



City Council Meeting Schedule October 2018

October 2, 2018

Tuesday, 6:30 p.m.

REGULAR COUNCIL MEETING

October 9, 2018

Tuesday, 6:10 p.m.

EXECUTIVE SESSION PER RCW 42.30.110(1)(i)
Potential Litigation (20 minutes)

Tuesday, 6:30 p.m.

WORKSHOP MEETING
1. 2019 TPA Budget & Marketing Plan
2. Employee & Community Relations Department
Update
3. Finance Department Update

October 16, 2018

Tuesday, 6:30 p.m.

REGULAR COUNCIL MEETING

October 23, 2018

Tuesday, 6:30 p.m.

WORKSHOP MEETING
1. Water & Sewer Rate Update
2. IT Strategic Plan Update
3. Management Services Department Update
4. Public Works Department Update

October 30, 2018

Tuesday, 6:30 p.m.

WORKSHOP MEETING

1. 2019/2020 Biennial Budget Presentation
2. Property Tax Levy

To assure disabled persons the opportunity to participate in or benefit from City services, please provide twenty-four (24) hour advance notice for additional arrangements to reasonably accommodate special needs.

Please be advised that all Kennewick City Council Meetings are Audio Taped

October 2018
Updated 10/09/18

Council Workshop Coversheet



Agenda Item Number	1.	Meeting Date	10/23/2018
Agenda Item Type	Presentation		
Subject	Water & Wastewater Rate Study Update		
Ordinance/Reso #		Contract #	
Project #		Permit #	
Department	Public Works		

Info Only	☐
Policy Review	☒
Policy DevMnt	☐
Other	☐

Summary

City council adopted a rate increase for both the water and wastewater utilities for the 2017/2018 budget in 2016. The rate study presented at that time required ongoing rate increases to support ongoing operations and capital projects as well as projected debt service. Public works along with the City's consultant FCS Group will be presenting an update to the rate study including proposed rate increases, comparisons to local cities, revenue requirements and projected needs.

Through

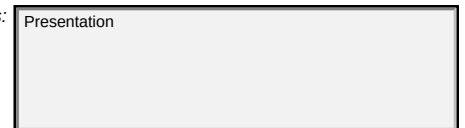
Dept Head Approval

City Mgr Approval

Cary Roe
Oct 18, 13:53:54 GMT-0700 2018

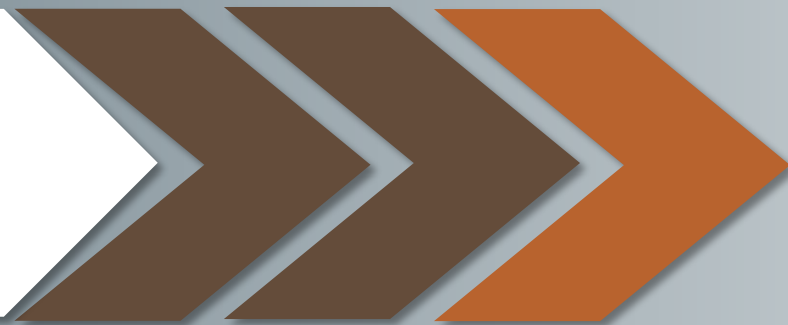
Marie Mosley
Oct 18, 21:10:49 GMT-0700 2018

Attachments: Presentation





City Council Workshop



Water & Wastewater Rate Study Update

Cary Roe, P.E. Public Works Director, City of Kennewick
Angie Sanchez Virnoche, Principal; FCS Group

October 23, 2018





Background

- ◆ The water/sewer Rate study was completed in 2016
 - 20 year plan with rate focus on 2017-2021
- ◆ The study utilizes the operational and capital improvement needs included in the:
 - General Sewer Plan adopted in 2015
 - Wastewater Treatment Facility Plan adopted in 2015
 - Water Comprehensive Plan in 2016
- ◆ Council adopted the water/sewer rate increase for the 2017/2018 Biennium
- ◆ Revisit water/sewer rate strategy for 2019/2020 Biennium

Deferred Maintenance

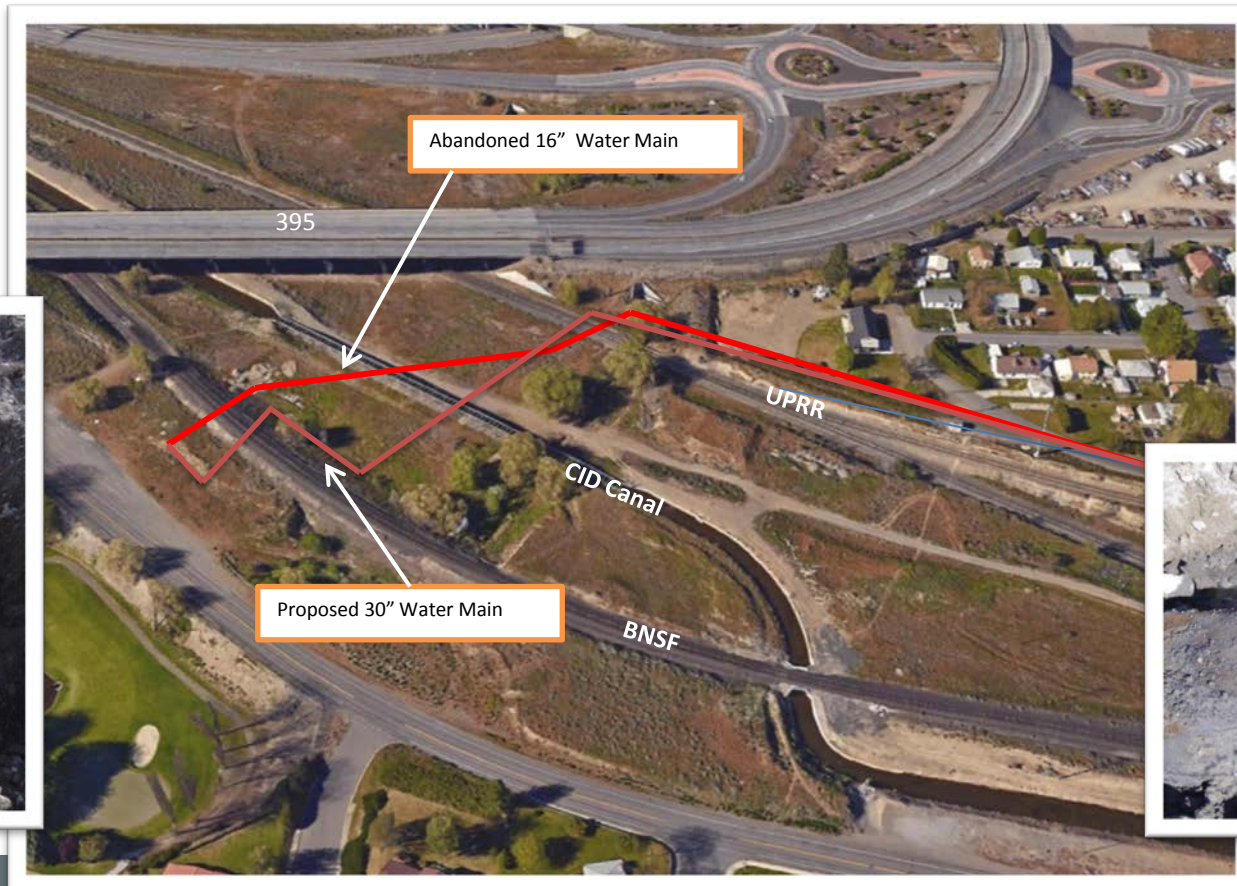
- ◆ Union Pacific Railroad sewer main consists of 5.7 miles of deteriorating 24" Sanitary Sewer. We had a collapse and an emergency repair. Currently in final design and permitting.





Deferred Maintenance

- Large Diameter Water Transmission Main from Ranney Well System. Transmission main abandoned due to leaking. Currently in final design and permitting





Deferred Maintenance

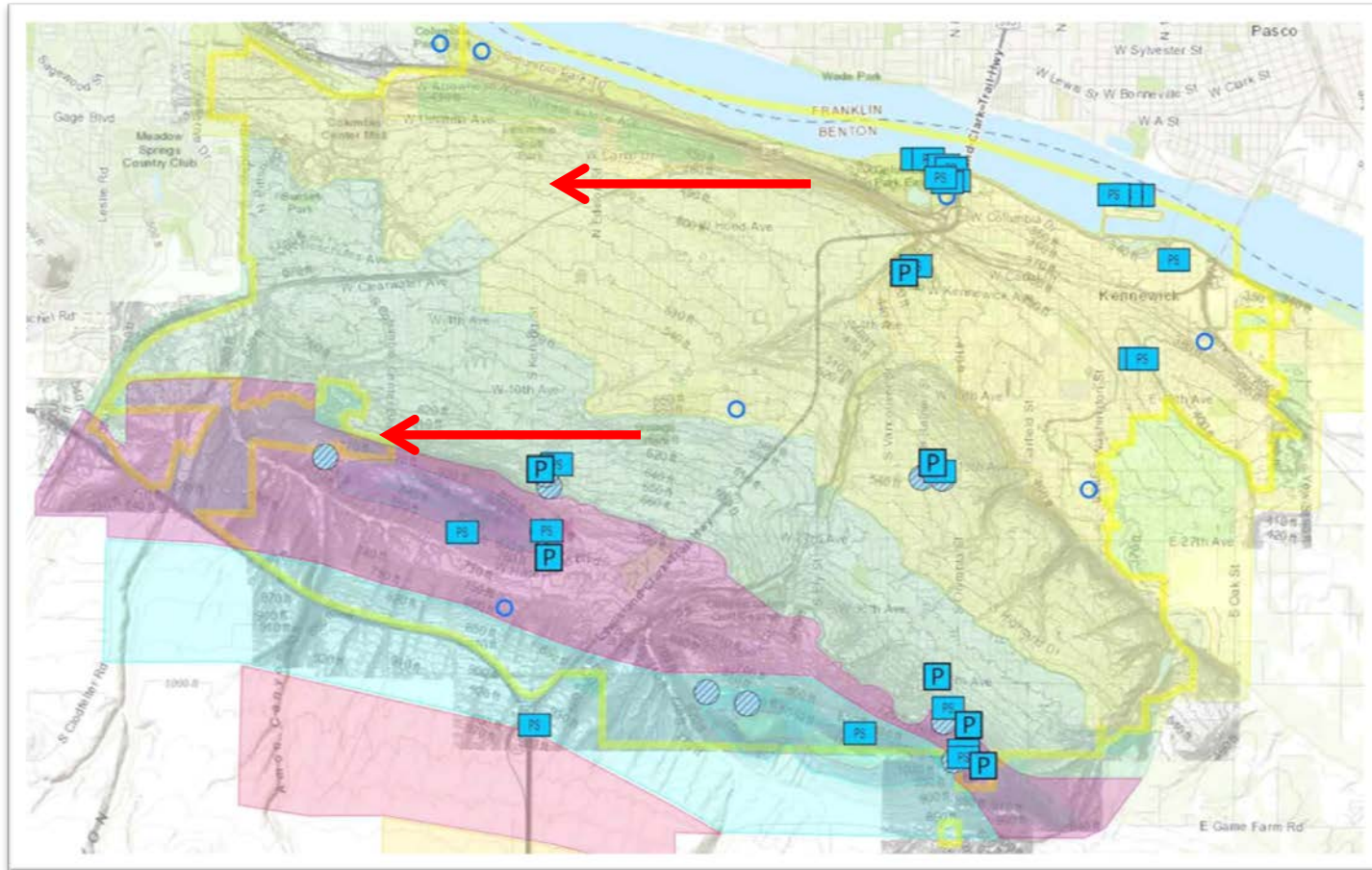
- ◆ 18th & Kellogg 10MG Reservoir. Structure is reaching it's useful structural life with columns beginning to punch through the roof.





Deferred Maintenance

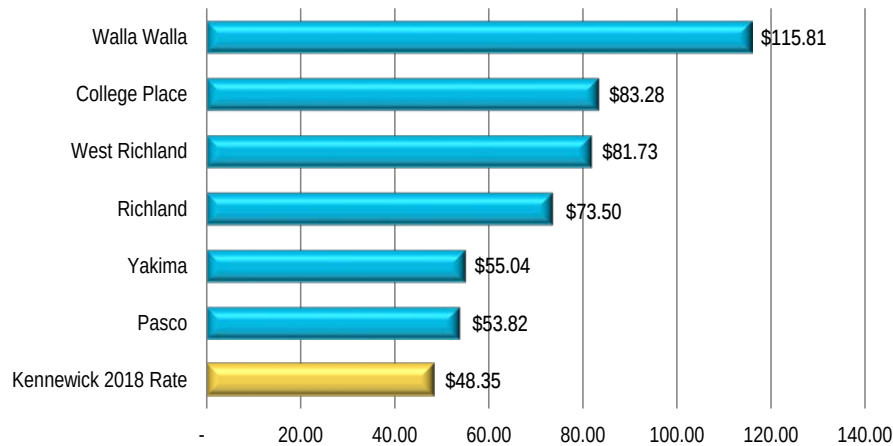
- ◆ Operational deficiencies moving water to the west. Requires construction of dedicated transmission mains, and booster pump stations





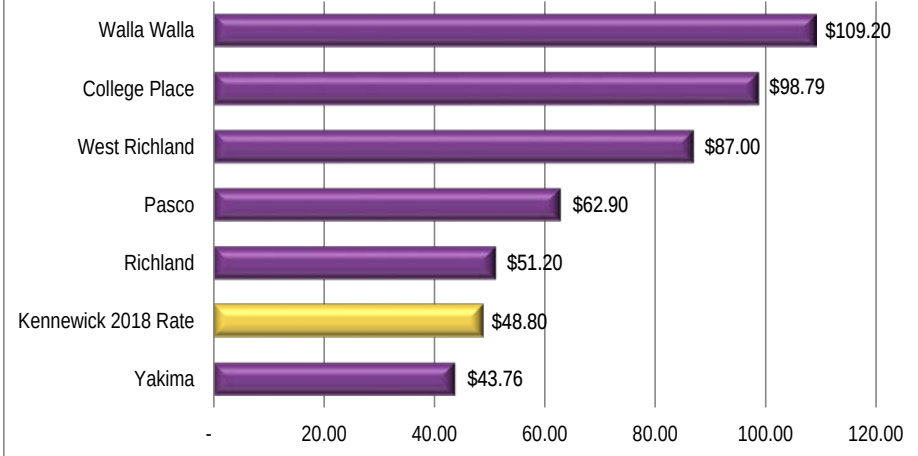
Residential Bill Comparisons

2018 Water Residential Sample Bills



Note: Assumes residential meter $\frac{3}{4}$ " and 20 ccf bi-monthly usage

2018 Wastewater Residential Sample Bills



Note: Assumes 13.3 ccf bi-monthly usage where applicable



Discussion Outline

- ◆ Overview of study review
- ◆ Key assumptions
- ◆ Summary of findings
- ◆ Staff Recommendations



Revenue Requirement

- ◆ Multi-year financial plan
- ◆ Determines the amount of revenue necessary to meet all utility financial obligations
 - Operating costs
 - Debt service
 - Capital expenditures
 - Fiscal policy achievement
- ◆ Evaluates sufficiency of current rates on a stand-alone basis
 - Cash Flow: revenue sources will meet total cash outlays
 - Coverage: allowable revenues will equal at least cash operating expenses plus a multiple of revenue bond debt service
- ◆ Monitor progress of rate strategy every two-years during budget process

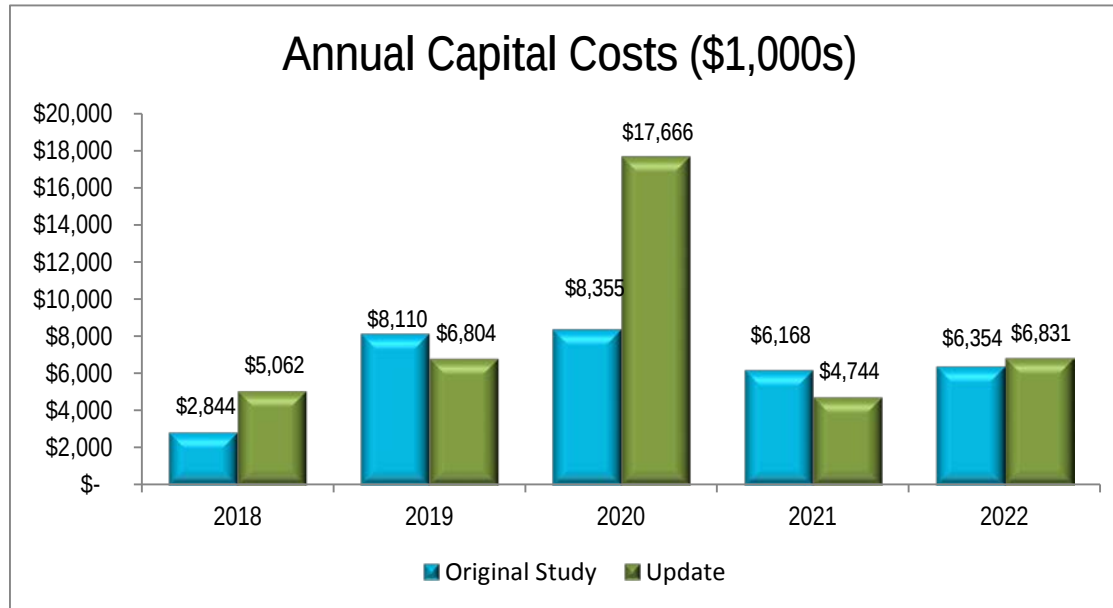


Key Assumptions

- ◆ 20 year plan with rate focus on initial five years (2017 – 2021)
- ◆ Updated during Biennium budget process
 - Revenue and expenses based on actual results 2015/2016 and revised projections for 2017/2018
 - Fund balances
 - Capital costs
- ◆ Customer growth of 1.5% per year
- ◆ Fiscal Policy Targets–
 - 90 days O&M water; 60 days O&M sewer
 - Capital Reserve 1% of original cost asset value
 - System Reinvestment target = annual depreciation
 - Debt service coverage = 1.25 minimum



Key Components – Water



- ◆ Capital costs accelerated and higher ~ +\$9.3 million
 - 18th and Kellogg reservoir improvement
- ◆ Capital program funded by:
 - Existing resources: cash reserves, rate funding, front footage fee, connection fees
 - New debt proceeds required - \$23.4 million
 - Revenue bonds: \$14.8 million 2020 & 2021
 - Low interest loans: PWTF \$3.0 million in 2019 & 2020, other loan \$2.6 million 2021



Residential Bi-monthly Bill Impact

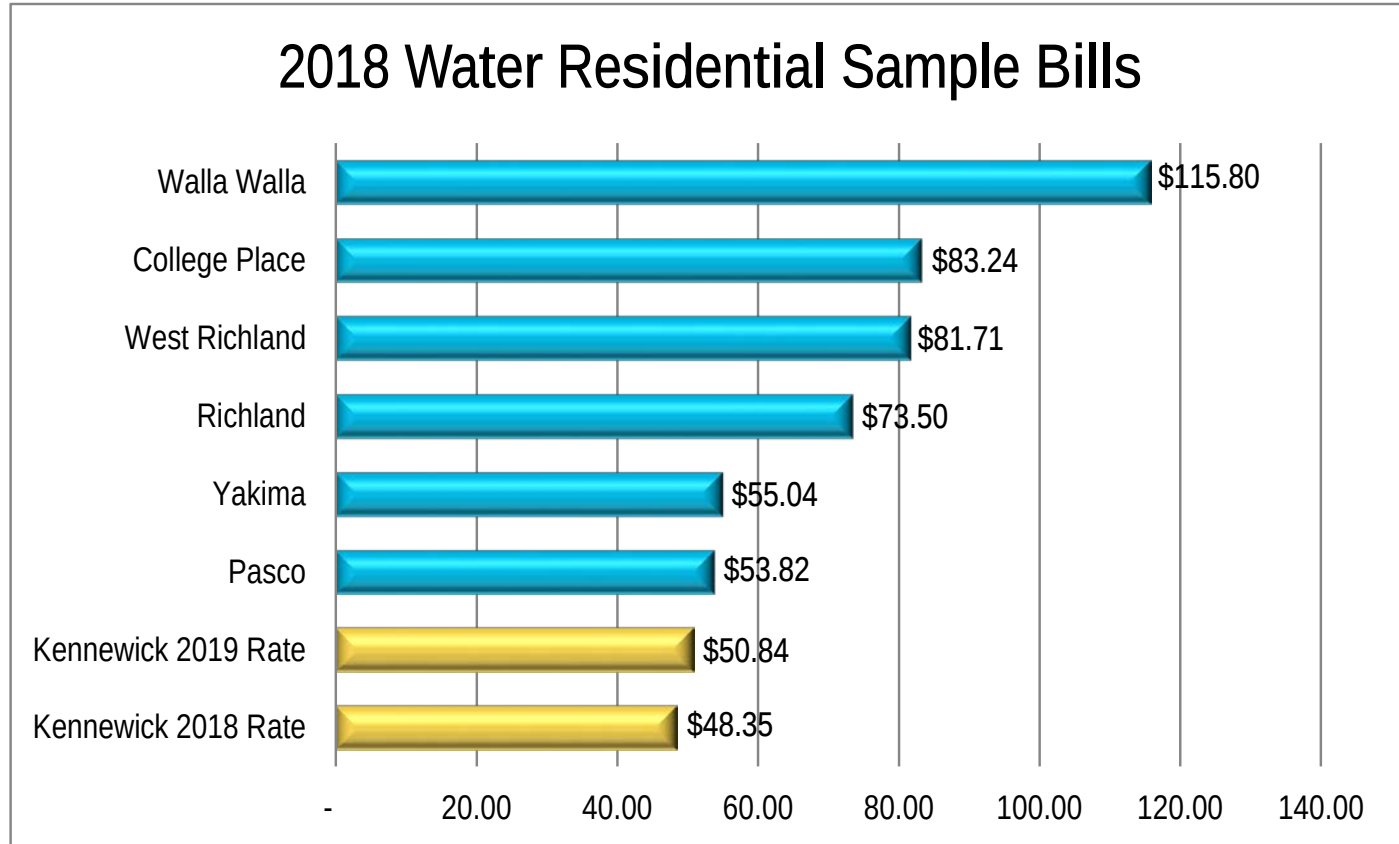
Water Sample Bill	Existing	2019	2020	2021	2022
Policy Increases - Annual CPI		2.00%	2.00%	2.00%	2.00%
Proposed Increases - Above CPI		3.15%	3.15%	3.15%	3.15%
Total Proposed Increases		5.15%	5.15%	5.15%	5.15%
Sample Residential Bi-Monthly Bill	\$ 48.35	\$ 50.84	\$ 53.46	\$ 56.21	\$ 59.11
Difference		\$ 2.49	\$ 2.62	\$ 2.75	\$ 2.89

Note: Sample bill for residential customer with 3/4" meter and average bi-monthly usage of 20 ccf

- ◆ City practice is to annually index fees and charges to CPI
 - Assumed at 2% per year
- ◆ Additional 3.15% per year above current practice
- ◆ Rate impacts shown are bi-monthly



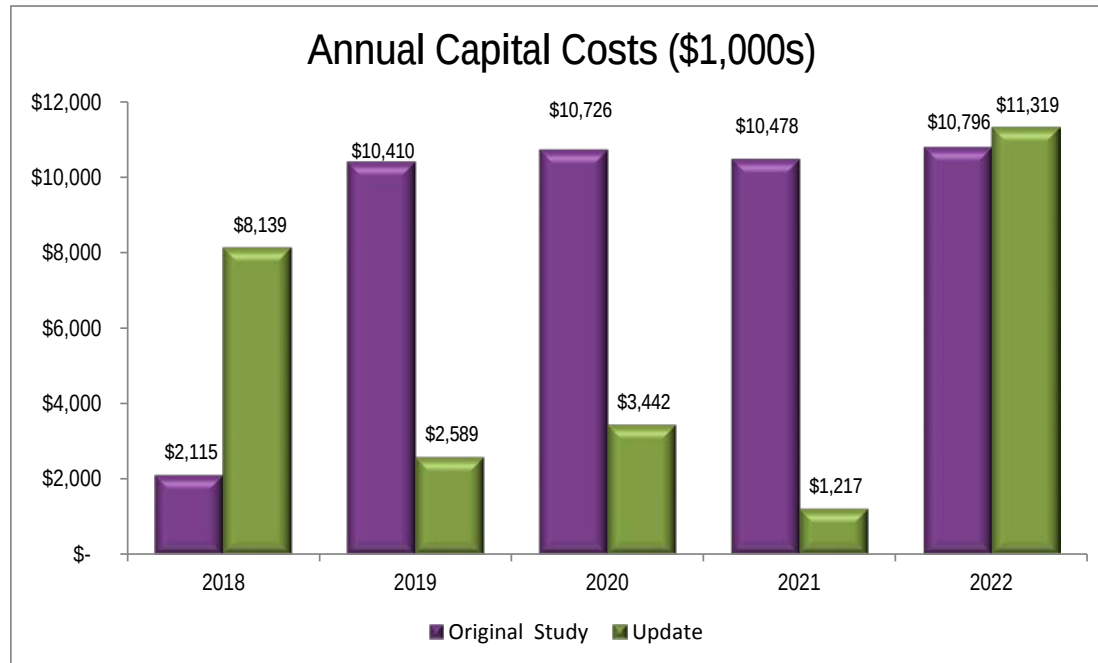
Rate Comparison



*Note: Assumes residential meter 3/4" and
20 ccf bi-monthly usage*



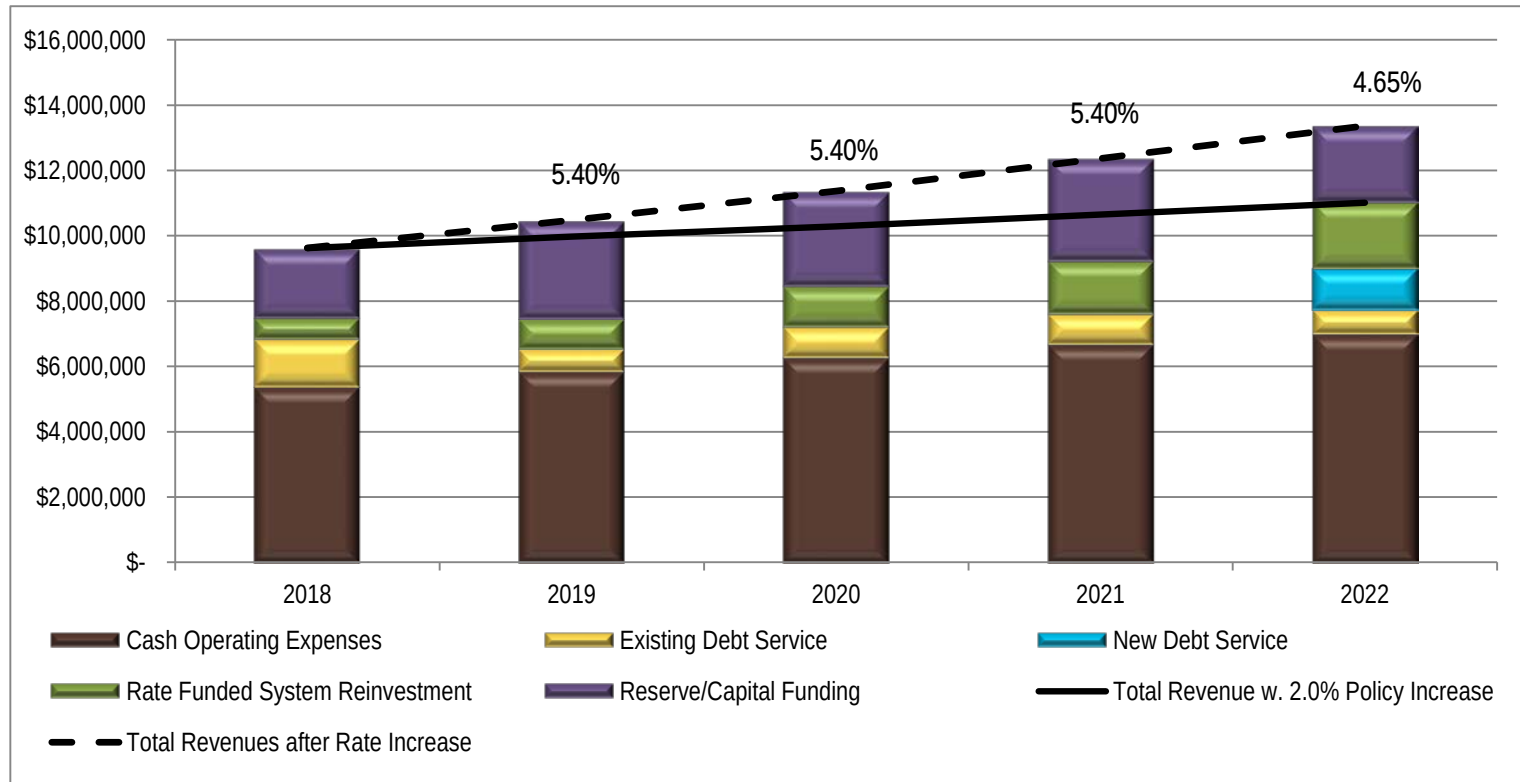
Key Components – Wastewater



- ◆ Total capital projects delayed from original schedule – projects still needed ramp up begins in 2022
- ◆ Capital program funded by:
 - Existing resources: cash reserves, rates, connection charges
 - No new debt assumed for 2019/2020 Biennium
 - \$16.6 million in new loan proceeds may be required in 2022 – revisit during next review



Wastewater Summary



- ♦ Wastewater outperforming plan
 - Delayed capital spend and no new debt required until possibly 2022
- ♦ Current rate strategy can hold for 2019/2020 Biennium



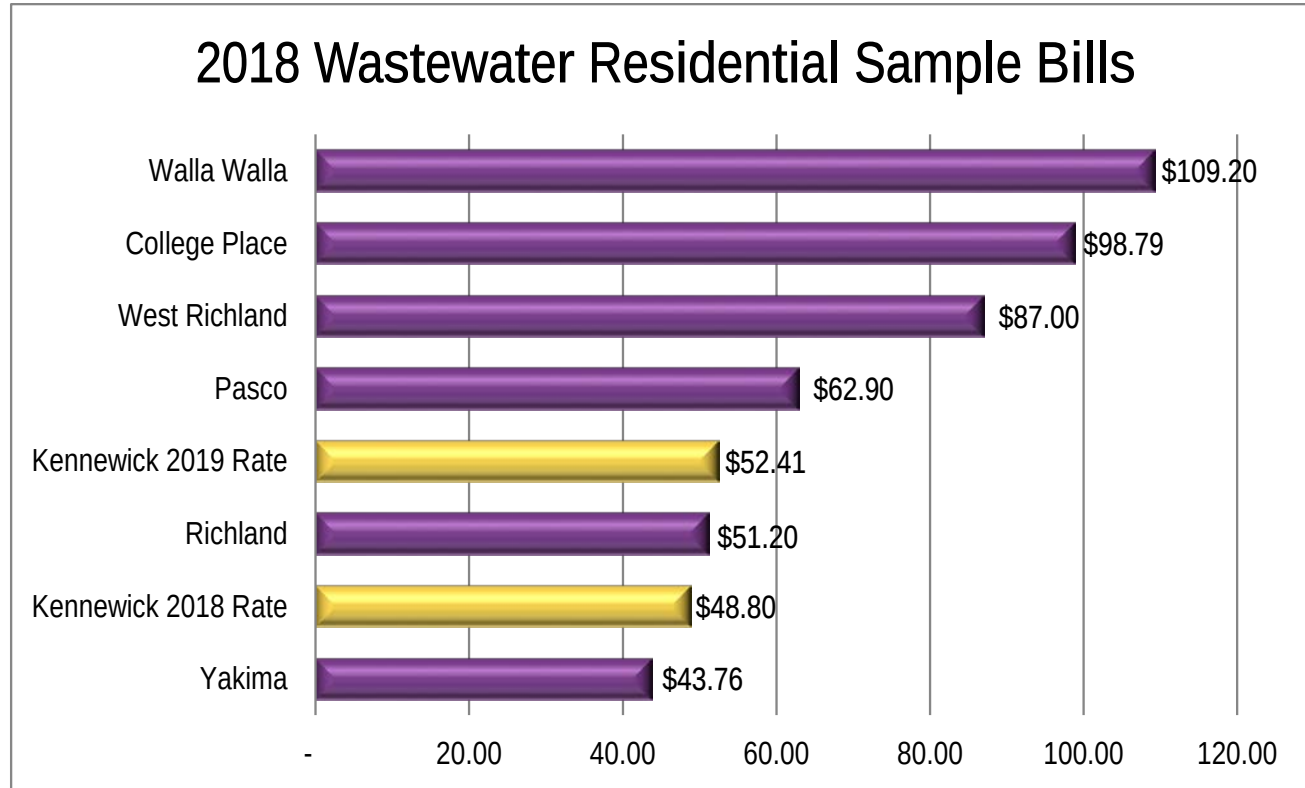
Residential Bi-Monthly Bill Impact

Wastewater Sample Bill	Existing	2019	2020	2021	2022
Policy Increases - Annual CPI		2.00%	2.00%	2.00%	2.00%
Proposed Increases - Above CPI		5.40%	5.40%	5.40%	4.65%
Total Proposed Increases		7.40%	7.40%	7.40%	6.65%
Sample Residential Bi-Monthly Bill	\$ 48.80	\$ 52.41	\$ 56.29	\$ 60.46	\$ 64.48
Difference		\$ 3.61	\$ 3.88	\$ 4.17	\$ 4.02

- ◆ City practice is to annually index fees and charges to CPI
 - Assumed at 2% per year
- ◆ Additional 5.40% per year above current practice for 2019 and 2020
- ◆ Rate impacts shown are bi-monthly



Rate Comparison



*Note: Assumes 13.3 ccf bi-monthly usage
where applicable*



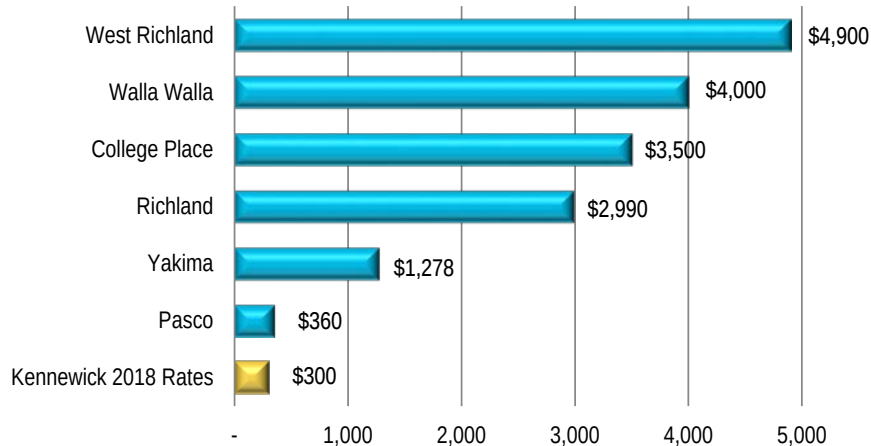
Connection Charges

- ◆ Charged to new development as a condition of service
- ◆ Revised Code of Washington RCW 35.92.025 grants authority to fix rates and charges for connecting to water and sewer systems
- ◆ Represents a proportionate share of the cost of system infrastructure investment

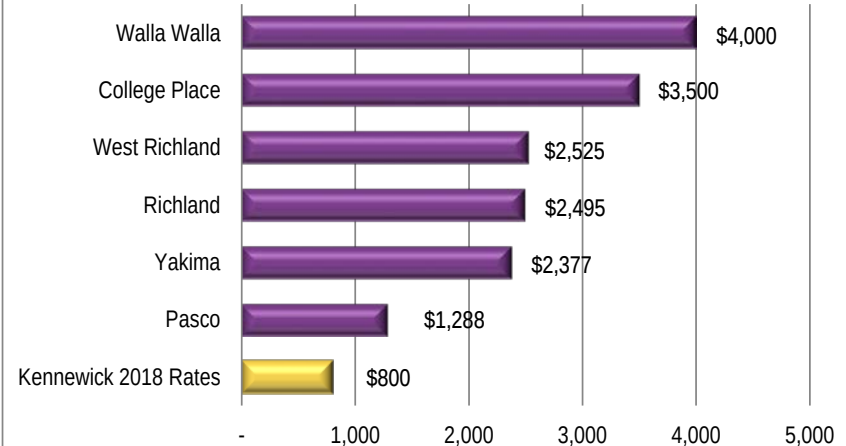


Connection Charge Comparison

Water Connection Charges



Wastewater Connection Charges



- ◆ Review and update charges in 2019



STAFF RECOMMENDATIONS

- ◆ Implement Rate Recommendations
 - Implement Rate increase for 2019 – 2020 biennium
 - Continue with current Policy of increasing rates annually by CPI (est. @ 2%)
 - Water = 3.15% for 2019 & 2020
 - Sewer = 5.40% for 2019 & 2020
- ◆ Connection Fees
 - Review and update connection fees late 2019 or early 2020
- ◆ Implement rate modifications January 1st, 2019

Angie Sanchez Virnoche

Vice President/Principal

angies@fcsgroup.com

425.336.4157

Contact FCS GROUP:

(425) 867-1802

www.fcsgroup.com

Council Workshop Coversheet



Agenda Item Number	2.	Meeting Date	10/23/2018
Agenda Item Type	Presentation		
Subject	IT Strategic Plan		
Ordinance/Reso #		Contract #	
Project #		Permit #	
Department	Management Services		

Info Only	☒
Policy Review	☐
Policy DevMnt	☐
Other	☐

Summary

The City contracted with Sciens Consulting to assist in updating the 5-year Information Technology Strategic Plan. The purpose of this plan is to guide technology investments for the City over the next five years in terms of hardware, software and support services. Sciens will be at the workshop to present the Strategic Plan and review their recommendations with Council.

Through

Dept Head Approval

City Mgr Approval

Christina Palmer
Oct 16, 13:15:54 GMT-0700 2018

Marie Mosley
Oct 18, 21:12:34 GMT-0700 2018

Attachments: IT Strategic Plan 2019-2023



City of Kennewick

5-YEAR INFORMATION TECHNOLOGY STRATEGIC PLAN

September 24, 2018



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Section 1: Executive Summary

About the Strategic Technology Plan

This Information Technology Strategic Plan is the second 5-year Plan developed by the City of Kennewick. This Plan covers the Fiscal Years starting in January 2019 through December 2023. This Executive Summary provides a context for the IT Strategic Plan, specifically how it was developed, how it is organized, a summary of the initiatives included in the Plan, the investment required and a timeline for implementation.

The City of Kennewick engaged Sciens LLC to assist in the development of this Plan. This Plan provides a long vision for the infrastructure environment, technical direction for the City, and provides a path for a comprehensive, integrated solution to migrate out of the complex environment which exists today. As shown below, the phases in the development of this plan were conducted to assess the current state of the City's technology and its ability to support that technology.

Recommended Initiatives

The recommended initiatives have been grouped based on these findings centering on improving the IT Department's ability to provide technology services and solidifying the City's technology environment. This includes a focus on governance, infrastructure, applications, processes, strategy, and organization.

Strategy

A clear technology strategy is essential for government managers to understand the business rationale for technology, how and why technology is used, as well as for future planning. This section also considers how IT supports the overall City's strategy.

Governance

A Governance Committee and associated Technology Governance Policy are essential to assessing the value and risk of proposed IT initiatives for the entire organization. The Governance Committee should set overall priorities for the IT department projects with a broader, integrated perspective.

Architecture

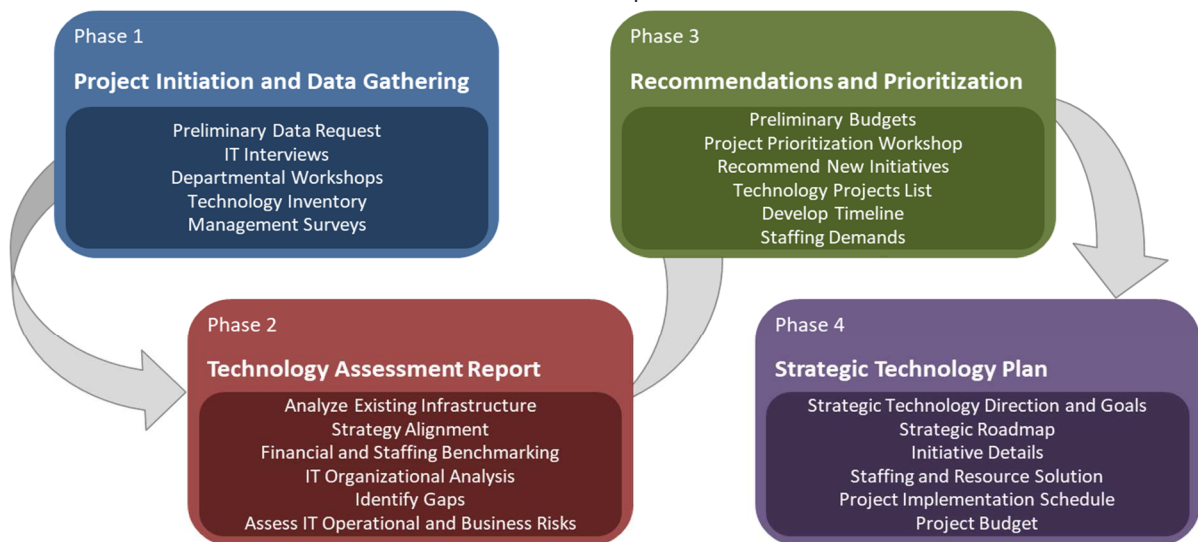
The City's current technical infrastructure and applications architectures and their effectiveness versus the City's and industry's direction. The technology investments made by the City, especially within IT to manage the City's technology infrastructure and applications.

Organization

IT Department, including how well its structure and culture, sourcing and work assignments support its success.

Process

Process review of Departments, IT and related policies and procedures, including how well these have been documented and metrics are being tracked to gauge their performance.



Sciens Assessment and Strategic Technology Planning Methodology



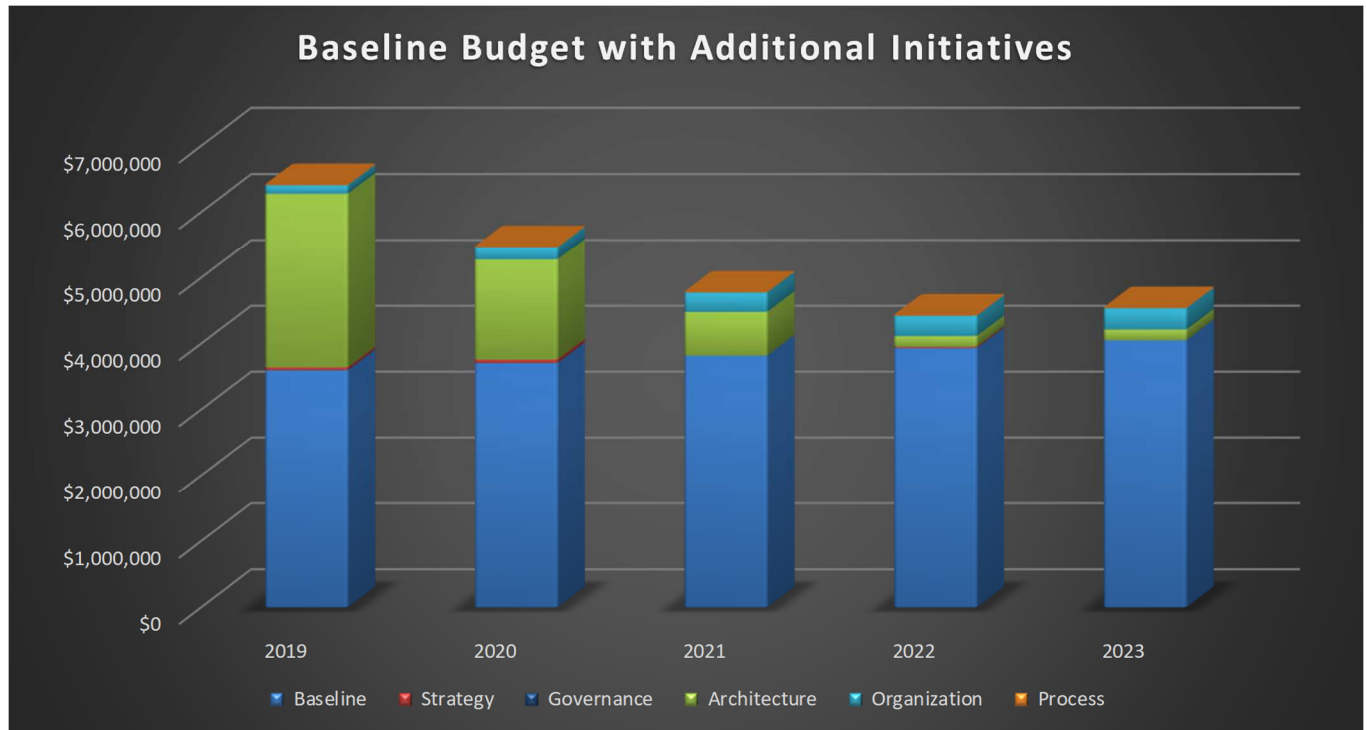
IT Goals and Initiatives Summary

The table below provides a summary of the goals and initiatives addressed in this Plan. The details for these tactics can be found in Section 3.

Technology Initiatives	Start	Finish	Total 5-Year Cost	Digital Government Model		
				Stabilize	Improve	Engage
Strategy						
S1. Software Training for End Users	19	19	\$ 40,000		●	
S2. Continuity of Operations Plan (COOP) Development	20	20	\$ 50,000	●	●	
S3. IT Plan Refresh	22	22	\$ 19,000	●	●	●
Governance						
G1. Address Gaps in City-wide Technology Policies	20	23	\$ 0	●		
Architecture						
A1. Upgrade the City Hall Data Center	19	19	\$ 258,500	●		
A2. Replace Outdated UCS and SAN Infrastructure	20	20	\$ 234,000	●		
A3. Increase Bandwidth to City Hall to 100 MB	21	21	\$ 23,400	●	●	
A4. Replace Network Switches and Routers	20	20	\$ 640,000	●		
A5. Update End User Devices and Standardize on Windows 10	19	19	\$ 862,000	●	●	
A6. Build a Disaster Recovery Data Site	21	22	\$ 500,000	●		
A7. Implement New ERP System	19	20	\$ 2,500,000	●	●	●
A8. Implement Advanced Authentication Functionality	20	20	\$ 45,100	●	●	
A9. Live Streaming Council Meetings	20	20	\$ 82,500		●	●
Organization						
O1. Hire Infrastructure Support Supervisor (1 FTE)	19	19	\$ 701,755	●		
O2. Hire Help Desk Support Staff (1 FTE)	20	20	\$ 232,747	●	●	
O3. Hire Network Support Staff (1 FTE)	21	21	\$ 306,423	●		
Process						
P1. Improve ITIL Performance	19	23	\$ 0	●	●	●
Total Plan Cost			\$ 6,495,425			

Investment Summary

The 5-year investment summary related to the goals and initiatives is shown below. The details for this investment can be found in Sections 3 and 4 of this Plan. The City's current baseline operating budget for IT is included with an estimated 5% escalation per year.

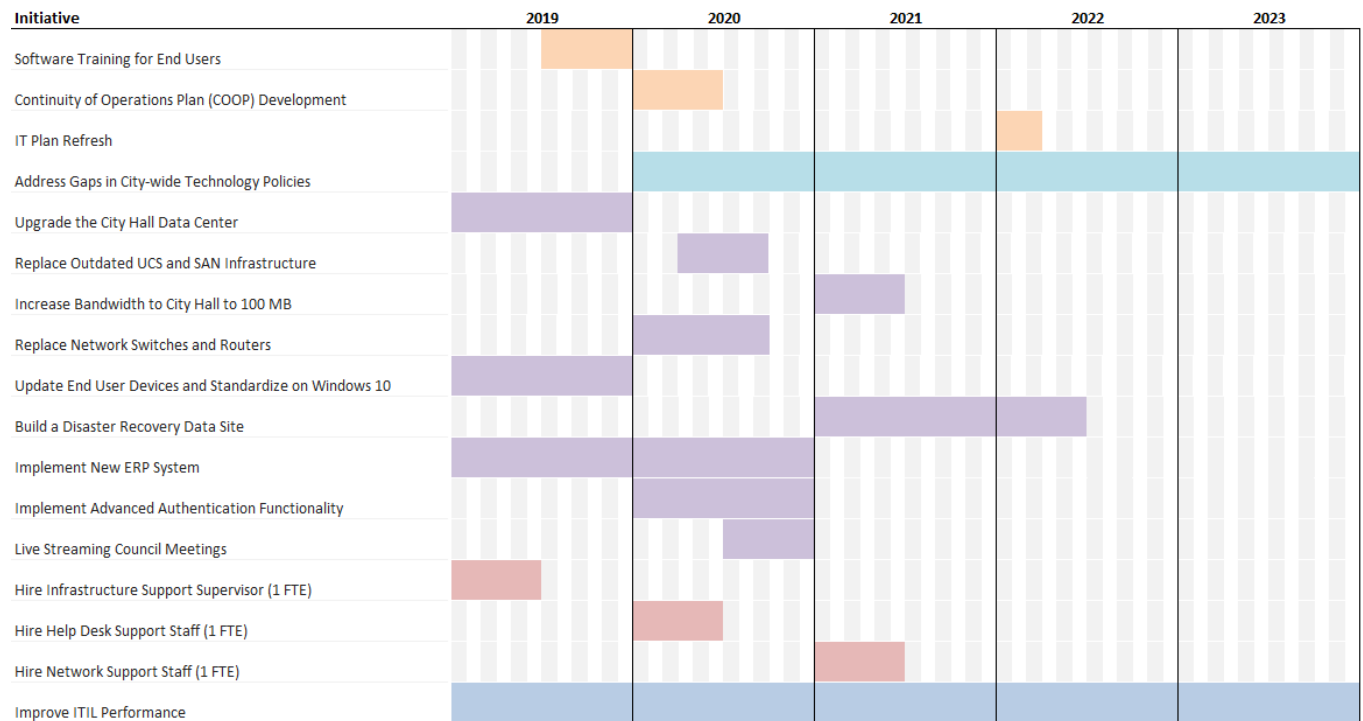


	Calendarized Investment					Total	Annual Average
	2019	2020	2021	2022	2023		
Strategy	\$40,000	\$50,000	\$0	\$19,000	\$0	\$109,000	\$21,800
Governance	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Architecture	\$2,640,100	\$1,521,500	\$661,300	\$161,300	\$161,300	\$5,145,500	\$1,029,100
Organization	\$127,000	\$187,350	\$293,918	\$308,613	\$324,044	\$1,240,925	\$248,185
Process	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Initiatives Subtotal	\$2,807,100	\$1,758,850	\$955,218	\$488,913	\$485,344	\$6,495,425	\$1,299,085
Baseline	\$3,599,180	\$3,707,155	\$3,818,370	\$3,932,921	\$4,050,909	\$19,108,535	\$3,821,707
TOTALS	\$6,406,280	\$5,466,005	\$4,773,588	\$4,421,835	\$4,536,253	\$25,603,960	\$5,120,792

Recommended Implementation Schedule

The recommended implementation schedule for the goals and initiatives is shown below using a calendar (not fiscal) year. The details for this can be found in Section 3 and 4 of the Plan. Actual implementation timing and order are subject to change based on evolving management priorities.

Projects Timeline



Section 2: Technology Assessment

2.1 Digital Government Assessment Model

City's Digital Government Vision

There has been a shift in how work is performed within local governments over the last two decades. Instead of increasing efficiency solely through work automation, managers are now improving performance with use of information technology that gives them the right information at the right time to make the right decision. With increasingly tight budgets, organizations can continue to reduce costs by improving efficiency, effectiveness and innovation.

To respond to these challenges and help transform the business, IT has begun to develop relationships with the Departments, transforming their relationship from infrastructure provider to innovation partner. Complex and costly projects, such as Enterprise Resource Planning, Police body-worn cameras, and automated meter reading, must be shown as sound investments for the City.

The Digital Government transformation emphasizes information management over information technology. This means that more focus needs to be placed on the organization, control and utilization of information – its structure, processing and delivery – instead of concentrating on the software and hardware of information systems. With this emphasis, management is better prepared to ensure that technology investment decisions are supported by clearly defined business requirements.

Technology must be used to allow departments to better integrate their information to meet the City's strategic direction and better serve the community. Ultimately, more efficient collaborative planning and coordination of initiatives, resources and investments will help to meet the City's goals and objectives.

Why Digital Government?

The idea of a "Digital Government" promises effective, reliable and secure electronic access to government 24 hours a day, 7 days a week, 365 days a year. Residents and businesses may access online resources for information about government services, conduct business or personal transactions, or participate in improvement efforts. Services and information may be accessed through traditional service

channels, such as mail, telephone or in-person at a local government facility; or people may prefer the Internet, smartphones or social media.

Digital Government also promises to untether departmental staff from their desks. Currently, staff may have to return to the office to input or synchronize the data they have collected in the field, or use intermittent connectivity from the field. Digital Government promises applications written for the field that can operate in low bandwidth environments with specific functions for the work being performed. This flexibility improves both workflow and productivity.

Finally, Digital Government promises to help City management engage users and citizens through easy-to-read, targeted performance management tools, such as dashboards, balanced scorecards, and key performance indicators. Gone are the days of month-end reports that managers comb through to determine their performance weeks later. Digital Government promises information on managers' desktops reporting information that is pertinent to each individual doing their job – now in real-time. The time between data collection and decision-making is reduced from weeks to minutes.

Though Digital Government holds many promises, governmental organizations are also required to enhance customer service and demonstrate fiscal restraint. Digital Government promises to lessen the demands on traditional service channels like telephone, mail and in-person, which enables cities to shift resources from outdated service channels to new services that benefit the community. Best of all, overall service will improve for residents. Planned, prudent investment in technology enables residents to conduct transactions with minimal local government staff involvement at a time that is convenient for the residents and helps to soften the effects of growing demands from a growing population on the government staff.

Expectations of effective customer service and access to services have fundamentally changed with the proliferation of Internet use. Citizens expect information to be available on-demand, and services to be accessed whenever and wherever. Municipalities must meet these expectations in order to maintain and potentially improve citizens' satisfaction levels.

Three Phases of Digital Government

Realizing the promises of a Digital Government are described in its three phases below.

Phase 1 – Stabilize

Much like constructing a building, the move to Digital Government requires constructing a stable, solid foundation. A standardized and simplified network, a hardened and well-maintained data center, and comprehensive disaster recovery processes must be in place to make the City's infrastructure capable of supporting the transaction volume, storage and security requirements, and stress placed on it. The focus of this phase is physical locations, structures, wires and switches, security provisions, and backup and disaster recovery capabilities.

Phase 2 – Improve

With a stable infrastructure in place, our attention turns to the applications or enterprise software systems that support the day-to-day operations of the organization. These applications must be robust enough to handle the organization's transaction volumes and integrated to minimize data re-entry between component systems. In addition, these applications should have a flexible, real-time reporting capability that allows for dashboard or portal views into information needed by managers to make time-sensitive decisions.

Phase 3 – Engage

With a stable infrastructure and backend applications in place, the focus then turns to extending the local government applications through online and mobility systems. Once the applications are implemented in Phase 2, it's time to train user staff, untethering them from desktops and enabling field transactions in real-time. Residents and businesses will also need to be notified that Web-based services are available on a 24x7x365 basis. Self-service capability for citizens and staff reduces demand on the City and improves delivery of service.

Although presented as three distinct phases, some organizations blur the lines, pursuing multiple phases simultaneously. Ultimately, this approach results in costing more money, delaying the deployment, and causing

disruption to government operations. Creating a Digital Government requires each phase to be planned, well-established and maintained before launching the next phase because each phase serves as the basis for the next phase. For example, applications require a fast, reliable network. Web services running on legacy applications will run slowly and frustrate the citizens instead of exciting them about the local government's new capabilities.

Each phase brings its own set of risks. Most local governments have limited resources for creating a Digital Government environment, and they want to minimize the disruption to municipal operations. For these organizations, a coherent strategy must be designed and pursued.

Varying views have emerged regarding the goals of Digital Government. Some believe that technology is a principle means for fundamentally reshaping government and democracy. Others focus more on short-term opportunities of simply enhancing the services delivered to citizens (G2C), facilitating enhanced interactions between government and businesses (G2B), as well as enhancing government operations (G2G). For most, however, engagement with citizens through Digital Government initiatives is about transparency, accountability, and driving innovation.

Most believe that Digital Government helps to engage and inform the community by creating a more responsive, efficient and accountable government. Greater government accountability pressures the operating departments to deliver higher quality services.

In the end, the primary goals for Digital Government are to satisfy customer service expectations and increase the efficiency and effectiveness of government operations. Additionally, Digital Government is expected to provide access to information and transactions online, increase community participation in government, and demonstrate full disclosure and trustworthiness.

Current Progress of the City

The City of Kennewick has made significant progress toward the "Improve" phase of Digital Government and is actively improving workflows of the end user departments through the use of technology. The City has accomplished some progress through Phase 1 – Stabilize, where it has deployed a stable network and phone system. However, technology

under investments (as measured against benchmarks), including staffing, and a lack of overall disaster recoverability has limited the overall efficiency of the organization and constrains the current staff to serve the end user departments and citizens to the best of their ability.

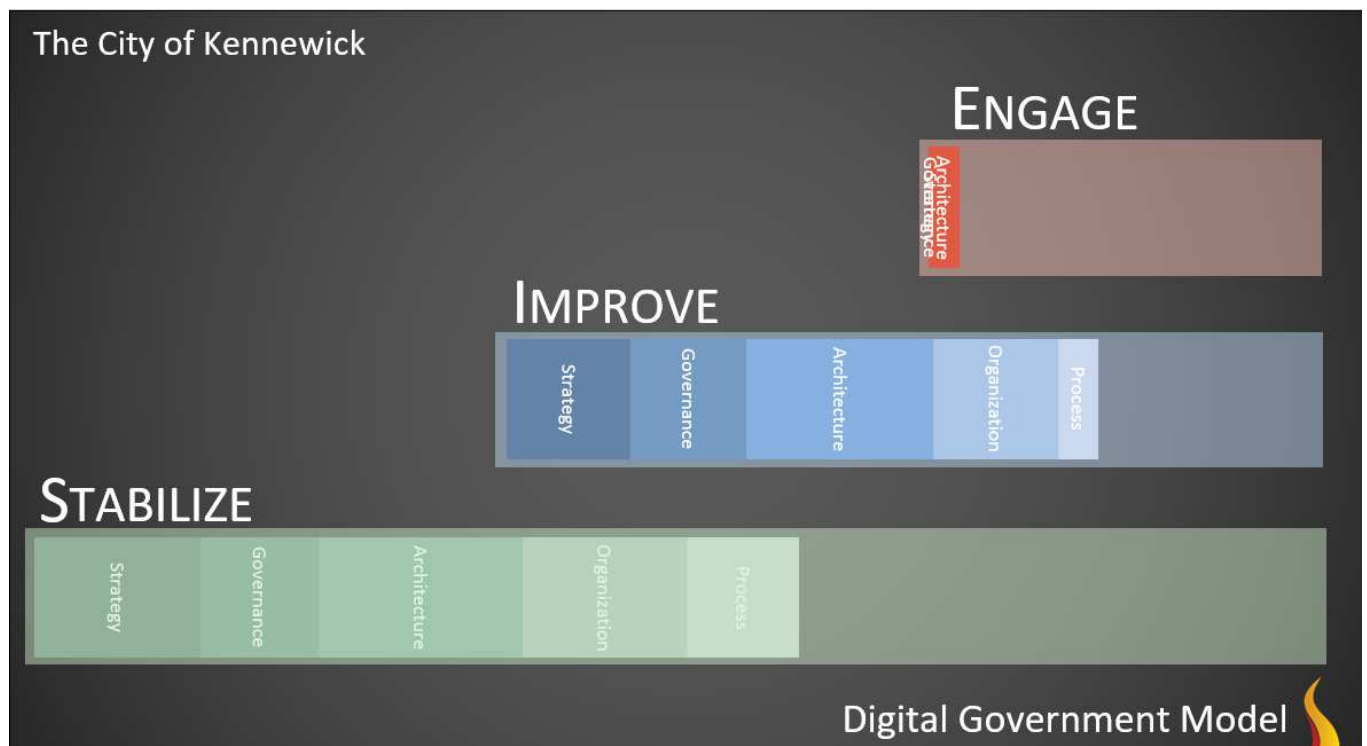
In Phase 2 – Improve, the City has begun the replacement of its legacy financial system, Eden, and is also concurrently replacing its Public Safety system through BiPIN in which the City of Kennewick is taking the lead project management role. While these two major projects will enable the City to move along the Digital Government scale and massively improve the efficiency within the City, the strain being placed on the current IT staff is enormous. IT is constrained by a limited number of resources, but at the same time is dealing with a growing demand from City Management and operational departments.

The City is starting to provide Phase 3 – Engage features, such as Citizen Mobile eGovernment and Open GIS; however, continued deployment of these type of initiatives is constrained by Phase 1 and 2 limitations. Continued deployment of Phase 3 initiatives will strain the existing infrastructure (Phase 1) and compound the need for departments to re-enter data (Phase 2).

As shown in the Digital Government Model graphic below, Phase 1 – Stabilize is much lower than Phase 2 – Improve, and therefore is off balance creating a weak overall support structure. This needs to be addressed before the City continues with any Phase 2 or Phase 3 initiatives.

City Management recognizes **the need to continue maintaining and investing in the City's infrastructure**. The City has made investments in its network infrastructure, with recent improvements to the fiber connecting most of the City's facilities. A majority of users have reported the network is generally stable and are overall satisfied with the technology hardware they are provided. However, constant investments are required to maintain the current stability of the infrastructure. Also, currently there has not been hardware lifecycle replacement plan for server and network systems leading to systems being used close to or beyond useful life.

Overall, end users are satisfied with the level of support they receive from IT because IT has prioritized end user support over ongoing infrastructure support. Ultimately, much of IT's time is spent in reactive problem resolution instead of proactive planning and system maintenance, such as the **development of a Disaster Recovery Plan** or performing maintenance support processes. These tasks are critical in



mitigating the City's long-term risk environment. As shown in the Digital Government Model graphic, the Process section is the weakest area within IT.

On the applications side, the City largely operates on a fragmented architecture. The core administrative system, Tyler Eden (legacy) has performed reliably since its installation, but it lacks functional integration with other systems, especially the other two core systems, GIS and OnBase (EDMS). **With the selection of a modern ERP solution, these limitations should not be a hindrance when it comes to reporting, mobility, dashboarding, or transparency as the project is implemented, just as long as the interfaces to other City systems are built. This new system *should improve the City's ability to secure data integrity and optimize operational workflow.*** As these projects move forward, IT's role in implementation becomes increasing more important to ensure project success.

Users identified that they refer directly to the software vendor for application support rather than asking IT first to find a solution. This is partly due to IT's structure and the limited staffing has forced each of the IT staff to be competent in an extensive portfolio of support areas. Support is focused on the most urgent areas, typically end-user support and Infrastructure support and recovery. Recommendations in this Assessment call for increasing the number of IT staff and restructuring the IT Department to operate with more functional specialization to allow IT to handle both reactive and proactive areas.

City Management is looking to leverage technologies that are flexible and allow the City to grow more efficiently. Consistent with this strategic technology direction, the operational departments should be involved in the process of selection to make sure there is integration between departmental systems. This assessment recommends that IT provide ongoing strategy direction to the operational departments and advise City Management on key technology decisions.

Recommendations in this Assessment enable the IT Department to mitigate long term risk by stabilizing ongoing maintenance of the City's server Infrastructure and prioritizing integration of enterprise applications. These initiatives will allow the City to advance through Phase 1 and

2 and position the City to move effectively into Phase 3 where analytics, dashboarding, and additional self-service capabilities can be provided both internally and, if desired, externally.

This five-year Plan addresses these needs and assists the City in its continuing development across all three Phases of Digital Government.

Transforming the IT Department

Traditionally, IT has been seen as fulfilling end-user and infrastructure support functions. Over the last 20 years, investments in technology have been focused on daily operations. Computers were bought to improve productivity, and networks were created to enable departmental communication with the servers hosting their siloed system. The City's IT Department leads the process of replacing core enterprise applications while Operational Departments provide the expertise in business needs and functionality requirements.

The Digital Government Vision discussed in this Assessment provides focus for the IT Department and a framework to the rest of the organization for strategic technology initiatives.

For IT to effectively transform to Digital Government Enabler, the Department must be seen more as an equal partner to the functional, citizen-facing departments. This type of partnership means that IT must become involved when a Department is looking to improve service or efficiency, not after they have bought a system. The quality of service provided by the City to the community is dependent upon recasting the IT department in this role.

2.2 Assessment Process

Data Gathering and Interviews

Sciens began the Assessment by sharing data gathering toolsets and surveys with the City. These tools were designed to get an understanding of the environment today. Then, through IT interviews, Sciens performed a thorough examination of how each area within IT supports, maintains, and collaborates the end user departments and citizens. Some of the information collected includes:

- Financial, operational and physical infrastructure inventory;
- The City's strategic business direction;
- IT department meetings to understand functional and business needs; and
- IT organizational review, support processes and technology risks.

Sciens collected, analyzed, and applied this information to our Digital Government Model to calculate a maturity score in each of the 23 areas assessed shown on the following page. Each area has a set of standardized questions that provide an input into the Assessment Tool, resulting in a calculated percentage score. This score is then analyzed to identify strong areas and areas for improvement. Findings and recommendations are identified on the following pages and may be developed into future projects. This method of assessment ensures that the major gaps in the City's technology are identified so that these can be placed in the highest priority when projects are developed in the next phase.

The Review phase is comprised of separate tasks designed to evaluate every aspect of the IT Department's business, both managerially and technically. Data is collected through interviews and focus groups with the IT Department's staff, the City's Departmental Directors and key Departmental staff members, as well as through an examination of physical sites and documentation.

City's Strategic Initiatives

Based on the interviews and data collection documents, the City's Areas of Strategic Focus are shown to the right. The following are IT and Plan initiatives that support these City objectives.

City Strategic Initiatives	IT/Plan Initiatives
Future Growth Sustainability	Targeted Projects
Systematic Infrastructure Investment	Planned Digital Government Transition
Service Excellence to Citizens	Operational Improvement through Software Modernization
Inclusive & Collaborative Governance	Prioritization through Steering Committee
Ensuring a Capable and Ready Workforce	IT Structure to Support Operational Departments

Assessment Scale

The overall goal for implementing technology is to enhance existing individual departments' business processes as well as cross-functional processes. Technology is intended to enhance these processes by:

- Making them more efficient and effective
- Improving decision-making
- Providing enhanced customer service to both internal and external customers
- Improving transparency and analytics
- Reducing costs

As such, one of the goals in conducting this IT Assessment is to provide a coordinated, planned approach toward the deployment of technology with the intention of supporting the business goals of the City. Each major technology area has been rated on a maturity scale and the risk to the organization associated with each major process is identified. These two scores are inputted into the Digital Government Model in order to assess the City's overall readiness for future technologies. The following scale has been developed to measure the functional maturity and risk (designated in color) for the various IT assessment areas:

Category	Description	Functional Maturity/ Risk Level
Optimized	Best Practice in the Industry	
Managed	Mature or Fully Applied Practice	
Defined	Progressing Performance	
Repeatable	Improvements Identified	
Initial	Needs Significant Improvement	

Digital Assessment Readout

The table below provides a summary of digital maturity and risks associated with the assessment areas identified for the IT review conducted in August 2018:

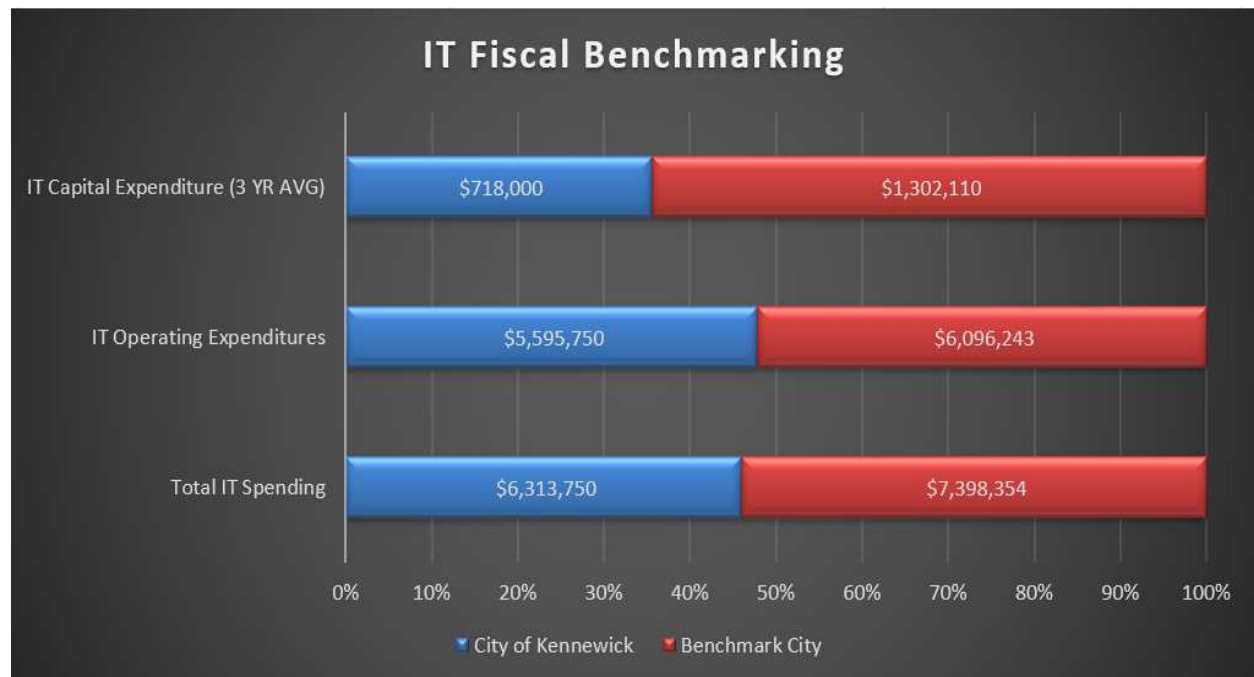
Area Accessed	Functional Maturity / Risk Level
Strategy	
Fiscal Benchmarking	
City's Technology Direction	
Governance	
End User Satisfaction	
Technology Governance	
IT Policies	
Architecture	
Servers, Storage and Backup	
Network	
Data Centers	
Network and System Management	
End User Computers	
Mobility	
Telephony	
GIS	
Enterprise Applications	
Business Continuity	
Security Risk	
Organization	
Staffing Levels	
Organizational Structure	
Process	
Release Management	
Service Management	
Support Management	
Security Management	
Operations Management	

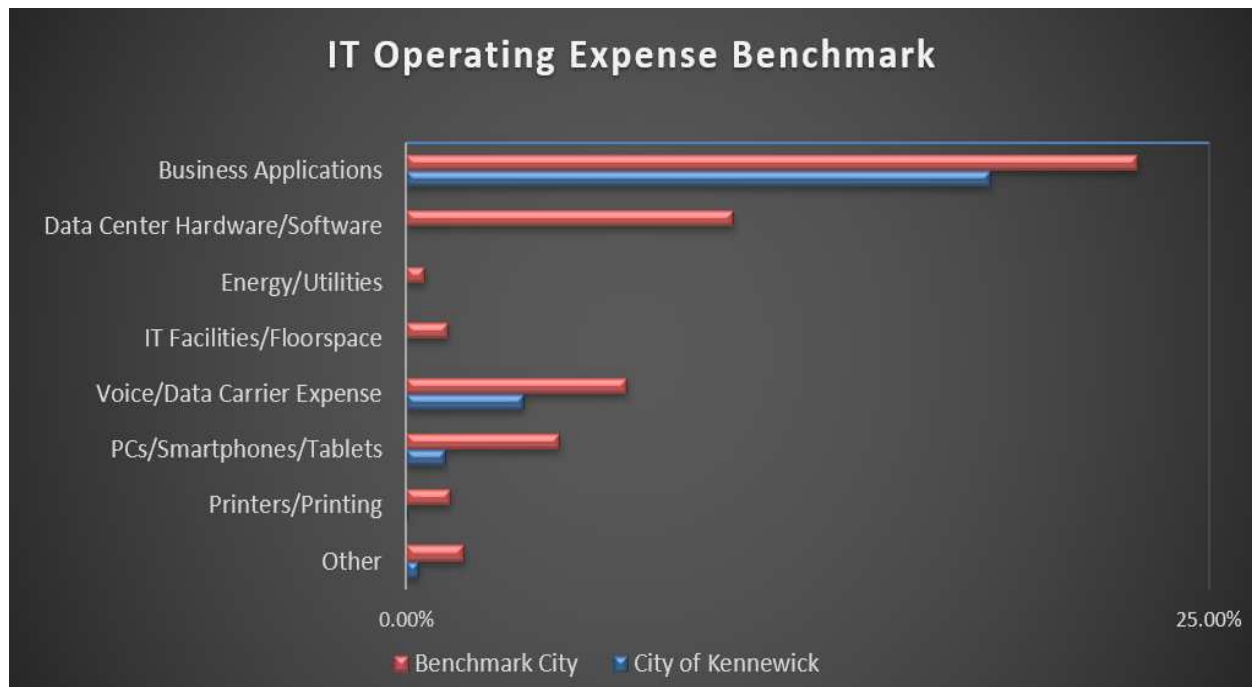
2.3 Strategy

Overview

The information in this section explores the City's current technology strategy, including the City environment and municipal operation supported by the Information Technology (IT) Department and how the City has allocated its financial resources with regards to technology. This section also examines the City's current IT Strategic direction and the alignment of technology strategy between City and IT Management, as well as the end users' view of the technology strategy being implemented by the IT Department.

	Functional Maturity / Risk Level
Fiscal Benchmarking	3
Areas of Review: IT Capital Expenditure, IT Operating Expenditure, Total IT Spending.	
Findings: - Identified in the chart below, the financial benchmarking of the City is much lower than the average in all areas of spending (Capital Expenditures, Operating Expenditures, and IT Total Spending) compared with other similar sized municipalities. - Over the past three years, the City has under-invested in technology-related infrastructure capital investments. This is evident more in hardware purchases rather than software application purchases. Refer to section 2.4 for more information. - The IT Department is vastly underspending on datacenter hardware compared with the benchmark. Spending on datacenter expenses should increase 10.2%. - Based on the results of the benchmark, it appears that costs are under allocated in most of the critical areas (to include staffing) and the overall IT operating expenditures should increase to \$6 million. - Capital expenditures are also low and should to be almost doubled over the next 3 years.	





IT Operating Expenses Benchmark			
	Benchmark City	City of Kennewick	Suggest Adjustment
Business Applications	22.80%	18.21%	4.59%
Data Center Hardware/Software	10.20%	0.00%	10.20%
Energy/Utilities	0.60%	0.00%	0.60%
IT Facilities/Floorspace	1.30%	0.00%	1.30%
Network Infrastructure	6.30%	1.63%	4.67%
Security	2.00%	0.52%	1.48%
Voice/Data Carrier Expense	6.90%	3.67%	3.23%
PCs/Smartphones/Tablets	4.80%	1.23%	3.57%
Printers/Printing	1.40%	0.06%	1.34%
Other	1.80%	0.39%	1.41%

Recommendations:

- Capital infrastructure spending should be increased to meet demands of improving the physical environment and disaster recovery measures. These funds could be allocated to a technology replacement cycle for all hardware that is replenished every year to ensure an up-to-date, disaster resilient environment.
- The Total IT budget should be increased to the benchmark and applied to the following areas: staffing, infrastructure and security.
- The IT operating budget should be increased to \$6.1 million to support the growing needs of the City and hire staff to support the complex environment.
- Network infrastructure needs more funding as the City's switches and routers are coming end-of-life over the next two years.

	Functional Maturity / Risk Level
City's Technology Direction	 4
Areas of Review: The overall vision for the City on future technologies including Citizen demands and delivering analytics and transparency.	
Findings: Based on the findings and interviews, the role of technology: - Has improved and grown over the years in Kennewick and is looking to this plan to achieve a strategic guideline to better meet citizen and department demands. The City's structure has placed an emphasis on moving toward looking at technology from a business-unit perspective. Ability to meet Citizen demands for services: - Current technology does not meet the needs of most citizens (i.e., credit card payments, mobile payments), and management would like to see improvement in the current level of service provided. Ability to deliver analytics and transparency: - Doing fairly well with analytics internally and are working on improving the transparency presence on the City's website.	
Recommendations: Implement the initiatives from the results of this plan to increase Digital Maturity in able to begin better enabling departments and meeting citizen increasing demands.	

2.4 Governance

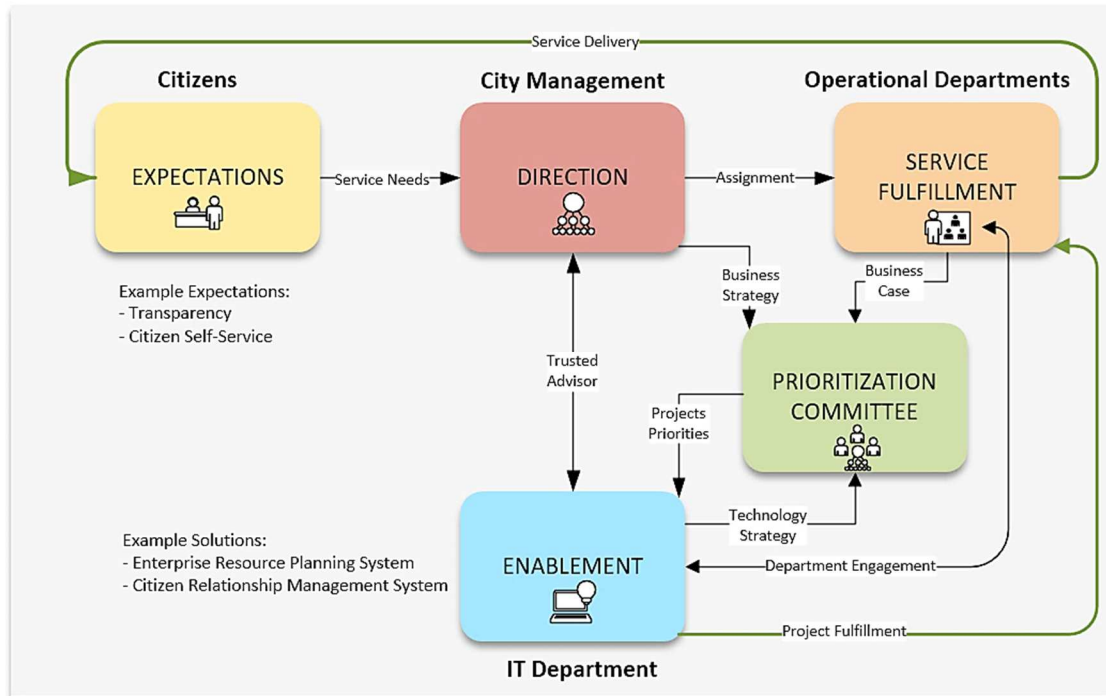
Overview

As technology has become more integrated into City processes, the process used to ensure that technology acquisition, upgrades and support remain in alignment with the City's business strategy, i.e., governance, needs to be formalized. While IT Management is concerned with the planning, organizing, directing and control of IT resources, IT Governance is focused on ensuring that the City receives the maximum value from its IT investments.

	Functional Maturity / Risk Level
End User Satisfaction	4
Areas of Review: End user satisfaction, Help Desk service, IT Department satisfaction, ability to promote efficiency and innovation.	
Findings: ▪ Overall IT service satisfaction level – 93% ○ Hardware service – 92% ○ Software service – 94% ▪ The IT Department as a whole is liked and respected by the staff in IT and outside departments. Feedback from City Management suggests the IT Director has a noteworthy ability to execute any and all technology requests asked by the departments and upper management. ▪ The IT department staff feel empowered and enjoy their work overall. Even though, IT is understaffed, the staff are excited about projects and learning new skillsets. ▪ End users feel like IT listens to their needs and is fairly quick to get them the support they need in order to carry out their job. ▪ End users expressed the need for more software training as little or none is done through onboarding.	
Recommendations: ▪ The City should continue transitioning IT's role from being reactive to proactive, advising Management on new technology projects and engaging with operational departments. ▪ Train end users on basic software platforms they are having concerns with. This is mostly seen in MS Office products and OnBase EDMS.	

	Functional Maturity / Risk Level
Technology Governance	4
Areas of Review: communication throughout organization, current process, business strategy vs. technology strategy, IT's role within RG.	
Technology governance is defined as the level of communication, collaboration and engagement of IT and the operational departments on an ongoing basis and when making important technology decisions. It shows the optimal relationships in the City and the role of each member. It ensures good communication, leading to a successful project that is both implementable and manageable. The City will need to redefine the relationship between IT and the operational departments. The first step in preparing the City for this new structure is aligning the governance process with the intentions of management. During on-site interviews, City Management and IT Management were asked to identify the governance components within the City's workflow to deliver the services required by the Citizens. Described below is the ideal relationship governance process the City should seek to obtain.	

As shown in the diagram below, City Management derives its objectives from multiple sources throughout the City. Community outreach, social media, and community boards are used to make citizens aware of City developments and allow them to voice their opinions or desires on City matters. As more citizen data is collected, City Management identifies trends and common themes found throughout the community. City Management takes these common themes and derives City objectives, possible projects the City can pursue to meet **citizen needs**.



While this is occurring, City Management is also deriving objectives from department **feedback**. Similar to their engagement with citizens, City Management allows Departments to explain the service demands upon them, and to present objectives that should be adopted to support them. Because many Departments interact with citizens on a more frequent basis, City Management expects these objectives to be well-founded and directly related to improving citizen engagement and service. City Management then **assigns** potential projects to each of the operational departments during the yearly budget process. Operational departments develop and submit a **business case** to the IT Governance Committee, who analyzes them for feasibility and **prioritizes** each objective for IT. City Management helps the committee with overall **business strategy** while IT assists with the **technology strategy**.

During this process, IT may be involved in helping to **advise** management on the technology impacts of the project initiatives, and the committee will provide IT with the **project priorities**. IT should be thought of as a trusted advisor, where key decision makers lean on them for integration guidance. However, during the planning of some capital projects (e.g., construction, economic development) strategic IT inputs are not often considered. This lack of engagement in key technology initiatives leads to IT being requested to meet the service **delivery needs** from the operational departments without the resourcing which was initially approved by City Management during the budget **business prioritization**. This can also lead to inefficient systems that do not communicate with the rest of the City. IT's limited participation as a **trusted advisor** to senior management during project decisions has led to ineffective coordination between IT and operational departments.

In addition to being a trusted advisor, IT also needs to have **strategic alignment** with City Management on major priorities, projects, and initiatives. This enables **higher performance** by optimizing the contributions of people, processes, and inputs to the realization of measurable objectives and, thus, minimizing waste and misdirection of effort and resources to unintended or misrepresented projects. When the City Management and IT are on the same path, this assures IT initiatives generate organizational value and mitigate City risks. Building transparency, trust and technology awareness throughout the organization enables the City to make better and **informed decisions** regarding technology initiatives and investments.

Recommendations:

- The continuation to utilize the IT Steering Committee to strategize and deploy the technology direction for the City. This committee includes the following stakeholders:
 - City Management to represent the business strategy;
 - Operational Department affected by project to present business case; and
 - IT Department to advise on technology path and project management.

Policies	Functional Maturity / Risk Level
Areas of Review: List of current policies, depth of detail and accuracy, enforcement and review.	
Findings: ▪ Policies were developed by IT with input from departments and approved by City Management. ▪ Many important policies have not been written due to the limited resources in IT being allocated to other areas. ▪ Not clear whether policies are being enforced in the departments. ▪ Survey results indicate that policies are signed, but many of the users are unaware or forgot what a policy means.	
Recommendations: ▪ After a thorough review of current policies, IT should review and update its current policies and at a minimum, add new policies to cover these areas: - Mobile Device Acceptable Use (City Staff) - Internet Acceptable Use (City Staff) - Email Acceptable Use (City Staff) - BYOD Acceptable Use (City Staff) - Purchasing (IT) - Backup (IT) - Patch Management (IT) - Systems Maintenance (IT) - Information Security (IT) - Computer Software (IT) - Change Management (IT) - IT Standards (IT) - IT Support (IT) - Physical Access (IT) ▪ IT should setup procedures for reviewing and enforcing policies.	

2.5 Architecture

Overview

As a part of this assessment, a high-level review of the technical components and software applications was provided. While this assessment identifies some opportunities that can improve the technical environment, the City recently made significant investments in technology (infrastructure, virtualized servers, ERP system, etc.). Through proper leadership, appropriate enforcement policies and procedures, standardization, training, and project management, the IT environment can be further improved and emerging technologies can start to be explored.

Servers, Storage and Backup		Functional Maturity / Risk Level
		2
Technology Category	Current	
Total # of Servers (Virtual and Physical)	57 (55 virtual / 2 physical)	
Server Hardware	Cisco UCS blade servers	
Virtualized Servers %	VMware vSphere 6.5 Enterprise; 96%	
Storage Area Network (SAN) capacity	NO SAN, only NAS; 120 TB; 33% utilization	
Backup Procedure	Incremental backups each weeknight, Full backups on weekends. On SQL server - Full backups of production databases are run nightly; system databases are run weekly. Transaction log backups are run periodically through the day. All backups are stored locally on the server. These backups are included in the enterprise backups of the server. BiPIN - Incremental daily, full weekly, all to tape.	
100% Data Recovery Time in the Event of a Disaster	1-3 days	
Hardware Replacement Cycle	None in place, current chassis is 9 years old.	

Findings:

Servers

- IT is utilizing VMware to optimize the efficiency of delivery services in place of adding more support staff and physical servers.
- The average age of the physical servers are 9 years old.
- IT feels that the number of servers currently is not enough to satisfy today’s business needs. More virtual servers will need to be deployed to support the new ERP and Public Safety systems.
- Users don’t have any complaints about the performance or off-site reliability with the virtualization being used; departments seem satisfied with the current environment.

Storage and Backup

- File storage is centralized on a NAS (Network-attached Storage) housed in the main data center with a total capacity of 120 TB. With the City’s plans to expand the integration of GIS and EDMS, the storage capacity of the NAS will need to be increased or replaced with a SAN.
- The City can recover from normal disk crashes; however, with a catastrophic loss such as a data center building fire, the recovery would take time. However, the backups of virtual servers can provide recovery of entire servers from backup because a remote site is utilized serving as DR backup.
- A large number of new applications and projects (e.g., Bipin, ERP, Scada) are going to significantly increase the storage requirements of the City in the next several years. This means that the current storage levels will not be sufficient to support these projects in a reliable manner.

Recommendations:

- The Cisco UCS blade servers are over 9 years old and need replacing. Newer blades can be transferred to a new chassis while the older blades will need to be replaced.
- Since the City's storage utilization is already at a high percentage, the expanded use of document management and new enterprise application projects will require an upgrade or replacement to the City's storage systems.
- Review the current backup policy to ensure that meets the requirements of the City and supports these new applications in the event of a catastrophic disaster.

Network		Functional Maturity / Risk Level
		4
Technology Category	Current	
Network Infrastructure	Cisco	
Security Infrastructure	Cisco	
Wireless Network Carrier	Meraki (Cisco)	
Remote Access	Cisco VPN for end users	
Directory Services	Microsoft Active Directory	
# of internet point of presence (PoP)	2 – The primary, redundant ISP for City Hall and all departments (except Frost) is Noanet (50Mbps). For Frost, the primary ISP is Spectrum (100Mbps). The system is designed to failover to the Spectrum connection in the event of a failure in City Hall.	
Underlying Cabling	Cat-5, Cat-5e, MMFiber, SMFiber	
Firewalls	WSUS	
Security on the Network	Encryption	
Hardware Replacement Cycle	None in place, switches are 9 years old.	

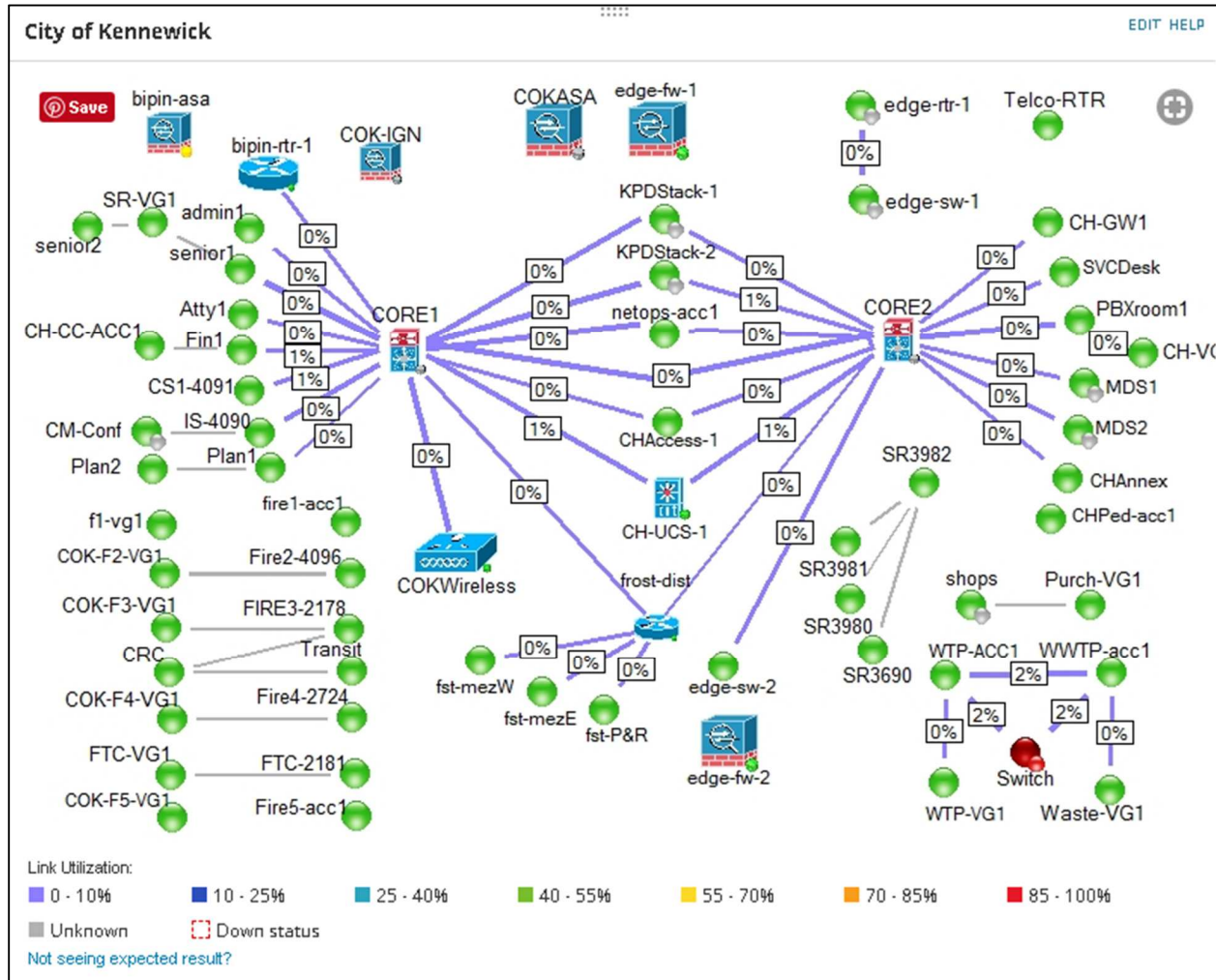
Findings:

- As shown in the current network diagram below, the City's network is equipped with two PoPs (one at City Hall and one at Frost) and linkage between City Hall and all outside locations is through a 50 MB Noanet fiber connection. The Frost location is supported by a 100 MB Spectrum connection which also serves as a failover point in the event of a catastrophic event. Based on current status and utilization rates, these connection speeds should be sufficient over the next few years. However, as BiPIN cloud RMS and any other Cloud-based applications come onto the network, the 50 MB Noanet connection will become strained and utilization rates will increase.
- All firewalls and patches have been updated to the latest version of firmware.
- There is no hardware replacement cycle in place for network devices. Switches are more than 9 years old on average.
- The City is currently equipped with 2 domains (both located at the City Hall) and has 6 domain controllers (4 virtual) for all domains located at these data centers (Corporate and BiPIN), allowing for load balancing, and protected authentication in case of catastrophic disasters at one location.
- Overall, the network system is solid, providing for a fully resilient, disaster recoverable network loop to ensure end users are receiving reliable performance on their workstations.

Recommendations:

- Work with Noanet to increase bandwidth to at least 100 MB to the City Hall PoP.
- Implement a network replacement cycle for switches and routers to be replaced every 7 years.

City of Kennewick Existing Network Architecture



		Functional Maturity / Risk Level
Data Centers		
Technology Category	Current	
Total # of Data Centers	1 formal data center, 40 equipment rooms	
Access Control	Badge access; 50%	
Raised Floors	No	
Camera Monitoring	No	
Fire Suppression	Yes, but water based (sprinkler system)	
Adequate Cooling	Yes (in some)	
UPS	Yes, but only 70% Utilization	
Server Replacement Cycle	No replacement cycle in place.	
Findings:		
▪ The City’s main data center, located at City Hall, supports City operations. Physical security is provided through keycard access. ▪ The City Hall data center does not have raised flooring in the event of flooding. ▪ None of the data centers are monitored by cameras, no physical tracking of who enters or what they do is being done. ▪ Fire suppression in the main data center is a water-based sprinkler with sprinkler heads over the main system racks. This was designed for building fires, but not technology. Other locations are equipped with fire extinguishers mounted on the walls. ▪ Cooling capacity is semi-adequate in some of the equipment rooms. Frost data room needs better climate control functions. ▪ Most of the network and server devices are on UPS and their power intake is NOT actively monitored. Currently all equipment is on standalone UPS rather than an enterprise class UPS. There are reports of having power issues at least once a year. The last was in November 2017 when a UPS went down and took down the controller for the VNX. ▪ Batteries are not tested on a regular basis and are replaced when they fail, no replacement cycle in place.		
Recommendations:		
▪ The IT Department should continue backing up critical data and applications to offsite data center for data and application security and continuative operation, reducing the risk of the City Hall data center. ▪ Raised floors need to be installed at the City Hall data center. ▪ IT needs to install an alternate dry fire suppression system for the main data center. ▪ Climate control needs to be installed at the Frost site since is houses the City’s 2nd internet PoP. ▪ Acquire an enterprise class UPS to mitigate power issues and provide ample amount of power to the Data Center at City Hall. Begin to monitor the power being used by the data centers to ensure the UPS can handle the load. ▪ Replacement cycle for batteries should be implemented every 6 years. ▪ A DR backup data center should be built at a location at least 5 miles away from the City Hall. This will help mitigate risks of failure and inoperability when a critical event occurs.		

Functional Maturity / Risk Level	
Network and System Management	5
Areas of Review: Network Traffic, Network and Systems Monitoring Software, Network Reporting, New User and Workstation Setup, Remote Access.	
Findings: - Network traffic is monitored on a constant basis. - The process in place to maintain and monitor the network and systems is automated alert triggering through SolarWinds software. This is the best software currently on the market for this function. - IT expressed these network monitoring tools are working effectively. - The current toolset provides sufficient scanning and reporting capabilities. - The system is able to be managed from outside the office, which allows for nighttime monitoring and management. - It currently takes less than 30 minutes to add a new user to the network, but several hours to install a new workstation to the network. This is due to the image being old and several updates are needed. IT recently purchased SCCM and is working to make this process better. - Remote access: VPN connection for users outside the office. End users are very satisfied with the connection speed and reliability throughout the City.	
Recommendations: - Continue utilizing network monitoring/ management software with good reporting and analytical tools. Stay up-to-date on software training to ensure staff is monitoring the network correctly. - Update telecommunications policy.	

Functional Maturity / Risk Level	
End User Computers	3
Technology Category	Current
Total # of Workstations	565 (PC 335, Laptop 110, Tablets 30, iPads 30, MDT 60)
Desktop/Laptop Hardware	Dell and MDT Getac, Data 911, Microsoft Surfaces
Desktop operating system	Windows 7, 8, and 10
Business Application Environment	Microsoft Office
Hardware Replacement Cycle	Every 5-6 years
Findings: - There is a solid replacement lifecycle on the hardware in place, replacing desktop hardware every 5-6 years. This process is centralized in the IT department, where IT replaces all computers and laptops in the City in the same year. IT expressed this process works well and is easy to manage. - From department surveys, end users are satisfied with the current hardware they have. - As of 2018, all computers are in their 5th year of life and need to be replaced. This includes 450 PCs and laptops as well as GTECH MDTs (5) and G2 tablets (5). - With the recent introduction of Windows 10, IT may experience some user complaints with this transition to the new platform.	
Recommendations: - In year one of this plan, replace all end user computers and some of the older tablets used in the field. - Since most of the City is going to Windows 10, provide comprehensive training to end users.	

		Functional Maturity / Risk Level
Mobility		4
Technology Category	Current	
Total # of Smartphones/ Tablets Supported	200/60	
Smartphone/ Tablet Hardware	Apple iPhone/ (30 iPads, 30 Surfaces)	
BYOD Support	No	
Average Age	1 year for phones, 2-6 years for tablets	
Hardware Replacement Cycle	None, replaced as needed (broken, outdated)	
Findings:		
- With the exception of application integration with Apple, end users are very satisfied with the current mobile device environment. - Tablets are an average of 2-6 years old. Some of these are nearing end-of-life and will need to be replaced within the next few years. - The City does utilize Mobile Device Management (MDM) software. This allows for better management of end user hardware for a more streamlined, simplified architecture to reduce the burden on IT internal staff.		
Recommendations:		
- Replace tablets throughout the departments over the next few years and setup a Technology Replacement Fund for mobile devices and tablets. - The MDM software is an effective tool used by IT to manage all mobile devices within the City. This provides real-time information of devices and users, as well as capability to manage passcodes, send messages, remote view, sync, as well as locking and remote wiping the device if compromised. It is recommended to continue using this solution. - Disparity of operating systems (e.g. Windows, iOS) increases the complexity of mobile application deployment. Standardization onto one platform, ideally Windows 10 hybrid devices for maximum compatibility with available and modern applications while providing a lightweight portable user device.		

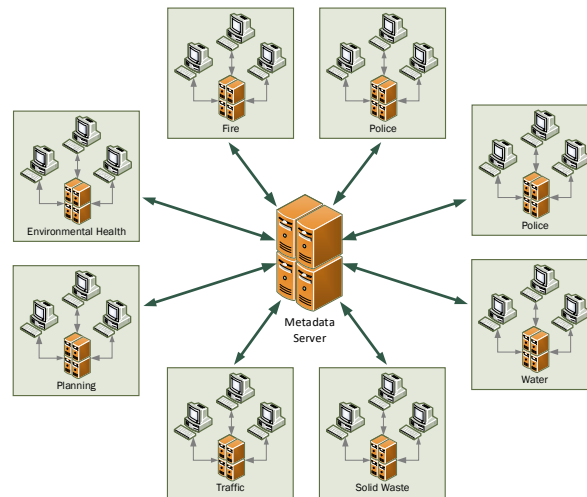
		Functional Maturity / Risk Level
Telephony		4
Technology Category	Current	
Total # of Phones Supported	350	
Telephone System Infrastructure	Cisco Call Manager	
Service Provider	Cisco	
911 Capability	Yes	
Hardware Replacement Cycle	The phone system is 5 years old.	
Findings:		
- The City has implemented a new Cisco telephony system. End users are satisfied with the functionality of the system and enjoy using the handsets. Cisco is the best telephone system in its class and has excellent customer service support. - May want to explore pay-by-phone functionality for citizen usability.		
Recommendations:		
None		

GIS

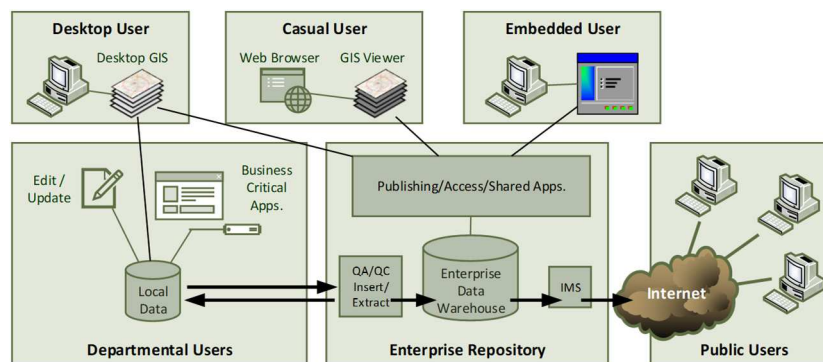
Area of Review: Dedicated Staffing, Version Levels, Integration with EA, Database Model, GIS Support, Training

Findings:

Understanding basic application architecture, relationships between integrated municipal applications and the component interfaces required to support GIS solutions provides a foundation for understanding distributed GIS applications which would be implemented in the City. The GIS can serve as a primary integrating database which ties all of the operational departments as shown below.



The Client Server GIS Architecture combines a variety of closely integrated applications to establish a fully supported system solution.



The Integrated GIS architecture can be configured in three tiers:

Client Tier

- PC workstations that provide user access to the GIS System.
- The Workstation displays and controls application processes, which could be running X-emulation software, Windows terminals, or Web browser clients.
- Client functions include general spatial query and analysis studies, simple map production tools for general users and commercial map productions for professional users, general-purpose query and analysis operations, and spatial data maintenance.
- In single tier architectures the client application server and desktop user workstation may be the same platform

Application Tier

- Application servers that handle application processing.
- GIS applications are supported within the distributed configuration by hardware platforms that execute the GIS functions. This tier supports access to the database tier and Web transaction servers that provide transaction-based map products to Intranet and Internet browser clients
- GIS applications can provide interfaces to custom business solutions that support specific business needs such as the permitting and inspections systems. End users do not require geographic expertise and use applications to support standard business functions
- The application server processes all spatial and attributes data requests received from the GIS client application. A transaction request is prepared by the GIS application client and sent to the server for processing. The server process completes the transaction query to the database server and returns the response back to the client for processing. There is no requirement in this configuration to map the database server disk to the GIS client.
- The server can also provide a communication interface between the City's applications and an Internet Web server.
- In a two-tier architecture, the application server and central data server may be on the same platform
- In a centralized solution, application servers can be UNIX or Windows NT platforms that provide host-computing services to a number of GIS clients.

Database Tier

- Servers that house the supporting database.
- The GIS System relational database is the central repository for storing all of the City's spatial and attribute data into a single standard commercial DBMS such as Oracle or MS SQL server.
- Interacts with the application server for displaying, retrieving, and analyzing data, and generating maps and reports.

Kennewick has well-established GIS capabilities that are centralized function within IT and are primarily focused on supporting Public Works' needs. GIS applications support is increasingly integral to the City's applications and the GIS applications support capabilities need to be incorporated into core business applications. Analytic functions should be supported within Operational Departments and should be staffed there, while application support and programming should be housed with IT. This way both Operational Departments and IT are actively communicating and working through these complex issues. Training and tools are being made available to department users.

Functionality and interfaces with GIS are limited with the current systems, but with the implementation of a new ERRP and Public Safety system, GIS will become the backbone of these system's integration. Some of these functions include meter reading, asset management, planning and development, OnBase, and vehicle tracking.

Recommendations:

- Continue working to improve base layers and consistently geo-validate new addresses.
- With the impending implementation of Public Safety and ERP, consider adding more GIS staff as the environment becomes more complex. More data will need to be entered into the GIS system as these two projects come online.
- Establish a common data architecture across systems, centrally managed data models, data audit standards, and data encryption. Applications are integrated in real time in order to reduce dual entry of information.

		Functional Maturity / Risk Level
Enterprise Applications		
Main Enterprise Application	Description	
ERP	Eden	
Planning and Development	Eden	
Public Works	Hansen	
Transparency and Analytics	GovQA and Crystal Reports	
Document Management	OnBase	
Police RMS and CAD	Intergraph	
Fire RMS	Image Trend	
Website	Civic Plus	

Findings:

The applications focus area centers on the software used to support government services and core business functions. Departmental interviews were conducted to review the major strengths and weaknesses of the City's major applications environment. This mixture of integrated and peripheral applications is presented in the graphic on the next page.

Entire System

As a consequence of older, less flexible (legacy) systems that continue to be used by municipalities, departments have created work-arounds to ensure that they can deliver services to their customers. They have turned to independent systems that are not integrated with the core application. Such is the case in the City of Kennewick. For example, because certain functionality was not covered by **Eden** or **Hansen**, and/or the workflow capabilities of these systems are limited, the City has turned to 3rd party applications to provide these capabilities. Users also rely heavily on Microsoft Access databases or Excel spreadsheets to track data not easily available through the core application.

Many of these applications operate over varied hardware and application programming languages. The multiple platforms supported by the City (e.g., Legacy, Client/Server, and internally developed Access databases and Excel spreadsheets), leads to an environment that is more difficult to manage and plan for, and requires more substantial staffing to support.

The City of Kennewick's overall application architecture is characterized by the use of non-integrated departmental applications. This has left the City with the need for redundant entry due to the segmented nature of the application architecture. This mixture of integrated and peripheral applications is presented on page 27.

Enterprise Resource Planning System

The City operates with a single core enterprise resource planning (ERP) application, Tyler Eden. The functions supported by this application are Finance, Human Resources and Planning/Zoning/Building. Ultimately, the goal of any ERP system is to provide managers with the just-in-time information they need to make the right decisions. The major functional challenges presented by Eden's architecture are workflow and reporting. Users may have to enter information multiple times in the system; and, while there is detailed information in the system, it is difficult for users to get at it. Users have to rely on Crystal Reports to extract information; often this information is reentered into Excel to analyze and report out.

Eden has areas of weakness. The City has attempted to cover some areas of weaknesses by developing workflows through LiquidOffice for forms and workflow, supported by OnBase for document management. While these have worked well, the City has begun moving away from a traditional commercial, off-the-shelf

(COTS) applications environment that is easier to support, to one in which development is occurring and is more complex to support. While the LiquidOffice workflows have been custom developed for the City, users will have to compromise on some functionality with ERP systems; however, that content will be fully-integrated without interfaces and will require substantially less support.

In other areas, the City has turned to the use of COTS applications to supplement Eden. For example, in Human Resources, the City has purchased NeoGov to manage personnel and applicant tracking information and workflow. NeoGov has the added advantage of being a Cloud-based application (i.e., hosted by NeoGov at their site), which means that the application only requires network and Internet services from the IS Department, and results in little support demand.

As a result, the City has already begun the process of replacing its ERP system to a modern, efficient, workflow-centric solution. It is projected that within the five-year period covered by this Plan, the City will have a new ERP system completely implemented. Although an industry standard platform that helps reduce the long-term IS support and provides state-of-the-art capabilities will be more useful to the user community, the responsibility of the application integration and systems management would fall on an IS staff whose skills are largely infrastructure-based.

Document Management System

LiquidOffice and **OnBase** are currently driving workflow within the City. LiquidOffice handles Timecard Process, Travel Process, Fire Investigation Process, and Change of Status, while OnBase is the main document storage system which integrates several other process workflows the Eden system cannot control through the use of customized scripts the City's IT Department has developed.

As part of the ERP replacement process, LiquidOffice will be replaced and all of the current workflows within the system will be transferred to the new ERP system functionality, if available. OnBase will remain the main document storage/archival system, but its workflows might be transferred to the new ERP, if the system supports this complex functionality. OnBase will be interfaced to the new ERP system so that documents generated by the ERP system are stored in OnBase for document archival.

Public Safety

The City's Public Safety systems are managed by the Bi-County Police Information Network (BiPIN), a consortium of various law enforcement agencies in Franklin and Benton Counties, Washington. While this group makes the technology decisions for all its City and County members, the actual application and data is stored within the City of Kennewick.

The organization's current RMS/JMS system consists of law enforcement records management, mobile data computing, and jail management systems acquired from Intergraph Public Safety in 2003. BiPIN's RMS/JMS has operated for the past 14 years. The organization considered migrating to the Intergraph's most recent version of their RMS/JMS, however, the vendor's delay in the development of a JMS and the lack of robust field reporting capabilities prompted the agency to consider alternate products.

The **Intergraph I/LEADS** RMS/JMS operates in a traditional MS Windows based client/server environment. The system has effectively supported the agency yet has extensive limitations relative to field reporting and analytics. Further analysis of the organization's functional processes shows that the lack of integration forces member agencies to operate in a reduced state of efficiency primarily due to the extensive paper tracking, manual workflows, and re-entry of information into multiple systems.

As a result of these inefficiencies, BiPIN has decided to replace the I/LEADS Public Safety system. Currently the group is in the process of selection and implementation should begin next year.

Business Continuity	Functional Maturity / Risk Level
	
Areas of Review: Current DR plan, replication of services, network stability, backup data center, documentation	
Findings: ▪ The City does not have an updated continuity of operations plan. ▪ IT does not have a formal continuity of operations plan and has not been tested. ▪ Currently, recovery times for applications would take more than 2 days. ▪ There is no alternate data center that would provide DR capabilities in the event of a natural disaster. Backups are also stored in the same data center. If a critical event happened, the City would most likely loss most of its data and operational functionality for an extended period of time. ▪ Critical IT roles are cross-trained to assure continuity, but the limited current staff levels could not support people taking long times of leave (over 2 weeks).	
Recommendations: ▪ Further development of the disaster recovery plan should be undertaken. The plan should provide Business Continuity items for keeping essential services running in the event of a disaster and Return to Operation (RTO) Objectives as developed in conjunction with your key end-user departmental stakeholders. The plan should be updated annually. ▪ Develop a plan to document detailed support information for each application and hardware. ▪ Development of a formal DR site which is at least 5 miles away from the City Hall data center is critical to business continuity and disaster preparedness.	

Security Risk	Functional Maturity / Risk Level
	
Areas of Review: Perimeter defense, authentication, monitoring, application deployment, design, data storage and communications, security policy, patch management.	
Findings: ▪ The results of the “Technical Risk Assessment Tool” showed that Applications and Human Resources risks were the areas of highest concern. ▪ Here are the main concerns for Applications: - No regular testing of Application and data recovery - No controls exist to enforce password policies in key applications - Key applications do not encrypt sensitive and business critical data that they process ▪ Here are the main concerns for Human Resources: - No performed security assessments of the environment through independent third-parties - No security awareness program - No formal employee exit process exists	
Recommendations: ▪ Begin a testing environment for main applications used in the City. ▪ Require more complex passwords that are changed every year. ▪ Develop security protocols within IT for new staff. ▪ Third-party assessments should be conducted to gain a valuable and objective view of an organization's security posture. ▪ A security awareness program helps employees contribute to a company's overall security posture by keeping them up-to-date on security risks.	

2.6 Organization

Overview

This section assesses the organization of the IT Department to include staffing level compared with benchmarks and analyzes current resources compared with future technology initiatives. The current organizational structure is assessed for gaps in functionality and specialty of technical areas.

Staffing Levels	Functional Maturity / Risk Level
Areas of Review: Staffing Levels compared to benchmarks	3
Findings: ▪ For their current technological volume, IT is sufficiently staffed in most areas, but the two main areas that are lacking are: Network Support and Help Desk. ▪ Kennewick's technological environment is highly complex which results in a high level of IT Intensity. IT Intensity is brought on by the following factors: - Growing number of servers and storage hardware - Large suite of business applications - Four operating platforms supported - High level of custom system usage requiring increased IT involvement and monitoring ▪ This causes the IT staff to scramble for service requests, which might satisfy end users, but ultimately, they are unable to complete other critical tasks such as: - Properly maintain the infrastructure environment - Document processes for emergencies and succession planning - Train on basic systems/applications to give comprehensive support to end users ▪ In analyzing the Organization chart and comparing FTE findings from data collection to IT Staff Benchmarks shown below, key limitations of the current structure and staffing recommended adjustments are identified. - Network Devices per Network Support Staff Member should be at 38. Kennewick is 71. - PCs per Desktop Support Staff Member should be at 233. Kennewick is 404. - End Users per Help Desk Support Staff Member should be at 272. Kennewick is 480. ▪ IT is utilizing fewer resources than the average organization in the following areas: Server Support Staff, Network Support Staff, Database Administration, Documentation, Training, Desktop Support Staff Member, and Help Desk Support Staff Member.	
Recommendations: ▪ Based on the analysis on the next page and the current level of technology in the City, IT Management will need to add an additional 3.0 FTEs in the following years of this plan. ▪ The areas that will fill this gap are Hire Infrastructure Support Supervisor (+1 FTE), Network Support (+1 FTE) and Help Desk Support (+1 FTE). This will enable the IT department to better service customers both face-forward and on the backend. ▪ By pursuing a strategy of standardization and simplification to the technological environment while simultaneously adjusting their organizational structure, the IT Department should be able to reduce complexity and lower IT Intensity.	

City of Kennewick IT Staffing Benchmarks

Metric	Kennewick Current IT Staffing	Kennewick Demand per Staff	Benchmark Ideal Demand per Staff	Suggested Adjustment
Server Instances per Server Support Staff Member	1.5	38	35	+0.1
Network Devices per Network Support Staff Member	1	71	38	+0.9
Applications per Application Support / Business Analyst	5.6	6.25	5	+1.4
PCs per Desktop Support Staff Member	1.4	404	233	+1.0
End Users per Help Desk Support Staff Member	1	480	272	+0.8

City of Kennewick Recommended IT Staffing Levels

Staffing Levels -FTEs			
Staffing Area	Current FTEs	Future FTEs	Suggested Adjustment
IT Management	1.5	1.6	0.1
IT Finance/Purchasing/Vendor Management	0.4	0.2	(0.2)
Project Management	1.0	0.6	(0.4)
Clerical/Administration	-	0.1	0.1
Applications Support	3.0	3.2	0.2
Business Analysis	2.6	3.2	0.6
Data Management	-	0.2	0.2
Quality Assurance/Testing	-	0.1	0.1
Database Administration	0.1	0.3	0.2
Server Support	1.5	1.6	0.1
Network/Communications	1.0	1.9	0.9
Security	0.5	0.6	0.1
Help Desk	1.0	1.8	0.8
Desktop Support	1.4	1.4	0.0
Documentation, Training, Process, Standards	-	0.1	0.1
Other	1.0	1.1	0.1
Total Staffing	15.0	18.0	3.0

Organizational Structure	Functional Maturity / Risk Level
Areas of Review: Current organization structure, functional groupings, current technology demand, demands as a result of the project in this plan.	4
Findings: ■ The current IT organizational structure effectively segregates specific job functions (e.g., end-user support is distributed throughout various organizational areas) with a solid structure for conducting business and distributing tasks. No reorganization is necessary. ■ There are well-defined functions within the IT organization. Each staff member has a set of defined skills and tasks they are responsible for to make the organization successful. ■ With the increase in technology projects over the next 5 years, the IT staff will need to be expanded to provide backend support to the end users in order to continue the level of service they provide today.	
City of Kennewick Future IT Organization Chart Legend - Existing Position - Added Position Proactive ← → Reactive	
Recommendations: ■ Build out infrastructure management, network and help desk support capabilities. ■ Specialize main functions within IT in order to provide better service and advising to new projects (i.e., applications, infrastructure, support).	

2.7 Process

Overview

Internal IT policies, supporting processes, and procedures were found to be lacking; this is reflected in the overall performance of the City against IT Service Management standards. As part of the planning project, a review was conducted of IT support through a review of the IT Service Delivery Management. The reviews were conducted through the use of structured assessment checklists and on-site interviews.

	Functional Maturity / Risk Level
Release Management	3
Areas of Review: Change Management, Configuration Management, Release Management.	
Description: - Tracks changes and lessons learned in a corporate knowledge base. - Tracks inventory and changes in a configuration management database. - Liaises between the change development team and the operations area.	
Findings: - Operational Business Service View - Procedures are written down and implemented. Feedback received and revisions are made. Procedures contain too much information, unwieldy. - At this third level of maturity an IT organization has moved beyond a technology-focused representation of operational IT services, and now provides business context for service level agreements and metrics that help to make explicit links between operational IT quality and the effectiveness of operational business processes. - IT service levels and metrics are presented and managed with business context but services still only address current operational systems.	
Recommendations: Refer to Appendix B: IT Service Management Assessment Details for Best Practices Recommendations.	

	Functional Maturity / Risk Level
Service Management	
Areas of Review: Service Level Management, Financial Management, Capacity Management, Availability Management, IT Service Continuity Management.	
Description: - Ensures that all of the IT services being provided to organizations are aligned to the organizations' need for them. - Maintains a working relationship with organizations, understands their need for IT services, and manages the introduction of new services, service improvements, and (eventually) service reductions and retirements.	
Findings: - No Service Delivery Processes - Procedures are not written down although staff may understand what is required of them. Performance is not controlled. - At this first level of maturity there may be talk of providing a service-based perspective on what the IT organization does, but it doesn't go any further than that. - Development and integration projects are managed in a separate organizational silo from administration and operations, and moreover administration and operations practices are themselves likely to be "stovepiped" according to technology specialties	
Recommendations: Refer to Appendix B: IT Service Management Assessment Details for Best Practices Recommendations.	

	Functional Maturity / Risk Level
Support Management	
Areas of Review: Service Desk, Incident Management, Problem Management.	
Description: - Provides technical support for City organizations, resolving incidents and problems using highly automated tools and knowledge base systems. - Provides production support for line-of-business applications. - Gives feedback to the development and design team.	
Findings: - Operational Business Service View - Procedures are written down and implemented. Feedback received and revisions are made. Procedures contain too much information, unwieldy. - At this third level of maturity an IT organization has moved beyond a technology-focused representation of operational IT services, and now provides business context for service level agreements and metrics that help to make explicit links between operational IT quality and the effectiveness of operational business processes. - IT service levels and metrics are presented and managed with business context but services still only address current operational systems.	
Recommendations: Refer to Appendix B: IT Service Management Assessment Details for Best Practices Recommendations.	

	Functional Maturity / Risk Level
Security Management	
Areas of Review: Security policy, firewall, passwords, third party access, user authorization, identification & authentication.	
Description: - Ensures data confidentiality, data integrity, and data availability. - Influences business policies, such as defining exit procedures to follow when an employee leaves the company.	
Findings: - Operational Technology View - Procedures may be written down. However, many have not been tested, are not deployed, or are not tracked. - At this second level of maturity, an IT organization has already implemented some aspects of “traditional” IT Service Management (ITSM) practices and has started to pull operational technology practice stovepipes together. - IT services are defined and managed but only address current operational systems. If service levels, or metrics are used they are technology based.	
Recommendations: Refer to Appendix B: IT Service Management Assessment Details for Best Practices Recommendations.	

	Functional Maturity / Risk Level
Operations Management	
Areas of Review: System Administration, Directory Services Administration, Network Administration, Service Monitoring and Control, Storage Management, Workforce Management.	
Description: - Ensures that daily, routine tasks are performed reliably within specific technology areas and production systems (including messaging and system administration). - Performs scheduled and repeatable processes such as data backup, archiving and storage, output management, system monitoring and event log management, and file and print server management.	
Findings: - Operational Business Service View - Procedures are written down and implemented. Feedback received and revisions are made. Procedures contain too much information, unwieldy. - At this third level of maturity an IT organization has moved beyond a technology-focused representation of operational IT services, and now provides business context for service level agreements and metrics that help to make explicit links between operational IT quality and the effectiveness of operational business processes. - IT service levels and metrics are presented and managed with business context but services still only address current operational systems.	
Recommendations: Refer to Appendix B: IT Service Management Assessment Details for Best Practices Recommendations.	

Section 3: Five Year Goals and Initiatives

Overview

As a result of the planning process, certain goals and initiatives were identified with an objective of completing Digital Government Phases 1 (Stabilize) and 2 (Improve) and position the City to enter Phase 3, Engage. These goals and initiatives are grouped using the five assessment areas:

Strategy, Governance, Architecture, Organization, and Process. The table below outlines the initiatives found in each of the groupings of this section. Each technology initiative has an element of the Digital Government Model assigned to it to show which phase it applies to, which can be found to the right. Details of each project and a breakdown of the budget can be found in the latter pages of this section.

Technology Initiatives	Start	Finish	Total 5-Year Cost	Digital Government Model		
				Stabilize	Improve	Engage
Strategy						
S1. Software Training for End Users	19	19	\$ 40,000		•	
S2. Continuity of Operations Plan (COOP) Development	20	20	\$ 50,000	•	•	
S3. IT Plan Refresh	22	22	\$ 19,000	•	•	•
Governance						
G1. Address Gaps in City-wide Technology Policies	20	23	\$ 0	•		
Architecture						
A1. Upgrade the City Hall Data Center	19	19	\$ 258,500	•		
A2. Replace Outdated UCS and SAN Infrastructure	20	20	\$ 234,000	•		
A3. Increase Bandwidth to City Hall to 100 MB	21	21	\$ 23,400	•	•	
A4. Replace Network Switches and Routers	20	20	\$ 640,000	•		
A5. Update End User Devices and Standardize on Windows 10	19	19	\$ 862,000	•	•	
A6. Build a Disaster Recovery Data Site	21	22	\$ 500,000	•		
A7. Implement New ERP System	19	20	\$ 2,500,000	•	•	•
A8. Implement Advanced Authentication Functionality	20	20	\$ 45,100	•	•	
A9. Live Streaming Council Meetings	20	20	\$ 82,500		•	•
Organization						
O1. Hire Infrastructure Support Supervisor (1 FTE)	19	19	\$ 701,755	•		
O2. Hire Help Desk Support Staff (1 FTE)	20	20	\$ 232,747	•	•	
O3. Hire Network Support Staff (1 FTE)	21	21	\$ 306,423	•		
Process						
P1. Improve ITIL Performance	19	23	\$ 0	•	•	•
Total Plan Cost			\$ 6,495,425			

3.1 Strategy Initiatives

Overview

City Management wants to utilize technologies that are flexible and enable the City to grow more efficiently. In order to accomplish this, IT needs to begin developing a strategy for technology's purpose in the City. IT should meet with City Management to layout a framework that will lead to a fully integrated, functional City. Instead of having Operational Departments deciding independently on technology that suits their own needs, the City needs to start looking to IT as a partner for consulting direction. The projects presented are a result of the findings found in Section 2.



S1. Software Training for End Users

Description

Users expressed a lack of understanding on how to fully utilize MS Office products when performing everyday tasks. Main concerns of the software are in the areas of: Outlook, Adobe and Adobe Pro. In addition, users also expressed they did not fully understand how to effectively use OnBase for simple tasks. Conduct a City-wide, onsite training class for all end users who use MS Office and OnBase.

Strategic Outcome

Improved user ability and comprehension of City-owned software platforms to allow for better processes and more efficient workflows for end users in the City.

Cost Estimate

Cost	2019	2020	2021	2022	2023
Onsite Training	\$40,000	\$0	\$0	\$0	\$0
Total Project Cost	\$40,000	\$0	\$0	\$0	\$0

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management Project	40				
Management Applications	240				
Infrastructure Customer Service					
Total Level of Effort	280	0	0	0	0

S2. Continuity of Operations Plan (COOP) Development

Description

Without a Continuity of Operations Plan in place, the City puts itself at a major risk in the event of a natural disaster. The area could be prone to mass fires, which could shut down the City for an extended period of time. Develop a continuity of operations plan that incorporates a technology disaster recovery plan with established methods to be tested at regular intervals.

Strategic Outcome

A Continuity of Operations Plan (COOP) will provide a step-by-step guideline for the City on what to do when an emergency happens. This will greatly decrease the overall vulnerability of system failure of the City.

Cost Estimate

Cost	2019	2020	2021	2022	2023
Consultant	\$0	\$50,000	\$0	\$0	\$0
Total Project Cost	\$0	\$50,000	\$0	\$0	\$0

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management Project		20			
Management Applications		80			
Infrastructure Customer Service		20			
Total Level of Effort	0	160	0	0	0

S3. IT Plan Refresh**Description**

Provide a bi-annual review and update of the planned initiatives for the upcoming year based upon changing priorities and conditions in advance of budget preparation.

Strategic Outcome

To enable the IT Department to have a mid-plan review and recommendations on how to continue moving forward in Digital Government.

Cost Estimate

Cost	2019	2020	2021	2022	2023
Plan Refresh	\$0	\$0	\$19,000	\$19,000	\$0
Total Project Cost	\$0	\$0	\$19,000	\$19,000	\$0

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management				40	
Project				80	
Management				20	
Applications				20	
Infrastructure				20	
Customer Service				20	
Total Level of Effort	0	0	0	0	0

3.2 Governance Initiatives

Overview

As technology has become more integrated into City processes, the process used to ensure that technology acquisition, upgrades and support remain in alignment with the City's business strategy, i.e., governance, needs to be formalized. While IT Management is concerned with the planning, organizing, directing and control of IT resources, IT Governance is focused on ensuring that the City receives the maximum value from its IT investments. The projects presented within Governance are a result of the findings found in Section 2.



G1. Address Gaps in City-wide Technology Policies

Description

Develop and maintain policy weaknesses identified in the assessment to include: Acceptable Use (computers, internet, etc.), security (passwords), and customer-centric IT areas (asset disposal, change management, incident response, and purchasing). Strict enforcement and periodic re-education of existing policies with support from management is crucial.

Strategic Outcome

Stronger policies create a more risk-adverse environment.

Cost Estimate

Cost	2019	2020	2021	2022	2023
None	\$0	\$0	\$0	\$0	\$0
Total Project Cost	\$0	\$0	\$0	\$0	\$0

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management		40	40	40	40
Project		120	80	80	80
Management					
Applications					
Infrastructure					
Customer Service					
Total Level of Effort	0	160	120	120	120

3.3 Architecture Initiatives

Overview

In order to meet City staff's and citizen's expectations, the City must maintain the underlying technology infrastructure and protect its investments. In addition, IT needs to devote resources into the standardization, simplification, modernization, and risk mitigation of the City's technology infrastructure. The following projects address these needs in order to "stabilize" the environment and move to improving the business needs of the City. The projects presented in Architecture are a result of the findings found in Section 2.

A1. Upgrade the City Hall Data Center

Description

As a result of the assessment in Section 2, the City's main data center housed in City Hall is substantially lacking in core disaster recoverable infrastructure. This location presents several risks to the servers and data including water sprinkler-based fire suppression and no physical security measures are installed. A more extensive vulnerability review of the data center should be undertaken and remediated. Areas to take into consideration are: a dry fire suppression system, new UPS, and ventilation.

Strategic Outcome

Mitigate the present risk of a critical event destroying the data center and all associated servers.



Cost Estimate

Cost	2019	2020	2021	2022	2023
Dry Fire Suppression	\$30,000	\$0	\$0	\$0	\$0
APC UPS & Electrical	\$33,500	\$0	\$0	\$0	\$0
AC Unit (7 ton)	\$20,000	\$0	\$0	\$0	\$0
Services and Labor	\$175,000	\$0	\$0	\$0	\$0
Total Project Cost	\$258,500	\$0	\$0	\$0	\$0

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management	60	20	20	20	20
Project	60				
Management					
Applications					
Infrastructure	120	40	40	40	40
Customer Service					
Total Level of Effort	240	60	60	60	60

A2. Replace Outdated UCS and SAN Infrastructure

Description

The current UCS and NAS units are outdated and no longer expandable to meet the City's needs. These two critical pieces of hardware need to be replaced with more modern, robust infrastructure that will enable flexible storage and more reliable performance. As the City implements more applications, the criticality of this hardware increases.

Strategic Outcome

Ensure that the new ERP and Public Safety systems have a solid backend infrastructure to support the robustness of these systems and mitigate the risk of system failure.

Cost Estimate

Cost	2019	2020	2021	2022	2023
UCS	\$0	\$150,000	\$0	\$0	\$0
SAN	\$0	\$84,000	\$0	\$0	\$0
Total Project Cost	\$0	\$234,000	\$0	\$0	\$0

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management		40	20	20	20
Project		120			
Management					
Applications					
Infrastructure		240	120	120	120
Customer Service					
Total Level of Effort	0	400	140	140	140

A3. Increase Bandwidth to City Hall to 100 MB**Description**

The bandwidth to the City Hall PoP is currently 50 MB. As new systems are brought online and network traffic increases, this bandwidth will not be able to support the load needed to operate the City's vital functions. The bandwidth will need to be increased to 100 MB to support the potential load of network traffic and reduce the overall risk to the City.

Strategic Outcome

To ensure the new ERP and Public Safety systems operate on a solid network that has enough bandwidth to increase traffic and not hinder City operations.

Cost Estimate

Cost	2019	2020	2021	2022	2023
Bandwidth Increase	\$0	\$0	\$7,800	\$7,800	\$7,800
Total Project Cost	\$0	\$0	\$7,800	\$7,800	\$7,800

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management			80	20	20
Project			80		
Management					
Applications					
Infrastructure			240	120	120
Customer Service					
Total Level of Effort	0	0	400	140	140

A4. Replace Network Switches and Routers**Description**

The IT Department has attempted to maintain a regular replacement cycle for the City's hardware including network devices (switches, routers, servers). However, due to limited resources and prioritization, many of these devices are beyond their optimal lifespan. This places the City at risk of network failure. IT will acquire, plan, and implement new network components and decommission end of life devices.

Strategic Outcome

Mitigate the risk of network failure and City inoperability.

Cost Estimate

Cost	2019	2020	2021	2022	2023
Switches and Routers	\$0	\$400,000	\$0	\$0	\$0
Switch	\$0	\$0	\$80,000	\$80,000	\$80,000
Maintenance	\$0	\$0	\$80,000	\$80,000	\$80,000
Total Project Cost	\$0	\$400,000	\$80,000	\$80,000	\$80,000

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management		20			
Project					
Management					
Applications		40	40	40	40
Infrastructure					
Customer Service		20			
Total Level of Effort	0	80	40	40	40

A5. Update End User Devices and Standardize on Windows 10**Description**

The City has implemented a replacement cycle for end user computers that are replaced every 5 years. Currently, devices are in their 5th year, so all City computers will be replaced next year. The cost estimate to the right provides a budget for this initiative while the level of effort implies the impact to IT staffing to deploy the devices. The City should also investigate its options for transitioning to Windows 10 (e.g., gradual versus simultaneous fleet transition).

Strategic Outcome

Ensure end users are utilizing up-to-date technology and are supplied with the resources they need to improve their functionality and efficiency.

Cost Estimate

Cost	2019	2020	2021	2022	2023
PC Replacement (450)	\$562,500	\$0	\$0	\$0	\$0
MDT Replacement (5)	\$7,500	\$0	\$0	\$0	\$0
Tablet Replacement (5)	\$4,000	\$0	\$0	\$0	\$0
Windows 10 License	\$57,600	\$57,600	\$57,600	\$57,600	\$57,600
Total Project Cost	\$631,600	\$57,600	\$57,600	\$57,600	\$57,600

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management	80	40	40	40	40
Project	80				
Management	80				
Applications	80				
Infrastructure	80				
Customer Service	960	240	240	240	240
Total Level of Effort	1280	280	280	280	280

A6. Build a Disaster Recovery Data Site

Description

The City currently does not have an IT disaster recovery data center. A disaster recovery (DR) site is an alternative backup facility, that is used when a primary location becomes unusable due to failure or disaster. It contains equipment and infrastructure that can be temporarily used to manage business processes until the main site's functionality is fully restored. A disaster recovery site is an important asset because it keeps an organization running at all times. The City will build an DR site at a location at least 5 miles away from the primary data center in City Hall.

Strategic Outcome

A DR site will allow for continuous use of City applications, uninterrupted service, even if the servers and data center went dark.

Cost Estimate

Cost	2019	2020	2021	2022	2023
DR Site Build-out	\$0	\$0	\$500,000	\$0	\$0
Total Project Cost	\$0	\$0	\$500,000	\$0	\$0

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management			240	240	240
Project			520	240	240
Management			520	240	160
Applications					
Infrastructure					
Customer Service					
Total Level of Effort	0	0	1280	720	640

A7. Implement New ERP System

Description

With the selection of the new ERP system for the City almost complete, the implementation of this system should begin at the beginning of next year. The ERP will take 24 months to implement and train the end users on the software. The system should be fully online and functional by the beginning of 2021.

Strategic Outcome

With this new system, the City should gain modern functionality that will allow workflows to be more efficient and provide better data and service to citizens.

Cost Estimate

Cost	2019	2020	2021	2022	2023
Software	\$1,000,000	\$400,000	\$0	\$0	\$0
Services	\$750,000	\$350,000	\$0	\$0	\$0
Total Project Cost	\$1,750,000	\$750,000	\$0	\$0	\$0

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management	80	80	40	40	40
Project	160	160	80	80	80
Management					
Applications	480	480	240	240	240
Infrastructure	120	120	120	120	120
Customer Service	240	240	240	240	240
Total Level of Effort	1080	1080	720	720	720

A7. Implement Advanced Authentication Functionality

Description

Advanced authentication functionality employs the use of the following factors of authentication: something you know (e.g. password), something you have (e.g. hard token). something you are (e.g. biometric). This provides a greatly enhanced level of security, because a system protected by AA is nearly impenetrable to a security breach from outside. The City has expressed for this need in patrol vehicles for the officers. The recommended solution is a combination of password and biometric fingerprint verification.

Cost Estimate

Cost	2019	2020	2021	2022	2023
Fingerprint Scanners	\$0	\$3,500	\$0	\$0	\$0
Configuration	\$0	\$20,000	\$0	\$0	\$0
Yearly License	\$0	\$5,400	\$5,400	\$5,400	\$5,400
Total Project Cost	\$0	\$28,900	\$5,400	\$5,400	\$5,400

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management		40			
Project		80			
Management					
Applications		240	40	40	40
Infrastructure		120			
Customer Service		120			
Total Level of Effort	0	600	40	40	40

A8. Live Streaming Council Meetings

Description

Livestreaming has become a valuable tool for governments to increase civic engagement. Governments of all sizes have taken to streaming city council meetings as a way to communicate their message to their community. With the implementation of a Government Transparency software, the City will be able to effectively livestream on their website and provide updates to City current events.

Strategic Outcome

Improved citizen outreach and transparency.

Cost Estimate

Cost	2019	2020	2021	2022	2023
Hardware	\$0	\$30,000	\$0	\$0	\$0
Software	\$0	\$10,500	\$10,500	\$10,500	\$10,500
Services	\$0	\$10,500	\$0	\$0	\$0
Total Project Cost	\$0	\$51,000	\$10,500	\$10,500	\$10,500

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management		40			
Project		40			
Management					
Applications		160	40	40	40
Infrastructure		60			
Customer Service					
Total Level of Effort	0	300	40	40	40

3.4 Organization Initiatives

Overview

The IT Department has traditionally been seen as a support function. To effectively undergo the transformation to digital government, the IT Department must be seen more as an equal partner to the functional, citizen-facing departments. The quality of service provided by the City to the citizenry is dependent upon this recasting of the Department. Technology is integral to the function of every department's business processes. The IT Department must continue to provide support for core business functions while providing leadership, all while facilitating core cross-departmental and City information management and technology functions.

01. Hire Infrastructure Support Supervisor (1 FTE)

Description

The IT Department's staffing levels are deficient in certain critical areas, notably in core infrastructure such as the network. This position was recommended in the previous plan, but has not been filled in the previous 5 years. It is also important to note that this position will be responsible for staying current in network and systems management due to the constant changing environment of cyber security. This position will bring staffing levels up to the benchmark. Add one (1) Infrastructure Support Supervisor to IT to support the increasing system and network needs of City.

Strategic Outcome

Improve core infrastructure management within the City.

02. Hire Help Desk Support Staff (1 FTE)

Description

The IT Department's staffing levels are deficient in specific critical areas, notably Server Support/Desktop Support. To improve the efficiency and quality of service to customers, staffing levels need to be brought up to benchmark levels as defined in the Section 2, Staffing Benchmarks. Add one (1) additional staff for customer support to the IT Department.

Strategic Outcome

Improve customer support to the Departments and allow for IT staff to focus on other critical areas in this plan, such as Process, DR, and Policies.



Cost Estimate

Cost	2019	2020	2021	2022	2023
Infrastructure Supervisor (1)	\$127,000	\$133,350	\$140,018	\$147,018	\$154,369
Total Project Cost	\$127,000	\$133,350	\$140,018	\$147,018	\$154,369

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management	40				
Project					
Management					
Applications					
Infrastructure	240	160	160	160	160
Customer Service					
Total Level of Effort	280	160	160	160	160

Cost Estimate

Cost	2019	2020	2021	2022	2023
Help Desk Support (1)	\$0	\$54,000	\$56,700	\$59,535	\$62,512
Total Project Cost	\$0	\$54,000	\$56,700	\$59,535	\$62,512

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management		40			
Project					
Management					
Applications					
Infrastructure					
Customer Service		240	160	160	160
Total Level of Effort	0	280	160	160	160

O3. Hire Network Support Staff (1 FTE)**Description**

The IT Department's staffing levels are deficient in certain critical areas, notably Network Administration. There have been complaints in the user departments of network problems and unreliable connections. To improve the efficiency and quality of service to customers, staffing levels need to be brought up to benchmark levels. Add one (1) Network support staff to the IT Department to support the increasing network needs of operational departments, as well as support of the new systems coming online.

Strategic Outcome

Improve network performance, reliability and security throughout the City.

Cost Estimate

Cost	2019	2020	2021	2022	2023
Network Support (1)	\$0	\$0	\$97,200	\$102,060	\$107,163
Total Project Cost	\$0	\$0	\$97,200	\$102,060	\$107,163

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management			40		
Project					
Management					
Applications					
Infrastructure			240	160	160
Customer Service					
Total Level of Effort	0	0	280	160	160

3.5 Process Initiatives

Overview

Internal IT policies, supporting processes, and procedures is what was reviewed in this section. These areas were found to be lacking and is reflected in the overall performance of the City against IT Service Management standards. The Information Technology Infrastructure Library (ITIL) is used by IT Departments internationally to implement quality management best practices on the services they provide. In essence, the system calls for you to document what you do, do what you document, and track performance of the process so you can continuously improve it. Details on best practices can be found in [Appendix B](#).



P1. Improve ITIL Performance

Description

Establish managers and owners to functions deemed critical and lacking in the ITIL evaluation. Create written procedures and policies to solidify the City's security and enhance IT's delivery of service to its customers. The most important areas are Configuration Management, Release Management, Security Management, Problem Management, and Capacity Management.

Strategic Outcome

Develop better processes within IT to more effectively manage, monitor and service the technology throughout the City.

Cost Estimate

Cost	2019	2020	2021	2022	2023
None	\$0	\$0	\$0	\$0	\$0
Total Project Cost	\$0	\$0	\$0	\$0	\$0

Level of Effort

IT Effort (Hours)	2019	2020	2021	2022	2023
Management	40	40	40	40	40
Project	60	60	60	60	60
Management	60	60	60	60	60
Applications	60	60	60	60	60
Infrastructure	60	60	60	60	60
Customer Service	160	80	80	80	80
Total Level of Effort	380	300	300	300	300

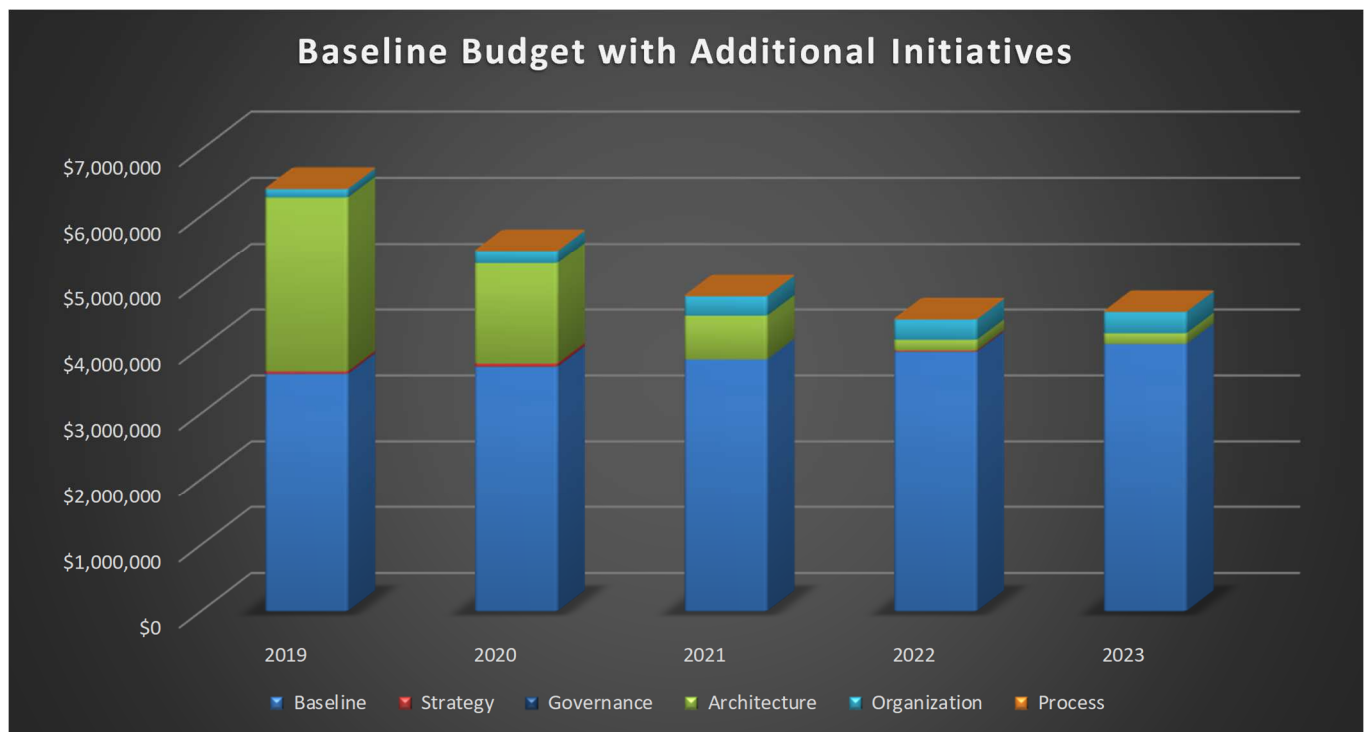
Section 4: Plan Implementation

Overview

This section details the investments, resourcing and timeline for the implementation of this plan.

Calendarized Investments

The calendarized investment schedule is shown in the diagram below. It contains the current baseline budget, grown year over year at a five percent increment for planning purposes. In addition, the investments shown for the Initiatives are shown grouped by associated Goal.



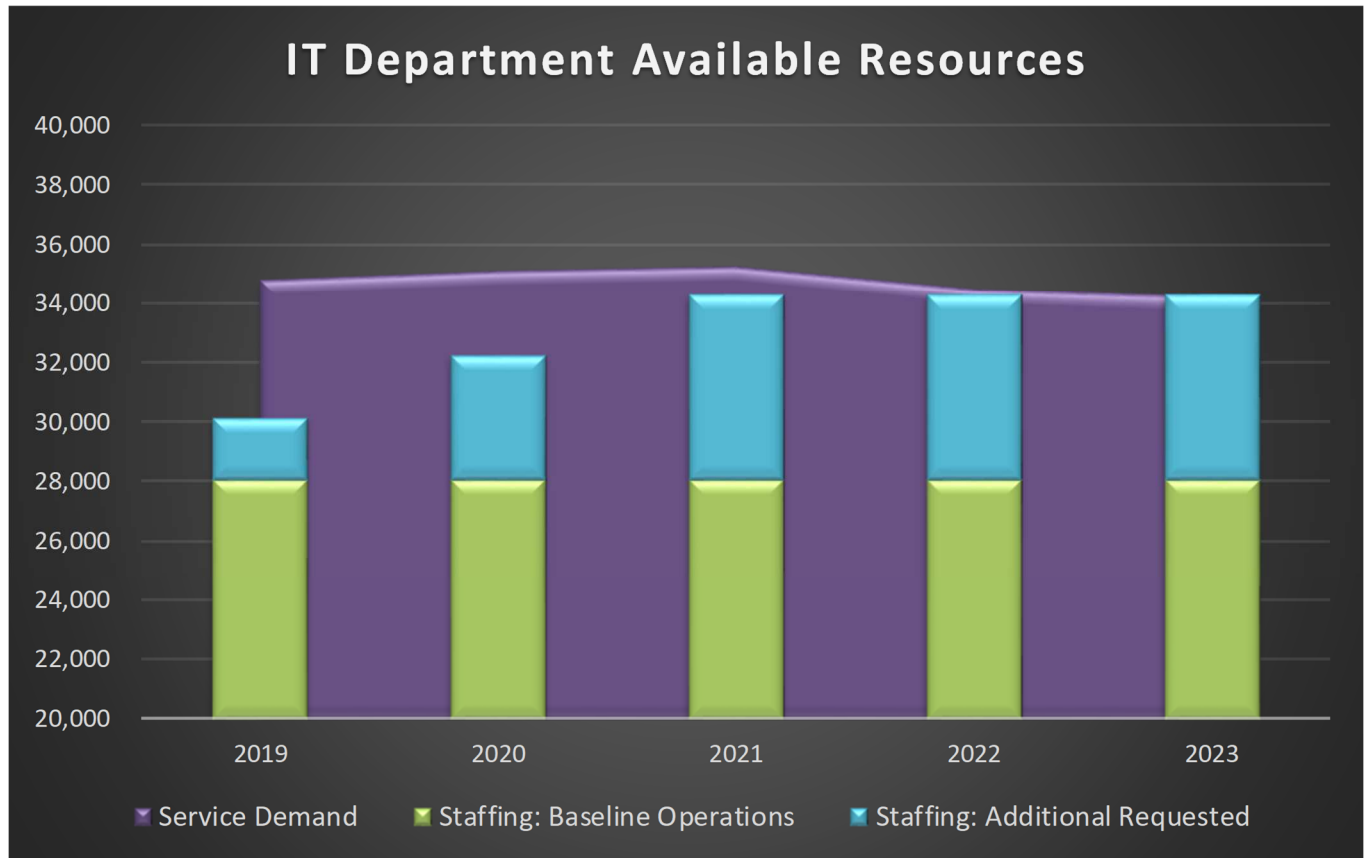
	Calendarized Investment					Total	Annual Average
	2019	2020	2021	2022	2023		
Strategy	\$40,000	\$50,000	\$0	\$19,000	\$0	\$109,000	\$21,800
Governance	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Architecture	\$2,640,100	\$1,521,500	\$661,300	\$161,300	\$161,300	\$5,145,500	\$1,029,100
Organization	\$127,000	\$187,350	\$293,918	\$308,613	\$324,044	\$1,240,925	\$248,185
Process	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Initiatives Subtotal	\$2,807,100	\$1,758,850	\$955,218	\$488,913	\$485,344	\$6,495,425	\$1,299,085
Baseline	\$3,599,180	\$3,707,155	\$3,818,370	\$3,932,921	\$4,050,909	\$19,108,535	\$3,821,707
TOTALS	\$6,406,280	\$5,466,005	\$4,773,588	\$4,421,835	\$4,536,253	\$25,603,960	\$5,120,792

Detailed Calendarization of Initiatives

#	Goal / Initiative	2019		2020		2021		2022		2023		5-Year TCO
		One-Time	Recurring	One-Time	Recurring	One-Time	Recurring	One-Time	Recurring	One-Time	Recurring	
	Strategy											
S1	Software Training for End Users	\$ 40,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 40,000
S2	Continuity of Operations Plan (COOP) Development	\$ -	\$ -	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 50,000
S3	IT Plan Refresh	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 19,000	\$ -	\$ -	\$ -	\$ 19,000
	Governance											
G1	Address Gaps in City-wide Technology Policies	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Architecture											
A1	Upgrade the City Hall Data Center	\$ 258,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 258,500
A2	Replace Outdated UCS and SAN Infrastructure	\$ -	\$ -	\$ 234,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 234,000
A3	Increase Bandwidth to City Hall to 100 MB	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,800	\$ -	\$ 7,800	\$ -	\$ 7,800	\$ 23,400
A4	Replace Network Switches and Routers	\$ -	\$ -	\$ 400,000	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ 640,000
A5	Update End User Devices and Standardize on Windows 10	\$ 631,600	\$ -	\$ -	\$ 57,600	\$ -	\$ 57,600	\$ -	\$ 57,600	\$ -	\$ 57,600	\$ 862,000
A6	Build a Disaster Recovery Data Site	\$ -	\$ -	\$ -	\$ -	\$ 500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500,000
A7	Implement New ERP System	\$ 1,750,000	\$ -	\$ 750,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,500,000
A8	Implement Advanced Authentication Functionality	\$ -	\$ -	\$ 28,900	\$ -		\$ 5,400	\$ -	\$ 5,400	\$ -	\$ 5,400	\$ 45,100
A9	Live Streaming Council Meetings	\$ -	\$ -	\$ 51,000	\$ -	\$ -	\$ 10,500	\$ -	\$ 10,500	\$ -	\$ 10,500	\$ 82,500
	Organization											
O1	Hire Infrastructure Support Supervisor (1 FTE)	\$ -	\$ 127,000	\$ -	\$ 133,350	\$ -	\$ 140,018	\$ -	\$ 147,018	\$ -	\$ 154,369	\$ 701,755
O2	Hire Help Desk Support Staff (1 FTE)	\$ -	\$ -	\$ -	\$ 54,000	\$ -	\$ 56,700	\$ -	\$ 59,535	\$ -	\$ 62,512	\$ 232,747
O3	Hire Network Support Staff (1 FTE)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 97,200	\$ -	\$ 102,060	\$ -	\$ 107,163	\$ 306,423
	Process											
P1	Improve ITIL Performance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	TOTAL	\$ 2,680,100	\$ 127,000	\$ 1,513,900	\$ 244,950	\$ 500,000	\$ 455,218	\$ 19,000	\$ 469,913	\$ -	\$ 485,344	\$ 6,495,425

Resource Utilization

The IT Department's available resource hours were evaluated against the demands of normal workload combined with that of the initiatives included in this Plan. This is illustrated below. The detailed hours allocation is shown by initiative in Appendix B: Detailed Calendarization of IT Staff Time Allocation by Initiative.



	2019	2020	2021	2022	2023
Hours Requirements					
Baseline Operations	31,200	31,200	31,200	31,200	31,200
Additional Staffing Requirements from Initiatives	3,540	3,860	4,020	3,260	3,000
Service Demand	34,740	35,060	35,220	34,460	34,200
Hours Availability					
Staffing: Baseline Operations	28,080	28,080	28,080	28,080	28,080
Staffing: Additional Requested	2,080	4,160	6,240	6,240	6,240
Staffing Availability	30,160	32,240	34,320	34,320	34,320

Detailed Calendarization of IT Staff Time Allocation by Initiative

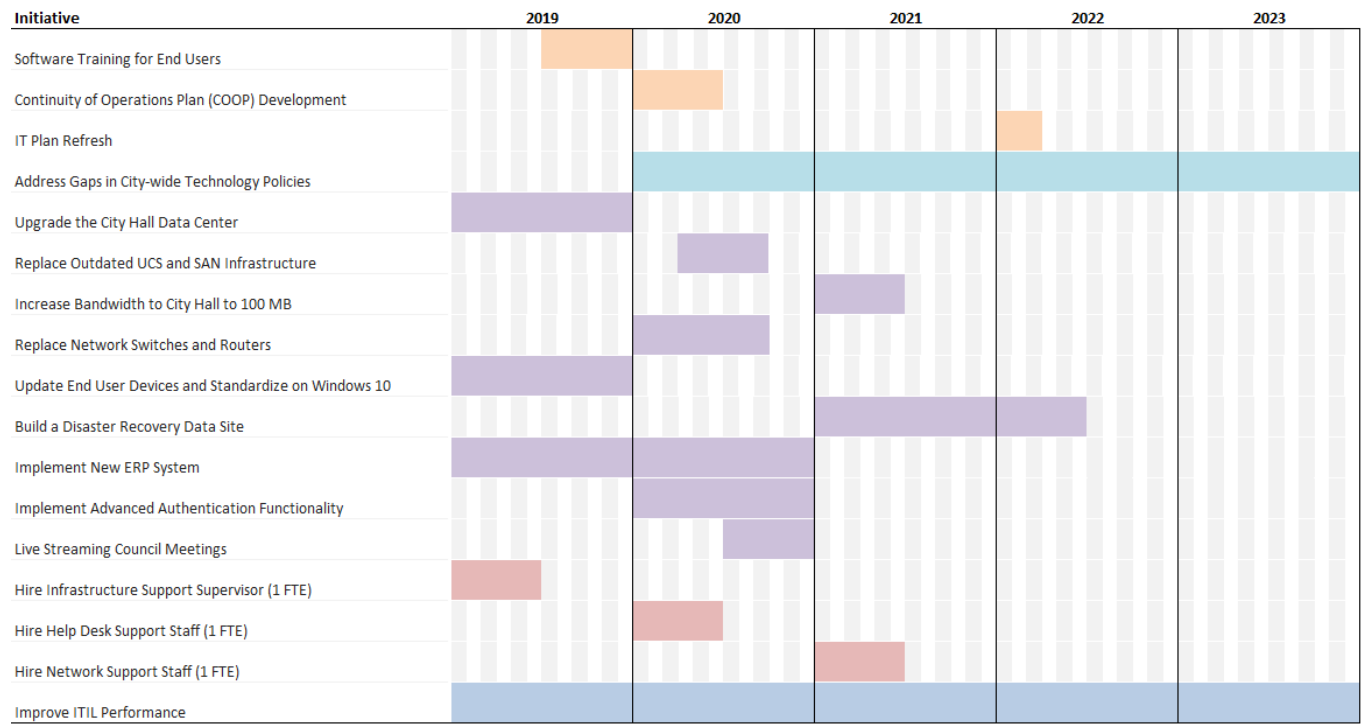
STAFF TIME ALLOCATION BY INITIATIVE		2019					2020				
#	Goal / Initiative	MGMT	PM	APP	INF	CS	MGMT	PM	APP	INF	CS
	Strategy										
S1	Software Training for End Users	40	-	240	-	-	-	-	-	-	-
S2	Continuity of Operations Plan (COOP) Development	-	-	-	-	-	20	80	20	20	20
S3	IT Plan Refresh	-	-	-	-	-	-	-	-	-	-
	Governance										
G1	Address Gaps in City-wide Technology Policies	-	-	-	-	-	40	120	-	-	-
	Architecture										
A1	Upgrade the City Hall Data Center	60	60	-	120	-	20	-	-	40	-
A2	Replace Outdated UCS and SAN Infrastructure	-	-	-	-	-	40	120	-	240	-
A3	Increase Bandwidth to City Hall to 100 MB	-	-	-	-	-	-	-	-	-	-
A4	Replace Network Switches and Routers	-	-	-	-	-	20	-	40	-	20
A5	Update End User Devices and Standardize on Windows 10	80	80	80	80	960	40	-	-	-	240
A6	Build a Disaster Recovery Data Site	-	-	-	-	-	-	-	-	-	-
A7	Implement New ERP System	80	160	480	120	240	80	160	480	120	240
A8	Implement Advanced Authentication Functionality	-	-	-	-	-	40	80	240	120	120
A9	Live Streaming Council Meetings	-	-	-	-	-	40	40	160	60	-
	Organization										
O1	Hire Infrastructure Support Supervisor (1 FTE)	40	-	-	240	-	-	-	-	160	-
O2	Hire Help Desk Support Staff (1 FTE)	-	-	-	-	-	40	-	-	-	240
O3	Hire Network Support Staff (1 FTE)	-	-	-	-	-	-	-	-	-	-
	Process										
P1	Improve ITIL Performance	40	60	60	60	160	40	60	60	60	80
	SUBTOTAL INITIATIVES	340	360	860	620	1,360	420	660	1,000	820	960
	SUBTOTAL FISCAL YEAR					3,540					3,860

2021					2022					2023				
MGMT	PM	APP	INF	CS	MGMT	PM	APP	INF	CS	MGMT	PM	APP	INF	CS
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	40	80	20	20	20	-	-	-	-	-
40	80	-	-	-	40	80	-	-	-	40	80	-	-	-
20	-	-	40	-	20	-	-	40	-	20	-	-	40	-
20	-	-	120	-	20	-	-	120	-	20	-	-	120	-
80	80	-	240	-	20	-	-	120	-	20	-	-	120	-
-	-	40	-	-	-	-	40	-	-	-	-	40	-	-
40	-	-	-	240	40	-	-	-	240	40	-	-	-	240
240	520	-	520	-	240	240	-	240	-	240	240	-	160	-
40	80	240	120	240	40	80	240	120	240	40	80	240	120	240
-	-	40	-	-	-	-	40	-	-	-	-	40	-	-
-	-	40	-	-	-	-	40	-	-	-	-	40	-	-
-	-	-	160	-	-	-	-	160	-	-	-	-	160	-
-	-	-	-	160	-	-	-	-	160	-	-	-	-	160
40	-	-	240	-	-	-	-	160	-	-	-	-	160	-
40	60	60	60	80	40	60	60	60	80	40	60	60	60	80
560	820	420	1,500	720	500	540	440	1,040	740	460	460	420	940	720
				4,020					3,260					3,000

Recommended Implementation Schedule

The recommended implementation schedule for the goals and related initiatives in this Plan is shown below.

Projects Timeline



Appendix A: Information Technology Infrastructure Library (ITIL) Description

Process Description

Internal IT policies, supporting processes, and procedures were found to be lacking; this is reflected in the overall performance of the City against IT Service Management standards. As part of the planning project, a review was conducted of IT support through a review of the IT Service Delivery Management. The reviews were conducted through the use of structured assessment checklists and on-site interviews.

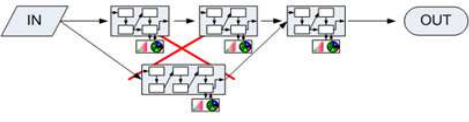
The following table provides a mapping between the IT Service Management Areas and the associated best practices functions required to be performed by the Areas.

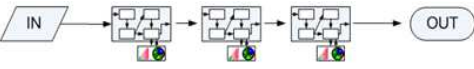
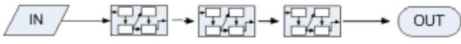
Area	Goal	Duties	Processes
Release	Release and change management	Tracks changes and lessons learned in a corporate knowledge base. Tracks inventory and changes in a configuration management database. Liaises between the change development team and the operations area.	Change Management
Service	A portfolio of business-aligned IT services	Ensures that all of the IT services being provided to organizations are aligned to the organizations' need for them. Maintains a working relationship with organizations, understands their need for IT services, and manages the introduction of new services, service improvements, and (eventually) service reductions and retirements.	IT Service Continuity Management
Support	Quality organization support and a service culture	Provides technical support for City Organizations, resolving incidents and problems using highly automated tools and knowledge base systems. Provides production support for line-of-business applications. Gives feedback to the development and design team.	Incident Management
Security	Protected City assets, controlled authorization, and	Ensures data confidentiality, data integrity, and data availability. Influences business policies, such as defining exit procedures to	Security Management

Area	Goal	Duties	Processes
	proactive security planning	follow when an employee leaves the company	
Operations	Predictable, repeatable, and automated system management	Ensures that daily, routine tasks are performed reliably within specific technology areas and production systems (including messaging and system administration). Performs scheduled and repeatable processes such as data backup, archiving and storage, output management, system monitoring and event log management, and file and print server management.	System Administration Network Administration Storage Management

Maturity Levels

The IT Service Management Areas were rated according to their maturity levels (Initial, Repeatable, Defined, Managed, and Optimizing) based on the maturation of its strategy, priorities, policies, processes and procedures. The characteristics of these maturity levels are provided in the table below.

Maturity Level			Rating
Level 5 Optimizing		Sustainable, Service-based IT Delivery Efforts are made to use the performance data being tracked to determine how to improve organizational performance. Root cause analysis is typically employed to get to the heart of performance issues. At this fifth level of maturity, an IT organization has transitioned itself to put a holistic service-based IT view at the heart of its mission and day-to-day activity. All key IT activities are carried out with the interlocking lifecycles of projects, systems and resulting services, supported by end-to-end IT management process automation and management information technologies, processes and practices. Governance organization and process are in place to ensure that the overarching service framework remains current and relevant.	

Maturity Level		Rating
Level 4 Managed	 Holistic, Service-based IT View Procedures are managed and metrics are being tracked to determine how well they are being followed. At this fourth level of maturity an IT organization has started to change the way that it is structured, to define its mission and key work activities in the context of delivery of a high-level set of IT services. High-level IT services provide the encompassing management framework for all IT activity – not just the operation of current systems.	
Level 3 Defined	 Operational Business Service View Procedures are written down and implemented. Feedback received and revisions are made. Procedures contain too much information, unwieldy. At this third level of maturity an IT organization has moved beyond a technology-focused representation of operational IT services, and now provides business context for service level agreements and metrics that help to make explicit links between operational IT quality and the effectiveness of operational business processes. IT service levels and metrics are presented and managed with business context but services still only address current operational systems.	
Level 2 Repeatable	 Operational Technology View Procedures may be written down. However, many have not been tested, are not deployed, or are not tracked. At this second level of maturity, an IT organization has already implemented some aspects of “traditional” IT Service Management (ITSM) practices and has started to pull operational technology practice stovepipes together. IT services are defined and managed but only address current operational systems. If service	

Maturity Level			Rating
		levels, or metrics are used they are technology based.	
Level 1 Initial		No Service Delivery Processes Procedures are not written down although staff may understand what is required of them. Performance is not controlled. At this first level of maturity there may be talk of providing a service-based perspective on what the IT organization does, but it doesn't go any further than that. Development and integration projects are managed in a separate organizational silo from administration and operations, and moreover administration and operations practices are themselves likely to be "stovepiped" according to technology specialties.	

Appendix B: IT Service Management Assessment Details

Release

The IT Department performed a few of the industry best practices for managing application release and managing existing configurations.

Change Management	
Function	Best Practices
Are change requests filtered for completeness, duplication and practicality and returned to the initiator where necessary?	Define, document and implement a process by which change requests are filtered for completeness, duplication and practicality.
Are all changes assessed for their impact and prioritized accordingly? (e.g., High/Medium/Low)	Define, document and implement a process by which changes are assessed for their impact and prioritized accordingly. Develop a standard set of change priorities, and ensure that only valid categories are assigned to requests for change. A standard prioritization system will improve understanding of the impact which the change may have on the infrastructure, and will ensure that appropriate time is spent validating, assessing and testing the change.
Are different procedures followed for the assessment and approval of normal or complex changes as opposed to simple changes?	You may wish to introduce more stringent approval procedures for complex changes or those that require major resource. Some minor changes may be pre-approved as "standard changes" where they follow an established path and their impact is minor. Different process models will be used for each type of change to reflect the different procedures.
Are different procedures followed to expedite the assessment and approval of urgent/emergency changes, as opposed to normal changes?	You may wish to fast-track emergency changes, so the entire process will need to be streamlined to ensure that all the major steps are completed more quickly than for a normal change.
Do all changes follow an approval process which prevents them from being implemented until the necessary approval has been granted?	Improve the procedures for the authorization of all changes by the relevant IT and business staff. This is important because it ensures that each change has built, test and implementation plans, together with back-out plans. Only after a complete assessment should the change be authorized and allowed to progress.
Are changes scheduled to reduce risk of failure, reduce likelihood of conflict with other changes, and minimize impact on the business?	Using information relating to service hours, business critical times and processing times, ensure that changes are implemented at a time of minimal impact and disruption to the business.
Is a schedule of forthcoming changes widely available to everyone in the organization?	Publish a Forward Schedule of Change and ensure that all staff have access to it. This provides a high level of view forthcoming changes, which will be particularly useful to Service Desk staff and change initiators.
Are all changes built to a common set of standards and procedures? For example, the distribution method is appropriate the change and the environment.	Devise a set of standards for the building of changes. Include such things as a standard distribution method for each environment, the maximum number of end points for each change and any tools, which should be used for creation of specific change packages.
Does an independent team test all changes in a test environment prior to implementation?	Implement a process which ensures that all changes are tested by an independent team. This will ensure that someone other than the person who built it reviews each change objectively.

Change Management	
Function	Best Practices
Are back out plans developed and tested for every change?	Ensure that each change has an appropriate back-out plan. This will prevent disruption to the users in the event of a change failure, by ensuring a swift restoration of service.
After implementation, is each change subject to a Post Implementation Review?	Implement a Post Implementation Review process for changes. This will ensure that lessons are learnt from the implementation of changes with weaknesses being addressed through a program of continuous improvement.
Does the SMF have an owner, who is responsible for its day-to-day management and ongoing development?	Establish a single point of ownership and accountability for the SMF. This person can be charged with implementing the other recommendations contained within this report through a program of continuous improvement. It also provides other SMFs with a contact point where deficiencies in the process are identified.
Are those performing the SMF aware of how to do so?	Ensure that staff have access to training material and experienced staff to assist them in learning the process. Mount an improvement program to increase process awareness.
Are the customers and end users of the SMF aware of it and conforming to it?	Mount an awareness campaign to ensure that everyone within the IT department is aware of the processes performed by this SMF.
Have the staff performing the SMF received appropriate training on the process, tools and any technical skills required to perform?	Develop a training plan for each member of staff. Consider their individual needs for interpersonal, technical, process and tools training.
Are tools used to assist in the execution of the SMF?	Implement the necessary tools ensuring where possible, that they are integrated with other tools management support tools.
Are all the processes within the SMF documented?	Without documentation, the process is open to interpretation and will lack a consistent approach. Document the process and make this documentation available to all staff performing the process. The documentation can be used in training and as a reference point.
Is the performance of the SMF measured against specific targets and Key Performance indicators and managed to them?	Develop a set of Key Performance Indicators for the SMF in order that performance can be baselined and then monitored on an ongoing basis to demonstrate improvement
Does the SMF integrate with all other SMF?	It is important to make sure SMF is integrated with other SMF to ensure commonality throughout.
Does the SMF have a continuous service improvement program by which deficiencies in the process are identified and improvements implemented?	It is important to formally document process improvements in order that effort can be prioritized and progress tracked. Develop a Continuous Service Improvement Plan for the process and publish its content and progress to staff involved with the process.

Service

IT performed very few of the industry best practices that would help the City to align IT services with the City's business goals. The following highlights the areas that require further follow-up.

IT Service Continuity Management	
Function	Best Practices
Have you performed a Business Impact Analysis to identify the impact on the business on the loss of key business processes and the supporting IT services?	In close liaison with the business undertake a Business Impact Analysis for each service. Identify the critical business processes, and the potential damage or loss that may be caused to the organization as a result of a disruption to critical business processes. The BIA also identifies the form that the damage or loss may take, the staffing, skills and facilities necessary to support business critical process and the time within which critical services should be recovered. It may be appropriate to work closely with the Availability Management and Service Level Management SMFs to obtain data to assist in this exercise.
Have you performed a risk analysis for each component that supports each service, identifying the risks and vulnerabilities and implementing appropriate countermeasures?	Define, document and implement a process for risk analysis of components in the infrastructure. Identify the threats and vulnerabilities associated with each service, and develop appropriate mitigation strategies. Ensure the results of the risk analysis are shared with key staff within IT and the business, in order that the risks may be understood.
Have you developed a Service Continuity Plan for each service, detailing the recovery options, prevention measures and procedures in the event of the loss key components?	Define, document and implement a process by which each service is included in a single Service Continuity Plan, which details the recovery options, prevention measures and procedures in the event of a loss of key components. Work closely with the business to agree the contents of the Plan, and ensure that risks and recovery times are understood and accepted. Consider including a summarized version of the Plan in the customer's SLA. Ensure that key staff in IT and the business are aware of the contents of the plan. Ensure that appropriate technical procedures are referenced in the plan where appropriate. Ensure that the business continuity planning areas have IT Service Continuity plans available for reference.
Do you have clearly documented procedures for the invocation of the Service Continuity Plan?	Define and document procedures for the invocation of a Service Continuity Plan. Work closely with the Service Monitoring and Control, Service Desk and Incident Management SMFs to define interfaces and hand-offs between processes. Ensure that a contact list is maintained for key staff, including out of hours contact details. Ensure that copies of Service Continuity Plans are stored off-site in the event of primary site unavailability.
Have you clearly documented procedures for returning back to normal service after invocation of a service continuity plan?	Define and document procedures for "return to base", following the invocation of a service continuity plan. Ensure that constraints around the use of standby sites such as maximum number of days allowed are understood. Ensure that the switch of IT equipment back to the normal site is undertaken under change control, and that technical documentation exists to ensure that this can be done without error.
Is the service continuity plan reviewed in light of changes that occur?	In concert with the Change Management SMF, define, document and implement a process by which the service continuity plans are reviewed as a result of changes to the services. For example, if critical components change.
Do you regularly backup critical data,	In concert with the Storage Management SMF, define, document

IT Service Continuity Management	
Function	Best Practices
and have a process for the restoration of data in the event of invocation of the service continuity plan?	and implement a backup strategy for critical data. Ensure that backup media is stored in a fireproof container, or off-site if appropriate. Ensure that data restoration times meet customer expectations, and where appropriate, Service Level Objectives.
Do you regularly test invocation of the plan under various failure scenarios?	Develop a testing schedule. Tests should be undertaken at least every six months, and after the implementation of major changes. Failure scenarios to be tested might include data center failure, building disaster, etc. Testing of the plan will ensure that the procedures documented in the plan are feasible and will provide some confidence that the plan can be executed.
Do you undertake post-test reviews, to identify lessons that can be learnt from the test, and identify improvements to the Service Continuity Plans?	Define, document and implement a process by which service continuity tests are reviewed to identify lessons that can be learnt and improvements that can be made to the service continuity plan. Consider the reasons for any failures encountered during the test and document potential solutions that can be implemented under change control. Following any major changes, ensure that a re-test is scheduled to ensure that the change has been successful.
Do you maintain technical recovery documentation for components within the infrastructure?	Working closely with the technical support teams in the organization, ensure that sufficient technical documentation exists to recover critical components in the event of a disaster. Maintain this documentation under change control, and ensure that it is used during Service Continuity testing where appropriate.
Does the SMF have an owner, who is responsible for its day-to-day management and ongoing development?	Establish a single point of ownership and accountability for the SMF. This person can be charged with implementing the other recommendations contained within this report through a program of continuous improvement. It also provides other SMFs with a contact point where deficiencies in the process are identified.
Are those performing the SMF aware of how to do so?	Ensure that staff have access to training material and experienced staff to assist them in learning the process. Mount an improvement program to increase process awareness.
Are the customers and end users of the SMF aware of it and conforming to it?	Mount an awareness campaign to ensure that everyone is aware of the processes performed by this SMF.
Are tools used to assist in the execution of the SMF?	Implement the necessary tools ensuring where possible, that they are integrated with other tools management support tools.
Have the staff performing the SMF received appropriate training on the process, tools and any technical skills required to perform?	Develop a training plan for each member of staff. Consider their individual needs for interpersonal, technical, process and tools training.
Are all the processes within the SMF documented?	Without documentation, the process is open to interpretation and will lack a consistent approach. Document the process and make this documentation available to all staff performing the process. The documentation can be used in training and as a reference point.

IT Service Continuity Management	
Function	Best Practices
Is the performance of the SMF measured against specific targets and Key Performance indicators and managed to them?	Develop a set of Key Performance Indicators for the SMF in order that performance can be baselined and then monitored on an ongoing basis to demonstrate improvement.
Does the SMF integrate with all other SMF?	It is important to make sure SMF is integrated with other SMF to ensure commonality throughout.
Does the SMF have a continuous service improvement program by which deficiencies in the process are identified and improvements implemented?	It is important to formally document process improvements in order that effort can be prioritized and progress tracked. Develop a Continuous Service Improvement Plan for the process and publish its content and progress to staff involved with the process.

Support

IT performed a larger proportion of the industry best practices for Service Desk and Incident Management.

Incident Management	
Function	Best Practices
Are adequate details recorded and logged for each incident received?	Define, document and implement a common set of details that must be recorded for each incident. For example, caller's name, location and contact details, nature of incident, number of users affected, impact, urgency and priority. Many incident-logging tools will enable the use of mandatory fields to ensure this minimum level of information is captured. Further fields may also be necessary dependent upon the organization.
Is each incident allocated a unique reference?	Implement a standard reference system for incidents. At its simplest, this could be a sequential number allocated for each new incident. The use of a unique reference ensures that individual incidents can be easily tracked and managed, and prevents confusion which can occur when no tracking system is used. Many incident-logging tools will insist upon each incident being logged under a unique reference number.
Are all incidents recorded on a specialist incident-logging tool?	Consider the acquisition of an incident-logging tool upon which incidents can be logged and tracked. In some smaller organizations, a simple database might be appropriate, but in larger organizations a specialist tool will be required as they can more easily manage a larger volume of incidents using automated means in many cases. Ideally, an incident-logging tool should be integrated with other service management tools within the organization, particularly Configuration Management, Change Management and Problem Management.
Are the details of each incident recorded against specific configuration items in a Configuration Management Database?	In concert with the Configuration Management SMF, make configuration data available to the Incident Management SMF, ensuring that each incident is logged against existing configuration items. This will provide an audit trail of incidents recorded against specific components and users, and will assist the organization in identifying incident trends.
Are incidents assigned to support groups when they cannot be resolved at the first point of contact?	Define, document and implement a process whereby incidents can be passed from the first point of contact to second and third line specialist support groups. Ideally, it should be possible to pass the

Incident Management	
Function	Best Practices
	incident electronically using an incident-logging tool, as this will prevent incidents becoming lost during the hand-off process and will enable a time stamped audit trail of when incidents are passed from one support group to another.
Is each incident assigned a classification code, which indicates the likely cause of the incident?	Define, document and implement a classification system for incidents, where each incident is assigned a classification code. These might include, hardware, software, or procedural, for example. The use of classification codes assists in the resolution of the incident as they can expedite the identification of an appropriate resolution. Furthermore, they provide a common set of data upon which reports can be based, greatly assisting in the identification of trends.
Is the impact and urgency of each incident assessed, and a resolution priority assigned?	Define, document and implement impact and urgency codes, and agree how priority codes will be derived from these. For example, an impact of 2 and a priority of 1 may dictate a priority of 1. The priority dictates the order in which recovery of incidents is attempted. Some incident-logging tools enable the automatic entry of the priority code dependent upon the impact and urgency code entered. The use of impact and urgency codes ensures that incidents are consistently resolved in the order that minimizes impact upon the end users.
Are the symptoms of reported incidents compared to a database or log of known errors to identify a workaround?	In concert with the Problem Management SMF, develop a process by which details of known errors and their associated workarounds are made available to the Incident Management SMF. Ideally, this information should be available electronically as part of an integrated service management tool, incorporating incident-logging capability.
When an incident is closed, is a closing category assigned which summarizes the cause of the incident?	Ensure that each incident is analyzed at closure, and its classification reviewed to ensure that it is correct. For example, an incident may have been assigned a category of Hardware, but during resolution of the incident, it may have been diagnosed as being a Software problem. The closing category should reflect the true cause, as this will enable further analysis of incident trends to be undertaken by the Problem Management SMF, and can be used to improve the accuracy of opening categories applied by the Service Desk.
Does the organization ensure that the originator is satisfied with the resolution of each incident prior to closure?	In concert with the Service Desk SMF, define, document and implement a process by which the Service Desk ensure that each incident has been resolved to the customer's satisfaction prior to closure. Practically, this will involve telephoning the customer to ensure that the incident has been satisfactorily resolved.
Does the SMF have an owner, who is responsible for its day-to-day management and ongoing development?	Establish a single point of ownership and accountability for the SMF. This person can be charged with implementing the other recommendations contained within this report through a program of continuous improvement. It also provides other SMFs with a contact point where deficiencies in the process are identified.
Are those performing the SMF aware of how to do so?	Ensure that staff has access to training material and experienced staff to assist them in learning the process. Mount an improvement program to increase process awareness.
Are the customers and end users of the SMF aware of it and conforming to it?	Mount an awareness campaign to ensure that everyone within the IT is aware of the processes performed by this SMF.

Incident Management	
Function	Best Practices
Are tools used to assist in the execution of the SMF?	Implement the necessary tools ensuring where possible, that they are integrated with other tools management support tools.
Have the staff performing the SMF received appropriate training on the process, tools and any technical skills required to perform?	Develop a training plan for each member of staff. Consider their individual needs for interpersonal, technical, process and tools training.
Are the processes within the SMF documented?	Without documentation, the process is open to interpretation and will lack a consistent approach. Document the process and make this documentation available to all staff performing the process. The documentation can be used in training and as a reference point.
Is the performance of the SMF measured against specific targets and Key Performance indicators?	Develop a set of Key Performance Indicators for the SMF in order that performance can be baselined and then monitored on an ongoing basis to demonstrate improvement.
Does the SMF integrate with all other SMF?	The inputs to this process will the result in the outputs of another process. The SMF must be designed so that the Service Strategy provides the Service Level Package that is used by the Service Design. The Service Transition uses the Service Design Package developed by the Service Design, to produce the early life support components that in turn are used by Service Operation. The performance reports produced as a result of Service Operation are then used to develop the continual service improvement strategies. This integrated Lifecycle flow is represented in Appendix A.1.
Does the SMF have a continuous service improvement program by which deficiencies in the process are identified and improvements implemented?	It is important to formally document process improvements in order that effort can be prioritized and progress tracked. Develop a Continuous Service Improvement Plan for the process and publish its content and progress to staff involved with the process.

Security

IT performed very few of the industry best practices for Security Management and administration.

Security Management	
Function	Best Practices
Does IT establish the security mission and vision by including organization's current state of security, security goals, and objectives to achieve those goals?	Develop a standard set of terms and conditions that each member of staff is subject to. This will ensure a consistent approach to dealing with workforce management issues.
Does IT identify who has authority to define, develop, and implement policies, who is accountable for security policies, and who is responsible for enacting those policies?	Develop a job description for each role performed within the IT organization. The job description describes the general position within the organization, a brief outline and main purpose of the role. It also describes the key responsibilities in terms of staff budget and technology. A job description can be used to assess individual's performance, help train new staff and development an advertisement to fill the role should it become vacant.
Does IT establish the data classification model by identifying types of common information, guidelines on how to classify new data, and rules on how to handle information?	Develop a template skills profile that each member of staff can complete and maintain, showing the skills they possess and an indication of the level of skill. These "skills" may be technical or interpersonal. Consideration should be given to ensuring that the rating applied to skill levels is consistent to ensure accuracy.
Does IT create policy documents addressing physical, perimeter, network, host, application, software development, and data security, and the standards, guidelines, and procedures within each category?	Develop an appropriate tool to collate skills profiles and job descriptions into matrices to allow analysis to take place. Analysis of the skills matrices will highlight skills shortages or duplications, and will form the basis of an improvement plan to remedy the situation through, for example, training or recruitment. Make the tool available to staff responsible for the placement of individuals in specific roles, and those responsible for hiring staff. This tool will facilitate longer term resource planning and development of individuals to meet skills shortages.
Does IT create an awareness program that establishes processes for disseminating security policies to user and managers, as well as methods of training and motivating staff?	Analyze the data within the skills matrix, paying particular attention to roles that are unfilled. Identify individuals within the organization who possess the required skills if possible, or initiate training or hiring activities to ensure that the skills gap is filled. This will enable more effective deployment of individuals in roles that more closely match their skills. It will also enable longer term resource planning to take place, rather than "just-in-time" recruitment.
Has an organizational Security Risk Assessment been performed to identify and prioritize risks to the business?	Define, document and implement a process for the management of the use of temporary contract staff. Develop plans to replace short-term contractors with permanent staff where appropriate, as this will reduce staff costs.
Has program effectiveness been measured by analyzing the effectiveness of the security risk management process and verifying that the controls are providing the expected degree of protection?	Define, document and implement a process by which hardware assets and software licenses are tracked, enabling them to be reclaimed from individuals who leave the organization. Work closely with the Configuration Management and Release Management SMFs to obtain the necessary information from existing data sources, such as the configuration management database.
Is there centralized logging capability?	Logging should be enabled across all applications in the environment. Log file data is important for incident and trend analysis as well as for auditing purposes. The applications should log failed and successful authentication attempts, changes to

Security Management	
Function	Best Practices
	application data including user accounts, severe application errors, and failed and successful access to resources. When writing log data, the application should avoid writing sensitive data to log files.
Is the log analysis and reporting process automated?	Logging should be enabled across all applications in the environment. Log file data is important for incident and trend analysis as well as for auditing purposes. The applications should log failed and successful authentication attempts, changes to application data including user accounts, severe application errors, and failed and successful access to resources. When writing log data, the application should avoid writing sensitive data to log files.
Are incidents correlated?	Event correlation offers full context and logical analysis through a sequence of related events. As a result, security analysts can make a thoughtful decision on what to do next to respond and investigate.
Is penetration testing performed on a regular basis?	Penetration testing looks at vulnerabilities and will try and exploit them. Organizations need to conduct regular testing of their systems for the following key reasons: To determine the weakness in the infrastructure (hardware), application (software) and people in order to develop controls.
Is employee security awareness training performed?	A security awareness program helps employees contribute to a company's overall security posture by keeping them up-to-date on security risks. Knowledgeable employees are your best source for reporting security issues. An effective awareness program should take into account all aspects of security—including application, network, and physical—while providing clear guidelines for what employees should do if they witness things that appear to jeopardize the security of any of these elements. Implement policies that regulate employee usage of company resources. Awareness programs should be a part of new employee orientation. Updates and refresher courses should be conducted regularly to ensure all employees are aware of the most current practices and risks. Periodic testing should be implemented to ensure employees have absorbed the material. Consider implementing a formal security awareness program to keep employees informed about IT related security risks. Implement policies that regulate employee usage of company resources and technology and include security awareness as part of new employee orientation. Knowledgeable employees are your best source for reporting security issues.
Is there a detailed incident response plan?	Institute procedures for the reporting of and response to security incidents, issues, and concerns. Designate an emergency response team that includes representatives from several disciplines including technology, human resources, and legal for responding to all security incidents and issues. Consider implementing a full incident response program that includes incident response teams, containment management, event correlation and analysis, and incident response procedures.

Security Management	
Function	Best Practices
Are tools used to assist in the execution of the SMF?	Implement the necessary tools ensuring where possible, that they are integrated with other tools management support tools.
Have the staff performing the SMF received appropriate training on the process, tools and any technical skills required to perform?	Develop a training plan for each member of staff. Consider their individual needs for interpersonal, technical, process and tools training.
Are all the processes within the SMF documented?	Without documentation, the process is open to interpretation and will lack a consistent approach. Document the process and make this documentation available to all staff performing the process. The documentation can be used in training and as a reference point.
Has program effectiveness been measured by analyzing the effectiveness of the security risk management process and verifying that the controls are providing the expected degree of protection?	Develop a set of Key Performance Indicators for the SMF in order that performance can be baselined and then monitored on an ongoing basis to demonstrate improvement.
Does the SMF integrate with all other SMF?	It is important to make sure SMF is integrated with other SMF to ensure commonality throughout.
Does the SMF have a continuous service improvement program by which deficiencies in the process are identified and improvements implemented?	It is important to formally document process improvements in order that effort can be prioritized and progress tracked. Develop a Continuous Service Improvement Plan for the process and publish its content and progress to staff involved with the process.

Operations

IT performed few of the industry best practices for Operations Management and administration.

System Administration	
Function	Best Practices
Are all changes to network resources and user accounts implemented under change control?	In concert with the Change Management SMF, implement a process by which all changes to network resources and user accounts are implemented under the control of the Change Management processes.
Are all changes to network resources and user accounts tested prior to implementation?	In concert with the Change Management SMF, implement a process by which all changes are tested by an independent party prior to implementation.
Is access to system passwords restricted to only authorized users?	In accordance with the Security Policy, restrict access to system passwords to authorized users only. Deploy appropriate physical and logical controls to maintain the integrity of the system passwords.
Does your organization regularly audit all network resources to understand the system usage, performance, disk allocations, file systems and peripherals?	In concert with the Configuration Management and Capacity Management SMFs, implement processes to regularly audit all network resources, and provide input into the Capacity Management and Configuration Management SMFs.
Is there a single team within your organization, which is responsible for the creation, amendment and deletion of user, group and e-mail accounts?	Define a process that ensures that a single team is responsible for the creation, amendment and deletion of user, group and e-mail accounts. This will provide a single point of accountability, and a center of excellence where all of the organization's key Systems Administration skills will be found.
Is this single team responsible for the resolution of all incidents affecting user, group and e-mail accounts?	In concert with the Incident Management SMF, develop a process by which all incidents affecting user, group and e-mail accounts are directed to the Systems Administration SMF for resolution. This will ensure a consistent approach to incident resolution and increase the efficiency of incident resolution.
Is this single team responsible for the resolution of all incidents affecting network resources?	In concert with the Incident Management SMF, develop a process by which all incidents affecting user, group and e-mail accounts are directed to the Systems Administration SMF for resolution. This will ensure a consistent approach to incident resolution and increase the efficiency of incident resolution.
Do those performing the SMF investigate the root cause of incidents to prevent a recurrence?	In concert with the Problem Management SMF, develop a process by which the root cause of incidents is investigated to prevent a recurrence. This will improve Service Performance and in turn, improve end user satisfaction.
Do you maintain a schedule of forthcoming releases, detailing the contents of the proposed release together with its proposed change?	Ensure that the allocation of software licenses does not exceed the number of licenses available. There are large penalties for organizations found to be in breach of software licensing laws so it is critical that the availability of licenses is controlled and does not exceed the level of licenses the organization has purchased.
After implementation, is each change subject to a Post Implementation Review?	Develop a schedule of forthcoming releases which stored electronically and available to all necessary staff. The schedule can be used by the Change Management SMF to ensure that changes are not scheduled to clash with the implementation of a release. Furthermore, the Service Desk SMF can use the schedule in addition to the Forward.

System Administration	
Function	Best Practices
Does the SMF have an owner, who is responsible for its day-to-day management and ongoing development?	Establish a single point of ownership and accountability for the SMF. This person can be charged with implementing the other recommendations contained within this report through a program of continuous improvement. It also provides other SMFs with a contact point where deficiencies in the process are identified.
Are those performing the SMF aware of how to do so?	Ensure that staff have access to training material and experienced staff to assist them in learning the process. Mount an improvement program to increase process awareness.
Are the customers and end users of the SMF aware of it and conforming to it?	Mount an awareness campaign to ensure that everyone within the IT department is aware of the processes performed by this SMF.
Are tools used to assist in the execution of the SMF?	Implement the necessary tools ensuring where possible, that they are integrated with other tools management support tools.
Have the staff performing the SMF received appropriate training on the process, tools and any technical skills required to perform?	Develop a training plan for each member of staff. Consider their individual needs for interpersonal, technical, process and tools training.
Are all the processes within the SMF documented?	Without documentation, the process is open to interpretation and will lack a consistent approach. Document the process and make this documentation available to all staff performing the process. The documentation can be used in training and as a reference point.
Is the performance of the SMF measured against specific targets and Key Performance indicators and managed to them?	Develop a set of Key Performance Indicators for the SMF in order that performance can be baselined and then monitored on an ongoing basis to demonstrate improvement.

Network Administration	
Function	Best Practices
Is a regular audit of the network components undertaken and details stored and maintained in accordance with the Configuration Management process?	An audit must be undertaken regularly so that effective support strategies can be deployed. Plan a regular audit of all the network components, and store the information in a repository maintained under Change Control such as the Configuration Management Database.
Are the network components continuously monitored and alerts produced when exceptions occur or thresholds are exceeded?	Implement a network management strategy where a tool continuously monitors the components within the infrastructure and produces alerts when thresholds are exceeded or exceptions occur. This will ensure that exceptions are quickly identified enabling remedial action to be taken quickly, therefore minimizing disruption to the end user.
Are alerts interpreted and appropriate action initiated to resolve the fault, either through automatic or manual actions?	Document details of the alerts which can be received by an operator together with the action which needs to be taken to clear the condition. This will ensure that alerts can be quickly dealt with, minimizing the risk of unplanned outages.
Are network faults investigated and resolved in accordance with the Incident Management process?	In concert with the Incident Management SMF, define, document and implement a process by which incidents are resolved in accordance with the incident management processes. It is important that all of the operational areas have a structure around which incidents can be managed and resolved. The Incident Management SMF provides the necessary guidelines, tool and processes.
Is a Network Security Policy in place?	A Network Security Policy should be developed in concert with the Security Administration SMF. It will ensure that industry best practices such as the National Security Agency C2 guidelines, are recognized and adopted by the organization.
Are measures in place to maintain the logical security of network hardware?	Implement measures to control logical security of the network in accordance with the contents of the Network Security Policy. These might include the use of user profiles, passwords and IDs.
Are measures in place to maintain the physical security of network hardware?	Implement measures to control physical security of the network in accordance with the contents of the Network Security Policy. These might include the use of anti-theft measures, access controls and environmental controls.
Are measures in place to protect the hardware from power supply incidents?	In concert with your Facilities Management team, assess the risks to the existing power supply system and implement appropriate countermeasures.
Is the overall security of the network regularly audited to identify vulnerabilities?	Implement a regular security audit of the network components to identify vulnerabilities. This should take place at least every 6 months and should involve tests of the deployed security strategy for each component within the infrastructure.
Are measures introduced to counter vulnerabilities identified in the audit?	Define, document and implement a process by which deficiencies and vulnerabilities in the Network Security strategy deployed can be corrected. Ensure that this process also includes a process by which changes made to the network security can be tested and support documentation updated accordingly.
Does the SMF have an owner, who is responsible for its day-to-day management and ongoing development?	Establish a single point of ownership and accountability for the SMF. This person can be charged with implementing the other recommendations contained within this report through a program

Network Administration	
Function	Best Practices
	of continuous improvement. It also provides other SMFs with a contact point where deficiencies in the process are identified.
Are those performing the SMF aware of how to do so?	Ensure that staff have access to training material and experienced staff to assist them in learning the process. Mount an improvement program to increase process awareness.
Are the customers and end users of the SMF aware of it and conforming to it?	Mount an awareness campaign to ensure that everyone within the IT department is aware of the processes performed by this SMF.
Are tools used to assist in the execution of the SMF?	Implement the necessary tools ensuring where possible, that they are integrated with other tools management support tools.
Have the staff performing the SMF received appropriate training on the process, tools and any technical skills required to perform the tasks?	Develop a training plan for each member of staff. Consider their individual needs for interpersonal, technical, process and tools training.
Are all the processes within the SMF documented?	Without documentation, the process is open to interpretation and will lack a consistent approach. Document the process and make this documentation available to all staff performing the process. The documentation can be used in training and as a reference point.
Is the performance of the SMF measured against specific targets and Key Performance indicators and managed to them?	Develop a set of Key Performance Indicators for the SMF in order that performance can be baselined and then monitored on an ongoing basis to demonstrate improvement.
Does the SMF integrate with all other SMF?	It is important to make sure SMF is integrated with other SMF to ensure commonality throughout.
Does the SMF have a continuous service improvement program by which deficiencies in the process are identified and improvements implemented?	It is important to formally document process improvements in order that effort can be prioritized and progress tracked. Develop a Continuous Service Improvement Plan for the process and publish its content and progress to staff involved with the process.

Storage Management	
Function	Best Practices
Has your organization produced a plan and/or policy for classifying, storing, restoring and recovering data?	The Storage Management SMF is complex and covers a wide range of potential environments and solutions. To assist in understanding your organization's policies and procedures it is advisable to document these so that they can be easily referenced. The document should then be maintained under change control. The plan/policy might contain: Matching storage requirements to appropriate media, Retiring / disposing of media, Recycling media for reuse, Verification of backups, Controlling media lifecycle, Supplying and controlling media for test / production environments.
Has your organization identified and classified the data requiring storage resource?	Identify and document the data requiring resources and the individual requirements for each set of data. For example, data security. How much data is to be stored? Where is data to be located? Projected data growth? Backup and Restore performance

Storage Management	
Function	Best Practices
	requirements, Archiving (Off-site storage requirements).
Have you identified events within the storage infrastructure, which require monitoring and implemented an appropriate monitoring solution?	Identify and document the events within the infrastructure that require monitoring. For each event, develop an appropriate threshold, action and tool for delivery of an alert.
Do you continuously analyze alerts and event logs produced by the storage infrastructure components to identify conditions that may indicate a hardware failure or enable you to anticipate a service outage?	Define, document and implement a process by which alerts and event logs are analyzed on an ongoing basis to identify conditions that may indicate a hardware failure or enable you to anticipate a service outage. This proactive analysis will enable remedial actions to be taken which will minimize the impact of hardware failure upon the services supported by the failed component.
Are storage related incidents resolved in accordance with the Incident Management SMF?	In concert with the Incident Management SMF, define, document and implement a process for the resolution of storage incidents. This will provide a consistent approach to the management and resolution of incidents, and a consistent approach to resolution will reduce the impact on end users when incidents occur.
Have you selected storage infrastructure components based upon the storage requirements within your organization?	Define, document and implement a process by which storage requirements are gathered and a detailed evaluation of the available storage components, and select the most appropriate for your organization, based upon their ability to meet reliability, capacity and response time requirements.
Do you regularly review storage requirements, updating the storage policy and/or storage components as necessary?	Define, document and implement a process to regularly review and update the storage policy. Make changes to the infrastructure to reflect the change in policy as appropriate.
Do you analyze trends in storage use and predict future storage requirements?	In concert with the Capacity Management SMF, define document and implement a process that analyzes storage use and predicts future storage requirements. This will enable more proactive upgrades of the storage environment, rather than reacting to storage incidents caused by lack of capacity. It will also enable more accurate budgeting of storage spending, and will involve the business in the process of providing anticipated volumes to assist in the prediction process.
Are changes to the Storage infrastructure made under change control?	In concert with the Change Management SMF, define, document and implement a process that ensures that all changes to the storage infrastructure are made under change control. This will reduce the likelihood of change failure and therefore increase availability. Furthermore, it will assist in the maintenance of accurate support documentation, therefore decreasing incident recovery times.
Do you actively manage storage resources effectively by, for example, managing the allocation of resource?	Implement measures to ensure that the storage resources are managed effectively. For example, ensure that you are fully aware of the storage capacity available and being used at all times. Implement a process by which manufacturer's fixes and patches are applied when they become available.

Storage Management	
Function	Best Practices
Do you manage limited use media such as magnetic tapes, to ensure that their use does not exceed the manufacturer's instructions?	Implement a process where the constraints on limited use media are documented and records maintained to ensure that their use does not contravene the manufacturer's instructions. This will reduce the risk of media failure causing unplanned outages.
Is there a process by which data can be restored from backup where required?	Define, document, implement and publicize a process for the restoration of data from backup. Ensure that the users of the process are aware of the process and targets to restore data from backup.
Do you log and track media in a Logical Media Library?	Develop and maintain a Logical Media Library. A Logical Media Library contains details of all the logical media in use within the organization, including details of its name, location and type. Consider, integrating this information with your Configuration Management Database. A Logical Media Library ensures that documentation and configuration data for each storage resource is readily available in a single location.
Does the SMF have an owner, who is responsible for its day-to-day management and ongoing development?	Establish a single point of ownership and accountability for the SMF. This person can be charged with implementing the other recommendations contained within this report through a program of continuous improvement. It also provides other SMFs with a contact point where deficiencies in the process are identified.
Are those performing the SMF aware of how to do so?	Ensure that staff have access to training material and experienced staff to assist them in learning the process. Mount an improvement program to increase process awareness.
Are the customers and end users of the SMF aware of it and conforming to it?	Mount an awareness campaign to ensure that everyone within the IT department is aware of the processes performed by this SMF.
Are tools used to assist in the execution of the SMF?	Implement the necessary tools ensuring where possible, that they are integrated with other tools management support tools.
Have the staff performing the SMF received appropriate training on the process, tools and any technical skills required to perform these tasks?	Develop a training plan for each member of staff. Consider their individual needs for interpersonal, technical, process and tools training.
Are all the processes within the SMF documented?	Without documentation, the process is open to interpretation and will lack a consistent approach. Document the process and make this documentation available to all staff performing the process. The documentation can be used in training and as a reference point.
Is the performance of the SMF measured against specific targets and Key Performance indicators and managed to them?	Develop a set of Key Performance Indicators for the SMF in order that performance can be baselined and then monitored on an ongoing basis to demonstrate improvement.
Does the SMF integrate with all other SMF?	It is important to make sure SMF is integrated with other SMF to ensure commonality throughout.
Does the SMF have a continuous service improvement program by which deficiencies in the process are identified and improvements implemented?	It is important to formally document process improvements in order that effort can be prioritized and progress tracked. Develop a Continuous Service Improvement Plan for the process and publish its content and progress to staff involved with the process.

Appendix C: Digital Government and Enterprise Architecture

Introduction

This appendix provides a basis for understanding the underlying elements of the Enterprise Architecture that support the transition to Digital Government.

Definition of the Enterprise Architecture

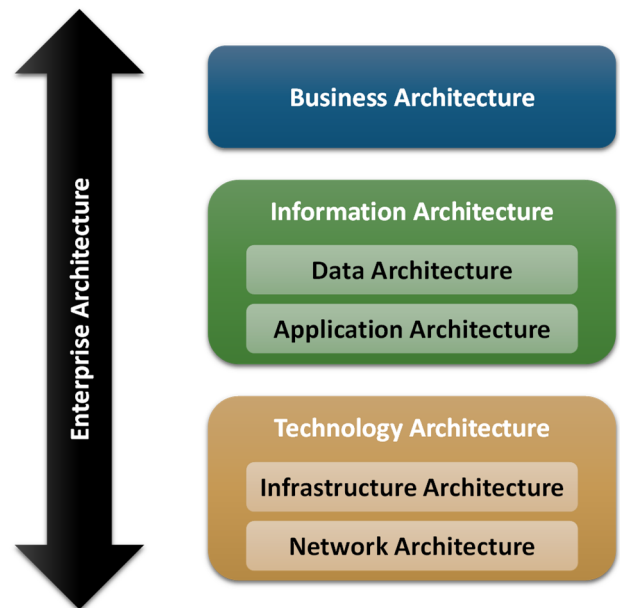
Over the past 20 years, one of the major emphases of government Information Technology planning has been the adoption of an enterprise architecture to help align IT standards with business needs. Enterprise-wide standards in local governments have been used to help achieve some of the prescriptive goals of Digital Government such as sharing and integration of information. Since many Digital Government applications (e.g., ERP, GIS) tend to be cross-departmental in nature and involve secure transactions, it is important to have enterprise-wide standards in place before implementing specific Digital Government measures. There are also infrastructure standards that are especially important to many Digital Government applications such as online transactions including the establishment of credit card payment capability and associated policies, technologies to support secure transactions such as public key infrastructure, and the establishment of common software standards.

The concept of an Enterprise Architectures was originally defined by the National Institute of Standards (NIST) in their Memorandum 97-16 (Information Technology Architectures). In this guidance, a five-component model was adopted by NIST that consisted of:

1. Business Architecture

Business Processes: This component of the Enterprise Architecture describes the core business processes which support the organization's missions. The Business Processes component is a high-level analysis of the work the City performs to support its mission, vision, and goals, and is the foundation of the EA. Analysis of the business processes determine the information needed and processed by the City. This aspect of the EA must be developed by senior managers in conjunction with IS managers. Without a thorough understanding of its business processes and their relation to the City's missions, the City will not be able to use its EA effectively. Business processes can be described by decomposing the processes into derivative business activities. However, the processes remain at a high enough level to allow a broad focus, yet sufficiently detailed to be useful in decision-making as the City identifies its information needs. Examples would include the payroll process, purchase requisition process, permit request process, etc.

Workflows and Relationships: This component analyzes the information utilized by the City in its business processes, identifying the information used and the movement of the information within the City. The relationships among the various flows of information are described in this component. These information flows indicate where the information is needed and how the information is shared to support mission functions. Examples include, the workflow for receiving a certificate of occupancy. The workflow will touch multiple processes including the submission of a request for inspection, and review by multiple City departments such as Fire and Community Development.



Information Architecture

- **Application Architecture:** The Applications component identifies, defines, and organizes the software systems that capture, manipulate, and manage the business information to support mission operations. It also describes the logical dependencies and relationships among business activities. Examples may include the Utility Billing Module, Applicant Tracking Application, or the Permit Tracking Application.
- **Data Architecture:** This component of the Enterprise Architecture identifies how data is maintained, accessed, and used. At a high level, the City defines the data and describes the relationships among data elements used in the City's information systems. In order to achieve the data architecture, the following models must be developed and incorporated within application design.
 - The conceptual model contains key entities and relationships and presents a high-level look at all of the entities within an organization. The Enterprise data model follows on the fundamentals created by the Conceptual Model by providing an entity relationship diagram that adds additional details. This model is part of the business model and shows what classes of information are required to support management and business intelligence purposes.
 - An enterprise logical model (EDM) is a fully attributed entity relationship diagram (ERD), which shows each entity, its relationship to other entities and specifies the applicable business rules.
 - Dimensional Model, represents facts and dimensions, which are used for reporting and analytical purposes.
 - Physical Data Model, is the final representation of the data base structures that will be generated from the model. It contains the detailed specifications for the database design and, in a model driven environment. Physical data models specify the data base design and should always be synchronized 100% with the database.

Technology Architecture

In the subsequent 20 years, the NIST EA framework has been further modified to address the evolving needs for the management of the delivery of information services. These include:

- The Zachman Framework for Enterprise Architectures — Although described as a framework, it is actually more accurately defined as a taxonomy and thus difficult to actualize.
- The Open Group Architectural Framework (TOGAF) — Although called a framework, is actually more accurately defined as a process and provides only a methodology for approaching EA.
- The Federal Enterprise Architecture — Can be viewed as either an implemented enterprise architecture or a prescriptive methodology for creating an enterprise architecture.

The history of the field goes back 20 years, but the field is still evolving rapidly. We have adopted the fundamental NIST model due to its straightforward simplicity and extensive adoption.

The following provides a description of how the Enterprise Architectures have evolved over the past 40 years and the current state of the art of City Application Architecture.

Evolution of the Enterprise Architecture

Centralized Proprietary Architecture

The early days of computing were dominated by centralized mainframes. These centralized behemoths provided for computation, storage, and input/output through separate major components. These systems supported the Business

Architecture with completely defined Information and Technology Architectures provided by a single vendor (e.g., IBM AS/400 (iSeries), IBM MVS, DEC VAX/VMS). These systems were first offered in the early 1970s and provided a more economical computing approach through utilization of the central processor for both computation and I/O, and by offering easier to use software systems requiring less user support. Such proprietary systems are now on the wane. Although systems such as the IBM iSeries remain popular, sales are declining, and some vendors are rapidly exiting the arena. Indeed, the IBM iSeries is the only older proprietary minicomputer which remains viable today.

Client/Server Architecture

The mainframe systems evolved towards the more distributed Client/Server (C/S) architecture. Client/Server involved the segregation of the single mainframe application so that it operated between a client application operating at the desktop and a server application executing at the backend server. The user application provides a graphical (GUI) with an "intelligent front end" user workstation (client), communicating over a local area network (LAN) or wide area network (WAN) to access the shared "back end" processor (server).

This architecture consists of four logical layers: the application, the server, the client and the network.

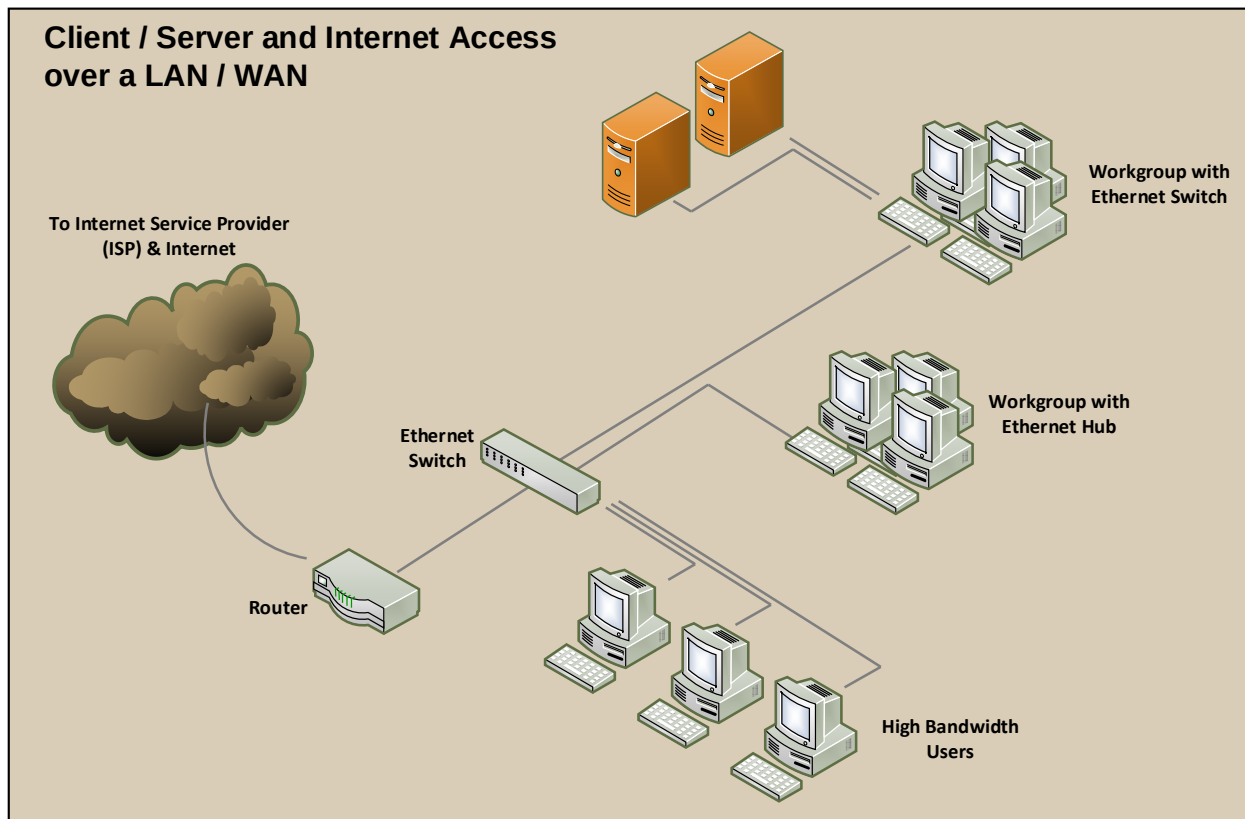
- **Application:** The first and most important component of the architecture is the application. The application is the program that runs on either the client or the server. It determines how the user perceives the O/S system. An application exploits the client's user interface for presentation to the user, and exploits the server for data services and some processing. However, the shifting of application logic to the client side has thrown the Operating System (O/S) model off balance forcing ever increasing processing requirements on the client. In order to maximize the utilization of the server, careful application partitioning design and development is critical in order to control the ever-increasing workstation processing requirements and costs.
- **Server:** The back end system, the server platform, must be selected in conjunction with the database server software. Critical issues in this platform include server capacity, database software meeting user performance requirements, and the server operating system supporting the chosen database software. Operating systems such as Windows Server and UNIX provide advanced features such as pre-emptive multitasking, multithreading, virtual memory management, and high performance Input and Output, which are critical to allowing high performance databases to operate.
- **Client:** The client is one of the most important aspects of the overall Operating System (O/S), yet most often overlooked. The client is where most of the application processing occurs and where the user perceives the overall system. Important aspects to consider when designing the client are the selection of a front-end development system that meets the programmer, database server, and user needs. Tools such as Visual Basic and SQL server are instrumental in providing effective applications; however, these tools must be selected in conjunction with the processor, operating system, and user interface.
- **Network:** A common characteristic of distributed clients and servers is their communications capability provided by the Internetwork. Within the integrative role provided by the Internetwork, the concept of the Operating System (O/S) computing is to assure that end users have transparent access to any computing resource needed across the City.
- **Internetwork:** The Internetwork which consist of a Local Area component or LAN, removes requests from the client to the server, and then transports the results back to the client. The Operating System (O/S) design requires the selection of the type of network, (e.g., Gigabit Ethernet, T-1), a transport protocol, and the networking equipment.

This architecture combines a variety of closely integrated commercial products to establish a fully supported system solution. The major benefits of Open Systems Client/Server Architecture are:

- Flexibility - client pieces can be added or changed without disturbing existing server data and services.
- Interoperability with legacy systems – Existing systems can find a server role (or a client role if appropriate). This allows old and new systems to retain connectivity and integrity.

- Speed of new application deployment – Given a stable server core, most new applications will boil down to deploying a client piece that supports a new process or product concept. This can be accomplished very fast with today's advanced client development tools.

These advantages of durability and flexibility of architecture drive the guidelines for good client server design. In essence, core, fundamental data and programs (objects) should reside on the server, whereas presentation, process models, end calculations, etc. should reside on the client. The client side then typically gathers and validates data and gives visual feedback, while the server side responds to client requests for data and services.



However, to obtain these advantages, one must deal with the higher complexity of Open Systems (O/S) because they have many more components than centralized predecessors. The networks, operating systems, database servers, user interfaces, front-end development tools, middleware, processor types, standards, and design methodologies all complicate the client/server strategy.

Critical issues with Client/Server architecture implementation are:

- Design – Most benefits from client server depend upon getting the functional split right. The server side must be stable and fundamental (should model true business objects), and communications between client and server should be minimal to accommodate network bandwidth constraints.
- Change Management – Changing to client server requires a new way of thinking about systems development, with emphasis on what to reuse and what to buy, rather than on what to build. Accomplishing this change in thinking can be a major challenge.

Web Services Architecture

Web Services merges the strengths of the centralized mainframe with the flexibility of distributed client/server. Applications are resident on a central server and are accessed through thin clients or browsers on the desktop. However, these applications

do not go out over the Internet; they reside on a server on an organization's network and operate within its intranet. These applications utilize the latest technologies, such as .Net, Java and HTML5, to maximize interoperability and data sharing capabilities. Though WEB services is where the general industry has been heading, the advent of mobility and tablets has altered the direction towards HTML5 based WEB services. However, vendors are not expected to make the full migration to HTML5 web services for another 5 years.

Web Services systems, like client/servers, utilize a client based “front-end” application called a web browser (e.g., Internet Explorer, Chrome). The application requests discrete information “pages” from the Web server and displays them on the browser at the user workstations. Users do not have to know how to connect to a server, or even where a server is located on a network. Older, powerful mainframe or client/server applications become easier to use.

There are several distinguishing features of Web Services applications:

- Use TCP/IP (transmission control protocol/Internet protocol) for both wide-area and local-area transport of information,
- Use HTML (hypertext markup language), XML (Extensible Markup Language), SMTP (Simple mail transport protocol) and other open Internet-based standards as the means of moving information from clients to servers
- Are based on Web services standards such as Web Services Description Language; SOAP (Simple Object Access Protocol); and Universal Description, Discovery and Integration, or UDDI
- Are completely owned by the City and not accessible from the Internet-at-large by the general public.

Many government organizations have already implemented intranets and have begun to realize some of the following benefits by using the web services technology.

Reduced Operating Costs

- Cost-effective solutions. Intranet applications can be developed more quickly than conventional applications, so the costs are lower and the time to completion is shorter-even when legacy databases are involved.
- Lower cost of ownership. Complex networks-those that involve a greater number of network protocols, vendors, and applications-are more expensive to own than simple ones. Intranets lead to reduced network complexity and can ultimately result in lower network ownership costs.
- Lower cost of training. Intranet applications share a common interface-easy-to-use web browser-so employee application training is easier and less expensive.
- Electronic processing saves money. The price of a paper-based purchase request is \$58, compared with about \$10 when done electronically. (Source: Concur Technologies).

Improved Communications

- Make it easier to for employees to send and receive information by providing e-mail services to the entire staff. Create an internal website for posting staff information such as eligibility guidelines for health and human services programs, technology support information, benefit information, worker safety information, policies regarding vacations and leaves, and agency guidelines and procedures.
- Government employees can easily find guidelines and information, they can more quickly and accurately respond to constituents and taxpayers.

More Efficient Forms Delivery

Reduce the cost of printing and distributing forms by posting them-in a format suitable for downloading-on an internal website. Introducing a revised form is also easier, because you simply have to post the new version instead of replacing the current inventory.

Simplified Report Generation

Make it easier for employees to generate reports by providing intranet-based applications that query the database to answer the most frequently asked questions. Creating a report can be as simple as "point and click" when the applications themselves perform the actual database query.

Easier Applications Deployment

- Human Resources: Manage payroll, time keeping, personnel, and benefits electronically on a government-wide basis, not agency by agency. Also track training and professional credits in the same way.
- Purchasing: Use standardized and easy-to-develop electronic forms to handle routing, approval, processing, and payment.
- Emergency Services: Maintain specific local information for community initiatives. Also integrate community-specific information with data from other departments, such as transportation, public works, social services, probation and parole, and motor vehicles.
- When citizens or customers can get the information and forms they need on their own, government employees have more time to address complex problems.

These application transitions have caused a similar transition in the network environment, such that the network traffic will be dramatically altered.

In such a dynamic environment, the Transport Network both LAN and WAN must support high-speed transmission to satisfy the response time requirements of the applications. Given the growing trend of traditional as well as new applications to send large quantities of burst-oriented data from LANs across the WAN, the network must now be able to provide high-capacity bandwidth on demand.

It is recommended that web services applications meet the following minimum requirements before being considered:

- Use a standardized SQL database (e.g., Microsoft SQL, Oracle)
- Support XML, HTML5 web services
- Be cross-browser compliant, including mobile browsers.
- Be capable of integrating to reporting tools (e.g., Cognos, Crystal, SSRS)
- Comply with all HIPAA security requirements.

Intranet Web Services Systems Integration

Data as we know it today is usually completely different in every single system we use. Each software system has its own database and internal "business logic" that means nothing to an external system. Because of this, we have to go to a lot of work in order to translate the data into either a common format, or to another form that the external system will understand. This translation layer can be very difficult to implement as well as time consuming (re: processor intensive) depending on the technology being used.

Since there are so many distinct systems in use today, this data translation layer has become more important in the integration of the various criminal justice systems. That is what WEB services and the intranet protocol XML (eXtensible Markup Language) is all about.

Web services use standard Internet protocols and data formats to extend a component-based programming model across the Web. HTTP (the method used today by Microsoft Internet Explorer) is used to access Web services, which are Web-based components and applications built on four core technologies: XML; Simple Object Access Protocol (SOAP); Web Services Description Language (WSDL); and Universal Description, Discovery, and Integration (UDDI).

XML, a self-describing tag-based language, is the foundation of the Web services architecture. Its main value lies in the fact that it is a platform-independent data-transport mechanism. SOAP is an XML grammar that specifies how data and commands are sent between applications. WSDL is another XML syntax that applications can use to query one another about the names and properties of the Web services that they support. UDDI is a directory mechanism for Web services that fills a role much like Active Directory's (AD's) role on a LAN. UDDI lets a Web services application dynamically discover available Web services that it can use.

WEB service and XML makes it possible to easily share data with anyone. This can be accomplished by a translation layer at each agencies system. While conceptually not much different than today's method of data transformation, XML makes this process very easy to implement as well as very fast. An XSLT (or XML Stylesheet Transformation) is an XML document that maintains a data mapping scheme to transform one set of data into another. Each agency wishing to share data with another simply needs to publish their schema so that the other agencies will understand their data. XML allows data from any database to be described in a universal format irrespective of vendor.

Architecture	Strengths	Weaknesses
Mainframes/ Minicomputers	Simple architectural solution Maximum systems management and control	Response times dependent upon system usage Unappealing user interface Proprietary solution High backlogs High maintenance and supporting resource costs
Client/Server	Scalability Openness Maximum response time and performance Appealing graphical user interface Solves some weaknesses of mainframe	Can be a complex solution Can put a high demand upon network bandwidth.
Web Services	Leverages best of both mainframe and client/server systems Reduced operating costs Improved communications More efficient forms delivery Simplified report generation Easier applications deployment	Evolving technology Some municipal application vendors have fully implemented the architecture

City Applications Architectures

Enterprise Resource Planning

The integrated suite of applications provided by the ERP comprise the Applications Architecture for the City's Administrative operations. They have been used by government over the years, operating in mainframe, client/server and now operating over Web Services architectures. The ERPs consist of an integrated suite of applications, as illustrated here.

These applications address the specific Architecture functions and have been developed by software vendors to encompass the Business and Information Architecture elements specified by NIST. The extensive development effort provided by the software vendors address many of the complex issues that the EA defines, and it provides the City with a defined architecture.

Alternatively, the City would define and develop all of the functional applications in a common platform, such as Microsoft Sharepoint. However, an internal development approach will require the City to expend extensive time and resources in developing and supporting an Information Architecture. In an environment of limited resources, especially within a municipal IT Department, it is not recommended that substantial resources be dedicated in this manner.

It is important to note that some, limited applications development resources will be needed in an architecture dominated by commercial, off-the-shelf (COTS) applications; these systems will meet most, but not all of the specific functional systems needs of the City. To close these gaps, typically in areas such as GIS, document search, integrated web applications, and systems interfaces, applications development will be needed.

The applications provide integrated process with e-commerce features to replace the existing paper routing process for functions such as: vendor interaction, bidding, requisitions, approvals, purchase order generation, fixed asset/inventory logging and accounts payable. Human Resource modules provide for applicant tracking, and payroll and personnel functions such as salary negotiations, step/range tables and pension processing. Systems currently available on the market today provide functions such as those described in the table below.



Function	Description/Components
Executive Management	Provide the ability for viewing overall and departmental actual budget status in an easy-to-use and easy to manipulate “dashboard” format.
Finance & Accounting	<u>General Ledger:</u> Provide displays and drill-downs. Allow the ability to track projects and grants across multiple fiscal years with an automated link to the general ledger chart of accounts. <u>Budget:</u> Allow the creation of the budget by using your current year’s fiscal information as a starting point. Allow the ability to perform what if analysis by departments or Citywide. Allow to link personnel details to budgeted line items and associate items, such as a computer and a desk for new employees. <u>Purchasing (including Bid Management, Requisitions, and Contracts Management):</u> Allow user access to enter requisitions with full access to available vendors, commodities, budget balances, and frequently requested items and automatically notify all approvers by e-mail. Elimination of paper routing should be key allowing purchasing staff to view all approvals and any attachments, and with one step can convert requisitions into purchase orders and encumber the funds. The system should allow for Purchase Orders to be sent to the vendor via hardcopy, e-mail, or fax. When the item arrives, the system should automatically notify Accounts Payable. Additionally, all items purchased from certain accounts or over the fixed asset dollar threshold should automatically create a Fixed Asset record and place it in a file for review with all associated purchasing and accounts payable information. <u>Fixed Assets:</u> Track all information for depreciation costs to post to the General Ledger and adhere to GASB reporting requirements. <u>Accounts Receivable/Cash Receipting:</u> Track all payments made to the City and provide for a single collection point for all cash receipts from peripheral systems, e.g., Parks & Recreation, Courts. This single collection point should allow citizens utilizing self-service to see all financial transactions they have with the City and make a single payment to close them out. <u>Treasury:</u> Allow for tracking and management of financial assets of the City. <u>Accounts Payable:</u> Allow payment of existing encumbrances by choosing a purchase order, having the details default, and adjust any differences. Any new invoices should be easily added to the system and charge to the appropriate accounts.
Human Resources	<u>Applicant Tracking:</u> Accept job applications over the Internet, from a kiosk, or by completing a traditional application. The system should allow applicants to open positions as a link on the City 's web site and allow applicants to enter their own information on a web application form with an attached resume. Allow departments to review, creation of an applicant database, run reports, and track interview information. Once hired, all information from the applicant’s record should flow through the system to create the base for their employee file without any need for staff to re-enter the information. <u>Personnel:</u> Given the proper security, allow personnel to have access to all the information they need to know about an employee. This will facilitate their ability to answer employee or supervisor questions regarding absences, training, certifications, and emergency contact information. Personnel would also include:

Function	Description/Components
	▪ Position Control: Allow to account and identify all the budgeted positions within the City. It should provide information on the number of Full Time Equivalents (FTEs) assigned to positions, and a description of the duties. The system should allow the ability to track the details regarding the positions and the personnel who held them. ▪ Personnel Budgeting and Projections: Allow the ability to create the next year's budget allowing increasing employee salaries for the rest of the current year. Along with the salaries, the system should allow the addition of fringe benefits so all information is considered. The system should allow salary projections to be done using an existing employee or a group of employees attached to a salary schedule and allow the calculation using percentage, dollar amount, or both, an increase or decrease to those employees' schedules, and provide a series of reports. <u>Payroll:</u> Allow setting up the parameters of the pay run and timecard entry, as well as calculating and running reports. In addition, allow exceptions-based payroll reporting so as to allow efficient default all of your employees' time and pay run information, leaving only the entry of personnel information who have worked outside the typical scope of their jobs. <u>Employee Expense Reimbursement:</u> Allow employees to electronically submit expenses for reimbursement. This should interface to payroll for payments. Features may include receipt image submission using a phone application. <u>Benefits:</u> Track and manage benefits information for staff, allowing for adjustments allowed. <u>Employee Reviews:</u> Provide a workflow for performing reviews, including templates and supervisory approval, and reporting on uncompleted reviews. <u>Training:</u> Track training and certification requirements for each position, with expirations. Allow for notification of employee and supervisor prior to expiration. Allow for the tracking of training and certifications taken by employees, with imaging and attachment of verifying documentation. <u>Employee Self-Service:</u> Allow access to all employees with a convenient web site so they can access their own employment information – anytime, anywhere. Either over the City Intranet, or from home over the Internet, the employees should have secure access to their payroll and personnel information through a web browser interface.
Community Development	<u>Electronic Plan Review:</u> Provide real-time review of detailed plans and regulatory documents with online examination, markup, commenting, electronic stamping and signature of plans, architectural drawings or licenses. Compare updated plans side by side or as an overlay to easily identify proposed changes. <u>Licenses:</u> Provide licensing management capabilities that utilize industry standards and templates for license type (e.g., business, occupational) and best practices workflow. <u>Permits:</u> Provide ability to complete a commercial or residential building permit and keep multiple departments informed in real time. Ability to configure workflow from application to issuance of a Certificate of Occupancy, including ability to route task lists and alerts, perform fee calculations, track collections.

Function	Description/Components
	<u>Inspections:</u> Provide Inspectors with real-time access to information, including list of inspections for the day, routing, current plans, historic permits, Code details, GIS, zoning and enforcement data. <u>Code Enforcement:</u> Provide Code Enforcement officers with the ability to create and manage cases, including attaching pictures, drawings or sketches, notes, video and sound files. Provide officers with real-time access to information, including daily job list, routing, current plans, historic permits, Code details, GIS, zoning and enforcement data. Ability to track/update status, communicate status and violations to citizens. <u>Citizen Self-Service:</u> Provide citizens with Web-based capability to submit plans, permit applications and fee payments, schedule inspections, and submit complaints. <u>Field Mobility:</u> Provide inspectors and code enforcement officers with the ability to manage cases and results for inspections using their mobile device. Ability to schedule inspections, plan routes and attach notes and photos. Provide store-and-forward capability for low/no connectivity areas.
Citizen Relationship Management	Citizen Relationship Management (CRM) solutions are designed to provide a single issues management database. The database contains all City issues and is available for use by all key City departments. Furthermore, it would be integrated with other key City systems, such as GIS, Utility Billing and Code Enforcement, so the maintenance of the data would be seamless and not require additional effort by department. Whether the issue was captured by a call center or by another department, all issues would be maintained in this single database for reference by any department. The CRM software solution must include address validation. Since the key for nearly all issues is the location of the issue, the system must capture accurate location information to ensure field coordinators, inspectors, monitors, etc. can locate the problem. Also, address validation is essential for identifying if the issue has already been input and is being addressed. The CRM software needs to be integrated with the core operational systems of the City. At a minimum, bi-directional interfaces should be implemented to: ▪ Community Services service request/work order management system. ▪ Code Enforcement application. The CRM solution should include the capability to extend the CRM system to the City web. Citizens should be able to input issues and check status via the Internet. Internet access allows citizens to be “self-served” anytime from any Internet capable computer. It should also include address validation and prompting for the closest addresses found. The citizen should be notified of status via email as an option. Given the availability to access GIS over the Internet, the system might also link the citizen to GIS to locate the street, intersection or specific address.
Asset Management	<u>Asset Tracking:</u> Ability to enter, track and manage City assets, including attributes, cost, value (considering depreciation), location and maintenance history. <u>Work Orders:</u> Ability to issue work orders for installation, repair, replacement, or preventative maintenance. Ability to turn service orders into work orders. Ability to track performance against work orders, including time and resources used, and mark completed.

Function	Description/Components
	<u>Fleet</u>: The system should allow tracking how much it costs to maintain equipment and vehicles. The system should allow the tracking of all costs associated to a service order for any vehicle or equipment serviced by the City. The orders should integrate with the inventory system to pull from the existing stock in warehouse inventory to complete routine maintenance or scheduled maintenance. Costs must be integrated to the general ledger so that the user can generate reports on items that are overdue for maintenance as well as the total costs associated with a specific item. <u>Inventory</u>: This function should be fully integrated with the general ledger, purchasing, and service request/work order system. <u>Field Mobility</u>: Manage work orders, establish calendars. Provide field personnel direct access to this functionality.
Utility Billing	<u>Premises and Customer Accounts</u>: Setup accounts, premises and owners, person responsible for the account. Add/change individuals, services, deposits. <u>Meters</u>: Inventory and track meters, order installations, track readings. <u>Rate Structures</u>: Ability to create and manage rate structures. <u>Billing, Payments & Collections, Adjustments</u>: Control billings, payment recognition, collection processing, adjustments, mailings, delinquency notices. <u>Citizen Self-Service</u>: Provide utility clients with web-based access to their utility account for real-time information, including: billings, payments, and consumption history. Also provide for credit card payments. <u>Service Requests & Field Mobility</u>: Manage service orders, establish calendars, cut-off-lists, assign on/off fees. Provide field personnel direct access to this functionality.

Electronic Document Management Systems

Electronic Document Management Systems (EDMS) provide an automated approach for controlling document-based information. These systems organize and manage collections of information in the form of electronic objects and provide access within workgroups and across the organization. EDMS is a combination of five components: Document Management, Imaging, Electronic Forms, Content Management and Workflow. These can be grouped into Imaging, Document Management and Content Management Applications.

Electronic document management (EDMS) software constitutes a set of services for organizing electronic documents; managing content; enabling secure access to documents and unstructured data; routing documents and automating related tasks; and facilitating document distribution. Core EDMS functionality includes library services (check-in/check-out, version control, and document-level security); cross-repository searching; common system administration; and unified system management.

Recent product introductions point to an increased leverage of Web technologies and standards (HTML, XML); the addition of Web publishing and enhanced information retrieval capabilities, and support for managing documents at a granular, component level. The EDMS market is in transition as core library services and repositories become commodities. The leading EDMS vendors— DOCUMENTUM, FileNET, and Laserfiche, and Microsoft Sharepoint — continue to morph their products into content management or knowledge management solutions.

Selection Guidelines

Application focus, implementation scale, and scope are general considerations in selecting EDMS software. In addition, the City should look for EDMS vendors that comply with industry standards and that have direct expertise in their business applications and specific industry or that have partnerships with system integrators who have that expertise.

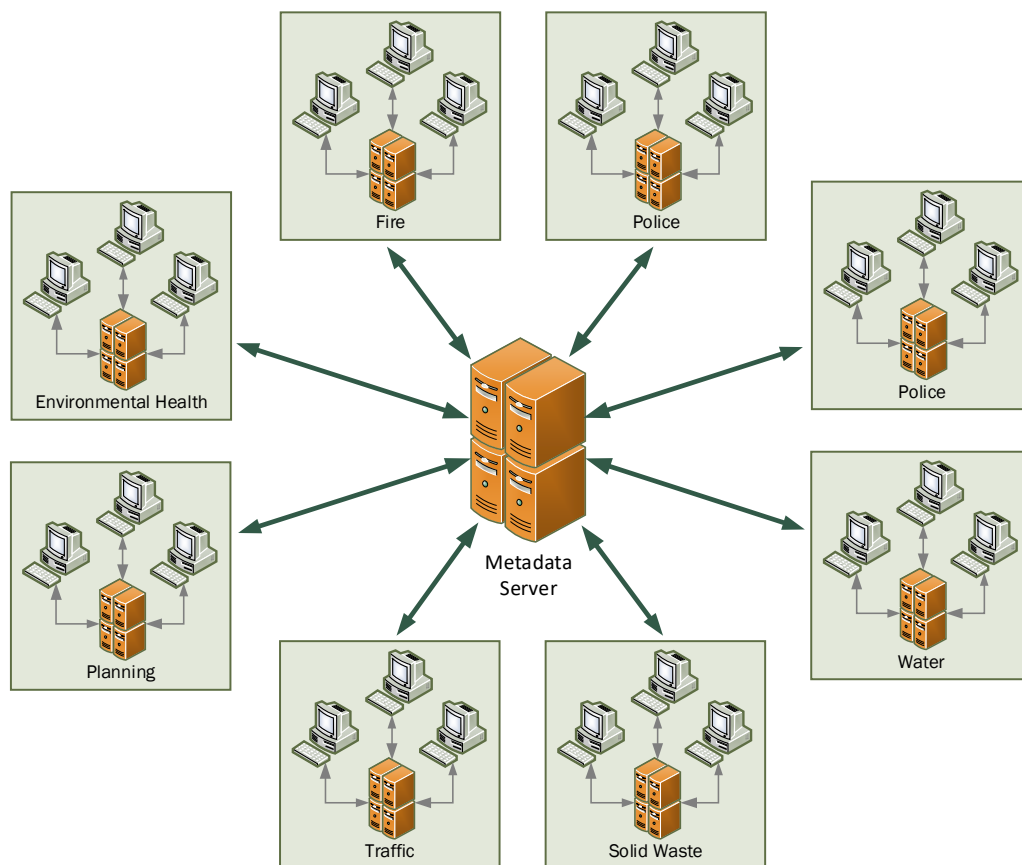
Other decisions in selecting EDMS software include the following:

The document management product's interfaces with the City's application infrastructure (e.g., ERP, Public Safety Systems).

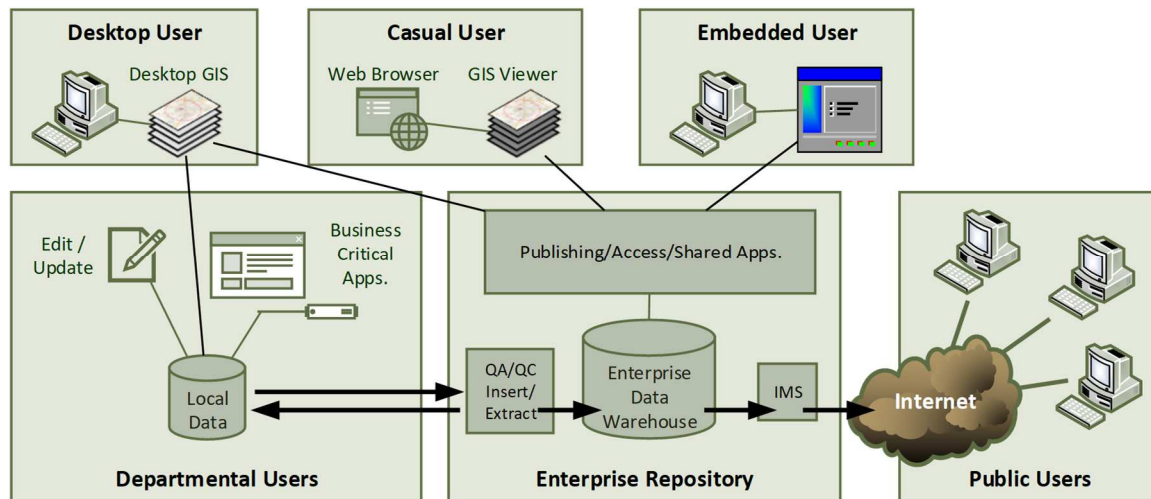
In a shift away from a workgroup focus, all EDMS software vendors want to position their products as enterprise-wide solutions. Toolkits that allow integrating many applications quickly are essential for enterprise-wide deployment, and templates, prototypes, models, and other aids can be useful for rapid implementation. Product technology must be flexible and scalable to satisfy enterprise-wide requirements. The capability to search repositories across servers, for example, is more important (and more difficult) than providing search services for a workgroup's single server. Search speed, or lack thereof, becomes an issue as the volume of documents increases dramatically across enterprise implementations. Distributed document databases may require such database features, as index replication and roll-back capabilities become more important in enterprise settings.

Geographic Information Systems (GIS)

Understanding basic application architecture, relationships between integrated municipal applications and the component interfaces required to support GIS solutions provides a foundation for understanding distributed GIS applications which would be implemented in the City. The GIS can serve as a primary integrating database which ties all of the operational departments as shown below.



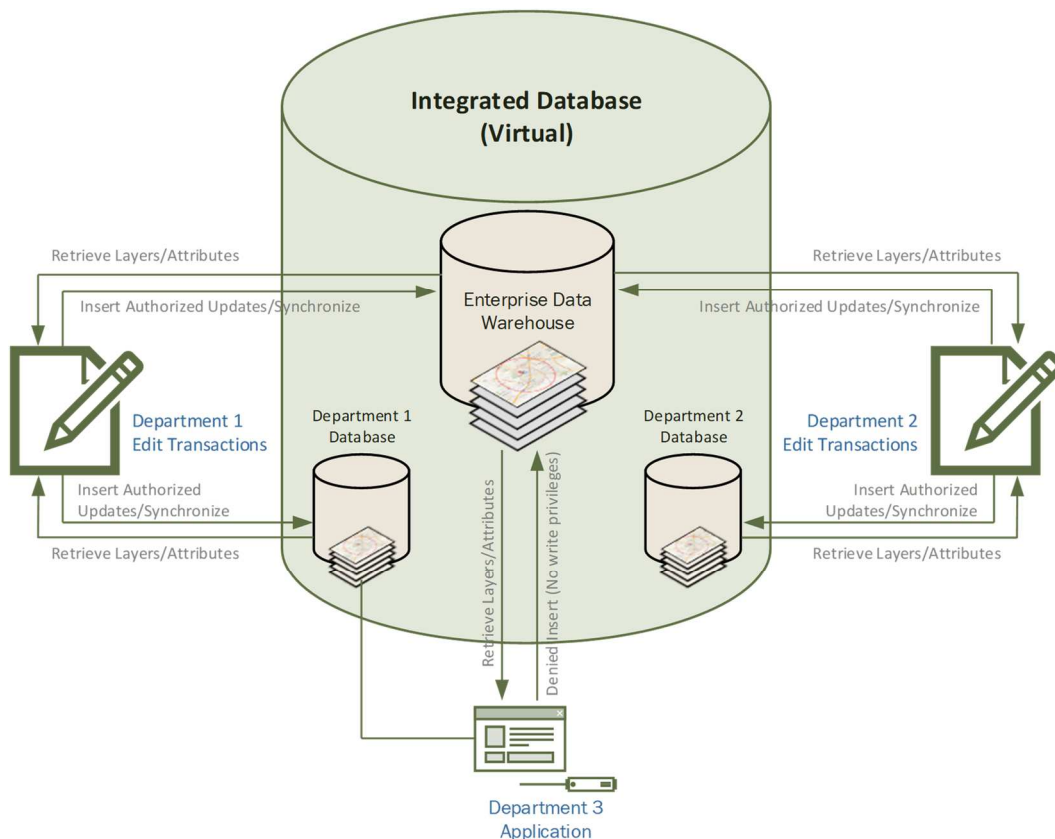
The Client Server GIS Architecture combines a variety of closely integrated applications to establish a fully supported system solution.



The Integrated GIS architecture can be configured in three tiers:

- **Client Tier**
 - PC workstations that provide user access to the GIS System.
 - The Workstation displays and controls application processes, which could be running X-emulation software, Windows terminals, or Web browser clients.
 - Client functions include general spatial query and analysis studies, simple map production tools for general users and commercial map productions for professional users, general-purpose query and analysis operations, and spatial data maintenance.
 - In single tier architectures the client application server and desktop user workstation may be the same platform
- **Application Tier**
 - Application servers that handle application processing.
 - GIS applications are supported within the distributed configuration by hardware platforms that execute the GIS functions. This tier supports access to the database tier and Web transaction servers that provide transaction-based map products to Intranet and Internet browser clients
 - GIS applications can provide interfaces to custom business solutions that support specific business needs such as the permitting and inspections systems. End users do not require geographic expertise and use applications to support standard business functions
 - The application server processes all spatial and attributes data requests received from the GIS client application. A transaction request is prepared by the GIS application client and sent to the server for processing. The server process completes the transaction query to the database server and returns the response back to the client for processing. There is no requirement in this configuration to map the database server disk to the GIS client.
 - The server can also provide a communication interface between the City's applications and an Internet Web server.

- In a two-tier architecture, the application server and central data server may be on the same platform
- In a centralized solution, application servers can be UNIX or Windows NT platforms that provide host-computing services to a number of GIS clients.
- Database Tier
 - Servers that house the supporting database.
 - The GIS System relational database is the central repository for storing all of the City's spatial and attribute data into a single standard commercial DBMS such as Oracle or MS SQL server.
 - Interacts with the application server for displaying, retrieving, and analyzing data, and generating maps and reports.

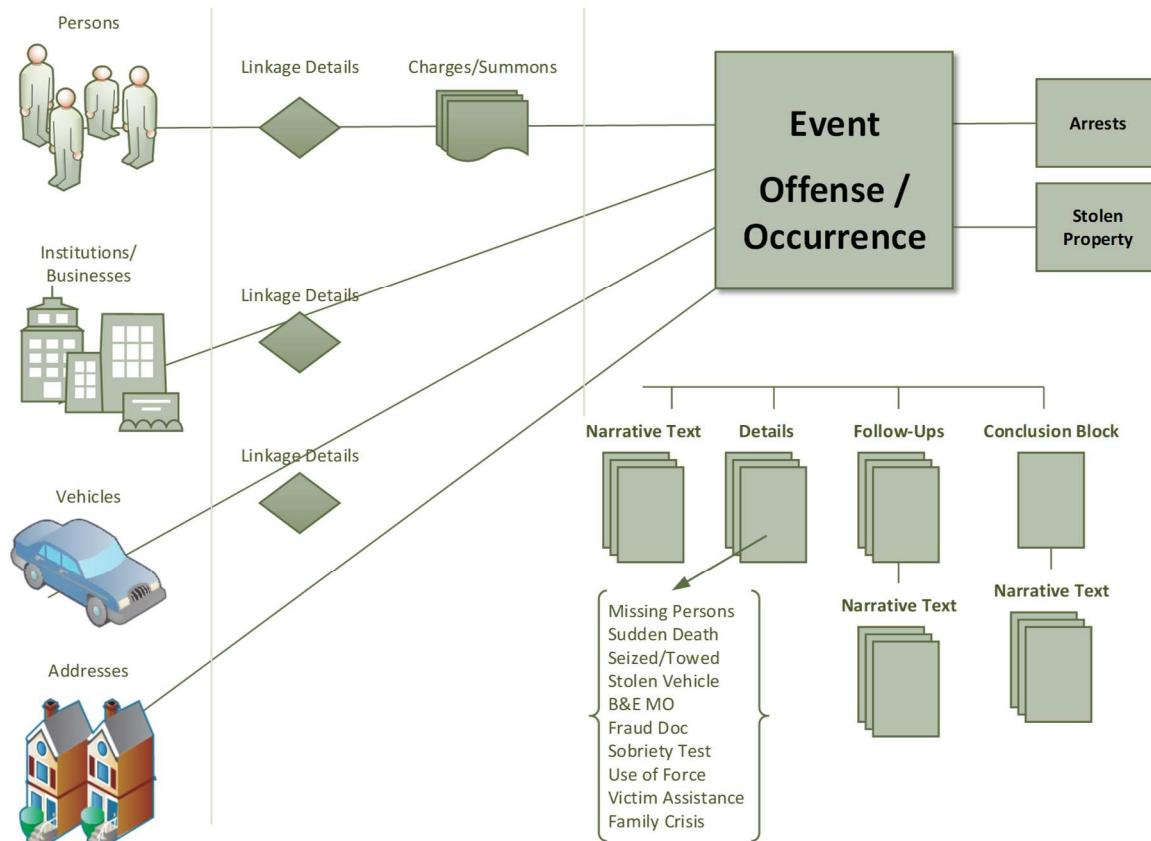


Public Safety Systems

The combined CAD (Computer Aided Dispatch) and Records Management Systems comprise the City's Public Safety Applications Architecture. The CAD system is the system that processes and initiates an incident. This system integrates internally with the E911 telecommunications system and provides call details such as the name and address of a caller so that the proper unit can be dispatched. Additionally, this is the application used to send information about the particular circumstances of the incident to the police officer. Data flows from the CAD system to the RMS where all of the necessary details are then stored if a report is ultimately required.

The RMS (Records Management System) contains all of the data from the numerous types of reports that any law enforcement agency must deal with. These reports which are primarily entered by field patrol officers might include an incident report, a booking sheet or arrest report, a witness statement or any other relevant report.

From here, data must be shared with several other internal and external applications. If an incident generated a report that requires further investigation by a detective, then the information would be sent to the Case Management System where the detective could maintain a collection of reports and other data that may be pertinent to an ongoing investigation that may include numerous different incidents.



Data from the RMS would also be shared with the Crime Analysis System so that an analyst could determine crime patterns and trends as well as report all crime data to the FBI. The RMS's Property Management System is yet another component of the RMS that tracks the chain of evidence of a given incident or crime. It too receives data from the RMS but can also exchange data with the detective case management as well as externally with the DA's CMS.

The RMS would also need to send data to the Jail's JMS (Jail Management System) anytime a person is arrested and booked into the jail. The Department of Corrections (DOC) RMS sends data to both the RMS and the DA's CMS whenever a change occurs in a given individual's incarceration status.

The Jail needs to share data with four different external agencies. Its own JMS contains all of the functionality that it requires such as reports, accounting, commissary information, purchasing, etc. It initially receives data from the Police RMS which is typically contained in a booking report. From there, the Jail must process the arrestee into their system. This involves taking information from the booking report and then integrating that data with that from other sources. DOC RMS is queried to obtain a record of any prior convictions or periods of incarceration. It is also important to obtain any public health data on the prisoner since this individual is now under the full care of the government. This information is obtained from the Health Department and included in the individual's record.

The Jail is closely tied to the Court since the Court will ultimately decide the disposition of the arrestee. The flow of data between the Jail and Court is a two-way link since they need to share information on the status of the prisoner and schedule

court dates. When the case has been decided, the Court will notify the Jail to remand custody of the individual to the DOC, keep the prisoner in custody for a set period of time or release the prisoner.

In addition to facilitating the Intra- and Inter-agency information flow, the entry of reports electronically can yield a multitude of benefits. These can include:

- Clerical: Since the officer would be directly linked into the system, he/she would not need to maintain a paper trail of data and there would be no need to have anyone else enter data.
- Errors: By using an on-line real-time access to the central database the incidence of errors would be significantly reduced. Since the system would give the officer immediate feedback, errors would be reduced. It is possible that the significant personnel savings would offset the acquisition and maintenance of the system.
- Costs: In the short run, this option is costly. However, when one calculates the savings over five years for reduced dispatchers, reduced clerical work due to less redundant data entry, less redundant statistical tracking, and fewer corrections required in data entry.
- Redundancy: This approach provides the least amount of redundant or duplicated data entry and database maintenance.
- Dispatchers: This is the only viable system that would allow officers to inquire directly into NCIC or other databases without having to tie up a dispatcher on voice communication and database searching. Currently, the officer has to call the dispatcher and the dispatcher has to enter the query into a system (while the officer is waiting for a response) and then the dispatcher has to call the officer, and the officer has to write the data onto paper for future reference. With a direct linkage the officer could key into a the database without the assistance of a dispatcher and then immediately retrieve data (without waiting and wasting time) and then have the data directly entered into his/her incident database or word processing document or printed immediately on the portable car based printer. The unique advantage of this technology would reduce the need for additional dispatchers/data clerks on every shift.
- Delay in data entry: If data were entered directly, there would be no need for extra clerical assistance to enter data.
- Feedback: This is the only option which provides on-line real-time feedback. Thus if an officer keys the wrong code for an incident he/she can correct his/her error before it gets logged or posted to the system incorrectly.
- User Satisfaction: This would probably give the officers the highest user satisfaction.
- Statute Statistics: Since this technology will provide for the full access to the tables of codes, officers would not have to carry books to identify codes.
- Audit Trail: Since the system would provide immediate recall and validation of data, this electronic audit trail would minimize or eliminate much of the paper capturing of data.
- Training: Since this approach would have the required Statutes data elements already imbedded in the system, the officer's learning curve would be significantly reduced.

In summary, the new integrated systems will provide the police with the ability to come closer to the "paperless" agency ideal. For example, a more effective incident entry and case management process would include key elements such as:

- Electronic Report Capture (Notebooks and Desktop Workstations)
- Electronic Supervisor Report Review
- Automated Case Assignment, with Supervisor Override
- Automated Assignment of Solvability Factors
- Automatic Report Distribution, with Logging

- Electronic Report Distribution to Outside Agencies
- Imaging Capture of Non-System Generated Documents and Photographs

Ancillary Document Integration

The purpose of an Electronic Document Management System (EDMS) integrated with the RMS is to associate relevant logical data component (e.g., a child's photo to the Missing Person detail page) so that a cohesive, integrated printed output report can be produced.

The EDMS facility that most public safety systems vendors offer assume that most of the information involved, stored and retrieved will be in digital, machine-processable form stored in the RMS. Document Images will only be used to store signatures, fraud documents, official certificates and diagrams (for instance), representing less than 10% of the printable material contained in the RMS.

The comprehensive enterprise EDMS products assume that image storage will be the primary medium, with digital data only used for searching and indexing to the images. For this reason, the implementation of an EDMS with the Police RMS is its limited use of associating ancillary documents and images within the RMS.

Council Workshop Coversheet



Agenda Item Number	3.	Meeting Date	10/23/2018
Agenda Item Type	Presentation		
Subject	Management Services Department Update		
Ordinance/Reso #		Contract #	
Project #		Permit #	
Department	Management Services		

Info Only	☒
Policy Review	☐
Policy DevMnt	☐
Other	☐

Summary

The Management Services Department will provide an overview on the department's structure, services provided, challenges and opportunities as we prepare for the upcoming biennial budget.

Through

Dept Head Approval

City Mgr Approval

Christina Palmer
Oct 17, 16:38:33 GMT-0700 2018

Marie Mosley
Oct 18, 21:22:01 GMT-0700 2018

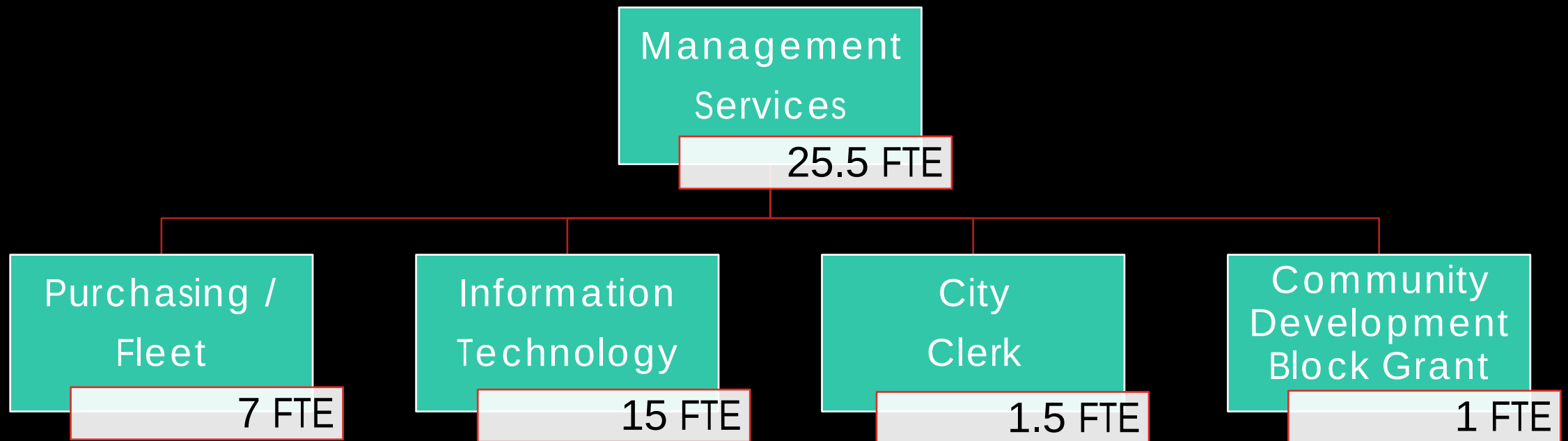
Attachments: Presentation



MANAGEMENT SERVICES DEPARTMENT UPDATE

Presented to City Council
October 23, 2018

DEPARTMENT OVERVIEW



PURCHASING / FLEET DIVISION

- Purchasing:
 - Centralized Procurement
 - Bid Processing
 - Contract Administration
 - Cell Phone program
 - Copier Maintenance & Replacement
 - Surplus Disposal
 - Fleet Admin Support
- Warehouse:
 - Inventory Stocking & Issuance
 - Receiving & Delivery
 - Surplus and Fleet Support
- Fleet:
 - Maintenance & Repairs
 - Vehicle & Equipment Replacement
 - Warehouse Support

PURCHASING / FLEET DIVISION

- Staffing Levels:
 - Purchasing Manager
 - 2 Buyers
 - 3 Mechanics
 - 1 Warehouse Worker
- Statistical Overview:
 - 900+ Purchase Orders Processed annually
 - Average of 150+ Auctions posted on-line annually (\$60,000 annually)
 - 921 Unique Items in Stock – Average value of Inventory \$329,510 (2017)
 - Supports repair and maintenance of 569 vehicles and pieces of equipment
 - Average fleet age of 11 years
 - Current Fleet replacement value \$24,127,824
 - 3,000 Average Fleet work orders annually

PURCHASING / FLEET DIVISION

Fleet Work Orders Completed



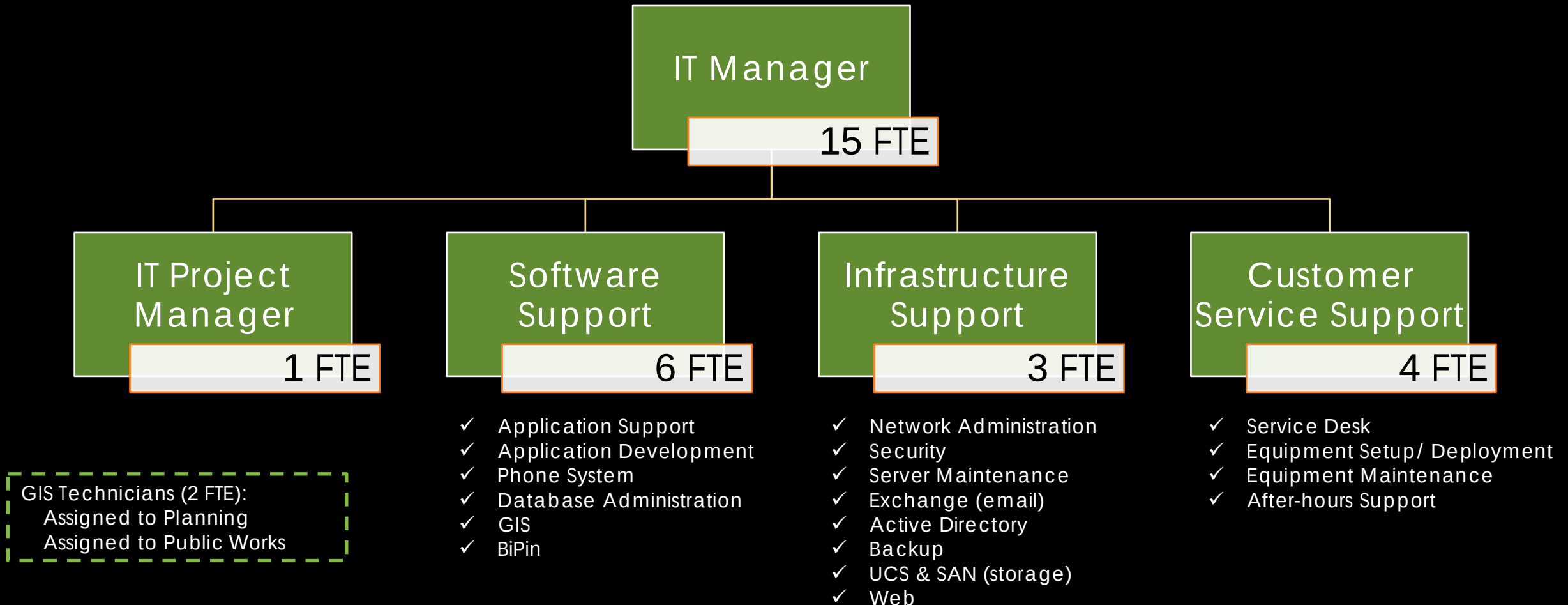
PURCHASING / FLEET DIVISION

- 2017/18 Accomplishments
 - Purchasing Policy Updated – thresholds align with best practices and provide efficiencies for Departments.
 - Implementation of records management for program support documentation, workflows and electronic signatures.
 - Reduced average value of inventory by \$150,000 & turnover rate doubled.
 - Nearly eliminated controllable service and repair requests not completed within 1 week. Increased customer satisfaction.

PURCHASING / FLEET DIVISION

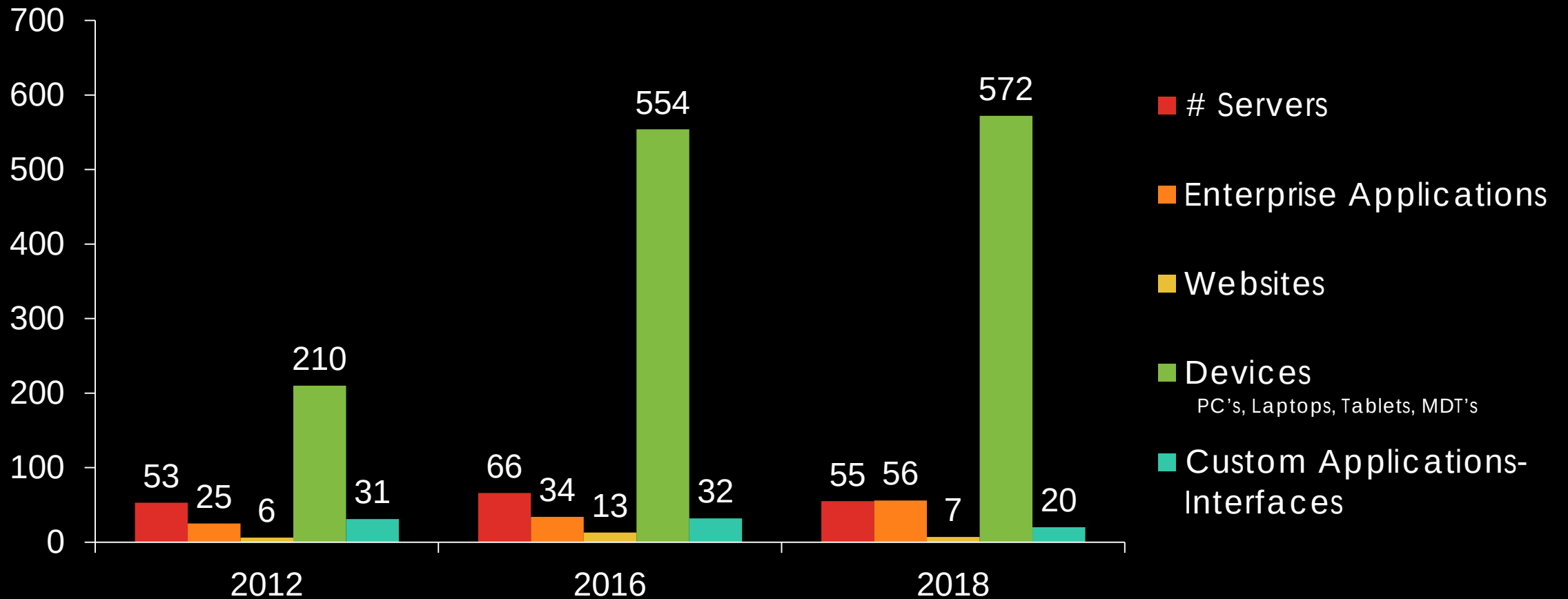
- Current Challenges:
 - Fleet Management System
 - Current system does not support critical management and reporting needs of a modern fleet operation
 - Facility
 - Facility adequate but not ideal for latest technologies and proximity to customer base
 - Equipment Replacement Funding
 - Increases have decreased average age of fleet and maintenance requirements
 - Critical in near term of 4-6 years
 - Improved preventative maintenance program will help to extend life of vehicles

INFORMATION TECHNOLOGY DIVISION



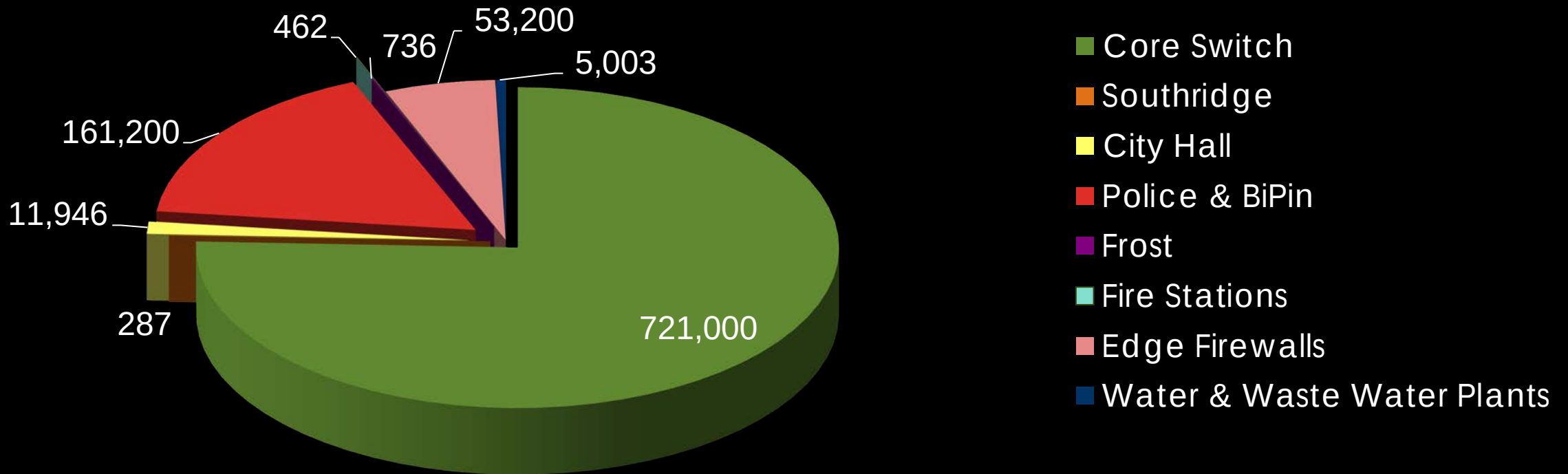
INFORMATION TECHNOLOGY DIVISION

Environmental Growth



INFORMATION TECHNOLOGY DIVISION

Avg Monthly Network Traffic Activity (in GB)



INFORMATION TECHNOLOGY DIVISION

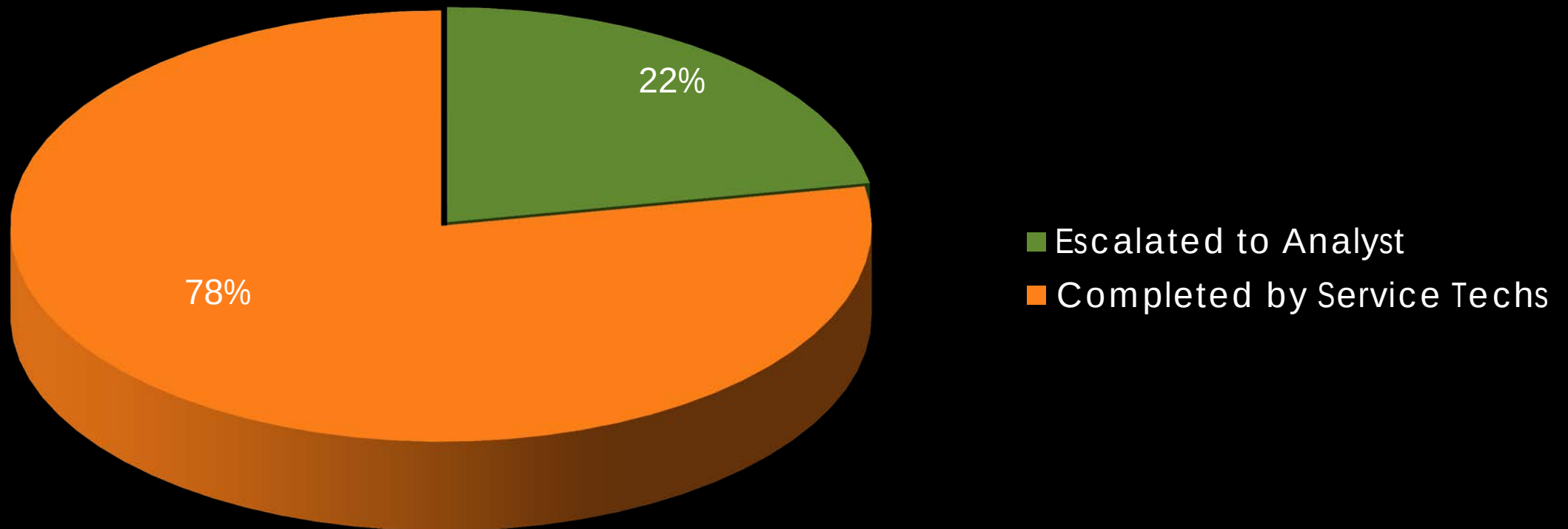
- Statistical Overview
 - Roughly 80% of the inbound e-mails are filtered as spam or infected with viruses.
 - Exchange Server (email) handles an average of 6,000 messages per day.
 - Currently managing 645 mailboxes
 - On average, we block roughly 1 million network attacks/probes each month
 - Overall storage utilized is 100TB of available 160TB (63%)
 - User data increased from 800GB in 2006 to over 10,900GB (10.9TB) in 2018
 - 2018 Network Up time 99.9%
 - Only unscheduled outage was 2am failure that was back up by 7am.

INFORMATION TECHNOLOGY DIVISION

- IT Service Desk
 - Provides multiple communication channels for staff to request service from a centralized Service Desk.
 - Phone
 - Walk-in Service Desk
 - Email
 - Online Service Request ticket
 - Service desk receives an average of 365 phone calls per month; roughly 2,025 work orders per year
 - Customer satisfaction has dramatically increased

INFORMATION TECHNOLOGY DIVISION

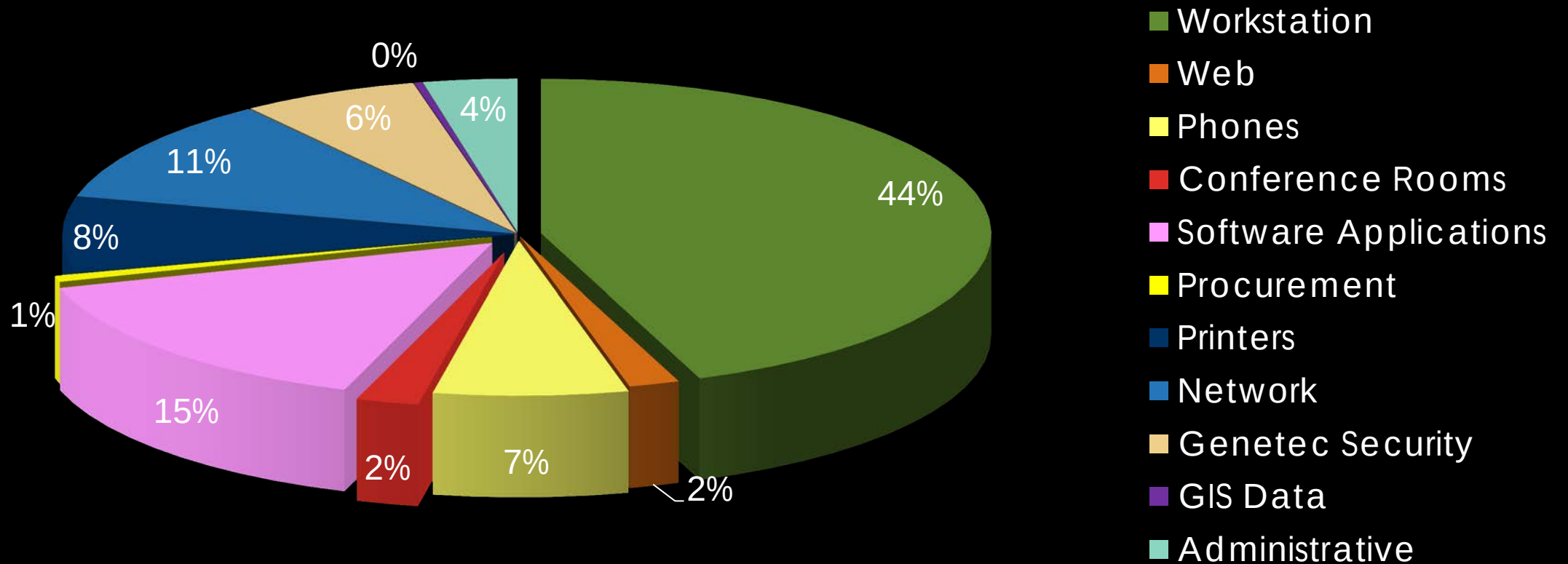
Service Desk Requests
2018 YTD



INFORMATION TECHNOLOGY DIVISION

Types of Service Desk Requests

2018 YTD



INFORMATION TECHNOLOGY DIVISION

- IT Capital Projects (Adopted 17/18 Budget)
 - Eden Replacement Needs Analysis and RFP
 - Network Infrastructure Upgrades
 - Wireless Network Upgrades
 - Fire ERS Replacement
 - OnBase Policy/Procedure Compliance
 - OnBase HR OnBoarding
 - Online Codification
 - KPD Audio Visual System Replacement
- IT Capital Projects (Carry-Forward from 2016)
 - Data Domain
 - Physical Security Upgrades Ph. 1
 - Core Switch Upgrade
 - Server OS Upgrades
 - Redundant ISP
 - Mobile Private Network (MPN) Ph. 2
 - Advanced Authentication (CJIS)

INFORMATION TECHNOLOGY DIVISION

2017 Project Assignments

- Data Domain ✓
 - Physical Security Upgrades Ph. 1 ✓
 - Core Switch Upgrade ✓
 - Server OS Upgrades ✓
 - Redundant ISP ✓
 - Mobile Private Network (MPN) ✓
 - Advanced Authentication – Pilot Group with KPD Motorcycles ✓
 - Eden Replacement Needs Analysis ✓
 - Network Infrastructure Upgrades Ph 1 ✓
 - Fire ERS Replacement ✓
 - OnBase HR OnBoarding and Policy/Procedure Compliance (*Deferred to 2018*)
 - Online Codification ✓
 - KPD Audio Visual System Replacement ✓
-
- Website - Active Directory Federation Services (ADFS) single sign on ✓
 - Solar Winds Patch Management Module (*Deferred to 2018*)

INFORMATION TECHNOLOGY DIVISION

2018 Project Assignments

- Solar Winds Patch Management Module ✓
 - OnBase HR OnBoarding and Policy/Procedure Compliance IN PROCESS
 - Wireless Network Replacement IN PROCESS
 - Network Upgrades Ph. 2 IN PROCESS
 - Eden Replacement RFP, Demo's, Selection IN PROCESS
 - Server OS Upgrade (cokapps1) ✓
-
- Physical Security Upgrades Ph. 2 ✓
 - Mobile Private Network (MPN) Ph. 2 (expansion to patrol) ✓
 - Advanced Authentication (expansion to patrol) ✓
 - KPD Fleet Replacement (new equipment) ✓
 - Office 2010 Upgrade to 2013 *(Deferred to be consolidated with 2019 workstation replacements)*
 - BIPIN iLEADS Replacement IN PROCESS
 - BIPIN Citrix Upgrade ✓
 - Solar Winds App Manager *(Deferred to 2019)*
 - SCADA System Replacement IN PROCESS



INFORMATION TECHNOLOGY DIVISION

- Current Challenges
 - Security Threats
 - Ransomware
 - Ongoing Probing Attacks
 - Regulatory Compliance
 - Preventative Maintenance
 - Outages from 3rd party providers / partners
 - Resolution of outages results in reprioritization of staff assignments
 - Succession Planning
- Future
 - Upgrade/replace outdated equipment & software
 - Implementation of staffing recommendations included in the Strategic Plan
 - Ongoing compliance updates to reflect current best practices for cyber security



CITY CLERK'S OFFICE

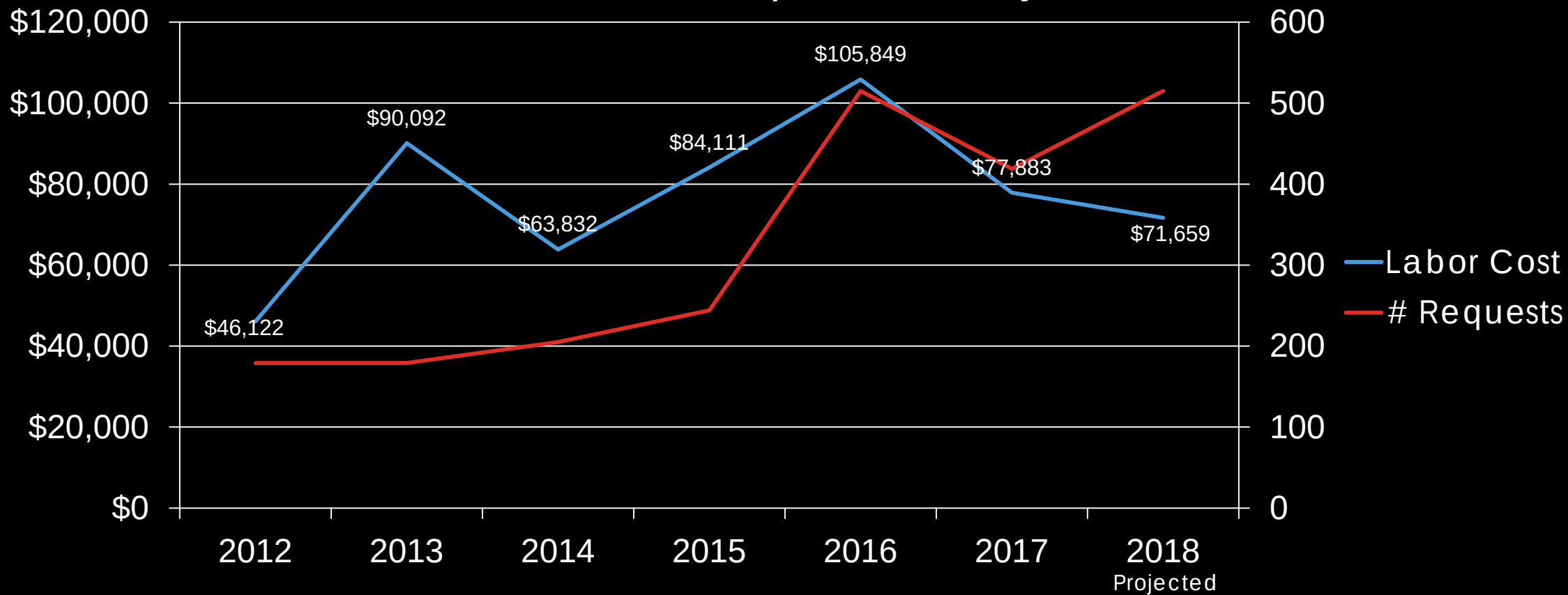
- Core Functions:
 - Agenda Management
 - Legislative Support
 - Regulatory Compliance
 - Records Management
 - Public Records Requests

CITY CLERK'S OFFICE

- 2017/2018 Accomplishments:
 - Completed transition of the Kennewick Municipal Code online hosting and updates to MuniCode.
 - Processed 355 City Council Agenda Items in 2017
 - 419 Public record requests received in 2017 (outside of police record requests)
 - Indexed 1,510 documents into OnBase in 2017
 - Staff spent 1,591 hours processing public record requests in 2017 (outside of police record requests)
This does not include the hours staff spent attending public records training, training other city staff, or managing city records.
 - City Clerk and Public Records Officer received their designation of Certified Public Records Officers from the Washington Association of Public Records Officers (WAPRO.)

CITY CLERK'S OFFICE

Public Record Request Activity





CITY CLERK'S OFFICE

- Current Challenges:
 - Public Records Act
 - Complexity of Act
 - New legislation & reporting requirements
 - Ongoing variations in Court interpretations on complying with the Act
 - Resource requirements in processing requests
 - Records Management Regulations
 - Applying WA State Archives regulations & best practice recommendations for records management and retention city-wide
 - Ongoing coordination with departments to migrate to centralized records system

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

- CDBG Program
 - Funded by HUD
 - Primary objective is improving our community by providing decent housing, a suitable living environment and expanding economic opportunities for persons of low and moderate income.
 - Funding requests are reviewed annually by the CDBG Advisory Board, who then provide recommendations to City Council for funding.
- HOME Program
 - HOME is the largest Federal block grant available to communities to create affordable housing.
 - Primary goal is to increase the supply of decent, safe, sanitary and affordable housing to low- and very low-income households.

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

- 2018 Funding Allocations:

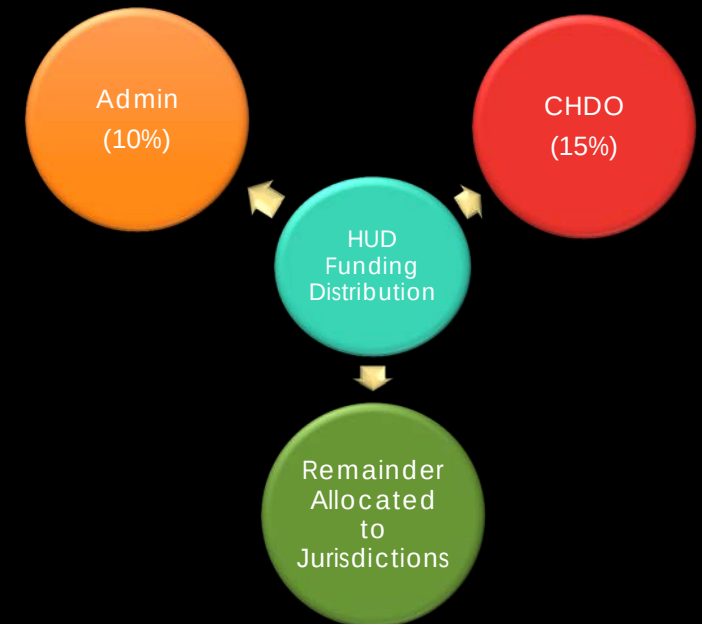
• Hawthorne St. / Juniper St. Improvements	\$420,000
• E. 1 st Ave. / S. Dawes St. Sidewalks	\$199,000
• Columbia Dr. Pedestrian Crossing	\$274,500
• Youth Recreation Scholarships	\$ 34,000
• ARC Therapeutic Recreation Scholarships	\$ 22,000
• Senior Life Resources Meals on Wheels	\$ 18,500
• StrEatery Pilot Projects	\$ 50,000
• CDBG Administration	\$130,700

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

- Community Impacts:
 - \$2,085,000 CDBG funds invested in Downtown Revitalization
 - \$125,000 provided to Historic Downtown for the construction of public restrooms
 - \$322,400 provided for the Clover Island entrance streetscape and public pathway
 - \$1.4 million for pedestrian ramp and audible crossing upgrades since 2010
 - \$200,000 towards installation of elevator at Toyota Center in 2011
 - Public Service projects over past 10 yrs (capped at 15% of each years CDBG allocation)
 - 8,643 Youth Scholarships provided
 - 7,696 Seniors were provided meals (Meals on Wheels program)
 - 535 Developmentally Disabled persons received assistance through Arc of Tri-Cities

HOME PROGRAM

- Program administered jointly with Cities of Richland & Pasco (Tri-Cities HOME Consortium). Richland is the Lead Entity.
- Of the annual funding allocation, Richland first sets aside 25% (10% for administration plus 15% for Community Housing Development Organizations (CHDO) eligible projects).
- Remaining funds are then allocated to each agency.
- Kennewick uses their allocation for the Homebuyer Downpayment Assistance Program.
- The rapid rise in home valuation and the scarcity of affordable houses has slowed the number of loans since 2017.



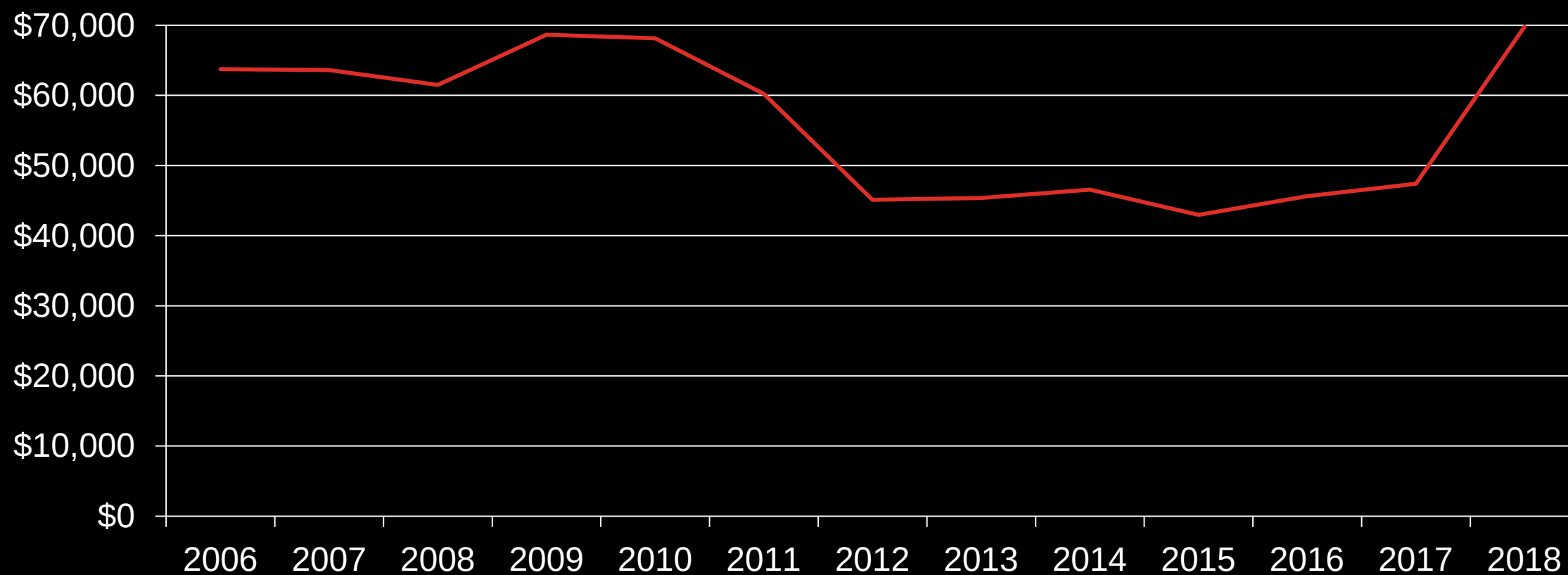


HOME PROGRAM

- Community Impacts since program started in 1999:
 - 568 families assisted with loans
 - Average loan amount is \$8,000
 - \$4,307,000 in assistance provided

HOME PROGRAM

HOME Admin Funds



COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

- Current Challenges:
 - Regulatory compliance with HUD regulations
 - Unpredictable entitlement funding amounts and release dates
 - Succession Planning

Council Workshop Coversheet



Agenda Item Number	4.	Meeting Date	10/23/2018
Agenda Item Type	Presentation		
Subject	Public Works Department Update		
Ordinance/Reso #		Contract #	
Project #		Permit #	
Department	Public Works		

Info Only	☒
Policy Review	☐
Policy DevMnt	☐
Other	☐

Summary

Public Works Department staff will be providing the City Council with an overview of the Public Works Department's organizational structure, primary programs and activities, as well as, cross departmental coordination and support.

Through

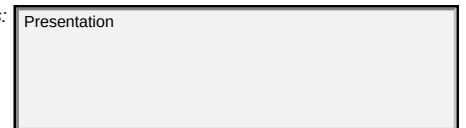
Dept Head Approval

City Mgr Approval

Cary Roe
Oct 18, 14:29:10 GMT-0700 2018

Marie Mosley
Oct 18, 21:27:04 GMT-0700 2018

Attachments: Presentation





Kennewick Public Works Department People and Programs Making a Difference

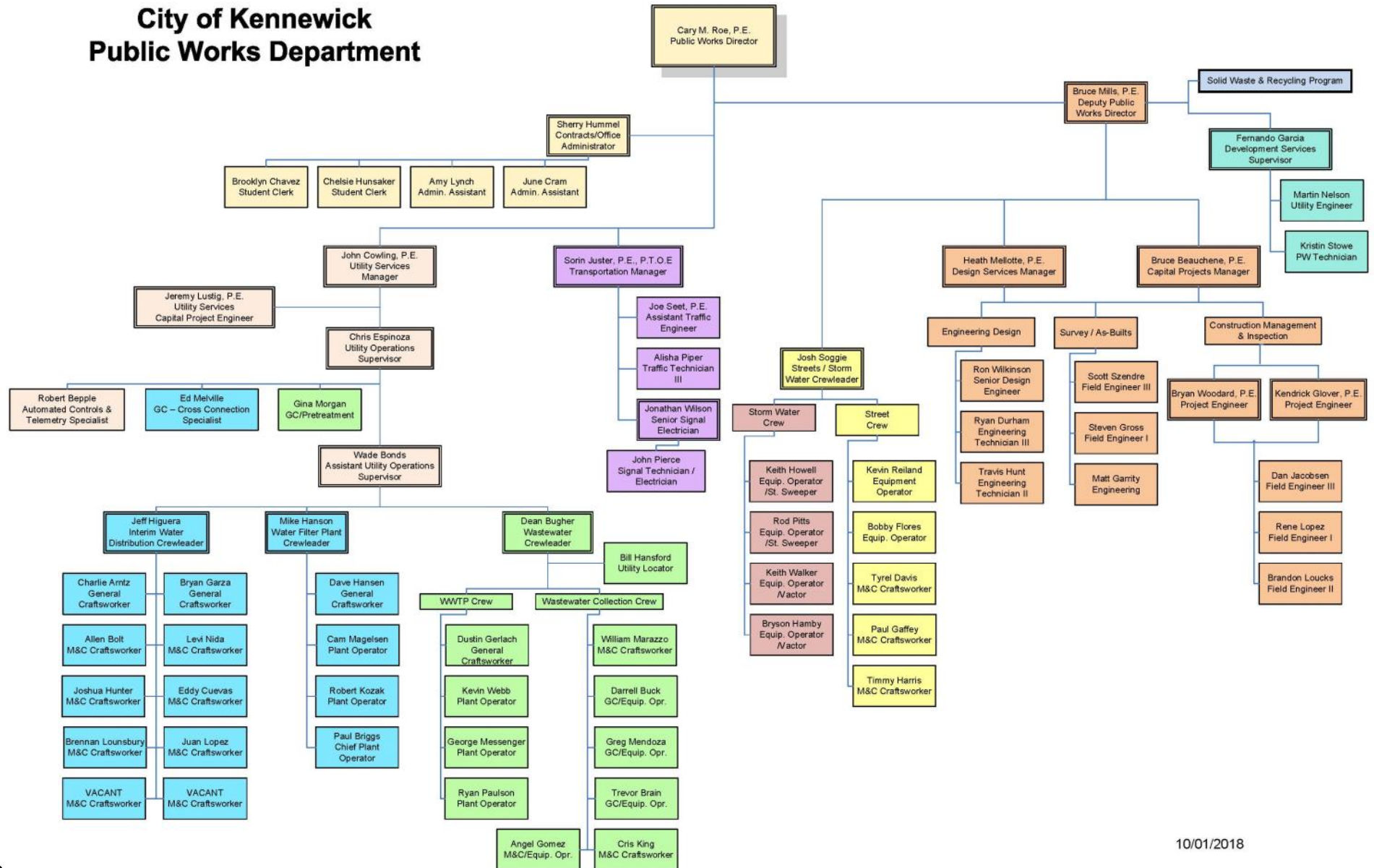
Council Workshop - October 23, 2018

Public Works Director
Cary M. Roe P.E.



Organization Chart

City of Kennewick Public Works Department



10/01/2018

Public Works Divisions

Traffic

Water

Sewer

Development
Services

Administration

Streets

Solid Waste &
Recycling

Stormwater

Engineering



Public Works Department

- General Fund Divisions
 - Administration
 - Traffic
 - Streets
 - Development Services
 - Engineering
- Enterprise Fund Divisions
 - Water
 - Sewer
 - Stormwater
 - Solid Waste and Recycling



Public Works Department

- 72 - Number of Full Time Employees
- 10 - Number of Part-time/Seasonal Employees

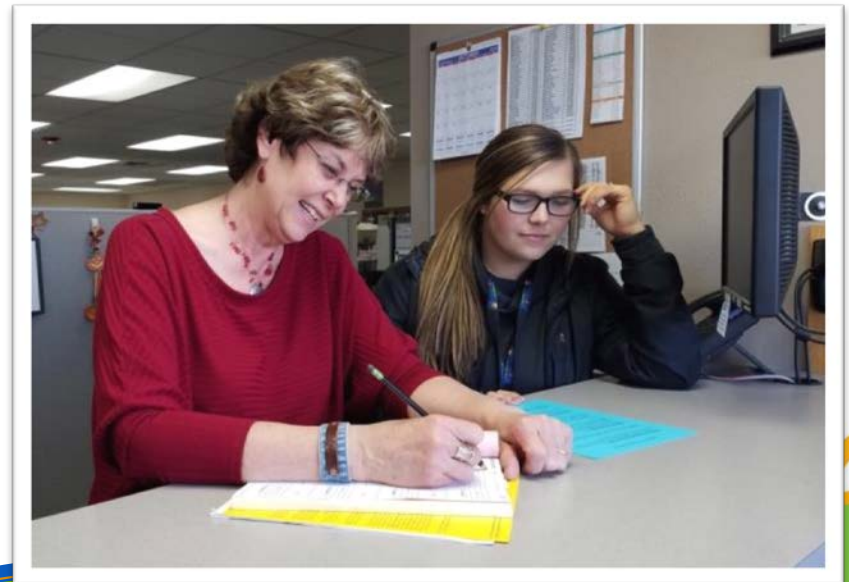
Biennial Budget	2017/2018
General Fund Operating Budget	\$ 8,827,571
Enterprise Fund Operating Budget	\$26,372,642
Capital Improvement Program Budget	<u>\$51,833,411</u>
Total Operating/Capital Budget	\$87,033,624



Division Responsibilities

Administration

- Management and leadership of Department
- Budget preparation, presentation and management
- Office supervision and support – primary interface with public
- Purchasing, travel, training support
- Professional Services and Construction Contract management
- Update of Comprehensive Plans
- Participation in Developer forums
- Regional Boards/Committee participation
- Emergency notifications
- Cross Departmental coordination and support



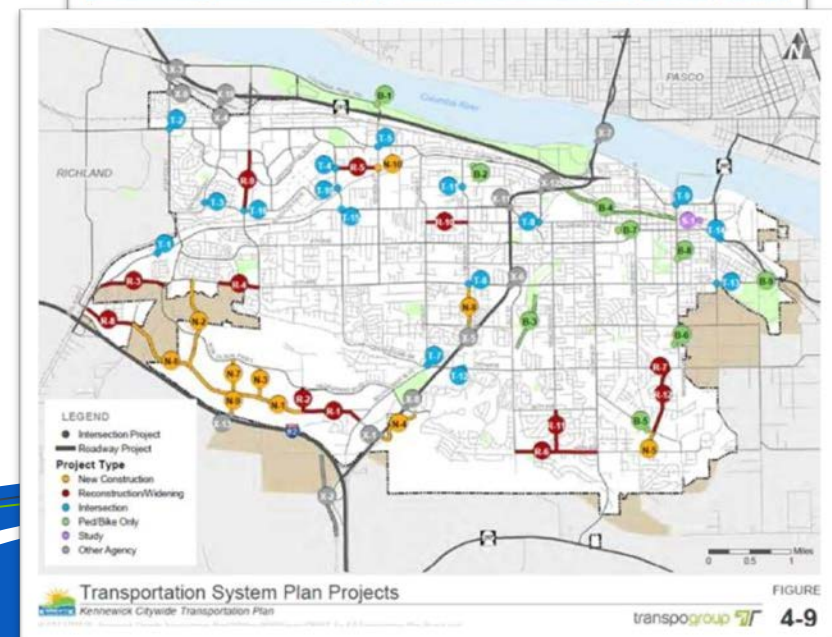
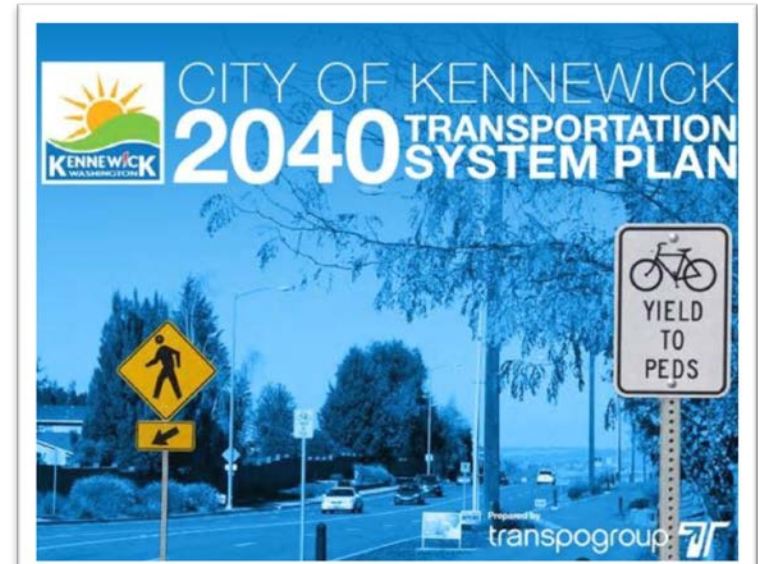
Traffic Division Responsibilities

- Operate and maintain:
 - 64 traffic signals
 - 19 Rectangular Rapid Flashing Beacons
 - 24 School Zones (20 mph)
 - 23 Roundabouts
 - 6,715 Street Lights
- Administer traffic detours and closures



Traffic Division (cont.)

- Review development applications for traffic impacts, mitigation and safety including street improvements, signage and striping, driveways, and sight distance.
- Administer Traffic Impact Fee program
- Capital Project review and support
- Produce Six-Year Transportation Improvement Plan
- Develop and update Transportation System Plan



Streets Division

Operate and maintain:

- Streets
 - 342 center lane miles of streets
 - 786 lane miles of streets



Streets Division

- Street Signs

- 13,000+ street signs
 - 1,654 stop signs
 - 386 yield signs
 - 1,400 warning signs
 - 4,879 street name signs
 - 900 speed limit signs
 - 343 school signs



- Lane Striping and Crosswalk Marking

- 1.7 million lineal feet of lane striping
- 10,510 gallons of traffic paint
- 400+ crosswalks with Thermo Plastic



Streets Division (cont.)

- Pavement crack sealing applied:
 - 67.5 tons
- Pavement repair, wheel path grind and patch
 - 29,700 square feet patched
- Weed control and shoulder grading:
 - 9.5 M square feet sprayed
 - 7 miles of shoulders graded



Streets Division (cont.)

- Snow and Ice Removal



Streets Division (cont.)

- Snow and Ice Removal Equipment/Materials
 - Two (2) Loaders
 - One (1) Road Grader (Rental of 2nd)
 - Three (3) 10 yard Plow Trucks
 - Four (4) 5 yard Plow Trucks
 - 650 Tons of salt storage
 - 12,000 Gallons of Deicer (Magnesium Chloride) storage



Development Services Division

- Review development applications to meet public works standards



	2017	2018
DPW Civil Reviews	74	74
Revenue from Civil Reviews	\$533,444	\$392,099
Value of civil works	\$10,668,880	\$7,841,980
DPW Permits Issued	579	629
Pre-Application Reviews	56	34
Feasibility Reviews	24	27



Development Services Division (cont.)

- New Infrastructure Added Due to Private Development

	2017	2018
Water Main	30,021 ft.	18,362 ft.
Fire Hydrants	70	36
Sewer Main	37,480 ft.	21,347 ft.
Sewer Man Hole	170	93
Storm Main	23,820 ft.	18,673 ft.
Storm Man Holes	177	109
Streetlights	133	97
Streets/Roads	5.8 Miles	3.6 Miles



Engineering Division

- Design Section

- In-house design of capital improvement projects
 - 2017 – 14 Projects – Est. \$7.7M
 - 2018 – 12 Projects – Est. \$8.1M
- As-built record drawings
- Grant writing
- ROW/Easement Vacations
- Surveying and legal descriptions



Engineering (cont.)

- Construction Section

- Inspection/quality control of City capital improvement and private development projects
- Oversight of permits for work in the right-of-way
- Small works roster projects



Stormwater Division

- Administer Eastern Washington Phase II Municipal Stormwater Permit
- Street Sweeping
 - 786 lane miles
(total of 3,112 swept in 2017)
- Maintain:
 - 152 miles stormwater pipe
 - 7,812 catch basins
- Repair/construct infrastructure improvements



Stormwater Division (cont.)

- Operate Street Waste / Decant facility (soon to be a 2nd)
 - 2016 – 640 tons
 - 2017 – 1,280 tons
- Operate Landfill facility
 - 2016 – 1,475 tons
 - 2017 – 1,643 tons



Stormwater Division (cont.)

- Zintel Dam
 - Inspect, monitor and maintain Dam



Flood of 1953 – Rainier St. at left Golf Course at bottom

- Inspect, monitor and maintain outfall pipes



Water and Sewer Division



18th & Kellogg 10 MG Reservoir



Water Treatment Plant



**Wastewater
Treatment
Plant**



**Columbia Gardens
Pretreatment**

Wastewater Treatment Plant

How Many Gallons a Year do we treat?

1. 236 Million
2. 847 Million
3. 2.1 Billion



Answer: **2.1 Billion** Gallons per year treated effluent!



Wastewater Collection System

- 302 Miles of Sewer Main
- 28,900 Feet of Force Main
- 6,541 Sewer Manholes
- 15 Lift Station sites

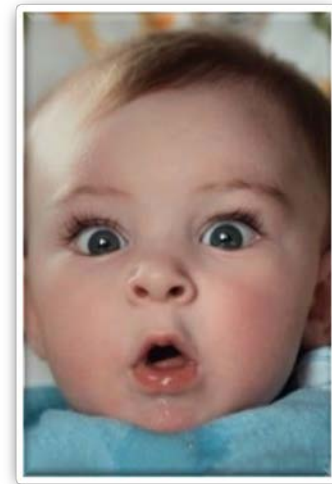


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Water Treatment Plant

How Many Gallons are produced each year?

1. 1 Billion Gallons
2. 4 Billion Gallons
3. 8 Billion Gallons



Answer: **4 Billion** Gallons per year produced!



Water Production

Value for your dollar



One Dollar

=

582 Gallons



4,406 bottles



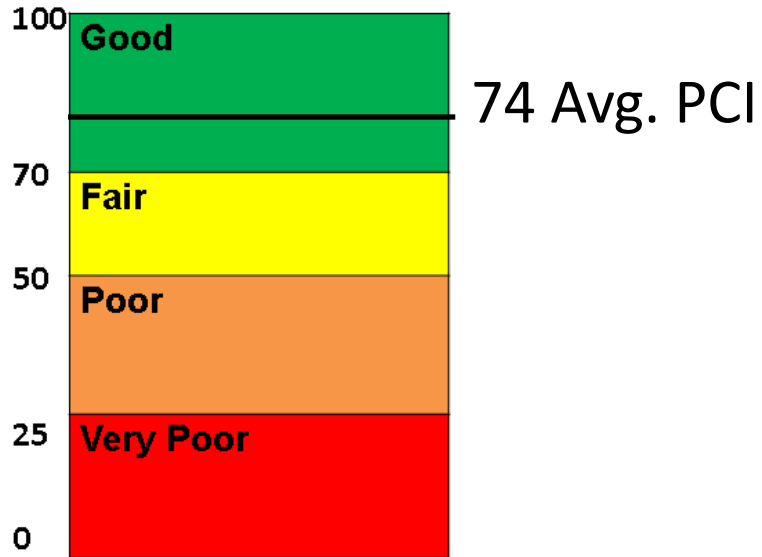
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Water Distribution System

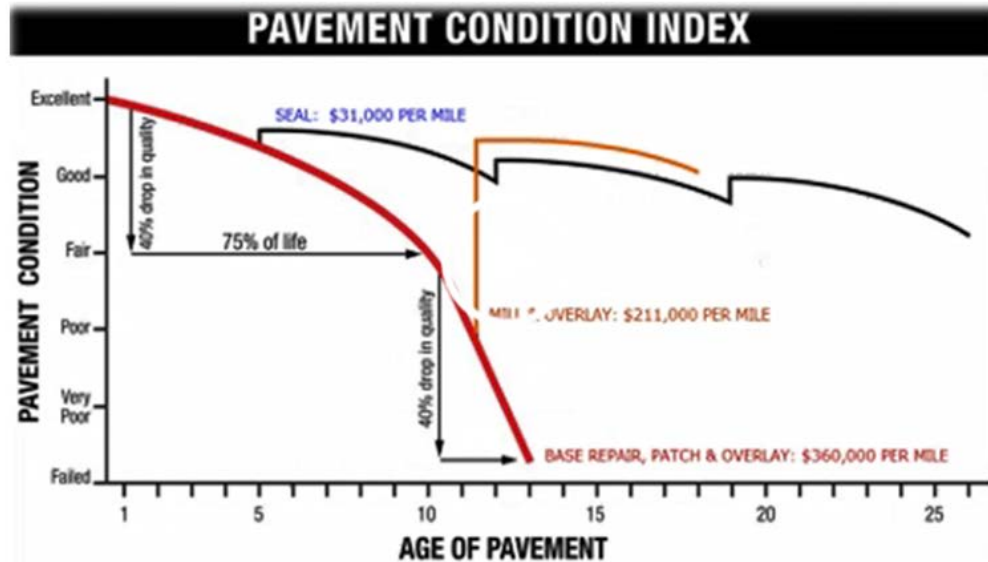
- 416 Miles of Water Main Line
- 24,833 Water Meters
- 2,773 Fire Hydrants
- 11,089 Water Valves
- 13 Booster Pump Stations
- 9 Reservoir Sites
- 31.5 Million Gallons of Storage
- ASR = 233 – 475 MG of Recovery per year
- 30 Water Quality Sampling Stations



Pavement Preservation



A stitch in time...



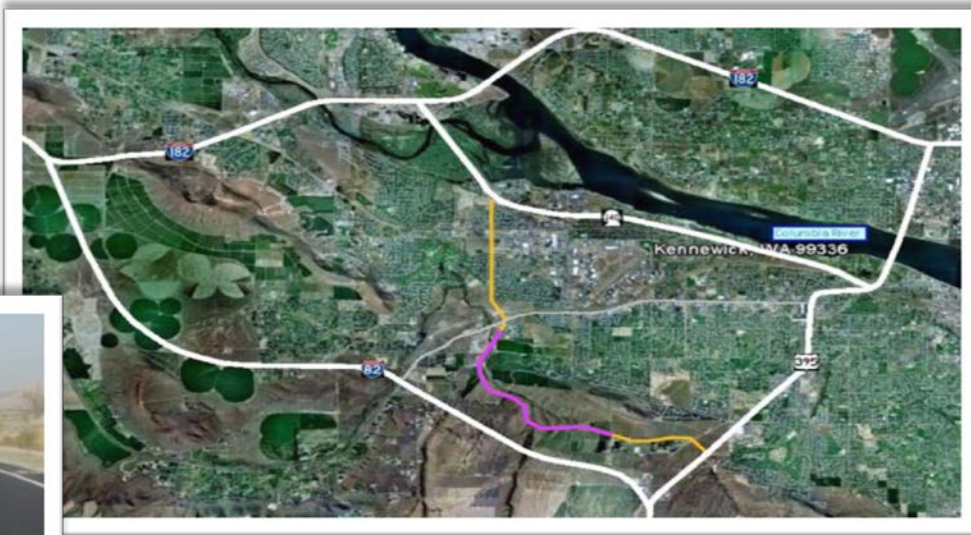
Pavement Preservation (cont.)

- 2017 - \$1,620,000 Invested
 - P1704-17 City-Wide Asphalt Restoration
(various locations to repair winter damage)
- 2018 - \$3,447,000 Invested
 - P1712-17 City-Wide Arterial Pavement Preservation
 - W. Columbia Drive (N. Kent Pl. to N. Fruitland St.)
 - S. Union St. (W. 27th Ave. to 10th Ave.)
 - W. 27th Ave. (S. Ely St. to S. Olympia St.)
 - P1801-18 City-Wide Asphalt Restoration
 - Columbia Center Blvd. (W. Quinault to W. Arrowhead Ave.)
 - S. Washington St. (E. 19th Ave. to E. 10th Ave.)
 - S. Quillan St. (W. 28th Ave. to W. 27th Ave.)
 - P1818-18 Bituminous Surface Treatment
 - Highland Drive (Olympia St. to Washington St.)
 - Washington Street (45th St. to north of Highland intersection)
 - 45th Avenue (Olympia St. east of the roundabout to Date St. and 44th Ave. intersection)
 - Garfield St. (45th Ave. south to the end of street)



Capital Improvement Projects

- Bob Olson Parkway
(Five-corners Roundabout to Sherman Street)



- Edison Street
(Clearwater Avenue to Canal Drive)



Capital Improvement Projects (cont.)

- Metaline Avenue
(Edison Street to Kellogg Street)



- Southridge Boulevard
(Christensen Road to Ridgeline Drive)



Capital Improvement Projects (cont.)

- Clearwater Safety
 - Arthur Street pedestrian crossing
 - Rectangular Rapid Flash Beacons, bus pullout, and turning movement/access restriction
 - Phase 3
 - Columbia Center Blvd. to Colorado Street – Turning movement /access restriction
 - Union Street Intersection – Channelization modifications, signal modifications, and turning movement/access restriction
 - Huntington to US 395 - Turning movement /access restriction



Capital Improvement Projects (cont.)

- Sidewalk work completed 2017-2018

Project	Description	# ADA Ramps	Sidewalk Repairs	New Sidewalk	Cost
P1613	2017 Pedestrian Improvements	12	36 locations 620 LF	5 Locations 595 LF	182,000
P1712	2017 Arterial Pavement Preservation	42	3 Streets 105 LF		205,000
P1801	2018 Asphalt Restoration	25	3 Streets 10 LF		166,000
P1804	Juniper & Hawthorne School Route	5		2 Streets 1,110 LF	159,000
P1819	2018 Pedestrian Improvements	0	12 Locations 135 LF		28,000
TOTALS		84	870 LF	1,705 LF	\$ 740,000



Capital Improvement Projects (cont.)

- Wastewater Treatment Plant – Phase 1
 - Upgrade to Ultra-violet disinfection
 - Activated sludge lift station
- Columbia Gardens Pre-Treatment Facility



Capital Improvement Projects (cont.)

- Aquifer Storage and Recovery

- 232 MG injected
- 220 MG recovered
- Final reservoir permit



- Water/Sewer System Improvements

- \$2.2 M Water, \$1.0 M Sewer Budgeted
- 6 Water Projects
- 6 Sewer Projects



Solid Waste/Recycling Division

- Manage Waste Management Franchise Agreement
- Facilitate resolution of citizen/business complaints
- Recycling events coordination
- Solid Waste Advisory Committee (SWAC) participation



Cross Departmental Coordination and Support

- Accident investigations, traffic control for incidents, new specialized signs, opened Keewaydin Drive (Police)
- Traffic control and assistance during events (Fire)
- Assist with issuance of permits, water meter turn off and turn on requests, installation of new water meters (Customer Service)
- Collaboration on private developments from pre-app to permit to completion (Planning and Building)



Cross Departmental Coordination and Support (cont.)

- Incentivized traffic impact fees, capital projects to promote growth and open up new areas (e.g. Southridge), partner on wayfinding signs ([Economic Development](#))
- Provide as-built records ([IT/GIS](#))
- Small cell applications, collaboration on ordinances and resolutions, contract/document templates ([City Attorney](#))
- Traffic control and community events participation, capital project assistance (e.g. Inspiration Park frontage) ([Parks](#))



Questions?



KENNEWICK
WASHINGTON



City Council Meeting Schedule November 2018

November 6, 2018
Tuesday, 6:30 p.m.

REGULAR COUNCIL MEETING

November 13, 2018
Tuesday, 6:30 p.m.

WORKSHOP MEETING
1. Committee Updates

November 20, 2018
Tuesday, 6:30 p.m.

REGULAR COUNCIL MEETING

November 27, 2018
Tuesday, 6:30 p.m.

WORKSHOP MEETING
1. Columbia Park Annual Plan Update
2. Small Cell Facilities

To assure disabled persons the opportunity to participate in or benefit from City services, please provide twenty-four (24) hour advance notice for additional arrangements to reasonably accommodate special needs.

Please be advised that all Kennewick City Council Meetings are Audio Taped

November 2018
Updated 10/16/18