaluate and identify future virtualization opportunities with the intent to further reduce the number of physical servers and maximize utilization of production servers.
- Since July 2009, all servers, desktops and laptops purchased by the City are Energy Star 5 rated.
- In 2010, the Information Technology re-evaluated environmental requirements for centralized servers, network and telecommunications equipment to determine if the central computer room temperature could be increased to reduce cooling costs. As a result of this study, the temperature was increased by two degrees resulting in energy savings.
- In 2011, the City further increased operating temperature in the computer room from 68 to 72 degrees in an effort to reduce energy consumption associated with cooling.
- In 2012, the City updated computer server purchase requirements to include "outside air" cooling capabilities. This will enable the City to reduce energy consumption by further increasing the operating temperature in the data center.
- In 2012 the City conducted a city-wide printer inventory project and identified opportunities to strategically reduce the number of standalone printers over the next several years. As a part of the project, the City implemented a managed print services

- agreement to monitor printer usage and reduce the cost of maintenance and consumables.
- In 2013, the City installed a new, more energy efficient Uninterrupted Power Supply (UPS) for the primary data center, and replaced the Storage Area Network (SAN) with more energy efficient hardware.

Environmentally Sensitive Practices in Information Technology

One of the Westminster City Council strategic goals is "*Beautiful, Desirable, Safe and Environmentally Responsible City.* Several current and future IT initiatives and activities supporting that goal are listed below:

Increasing utilization of resources and reuse of equipment

- Consistent with the City Council strategic plan, and other initiatives such as those outlined by www.step-initiative.org, the City of Westminster implemented practices to extend the useful life of current computing equipment. Beginning in 2009, the City modified the desktop computer replacement schedule from four years to five years, extending the City use of computers by one additional year. When City desktop and laptop computers are decommissioned, all data is wiped using industry best practices and computers are donated to a local rotary club where they are refurbished and distributed to eligible students and non-profit agencies in the community to further extend the useful life of the computer.

Eliminating use of environmentally harmful agents in Information Technology

- The Information Technology Department previously used Halon gas containing chlorine, bromine and fluorine elements for fire suppression in the City's central computer room. Studies have indicated that these elements are not broken down easily and have a harmful effect to the ozone layer. Supporting the City goal of being an environmentally sensitive City, the Halon system was replaced with Ansul Inerogen, an environmentally-friendly, people-safe agent that boasts zero ozone depleting potential.

Implementing environmentally sound recycling practices for decommissioned electronics

- In support of environmental sensitivity, the City selects and uses only those recycling firms that meet or exceed the U.S. EPA standards for electronic recycling and comply with all State of Colorado and federal laws pertaining to electronic recycling and destruction of sensitive data.

Reducing printing costs and paper wastes

- In 2009, the City reduced printing costs and reduced paper consumption through eliminating unnecessary printing, providing more capacity for storage of electronic documents, and standardizing on duplex printing on capable printers throughout the City. Additionally, all new printers are required to support duplex printing and provide for shared use to reduce the number of standalone printers.
- Through the use of new technology (Apple iPad's and software), the City implemented electronic council packets in 2011. This project reduced printing and paper waste by more than 49,000 pages per year.
- In 2014, the City implemented a managed print services contract and usage tools. With the implementation of a Managed Print Service contract for single function printers, the City has experienced a reduction in cost of more than $26,000 over the last two years. Additionally, the City has reduced waste through an employee education program and by implementing automated print rules.
- Beginning in 2019, the City will be deploying a new print management tool to enhance security, eliminate paper waste, and reduce cost by requiring proximity card scans at printers prior to print job processing.

REGIONAL COLLABORATION AND SERVICES

Strategic Partnerships
Internal and External

Through regional collaboration and shared services, the City has opportunity to meet City Council's objective of "Visionary Leadership, Effective Governance and Proactive Regional Collaboration" and "Financially Sustainable Government providing Excellence in City Services."

Multiple departments have leveraged regional collaborative opportunities to meet City Council goals and objectives, to advance services, improve quality of life and contain costs for projects. The Information Technology Department, in collaboration with other departments and government agencies, has engaged in several regional collaborative efforts, with several examples summarized below:

Lumen – The City participates in a consortium and through Lumen shares Westminster police records data with other participating law enforcement agencies. This collaborative data sharing effort has enabled Westminster and other jurisdictions to analyze metro area trends and compare crimes with those in other jurisdictions to solve cases that may otherwise be more difficult or time-consuming to solve.

Front Range Fiber Consortium – The City is an active member of the Front Range Fiber Consortium, with member agencies from state, county, city, and school districts looking for opportunities to collaborate on network infrastructure projects and capacity sharing.

E-911 Call Center Redundancy – 911 technology is ever changing and must be available 99.9%+ of the time. As Westminster upgraded the next generation 911 phone system, the City has had the opportunity to partner with a neighboring jurisdiction that was lacking funding for enhanced 911 technology to allow them remote use of the new system. Additionally, the City has partnered with two additional jurisdictions to create redundancy in the E-911 and provide an integrated backup site option for dispatch in the event of a disaster at any one of the locations.

Active911 to Improve Mutual Aid Response Time – In order to meet growing service demands and streamline operations, the City collaborated with three neighboring fire jurisdictions with the goal to provide resource availability information to one another, and to provide mapping for receiving and rendering mutual and automatic aid to one another. Each jurisdiction's IT Department configured their respective version of Computer Aided Dispatch (CAD) to leverage the sharing of information through the Active911 system to enable efficient mutual aid services. Participating in this Active911 group supports the City Council action item to *look for opportunities to collaborate and assist our neighboring jurisdictions*.

CGAIT – The City is an active participant in the Colorado Government Association of Information Technology group. CGAIT is a nationally recognized professional group, with membership consisting of more than 50 Colorado government members. Its mission is to promote advances in information technology in order to facilitate networking, collaboration, cooperation and education among government information technology leaders within Colorado resulting in greater efficiencies and effectiveness for member organizations while enhancing services to Colorado communities and its citizens. CGAIT has also spawned multiple public sector user groups in which the City has participated including the Project Manager User Group, Business Analyst User Group, and Service Desk Collaboration User Group. Participating in CGAIT supports the City Council action item to *"look for opportunities to collaborate and assist our neighboring jurisdictions"*.

Metropolitan Information Exchange (MIX) – In 2015, Information Technology Department leadership applied for and was accepted into this group with the goal of sharing and learning best practices from leading IT departments in major cities. Its mission is to promote progress in the IT profession by providing chief information officers of large local governments, with similar interests, the means for learning and exchanging ideas on various management and information processing matters.

Regional Network Sharing IGA – The City has entered into an inter-government agreement with Adams County to grant the County perpetual use of Westminster's fiber conduit in exchange for a perpetual fiber connection to the Adams County building and space within their data center to house a SAN with Westminster backup data. This agreement reduced network expansion expense for Adams County and enabled the City to have a third cost-effective backup location for critical data that is geographically separate from the City's primary and disaster recovery data center.

School Network Collaboration Project – The City is collaborating with the school districts (Jefferson Public Schools and Adams 12 Schools) to support education in the community their efforts to connect schools with high speed fiber. To assist in their project, the City is offering use of excess capacity in existing City conduit, saving the school districts money and time. In return, these agreements may provide opportunity to reduce the cost of installing conduit and fiber to connect four City locations to the City's fiber network.

INTER AND INTRADEPARTMENTAL TECHNOLOGY COMMITTEES AND TEAMS

Success in the use of technology and software applications requires more than an effective strategic for selection and deployment. Ongoing committees and teams have been established to insure that the City is using the technology securely, effectively and taking full advantage of application capabilities. Furthermore, these teams are instrumental in helping the Information Technology Department in planning for software application upgrades and establishing priorities.

Some of the committees and teams with Information Technology chair or participation include:

CIS Planning Team
This team meets on a monthly basis to discuss items affecting the operation or configuration of the software application, including billing issues, consumption, meter fees and City accounts. Furthermore, this team identifies and plans for upcoming changes that will impact the Utility CIS system and performs evaluation, testing and deployment of new software releases. Members include representatives from Information Technology, Public Works and Utilities and Community Development Departments.

AA Planning Team
This team meets on a monthly basis to discuss items affecting the operation or configuration of the building permit software application, integration with other major applications and evaluation and testing of new software releases. Members include representatives from Information Technology, Public Works and Utilities and Community Development Departments.

IT/Police/Fire (IPS) Planning Team
This team meets weekly/monthly to discuss application issues or problems that need to be addressed by Information Technology or the application vendor. This team is also responsible for defining application integration needs, evaluating new products and technology, evaluating and testing upgrades and revisions to the application software and working with other agencies using IPS to learn new ways to exploit the capabilities of the software. Members include representatives from Information Technology, Fire and Police Departments.

Change Management Team
This team meets on a monthly basis to discuss and test operating and application patches from vendors and to determine if those patches will have any negative impact or incompatibility with existing systems. After the evaluation period, this team schedules and

deploys the patches and updates. The team is comprised of members from all of the divisions in the Information Technology Department.

<u>The Network and Systems Security Team</u>
This team meets on a quarterly basis to discuss and test internal and external security vulnerabilities by using various security tools like Nessus. If vulnerabilities are discovered, this team works with the responsible party to ensure the appropriate patches or upgrades are applied and tested. The team is comprised of members from the Systems and Telecommunication teams in the Information Technology Department.

<u>JDE EnterpriseOne ERP Planning Committee</u>
The Committee meets on a bi-weekly basis to discuss and plan for ERP system needs and upgrades, and works together to evaluate new application releases, implementation and testing of new releases and training for users. This committee is also responsible for identifying opportunities to enhance application usability and integration with other City applications. This committee is comprised of staff from Finance, General Services and Information Technology Departments.

<u>Green Team</u>
The Green Team was given the responsibilities of increasing employee awareness on how employees can implement environmentally sensitive practices in their daily activities, making recommendations on practices to reduce the impact of City operations on the environment, serving as a resource to City departments in their efforts to adopt more environmentally sound approaches to their operations, and educating the community on the City's current and new greening efforts. The eighteen-member Green Team is comprised of staff from every City department, including Information Technology.

<u>Jefferson County Fiber Optic Network (J-FON)</u>
J-FON is a high speed data network designed to connect various public safety and governmental entities, including public safety answering points ("PSAPs"), in an effort to improve communication, information sharing, and interoperability. This board is responsible for the direction and configuration of this network build out. The Board consists of several local municipalities.

<u>Mobile Strategy Committee</u>
The Mobile Strategy Committee is an Inter-departmental steering committee consisting of one division representative per department to help the organization establish mobile development priorities.

<u>JDE Experience Team</u>
This team consists of a number of admin pros, supervisors and analysts who depend on the City's JD Edwards EnterpriseOne ERP system to perform their job. The team meets monthly to discuss and select ways the City can maximize its use of the system. The JDE EnterpriseOne ERP Planning Committee uses this team to focus and prioritize development

and enhancement efforts to best meeting the needs of the organization. The team also tests changes to the system and reviews new training materials.

Legislative Team
This team consists of members from various departments with the responsibility for reviewing legislation that could potentially impact the City. The IT Service Administrator, as a member of this team specifically seeks out legislation that could affect the City's technology infrastructure, policies, and codes. This service prepares the City to respond to and prepare for implications of legislative bills from the state and federal government.

Service Desk Development Team
This team consists of IT staff members focused on leveraging the Service Desk application to deliver high quality and timely service support to the City. The team was first assembled to implement the new Service Desk Plus system in 2018 and will continue to meet to implement enhancements.

MOBILE COMPUTING STRATEGIES

The explosive growth of mobile hardware and applications capable of enhancing service delivery, productivity, and efficiency is providing significant opportunities for organizations. A recent CIO survey of IT Directors and CIOs show that 67 percent believe mobility will impact their business as much or more than the internet did in the 1990s. The next generation of citizens, business owners, and employees will expect to have mobile applications at hand to help them in their daily activities. Navigating a course toward creating and executing a coherent mobile strategy is a challenge for many organizations due to the fragmentation and chaos in the mobile marketplace, where new hardware and mobile operating systems are coming out all the time. In 2014, Westminster, not unlike other organizations, had made some progress in deploying mobile applications within the organization, but has done so in a tactical fashion supporting lower level departmental goals and strategies. Westminster took a strategic approach to design and build an enterprise strategy and infrastructure for developing and managing mobile apps over the long-term. Without a well-defined and executed plan, Westminster faced risk of missing opportunities and executing only tactical and non-cohesive mobile application development approaches which will result in more costly, less integrated, and less sustainable solutions.

In 2014, Information Technology staff conducted meetings with management throughout all City departments to create a city-wide mobile application needs inventory. The results of this process helped the Information Technology Department identify tools, resources and strategies required to achieve a sustainable mobile technology environment. A Mobile Strategic Plan was prepared and included goals, prospective audience, current state of mobile technologies, network infrastructure to support mobile, needs assessment and inventory, support requirements, development methodology, management and security, and governance. The plan laid the foundation for a strategic, sustainable and cost effective approach for mobile technologies solutions. With the City Manager's Office and City

Council support for the plan, in 2015 additional staffing and a multi-year, $190,000 CIP budget were approved to execute on the strategic plan objectives. Strategic mobile objectives identified for 2015-2018 were successfully completed. The City was awarded the 2018 CGAIT Excellence Award recognizing the City for the outstanding success it achieved in the development and deployment of a custom mobile application to improve services and increase efficiencies at the Standley Lake Regional Park.

2019 INFORMATION TECHNOLOGY OBJECTIVES

The Information Technology Department management team has developed a detailed work plan for each functional area. Objectives listed below support the City Council goal of "Excellence in City Services" The major projects identified include:

Security Audit – Conduct the annual comprehensive network and server security audit and implement changes to systems, policies and practices as required to further fortify City systems.

Network Traffic Monitoring – Implement network traffic monitoring that will be monitored by a third-party NOC. The purpose is to quickly and securely identify and remediate any network traffic that could potentially transfer sensitive data to an illegitimate destination.

Security Policy Updates – Update and expand on security policies to comply with the National Institute of Standards and Technologies (NIST) Cybersecurity Framework.

Cybersecurity Incident Tabletop Exercise – Conduct a response readiness assessment and tabletop exercise to gauge the City's readiness to respond to an actual cybersecurity incident. Incorporate updates to policies and practices as needed following exercise.

Credit Card Chip Reader Implementation – Collaborate with the Finance Department to replace all magnetic credit card readers with chip and pin readers.

Disaster Recovery Exercise – Conduct a comprehensive disaster recovery exercise at the City's hot site to confirm the ability to meet disaster recovery objectives.

Migrate Email to a Cloud Provider – Migrate all email to a cloud service provider, with the goal of enhancing system uptime, expanding storage capabilities, improving spam filtering, and malware detection. Migrating to an email cloud provider will also simplify and enhance the City's disaster recovery capabilities.

Security Technologies – Assess and as deemed beneficial, implement additional security tools with funding approved by City Council in 2019. These tools will include, but are not limited to: annual security training for all benefitted staff, enhanced monitoring tools, enhanced data forensic discovery tools, audits and regular training for security staff.

Network Isolation – Currently, all computer servers in the City's Enterprise have the ability to reach one another based on complete routing tables. This greatly increases the potential destructive capabilities of malware as it could quickly spread across to the entire network. In 2019, utilizing advanced networking, the IT Department will dynamically filter the routing tables and only install routes to approved resources. This will greatly enhance security by reducing each location's network visibility and availability.

Expand Disaster Recovery Site Connectivity – Leverage existing network infrastructure and re-engineer to provide connectivity between the Public Safety Center, South Westminster facilities and the City's Disaster Recovery data center.

Project and Project Portfolio Management System –Implement Microsoft Project Online to provide more robust project management and portfolio management capabilities.

CIO Business Vision Survey - Use a third party research and advisory firm to conduct a survey of the City-wide management team to gain a more complete understanding of how IT customers view the services provided by the IT Department. Results from the survey will be assessed to identify opportunities and strategies to improve services and governance.

Service Desk Enhancements – Enhance the IT Service Desk to further streamline the procurement process, track technology document review such as contracts and RFPs, enhance incident response, and standardize technology change requests. A second objective is to identify and record metrics that will enhance the IT Performance Dashboard and provide additional data for decision making within the department.

IT Governance - Develop and implement a new governance process to insure alignment between new requested major software investments and City goals/priorities.

Information Technology Strategic Plan – Update the Information Technology Strategic Plan for 2019 to refresh and align with revised City Council objectives.

Expanding Knowledge and Learning from Leaders - Conduct on-site visits with two to three award winning Cities to learn how they are succeeding through strategic planning, IT governance, technology standards, best practices, security, application development, database management, and partnerships.

Document Management – Continue efforts to research requirements and implement, as appropriate, integration between the City's Laserfiche document imaging system and other major applications in the City (i.e. JDE, I-Leads, Courts, etc.).

Public Safety CAD/RMS System Replacement – Select and implement a new computer aided dispatch and records management system to replace an aged system and better meet the long term public safety department requirements.

Mobile Development Strategy – Continue deploying mobile software solutions to meet the strategic objectives defined in the City's comprehensive Mobile Strategic Plan, established in 2014. Will complete the backend infrastructure for secure rapid mobile application access to databases using in-house built API's.

Multi-Agency Computer Aided Dispatch System Integration - Collaborate with the Fire Department to implement a multi-agency solution to enable integration between Computer Aided Dispatch Systems

Cashier System – Partner with the Finance Department and PR&L Department to evaluate, select and implement a replacement cashier system.

PR&L Registration System – Partner with the PR&L Department to evaluate and implement a new registration system.

New Development for the City's Web Sites - Increase functionality of the City's website by adding Westminster Eservices Applications Framework, building a managed centralized .net base portal (APPnet Applications Portal).   Partner with Public Outreach and other divisions to continue to refresh the City's web site with new look and feel and navigation.

Modernize/Update Back End Infrastructure – Initiate several projects associated with modernizing and updating back end software and database infrastructure, including converting ASP code to .NET, upgrading virtual environments to vSphere 6.5, and replacing Web Sphere.

Utilities Maintenance Management System – In collaboration with Public Works and Utilities, implement the selected replacement software application for maintenance management.

Utility Billing and Administration System – Partner with the Finance Department to upgrade the City's Utility Billing and Administration software to gain access to more robust features needed to meet changing organization needs.

Technology Refresh for 2019 – In accordance with standard City technology refresh schedules, procure and replace desktop PCs, laptops, mobile devices, network equipment and software.

Court Case Management System – Partner with the Courts Division to determine if a new case management system may be required to meet future organization needs.

Upgrade the City's ESRI GIS System – Upgrade the City's ESRI GIS system to gain additional functionality for City departments.

Fire Department Records Management System – Partner with the Fire Department to select and implement a new records management system capable of meeting current and future needs of the City.

Business License Management System – Develop a new business license management system to better support license processes and internal system integration.

Business Intelligence Reporting tool – Implement Microsoft Power BI to connect a wide variety of data sources, provide business analytics and visual data, and to help in making more informed timely decisions across the City.

Project Portfolio Management - Implement MS Project Online to enhance technology project and portfolio management for IT.
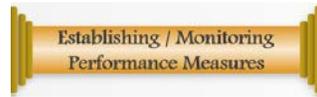
Performance Measure Review – Conduct a monthly review of the new IT performance measures established in 2018 to monitor trends and assess opportunities to enhance services. Evaluate conversion of the current performance measures dashboard to the Power BI to improve visual reports, data integration, and analysis.

ATTACHMENT A: TECHNOLOGY ARCHITECTURE, STANDARDS AND SECURITY

For security purposes, some specific hardware and configuration information is excluded from this document.

Data Networking and Transport Standards

The City has a Wide Area Network (WAN) to connect more than 40 City facility locations to the computers at City Hall. These facilities include the Westminster Public Safety Center (PSC), the Municipal Court and the Municipal Service Center (MSC) as well as all of the City's fire stations, recreation facilities, water treatment facilities and libraries. The core of the WAN consists of two Cisco Nexus backbone switches and 4 core routers. Single-mode fiber-optic cable provides the connection between City Hall, the PSC and the MSC. Twenty-two additional buildings are also connected to City Hall through a single mode fiber optic cable system. Data speeds on the network are at gigabit and 10 gigabit rates. The network also supports the reclaimed water system, the SCADA water control system and traffic control system. The remainder of the facilities are connected to the computers at City Hall through City-owned wireless networks. Information from these sites pass through the wireless network at a rate of at least 54 Mbps (megabits per second).

Types of Cabling

Within buildings and to the desktop:
Category 5 Unshielded Twisted Pair (UTP) cable is used to connect the end-user devices to the network. The links between the equipment on each floor and computer room are comprised of multi-mode fiber. Category 6 UTP and fiber cabling is used to connect the City backbone switches with all centralized servers within the computer room at gigabit speeds.

Between buildings:
The connections between buildings are currently made using single mode fiber-optic cable or wireless backhauls. The City owns the fiber-optic cabling between buildings and the wireless system.

Telephone Services

The City has standardized on Avaya VoIP telephone systems. The size and mission of the facility to be served determine the make and model of these switches. Use of voice mail and auto attendants is also determined by the needs of the facility.

The telephone system is continuously upgraded by timely upgrades of the main Avaya switch. The City uses Voice Over IP (VOIP) and has standardized on the Avaya solution for this technology.

Servers
The City has standardized on the Dell Power Edge line of servers for use throughout the City. This standard allows the Information Technology Department to carry an inventory of spare parts available for use in most of the servers, decreasing downtime following system failures. The Department also carries vendor maintenance contracts on servers hosting mission-critical applications to further reduce downtime. The standard operating system for servers is Windows 2012 R2 and 2016. The department installs standard anti-virus software on each server for protection and administration. Some servers require additional software such as Microsoft Office and application specific software. Servers are replaced on a four to five year replacement schedule. Funds for all server replacements are authorized by City Council and included in the Information Technology Department operating budget.

Workstations
The City has standardized on the Dell line of tower desktops and laptop personal computers. The standard operating system is Microsoft Windows. The standard suite of office productivity tools is Microsoft Office. Also, every PC installed within the City includes standard anti-virus software. Additional applications are installed as required for specific job-related requirements. Personal owned and unapproved software is not permitted on City workstations.

Mobile Devices
The City has standardized on the Apple devices running the latest stable version of iOS.

Databases
The City has standardized on Microsoft SQL server as the database for all new custom and purchased software applications if compatible. Oracle 11g will remain an alternate database when Microsoft SQL Server is not an option for off-the-shelf software applications. Support for legacy databases such as Universe will continue until applications using these databases are replaced. New applications are not developed in Universe, Informix or MS Access.

Internet/Intranet (COWnet)
The City has standardized on the current version of Microsoft IIS as the Web server software and a combination of ActiveX, JavaScript, ASP and .NET for interactive applications and backend database access. The Information Technology Department installs and maintains web servers used to host all City information and services. DotNetNuke software is used to provide content contributors with the ability to update departmental information on both the Internet and Intranet (COWnet).

Application Development Tools
The City uses several tools for developing or supporting custom software applications and reports, including Microsoft Visual Studio, Universe Studio, C#.net, JavaScript, SQL, Crystal Reports, SQL Reporting Services, Xamarin and Visual Studio web development

tools, and other development tools as provided by application software vendors. Additional development languages or tools will only be introduced when one of the current standards is not suitable or available to develop or support a new application.

System Hosting and Support

The Information Technology Department serves all departments by hosting, maintaining and supporting all 100% City owned computer servers and applications. Applications and services including Internet, Intranet (COWnet), calendaring, email and automated payment services are centralized on IT supported servers. The Information Technology Department also assists City departments with the evaluation and selection of new or replacement software applications that will conform to established organization technology standards.

ATTACHMENT B: FUTURE STAFFING NEEDS

During each budget preparation period, the Information Technology Department will prepare a comprehensive staffing assessment to determine future staff requirements to maintain current levels of support for existing systems and to support additional new systems and customers. Projections are based on historic trends as well as scheduled projects and upgrades. Some of the variables and trends used to project future staffing requirements include:

Number of employees using IT supported technology
Total PCs supported
Total mobile devices supported
Scheduled PC and server replacements
Number of desktop supported applications
Total Windows accounts supported
Number of network nodes supported
Number of Internet connections provided
Number of major software applications supported
Number of major database instances supported
Number of Internet and Intranet (COWnet) pages, languages and applications supported
Number of remote locations supported
Number of Web based services and cloud computing used
Number of technology purchases and tasks completed to fulfill purchases
Number of active and pending major technology projects

Staff additions and reclassifications are subject to City Manager's Office review and City Council authorization.

ATTACHMENT C: SUPPORTED TECHNOLOGY ENVIRONMENT

IT Services Team

Services Team Statistics
- Reviewed or developed 16 technology documents (contracts, RFPs, Council Agenda Items, and others)
- Received 39 potential technology project responses from the 2018 annual technology project survey.
- Processed approximately 317 credit card and 145 purchase order purchases in 2018 for $1,484,885 including over 62 vendors across 100 department codes (departments, divisions, subsidiaries, CIPs)
- Assisted with project management for multiple departments. The Department completed 40 major technology projects in 2018. As of the end of 2018, 41technology projects were in progress.

Software and Web Engineering Team

Web Development and Statistics

- Over 121,869 citizens, businesses and others visit the City's web site each month, representing more than 331,295 viewed pages and images (hits) monthly.
- City Web site job postings and applications, library, utility billing payment pages, city park rec center, parks and rec, police, and golf online services continue to be the most popular areas of the site.
- The Intranet (COWnet) (Employee Information Center) has over 677,587 viewed pages per year.
- The most frequently accessed pages on the employee Intranet (COWnet) are Phone Listings, General Leave, IT Service Center, Jobs, Employee Information, classifieds, training, database applications, and the link to the Credit Union.
- The Web Software Engineers support over 9,000 pages, 2,300 associated programs, over 18,000 graphic images and 5,000 pdfs.
- The utility billing web pay interactive page gives applicants the ability to save a trip to City Hall and allows our employees better workflow with less interruption. An average of 14,400 customers per month use the electronic services offered though the Web and IVR system to pay on their utility billing account.
- Other interactive services offered on the City's Web site include: job applications, recreation class registration and payment, Access Westminster online crime report, report code violations, traffic complaint, park pavilion reservation, F. A. S. T. Filing (for businesses to file and pay sales tax returns online), GIS, Permits, Library services, Maps, Photo Galleries, Police Forms and Channel 8 scheduling providing online scheduling information.
- Parks, Recreation and Libraries Activity Guide, City Code, Council Agendas, Council Meetings Webcast, Public Meetings, Community Event Videos, Business

Listings, Historic Westminster and other reference information are also available to users of the City's Internet site.

Major System Applications Supported by Software Engineers

- Some of the City's major IT Software Engineer supported applications include content management system DotNetNuke, Intergraph Police web applications, CAD and RMS, Alpine Fire Records System, JDE EnterpriseOne ERP, CityWorks Asset management, and Service Request, Justice Systems Court Administration, Advanced Utility Billing, GIS, Cashiering, Trak-IT, and Sales Tax systems. Software Engineers are responsible for developing interfaces and custom modules to operate with these applications.

Stand Alone Applications Supported by Software Engineers

- The Interactive Voice Response system (IVR) allows citizens and businesses to call for information on utility bills or retrieve the same information from the City's Web site. Citizens can also pay their utility bills over the phone or over the Web. All calls and payments are tracked for analysis through the Paymentus system. An average of 43,210 calls and Web access is processed through this system every month. Approximately 12,166 monthly credit card transactions and E-Checks are settled.
- The IT Department uses ServiceDesk a module in LandDesk to route and track Information Technology (IT) Service Requests. All IT service requests are entered and tracked through this system. The Service Center System is capable of accepting email and Intranet (COWnet) generated requests also.
- Other developed databases include Police Shift lineup and Vacation bidding, Police Recruit Database, Technical Service Database, Victims Advocate Database, Fire Inspections, Emergency Medical Services, On-Line Code Enforcement Violation Reporting, Police Department Training Database, a Label Maker Database for the City Manager's Office, Citywide Training Registration, Environmental Services Tracking Programs, Law Library, Economic Development's One View Business Database, Citywide PC Inventory, Classifieds and various city surveys.

Both the IVR system and the City's Web site directly supports the mission of the IT Department by providing alternate, cost effective, innovative methods for citizens and businesses to access information and conduct business with the City.

Systems Management Team

This team's responsibilities include:

- Install, configure, administer, troubleshoot and provide security and data integrity for over 250 Windows servers and 1200 Windows computers and laptops in over 40 City facilities.

- Provide consulting services for all departments on existing technologies and strategic direction and project management services for the acquisition, implementation and use of new technologies.
- Administer 3924 Windows user accounts and 1591 Exchange email accounts.
- Maintain a warm site disaster recovery/business continuity facility.
- Support for wireless hardware and software used by the City's Public Safety departments for all mobile applications including Dispatch, Field Reporting, LPR (License Plate Reader) and AVL (Auto Vehicle Locator).
- Administration of the Lease/Purchase Program for the replacement of City personal computer hardware.
- Manage software compliance and licenses.
- Manage Systems security including virus protection, content screening and spam filtering.
- Provide an IT Service Center for all City employees who access any of the City's computerized systems.
- Support for mission-critical systems, 24 hours a day, 7 days a week, 365 days a year.
- Perform data backups and recovery services for all centralized systems.
- Track and handle an average support calls volume in excess of 1200 requests per month.

Major Self-Hosted Applications Supported by Systems Analysts

- Citywide email and scheduling system and SMTP gateway
- Police/Fire Computer Aided Dispatch, Records Management, Field Reporting and AVL
- JDE EnterpriseOne Financial, Payroll and Human Resources
- Court Case Management
- Parks & Recreation Point of Sale, Facility Scheduling, Inventory Management and Class Registration
- Geographic Information Systems
- Fleet Management System
- Interactive Voice Response System
- Building Permit and Inspection System
- Microsoft Office for office productivity
- Microsoft SQL Server, Oracle, Informix, Progress and Universe for various database applications
- Cash Receipt Systems
- Utility Maintenance Management
- Document Management
- Email content filtering system
- Citywide Anti-virus
- Automated deployment and assets management system
- Security Application

Telecommunications / Networking Team

The telephone system consists of two large Avaya IP PBXs, four smaller standalone Avaya IP PBX systems, twenty-one Avaya Remote gateway systems, a Microsoft Unified Messaging and Auto Attendant System and a combination of a City-owned fiber optic and wireless systems and Birch Communications services at some remote sites. The telephone system currently has 1401 extensions and 896 Unified Messaging enabled mailboxes serving every department in the City. The wiring system transports both voice and data transmissions to all these users. All systems are very reliable with major downtime averaging less than one half day per year. The expansion, maintenance and repair of the systems are performed by the Telecommunications / Networking Team or contracted out to the private sector.

Westminster's LAN/WAN

The City of Westminster's computer network supports approximately 3177 (devices). Of these 3177 nodes, there are 1408 networked City computers. The Information Technology Department monitors the connection to the Internet to ensure good performance and secure connections. The City's networks are protected by a two tiered security check. All networked PCs have access to the Intranet (COWnet).

The Local Area Network (LAN) at City Hall is a three tier hierarchical design with redundant –high speed switches at the core. All of the City's servers are connected to these switches. The uplinks to the access switches, located in the telephone closets on various floors, are also connected to this core environment.

All of the devices at City Hall communicate at 100 megabits per second or more.

The City also has a Wide Area Network (WAN) to connect more than 40 City facility locations to the computers at City Hall. These facilities include the Westminster Public Safety Center (PSC), the Municipal Court and the Municipal Service Center (MSC) as well as all of the City's fire stations, recreation facilities, water treatment facilities and libraries. The core of the WAN consists of two Cisco Nexus backbone switches and 4 core routers. Single-mode fiber-optic cable provides the connection between City Hall, the PSC and the MSC. Twenty-two additional buildings are also connected to City Hall through a single mode fiber optic cable system. Data speeds on the network are at a minimum gigabit rate. The network also supports the reclaimed water system, the SCADA water control system and traffic control system. The remainder of the facilities are connected to the computers at City Hall through City-owned wireless networks. Information from these sites pass through the wireless network at a rate of at least 54 Mbps (megabits per second).

Types of Cabling

Within buildings and to the desktop:
Category 5 Unshielded Twisted Pair (UTP) cable is used to connect the end-user devices to the network. The links between the equipment on each floor and computer room are comprised of multi-mode fiber. Multimode fiber cable is used to connect the City backbone switches with all centralized servers within the computer room at gigabit speeds.

Between buildings:
The connections between buildings are currently made using single mode fiber-optic cable or wireless backhauls. The City owns the fiber-optic cabling between buildings and the wireless system.

ATTACHMENT D: INFORMATION TECHNOLOGY DEPARTMENT ORGANIZATION CHART - 2019

Information Technology Director
1.0 FTE

Executive Assistant
1.0 FTE

Information Systems Manager
1.0 FTE

Software Engineering Manager
1.0 FTE

IT Services Administrator
1.0 FTE

Senior Telecom Administrator
1.0 FTE

IT Systems Supervisor
1.0 FTE

IT Systems Supervisor
1.0 FTE

Lead Software Engineer
1.0 FTE

Technology Procurement Specialist
1.0 FTE

Network Engineer
1.0 FTE

Systems Administrator
1.0 FTE

Systems Administrator
1.0 FTE

Internet Software Engineer
1.0 FTE

Network Systems Technician
.5 FTE

Sr. Technical Support Specialist
1.0 FTE

Systems Administrator
1.0 FTE

Software Engineer II
.5 FTE

Sr. Technical Support Specialist
1.0 FTE

Sr. Technical Support Specialist
1.0 FTE

Internet Software Engineer
1.0 FTE

Technical Support Specialist
1.0 FTE

Technical Support Specialist
1.0 FTE

Management Intern, Software Team
1.0 FTE

Management Intern Systems Team
1.0 FTE

Lead Software Engineer
1.0 FTE

Software Engineer II
1.0 FTE

Software Engineer II
1.0 FTE

Software Engineer II
1.0 FTE

Lead Software Engineer
1.0 FTE

ERP Software Engineer
1.0 FTE

ERP Software Engineer
1.0 FTE

Software Engineer II
1.0 FTE

Software Engineer II
1.0 FTE

ATTACHMENT E: WORKLOAD INDICATORS AND RESOURCES

The following table shows historical workload indicators for growth areas, staffing levels and annual operating budget for the prior three plus current year.

Indicator	2015	2016	2017	2018
Number of E-mail users supported	1537	1632	1752	1591
Number of PCs supported	1276	1382	1395	1408
Number of network nodes supported	2050	2052	2305	3177
Web-based applications supported		44	45	57
Annual approved operating budget	3,173,708	3,261,797	3,839,154	3,998,390
Number of City mobile applications supported	14	14	14	16
* Total Authorized IT Department FTEs	27.3	31.0	33.0	33.0

*includes IT Systems and Software paid Interns

ATTACHMENT F: INFORMATION TECHNOLOGY DEPARTMENT OPERATING BUDGET SUMMARY

Budget Category	2019 Budget Amount
Personnel	3,535,572
Contractual	674,514
Commodities	34,900
Capital Outlay	200,000
TOTAL	$ 4,444,986