



City of Seattle

Enterprise Information Technology Strategic Plan 2012-2014



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This document is a product of the Chief Technology Officer and the Citywide Technology Board



INTRODUCTION

Bill Schrier
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These are interesting times for Information Technology (IT) in Seattle City government. Almost every government service relies on underlying computing and communications systems, from dispatching Police and Fire vehicles to paying a utility bill. Although budget cutbacks during the worst recession since the Great Depression continue to reduce funding for IT, the City's IT services remain some of the best anywhere, from our award winning public website and TV channel to our broadband communications network and geographical information systems.

While funding continues to decrease, the pace of technology change continues unabated. Seattle constituents are now far more likely to pick up their smartphone or tablet computer to access their government. Advances in massively scaled data center services like those offered by Amazon and Google—so called cloud computing—are leading to changes in application development and delivery.

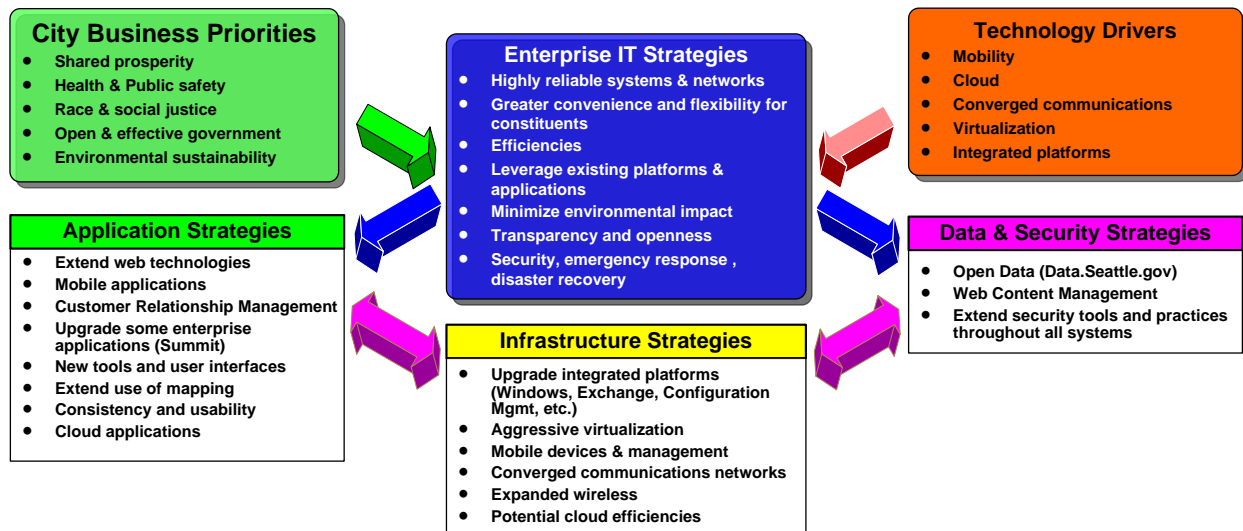
As we go forward into these interesting times, a few of our key strategies are:

- Continue to support the City's services with highly reliable systems and networks.
- Leverage existing platforms and applications to get the most we can from them with upgrades where justified and continual improvements.
- Adopt emerging technologies like mobile computing to improve interaction with City government for constituents and support City services on the move.
- Look at technologies like cloud computing for advantages and efficiencies where it makes sense.
- Operate technology to minimize the impact on the environment with tools like virtualization.
- Provide transparency and openness through tools like data.Seattle.gov.
- Continue to safeguard City networks and sensitive information with security disciplines, emergency response and disaster recovery.

ELEMENTS

This Enterprise IT Strategic Plan outlines directions in key technology sectors during 2012, through the next biennial budget (2013/2014) and beyond. It summarizes a much larger body of planning work in order to communicate high-level strategy to our constituents.

A substantial amount of the City's IT resources are devoted to department-specific projects and services, but this plan addresses **Enterprise IT**, defined as the applications, communications and computing systems necessary to provide a common basis for all or most departments. Enterprise IT applications and infrastructure enable City government to operate with a common set of technologies.



Elements & Key Strategies

The graphic above shows the key elements considered in IT strategic planning for City government:

- **City Business Priorities** represent new and ongoing business initiatives that drive technology needs and inform IT strategies.
- **Technology Drivers** focus on advances in new technology and obsolescence of existing IT investments.
- **Enterprise IT Strategies** identify the overarching IT strategies that address City business and technology needs.
- **Application Strategies** list the planned investments for applications supporting enterprise business functions like finance and accounting, human resources and customer service.
- **Data & Security Strategies** enumerate the decisions, standards and plans for collecting, storing and sharing information and data.
- **Infrastructure Strategies** are the actions necessary to provide reliable systems and adapt to constant change in computing and networks.

CITY BUSINESS PRIORITIES



City government business objectives guide all technology investments. The priorities are best expressed by the [Mayor's Office](#) issues and initiatives identified below. Enterprise level technology investments support one or more of these

Issues & Initiatives

Shared Prosperity

City government plays an important role in promoting job growth by attracting and retaining businesses, making Seattle an attractive place to live and providing the infrastructure to support prosperity.

Health & Public Safety

Public safety and health continue to be a primary responsibilities and priority for City government in day-to-day operations and emergency preparedness and response.

Race & Social Justice

The Race and Social Justice Initiative seeks to eliminate racial disparities and achieve racial equity in Seattle by ending institutional racism, promoting full participation of all residents in civic life and partnering with the community.

Open & Effective Government

City government strives to continuously improve both efficiency and effectiveness while maintaining transparency, increasing public engagement and encouraging stakeholder participation.

Environmental Sustainability

As stewards of the environment, City government is committed to sustainable growth and operations, as well as carefully evaluating investments for their environmental impact.

priorities.

TECHNOLOGY DRIVERS

Changes in the way the City does business are the primary driver for technology. The reverse is sometimes true as well, where emerging technology presents opportunities for progress. The key trends generating change are:

Mobility

Constituents want access to City information and services through mobile devices like smart phones and tablets. City workers are increasingly mobile and need access to technology to perform their jobs.

Green Computing

IT is both a major consumer of energy, and a tool to help reduce carbon footprint. Collaboration software, video teleconferencing and converged communications all reduce the need for travel and therefore the emission of greenhouse gasses. Server virtualization and storage consolidation reduce power consumption within the City's data center.



Cloud Services

It is increasingly common to subscribe to applications that run in large data centers outside City government or rent servers or storage running in such a data center. There are pros and cons to these cloud services with regard to cost, risk and flexibility.



Secure Information and Networks

City government computing systems continue to provide a high profile target for hackers. The City must safeguard its networks and data and keep constituent information private and secure.

Converged Communications

Fast, resilient communications support critical services like those provided by Police, Fire, and transportation. Separate communication networks devoted to voice, data, radio others are converging onto common technologies.

Open Data

Seattle City government is committed to transparency, making data available and useful. Constituents can use this data for analysis or to create web or mobile applications, including “mashups” that provide new services.



Integrated Customer Service

Constituents expect to be able to report problems, track the progress of solutions and be notified when the problem is fixed. Constituent relationship management (CRM) software enables them to do this over the phone or via the Web, with mobile access on the way. Call Center software enhances the ability to take in and address problems.

Flexible, interoperable and efficient core technology

Most IT is a utility that must “just work.” The great majority of IT investment and staff time is devoted to maintaining the thousands of computers, network linkages, business applications and databases within City government. Regular upgrades are required to keep the installed base of technology functional and efficient.

ENTERPRISE IT STRATEGIES

City government enterprise IT strategies are organized according to technology domains that are components of an overall IT blueprint or architecture. The Chief Technology Officer and supporting governance organizations maintain a series of Roadmap documents capturing high level IT strategies, emerging IT trends and projected changes. Many subject areas like cloud computing, mobility and converged communications merit specific strategies. This detailed information provides a basis for the summary level strategies presented below. The major strategic elements are organized into the following components:



- **Enterprise Business Applications** cover Citywide business applications such as financial, human resources, geographical information and others.
- **Enterprise Utility Applications** address general purpose software like email and calendaring, databases, server operating systems and mobile device management.
- **Web Technology** focuses on web and mobile applications development, social media, open data, collaboration and the tools and techniques used to manage these areas.

- **End User Technology** includes personal computers, mobile devices, office productivity software and the tools to manage them.
- **Network** covers voice, data, radio and wireless networks; call centers, Interactive Voice Response and the confluence of technologies under Unified Communications.
- **Security & Privacy** provides a cross-domain view of the security and privacy elements that need to be included in all technologies.
- **Data Center** includes data center facilities, servers, storage and management tools.

Enterprise Business Applications

This section addresses Seattle's enterprise-level software applications, defined as those serving common needs across all or most City departments. For example, all business areas utilize Summit, Seattle's financial management system as the accounting system of record. This section does not address planning and management of department-specific applications such as construction permitting or pet licensing.

FINANCIAL APPLICATIONS

Summit (an implementation of PeopleSoft Financials), serves as the City government accounting system of record, providing modules for general ledger, accounts receivable and payable, purchase order, asset management, labor distribution, billing, project cost, and budgeting. Other enterprise financial applications handle enterprise level functions like cash receipting, electronic payment and remittance processing. Strategies include:

- Upgrade the current version of PeopleSoft Financials in alignment with business process changes informed by the City's financial management reengineering effort.
- Expand financial services and utilization of existing Summit modules as identified by business analysis.
- Develop a business plan to implement a common Citywide budgeting system in light of Oracle product directions and City requirements.
- Replace the existing standard electronic payment vendor and transition applications.
- Continue to enhance and maintain enterprise applications providing cash receipting, remittance processing and other financial services.
- Determine the appropriate future path for Summit with respect to product lifecycles and product roadmaps.

HR & PERSONNEL

The Human Resource Information System (HRIS) provides HR administration, payroll and benefits services for the City's 10,000 plus employees. The application is an implementation of the EV5 product from Automatic Data Processing (ADP). There has been increased use of cloud-based solutions in the general HR software marketplace. ADP has a hosted product, although the City's implementation remains in the City data center. The strategies City government will pursue include:

- Enhancement of EV5 with regular updates to support efficiencies and improved management, including self-service, workflow, benefits management and mobile computing support.
- Continued use of cloud-based services such as online job applications from NeoGov.

- Evaluate long run strategies including tighter integration with financial systems and the emergence of cloud options.

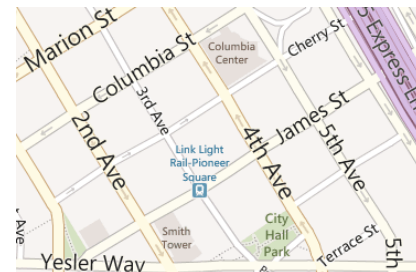
COMMUNICATIONS, CUSTOMER SERVICE AND EMERGENCY MANAGEMENT

The systems providing these functions are essential to City government’s ability to communicate with constituents for regular business and in emergencies. Strategies include:

- City government’s constituent relationship management (CRM) system provides a central place to report the most common types of service requests like abandoned cars, graffiti or potholes. A new product from Motorola replaced the previous CRM system in December 2011 and new service areas will be added and a mobile interface will be installed to enable service requests via smartphones or tablets.
- Emergency management relies on several critical systems, including a management system used statewide (WebEOC), geographic information services (GIS), an emergency notification system for outdialing and emerging systems to provide an integrated view of emergencies (the SPD Common Operating Picture). These systems will be maintained and enhanced in the near term.

GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND MAPPING

Seattle City government GIS services are recognized as being among the best of any municipality. The City provides internal and external users with geographic data via a central GIS database based on ESRI products. Hundreds of applications created by City departments and external entities rely on GIS services. Strategies include:



- Over 25 GIS data sets were added to the City’s online data portal at Data.Seattle.gov in 2011. More data sets will be provided along with tools to enable constituents to analyze City data and build applications.
- Many Internet-based applications rely on GIS web services and data. GIS will expand accessibility to City data for web and mobile applications.
- GIS infrastructure will be enhanced to support 24X7 operations and peak loads experienced in emergency situations.

Enterprise Utility Applications

These Citywide systems work in the background to support business applications and enable staff to work and communicate effectively. Examples include the City’s server operating systems, database management systems, directory services, mobile device management technology, email and archiving, and file systems. Key strategies include:

- Virtualization of servers to reduce energy use and space consumption in the data center. Approximately 60% of servers are virtualized in the data center.
- Continuation of the migration to an integrated set of products provided by Microsoft, the City’s strategic end-user computing platform. Migration from a mixed vendor infrastructure to an integrated set of products began in 2009.
- Assess emerging cloud solutions in areas where they make economic and operational sense.

- Explore emerging technologies like collaboration and unified communications where specific business requirements justify investment.

SERVER OPERATING SYSTEMS, DATABASE MANAGEMENT AND DIRECTORY

The systems in this category support the great majority of City government business applications and delivery of City services. Key strategies include:

- Work with application owners to upgrade or replace older software to run on current operating system and database technology, reducing support and licensing costs.
- Deploy new business applications according to City standards to safeguard security, improve maintainability and retire aging versions before they become security risks or create support burdens.
- Continue to aggressively leverage virtualization technology to reduce the number of physical servers, reduce energy usage and improve manageability.
- Consolidate database licensing wherever possible to minimize licensing costs.
- Continue the migration to Microsoft Active Directory.
- Assess the costs, benefits and suitability of shifting some environments to cloud-based services like Azure, and determine application development standards for cloud applications.
- Evaluate business intelligence tools available with database products, as well as standalone decision support solutions.

MOBILE DEVICES

The use of mobile computing devices inside City government is increasing. RIM BlackBerry devices are widely deployed in the City and a recent bring-your-own-device (BYOD) pilot is likely to expand. There are many pilot projects evaluating the use of tablets and smart phone applications to support the large number of City employees who work on the go. The City continues to update the tools necessary to manage and secure this environment, including Mobile Device Management software. Key strategies are:



- Continue to monitor technology advances in smart phones and tablets and the tools necessary to manage and secure them.
- Expand and improve the use of Mobile Device Management software currently deployed to keep devices and data secure and synchronized.
- Establish standards, policies and security measures for personal devices used for City business.

COMMUNICATION AND COLLABORATION

The City's messaging and collaboration platforms continue to be influenced by the promise of converged communications and cloud services. To successfully manage this environment, the City must evaluate new technologies as well as address the requirements of public disclosure laws that govern messaging. IT strategies surrounding communication and collaboration include:

- Evaluate migrating email services from Exchange 2007 to Exchange 2010 or 2013.
- Research emerging cloud service options for messaging, collaboration and converged communications.

- Continue to update City systems to integrate with converging communications systems as appropriate.
- Upgrade SharePoint and evaluate its ongoing use for future internal collaboration needs.

RECORDS ARCHIVING AND RETENTION

As more information flows through City systems, there is a growing need to archive and index all sorts of files, from email to video. Strategies include:

- Continue archiving of email with Nearpoint (installed in 2009/2010).
- Evaluate further options to support improved retrieval of information, including the next version of Exchange.
- Evaluate file archiving solutions for possible inclusion in the 2013/2014 budget.

Web

The Internet and Web continue to grow in importance as foundational elements for applications and communications. Innovation is increasing with mobile applications, new user interfaces, cloud computing and an exponential number of devices attached to the Internet. This section addresses the City's directions surrounding the World Wide Web, social media, open data, and mobile application development.

WEB AND MOBILE APPLICATIONS



Users interact with applications and data using an expanding variety of devices and through different channels, from traditional applications to social media, constituent relationship management (CRM), short messaging (text, Twitter), email and video chat. There are more choices for interacting with City government than ever. Strategies include:

- Deploy applications that support constituent choices in interacting with City government, and provide a similar look and feel across the options.
- Establish a constituent-facing application strategy to provide cohesiveness across the Web, CRM, mobile, and social media.
- Deliver mapping and geo-location services capable of supporting a broad range of applications, many of which depend on geographical information and are tested by heavy use during events like snow storms.
- Develop an integrated set of enterprise and departmental mobile applications.
- Carefully manage security for devices and constituent touch points.

INFORMATION

Seattle is committed to delivering reliable, secure and helpful information to the public. To support transparency and open government, the City created data.seattle.gov in 2010, exposing over 100 datasets for use by the public. The City must also address the emergence of sensor-based systems (e.g., building sensors, transportation systems, power grids) which are driving a significant need for data management. Seattle's information IT strategies consist of the following:

- Provide additional data sets and tools to the public on data.seattle.gov and encourage innovative use of this data for applications, analysis and mashups.

- Encourage the use of innovative techniques like crowd-sourcing and application development contests.
- Deploy Web applications to provide visibility on subjects like the Mayor's performance expectations, federal stimulus spending and others.
- Continue implementing a Web content management system to provide consistent branding and navigation, manage Web and mobile content, and streamline updates and redesigns.
- Plan for the growing flood of data provided by sensor-based systems necessary to support intelligent transportation, automated buildings and fleet management.

APPLICATION DEVELOPMENT

Web applications are undergoing tremendous change, with Web browsers becoming the de facto application delivery tool. Mobile devices present interface and security challenges and require new toolsets and approaches, as do applications designed to run in the cloud. Collaboration and portals continue to be important application concepts. Strategies include:

- Define methods and standards for building both native mobile applications and mobile Web applications. Areas of focus include HTML5, security, the role of application stores and tools for mobile application development.
- Continue to develop and deliver applications using existing toolsets like Microsoft's .Net framework and keep pace with platform changes with the emerging Windows 8 product set.
- Expand the www.seattle.gov Web portal to support more services like eGovernment polling and idea ranking and provide links to other portals like CRM.
- Leverage Web services technology for GIS, CRM and other systems.
- Leverage collaboration services by updating and expanding the use of SharePoint.

CONSISTENCY AND USABILITY

User interface (UI) technology is evolving rapidly. Text-based interfaces have given way to UIs with pictures, video and short messages. Touch, gesture recognition and voice are becoming commonplace, as are applications that superimpose data on the real world ("augmented reality"). Seattle City government will continue to provide a high quality, consistent user experience extending across the Web and mobile applications. Strategies include:

- Leverage Web content management to provide a consistent look and feel across Web pages, including those optimized for mobility.
- Determine best practices and common tools for emerging interface technologies like touch, action detection, voice, intelligent agents and others.
- Establish testing methods and tools to ensure delivery of secure and usable applications.

SECURITY AND PRIVACY

Seattle must maintain a secure online environment to protect constituent data. Emerging technologies like mobility, cloud computing and social media add new attack vectors on a regular basis. IT strategies include:

- Expand standard tools and services for Web security and extend these to emerging technology.



- Integrate standard security methods into project management practices to reduce application development and acquisition effort.
- Create a process to test and certify mobile applications.
- Implement solutions to keep the City's Web presence and its data protected from malevolent activity.

End User Devices

The approximately 12,000 personal computers (PCs) in use at the City must be kept up-to-date and secure. Emerging mobile technology adds a new mix of devices, platforms, security and support challenges. Key strategies include:

- Continue deployment of an integrated Microsoft product set and management tools to support general purpose PC computing and make it as efficient as possible.
- Introduce mobile technology and management tools where appropriate.
- Explore virtualization options to reduce costs and maximize operational control.



OPERATING SYSTEMS AND BROWSERS

The current standard operating system and browser deployed on City PCs are Windows XP and Internet Explorer (IE) 8. Microsoft will cease support for both in 2014. Newer product sets offer advantages in cost, manageability and features. Strategies include:

- Complete compatibility testing of business applications with Windows 7/IE 9 in 2012.
- Migrate to Windows 7 and IE 9 beginning in 2013.
- Evaluate Windows 8 and Internet Explorer 10, and determine the future migration path.
- Keep pace with changes in application development and delivery tied to the evolution in operating system and browser technology, especially HTML5.

VIRTUAL DESKTOP INFRASTRUCTURE

Similar to server virtualization, Virtual Desktop Infrastructure (VDI) hosts multiple desktop users within one physical server. VDI enables streamlined desktop administration, mobile access to desktop environments, and lower-cost desktop PCs (i.e., thin clients). This technology may also provide similar advantages for managing diverse mobile devices. The City's VDI strategies are:

- Pilot proof-of-concept VDI implementations in several City government departments.
- Determine the costs and benefits of supporting general users, mobile devices and applications with these tools.
- Develop a strategy for VDI, including a framework for departments to support a defined set of functionality.

STANDARD APPLICATIONS

The City provisions each user PC with a standard set of applications which are part of the integrated Microsoft stack:

- Continue operating on Microsoft Office 2007 (City standard).
- Evaluate and test application compatibility with Microsoft Office 2010 as part of Windows 7/IE 9 testing.
- Upgrade to Office 2010 with the Windows 7/IE 9 deployment beginning in 2013.
- Assess cloud-based office productivity options for some users and for users of mobile devices.
- Evaluate the emerging set of communications applications, which are currently installed to support some functions like short messaging.

PERSONAL DEVICES

The shift to mobility is driving rapid change in PC computing. Fewer vendors are selling desktop computers and “tabletization” threatens to transform traditional PCs with user interfaces developed for portability like touch, voice activated intelligent agents and gesture. IT strategies for personal devices include:

- Continue contracting with a single PC provider for standard PCs, achieving economies of scale and cost savings and environmental objectives. Seek new savings opportunities by continuing to review performance, cost and contract terms with the City's current standard PC vendor, HP.
- Continue the deployment of configuration management software.
- Monitor the evolution of smartphones, tablets and ultrabooks and their impact on vendor contracts and product sets.
- Evaluate and develop ways to manage mobile devices, integrate them into existing systems and keep them secure.
- Work with Network groups on the impact of mobile devices on Wi-Fi, cell and data networks.

Network

City government networks link business units, constituents and systems via telephone, radio and data networks and a wide range of wireless networks. In the general communications marketplace, traditionally separate modes of communication have begun to converge onto Internet protocols. The push for greater mobility and increased use of video is driving the need for more wireless and bandwidth.

DATA NETWORK



Seattle City government, in partnership with twelve regional partners, has one of the most complete high-speed data networks in the nation, connecting all downtown locations and many outside the City core. This network must keep pace with increasing demands for bandwidth driven by sensor-based systems, video and converged communications. Related strategies include:

- Continue upgrading the core network to 10 gigabit per second speed.

- Continue deploying new switching equipment and implementing open network protocols to support this effort.
- Share the network's spare capacity ("dark fiber") to third parties to support economic development in specific neighborhoods like Pioneer Square.
- Evaluate emerging trends that may require significant investment, including the transition to Internet Protocol version 6 (IPv6) and the requirement for increased security on network infrastructure (DNSSEC).
- Upgrade the City's remote access virtual private network (VPN) product to support employee remote access and mobility.

WIRELESS

A wide range of City services and applications depend on wireless and radio networks, including Police and Fire operations and utility crews. The City currently provides wireless network access throughout its core buildings and the region over various commercial and City networks. Major wireless strategies include:



- Continue to lead the effort to establish a regional public safety wireless data network, working with regional and federal partners.
- Enhance and standardize Wi-Fi and cellular networks to support internal City business functions with enhanced mobile options.
- Investigate ways to switch network traffic from cellular to Wi-Fi to achieve cost savings.
- Manage City government transition from existing 3G to 4G/LTE services in support of critical operations like Police and Fire.
- Evaluate and deploy emerging wireless technologies as they become available, solve existing problems and satisfy cost/benefit thresholds.

RADIO

Seattle City government is the managing regional partner in a consortium providing radio support for public safety operations over the 800 MHz frequency. Efforts are underway to convert the public safety radio network to open standards and digital technology. This involves implementation of a hybrid system to support both technologies during the transition. The City's radio strategies include:

- Ensure that radio networks support a full range of voice and data requirements, including video, next generation 911 and interactive communications.
- Continue adoption of integration standards to enhance emergency regional communication capabilities.
- Pursue use of 700 MHz wireless frequencies to support data with regional cooperation and federal government support.

PHONE NETWORK

Seattle maintains its own internal telephone network, which must remain functional during emergencies. The general marketplace has moved in the direction of voice over Internet Protocol (VoIP), eliminating the need for separate data and voice networks in some areas. The City's phone network strategies include:

- Transition to VoIP technology for the majority of City users while maintaining a core deployment of traditional and more resilient TDM devices for emergency services and disaster recovery.
- Implement technologies which provide compatibility across communications networks via Internet protocols (SIP trunking).
- Replace handsets in conjunction with the hybrid VoIP/TDM strategy.
- Determine the ongoing role of other voice communications solutions such as soft phones and cellular phones and the eventual inclusion in a unified communications strategy.

CUSTOMER SERVICE

Various communications technologies support the City's call centers and constituent contact channels. Many City services offer an interactive voice response (IVR) interface, enabling users to perform tasks with the use of a touchtone phone. Strategies include:



- Implement next-generation call center software in the Utility Call Center and other locations, enabling the combination of voice, email, fax, chat and short message communications.
- Complete the migration to next generation, standards-based IVR technology.

CONVERGED COMMUNICATIONS

In the general marketplace, traditionally separate communications networks are converging onto a common delivery method based on Internet technologies, a trend called unified communications (UC). UC enables the merging of voice and email, short messages, video conferencing and other streams of communication into an integrated set of tools. Full implementation of this technology is expensive and City government has no immediate plan to implement UC. However, ongoing investments in communications infrastructure help lay the groundwork for the future, and having a strategy in place reduces the risk of incompatible directions. Associated strategies include:

- Formulate a UC strategy to examine the risks, costs and benefits of a multi-vendor environment.
- Monitor emerging user requirements for blended communications, video teleconferencing and other services.
- Evaluate emerging converged communications products and modes of delivery (e.g., cloud).
- Make investments in communications infrastructure with converged communications in mind and avoid technological dead ends.
- Lay the infrastructure foundations to support UC with SIP trunking, which supports voice over IP telephone services.

Security & Privacy

Like other government entities, City of Seattle government is under continuous attack by hackers. While most information in City systems is publically disclosable, some represents the private business of our constituents. Other data, like plans for dams or police investigations, represent restricted operational information. Any breach in City networks has the potential to expose private or sensitive information, so the City maintains an aggressive cyber security program extending across all



departments, applications and systems. This section addresses the City's efforts to maintain a secure computing environment, organized by elements of the program.

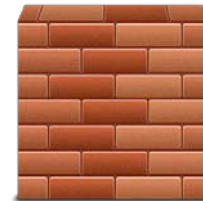
DETER, PREVENT, DETECT

A broad set of security initiatives focus on preventing attacks, deterring those who would do harm to our systems and detecting their presence when they make attempts on our security. Key strategies in this area include:

- Continue operation and enhancement of Web filtering, anti-virus and botnet detection and removal.
- Deploy anti-virus solutions for mobile devices as the sophistication of these threats evolve.
- Continue participating in regional IT log monitoring and information sharing initiatives to improve intelligence on threats and the ability to detect attacks and trends.
- Establish policies, development practices and tools to improve application security, including improved authentication methods.
- Evaluate, select and implement wireless event detection tools.

MINIMIZE POTENTIAL FOR ATTACK DELIVERY

Some security breaches are inevitable, but their effect can be minimized by sharing information, staff education and ensuring security measures are built into every application and system. Related strategies include:



- Continue testing all network-facing applications and extend tools and standards to evolving application types like mobile, new user interfaces and other developing technologies.
- Implement a knowledge management tool to share security solutions and expertise.
- Continue educating security staff, IT staff and City employees to raise their awareness and skills.

TRUSTED COMMUNICATIONS

Secure communications are essential to City government services, whether they are between Police working a case or between a constituent reporting an abandoned car to City government. The proliferation of communications methods like short text, email through social media sites like Facebook and even video chat make this more complex. The following strategies are being applied:

- Expand and refine existing methods of authentication and security for use with mobile, social media communications, internal City workflow applications and others.
- Increase the security of remote access methods as more of the workforce goes mobile.
- Assess emerging identification management products, including hosted and managed solutions.

REGULATORY COMPLIANCE

Various federal and state regulations safeguard particular types of information. Examples include restrictions on handling personal health information under the Health Insurance Portability and Accountability Act (HIPAA) and regulations covering electrical generation and distribution systems under the Federal Energy Regulatory Commission (FERC). Failure to comply with regulations can expose sensitive or private information. Strategies include:

- Continued careful attention to compliance programs and coordination with state and federal partners as requirements become more stringent.
- Provide increased security and checks and balances for privileged users with administrative access to systems.
- Provide options for dual-factor authentication for increased levels of security where needed.
- Monitor emergence of compliance issues for new technology such as virtual desktops and mobile computing.

Data Center

The City maintains a mission-critical consolidated server room (CSR) that hosts a wide variety of enterprise and departmental business applications. The CSR provides large-scale support for enterprise applications and midrange servers for general business applications, as well as storage, backup, management systems and high capacity printing. The migration of some applications and services to cloud options may affect the data center in the future, but careful consideration must be given to cost/benefit, security and data retention. Disaster recovery and business continuity are also critical issues for the data center given the scope of services supported.

DATA CENTER FACILITIES & OPERATIONS

Data centers consume an estimated 1.5% of the world's electrical output. The CSR takes advantage of virtualization technology to reduce the number of physical servers, costs and carbon footprint. City government data centers require sustained investments to replace obsolete equipment and maintain reliability. IT strategies include:

- Maintain existing operations with necessary equipment repairs and replacements, especially needed upgrades to environmental equipment.
- Evaluate options for an alternative data center to support emergency operations, including cloud options or partnering with Washington State or King County.
- Evaluate emerging cloud computing options with regional agencies and providers and define costs, benefits, and security requirements.
- Continue aggressive virtualization of servers.
- Finish upgrades to the data center network infrastructure.
- Continue to leverage production scheduling, system management and facilities monitoring tools to improve data center operations.
- Update high speed printing software and replace/upgrade hardware as needed and continue to evaluate printing trends in response to online bill presentment and payment options.

STORAGE AND BACKUP

City government applications depend on the ability to store, backup and recover large amounts of data. Some industry estimates project an 800% increase in stored data over the next five years, driven by video, records archiving, converged communications technologies, business intelligence/analytics and other trends. Related storage and backup strategies include:



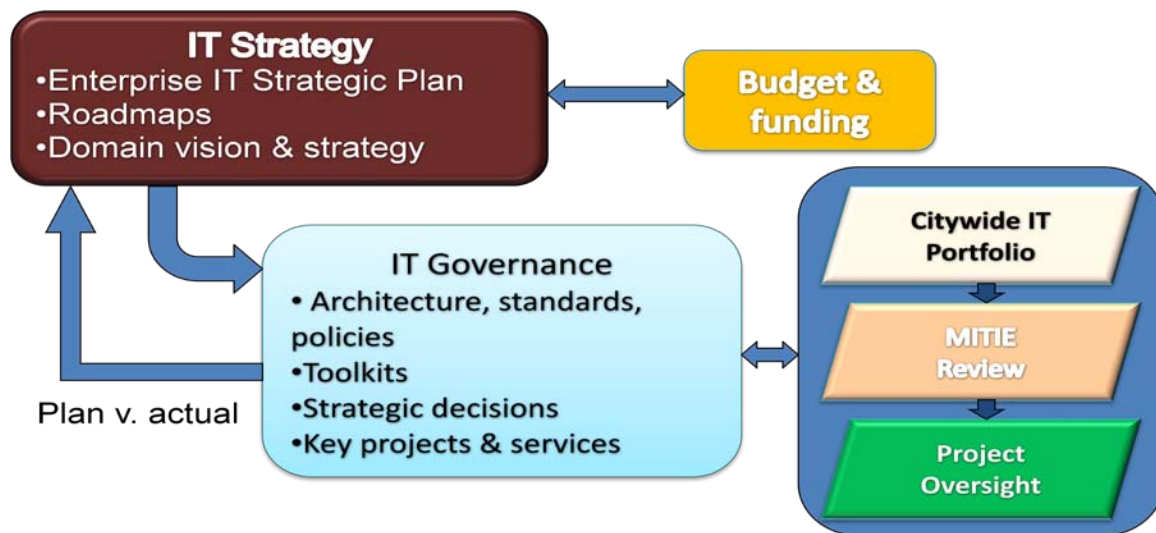
- Continue to expand storage capacity to support business needs, but manage the growth.

- Evaluate cloud-based and hierarchical data management options to supplement storage capabilities.
- Assess alternate backup software solutions as well as offsite disk backup.

CONCLUSION

The **Enterprise IT Strategic plan** sets the top-level direction for technology in alignment with City business objectives. It comprises one element of a larger management business system, the IT Management Framework, comprised of:

- **Budget planning.** The programs and projects outlined in the EITSP are prioritized, refined and estimated through the City budget process.
- **Architecture and Roadmaps** define how the elements of technology fit together, where City government is currently, and where it's going. These supply the detail for construction of the Enterprise IT Strategic Plan, adjusted as real budget plans emerge and programs are refined.
- **IT Governance and Coordination** consists of cross-departmental teams that make technology work across the City, with projects assigned to organizations like the Desktop Tech Team or Internet Board.



- **Portfolio Management** identifies and reviews *new* technology projects with risk factors or the potential for extension across the enterprise. New projects are reviewed for consistency with strategic directions and standards.
- **Project Oversight** assesses high-profile projects in order to increase the odds of success and maximize benefit. The focus is on project management guidance and performance monitoring for compliance with scope, schedule and budget.
- **Standards and Policies** outline the minimum requirements for delivering technology that works. Strategic projects and programs often result in the creation of new standards and policies.

DOCUMENT CONTROL

This document is a product of the Citywide Technology Board and the Chief Technology Officer, Bill Schrier. The document was prepared by:

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Version	Authors	Date	Changes/Comments
0.1	T. Morrow, R. Kaye, A. Doerzbacher	3/15/2012	First full draft -- for 3/20 Tech Board
0.2	T. Morrow, R. Kaye, A. Doerzbacher	3/22/2012	Candidate release draft for Tech Board review
1.0	T. Morrow, R. Kaye, A. Doerzbacher	3/30/2012	Final with changes from Tech Board and CTO